



MEETING NOTICE AND AGENDA

Notice is hereby given that the Kaysville City Council will hold a regular council meeting on Thursday, March 19, 2020, starting at 6:30 p.m. in the **Business Resource Center of the Davis Technical College, 450 South Simmons Way, Kaysville, UT.**

Q&A WITH THE CITY COUNCIL – 6:30 P.M.

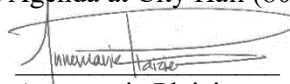
CITY COUNCIL MEETING – 7:00 P.M.

The agenda shall be as follows:

1. OPENING
 - a. Provided by Council Member Blackham.
2. DECLARATION OF ANY CONFLICTS OF INTEREST
3. CONSENT ITEMS
 - a. Approval of the Minutes of February 20, 2020.
 - b. Approval of Agreement with UDOT for East Frontage Road (EFR) infrastructure work – Public Works.
 - c. Approval of Agreement with UDOT for West Crestwood Tank Reimbursement – Public Works.
 - d. Award of Bid for the construction of a 1.0MG Water Tank located above the Orchard Ridge development, and construction inspection services – Public Works.
 - e. Award of Bid for asphalt seal coat subcontract – Public Works.
4. ACTION ITEM
 - a. An Ordinance amending Provisions of the Kaysville City Code regarding participating in meetings by telephone.
5. WORK ITEMS
 - a. Kaysville City Personnel Rules and Regulations – Changes to Section 3.17 Benefits Administration, Waiver of Coverage.
 - b. Weber Basin Water Conservancy District Sales Contract with Kaysville City for purchase of treated district water for municipal use.
6. CALL TO THE PUBLIC (3 MINUTE LIMIT, MUST SIGN UP IN PERSON)
7. COUNCIL MEMBER REPORTS
8. CITY MANAGER REPORT
9. ADJOURNMENT

Kaysville City is dedicated to a policy of non-discrimination in admission to, access to, or operations of its programs, services or activities. If you need special assistance due to a disability, please contact the Kaysville City Offices at (801) 546-1235.

I hereby certify that I posted a copy of the foregoing Notice and Agenda at City Hall (80 North Main Street) and emailed copies to media representatives on March 13, 2020


Annemarie Plaizier
City Recorder

KAYSVILLE CITY COUNCIL
February 20, 2020

Minutes of a regular Kaysville City Council meeting held on February 20, 2020 at 7:00 p.m. in the Business Resource Center of the Davis Technical College at 450 South Simmons Way, Kaysville, Utah.

Council Members present: Mayor Katie Witt, Council Member John Swan Adams, Council Member Michelle Barber, Council Member Andre Lortz, Council Member Tamara Tran, and Council Member Mike Blackham

Others Present: City Manager Shayne Scott, City Attorney Nic Mills, City Recorder Annemarie Plaizier, Community Development Director Lyle Gibson, Information Systems Manager Ryan Judd, Police Chief Sol Oberg, Fire Chief Paul J. Erickson, Brent Law, Cameron McKinnon, Ryan Eckardt, Kasey Adams, Dan Udy, Shawn McKinnon, Janine E. Nishiguchi, Cassie Ashton, Fawn Morgan, Cara Trujillo, Mariah Campbell, Craig G. Campbell, Carole Walker, Sidney Stevenson, Elizabeth Heath, Kristine Murdock, Bryce Huff, Simon Huff, Calvin Huff, Lucy Child, Lori Law, Ryan Law, Molly Child, Riley Child, Missy Stettler, Brittney Child, Jake Child, Kathy Kelley, Joshua Kelley, Blake Keeler, Floyd Landon, Karen Erickson, David Lawrence, Chelsea Lawrence, Avery Lawrence, Owen Lawrence, Rex Lawrence, Lincoln Talbot, Joleen Talbot, Jim Morgan, LeeAnn McKinnon, Darrell McKinnon, Stephen Lyon, Gardner Crane, Max Bodily, Mary Bodily, Josh King, Sherri Einfeldt, Ramona Porter, Randy Jefferies, Dave Morton, Keaton Morton

OPENING

Council Member Tran opened the meeting.

RECOGNITIONS AND PRESENTATIONS

WOMEN'S SUFFRAGE PROCLAMATION

Fawn Morgan, Chairman of the Kaysville-Fruit Heights Museum Executive Board, said that this year is the 150th anniversary of female suffrage first being granted to the women of Utah Territory.

A presentation was made to the City Council by the Kaysville-Fruit Heights Museum Board about the commemoration of women's suffrage in Utah and those involved from the Kaysville area.

Mayor Witt read a proclamation proclaiming 2020 as The Year of Equal Suffrage, and encouraged all citizens of Kaysville to join in commemorating the rich history of Kaysville's role in the movement for women's suffrage throughout the year to help gain a better perspective with which to build a better future.

PRESENTATION HONORING FIREFIGHTER BRENT LAW

Fire Chief Paul Erickson made a presentation honoring Firefighter Brent Law for his 30 years in the fire service. Chief Erickson said that Mr. Law grew up in Kaysville and has raised his family

here. He has served in the roles of Firefighter/Advanced-EMT as well as Engineer. His compassion always goes a long way with the public, and we appreciate all that he does for our department and for our community.

PRESENTATION HONORING FIREFIGHTER CAMERON MCKINNON

Fire Chief Paul Erickson made a presentation honoring Firefighter Cameron McKinnon and explained that he was voted by his peers as 2019 Firefighter of the Year. Mr. McKinnon was essential in helping with the design of our newest engine built and ensuring it was built to our specific qualifications. Mr. McKinnon also attended the National Fire Academy this year and he works for the Farmington Fire Department and Davis County Dispatch.

DEPARTMENT REPORT, COMMUNITY DEVELOPMENT

Community Development Director Lyle Gibson gave a presentation about the Community Development Department. He explained that the Community Development department examines how a property is used, from concept to reality. They are involved in rezones, subdivision review, construction review and inspection, economic development, business licensing and code enforcement. Kaysville is considered to be a high income area, with a younger population and larger families. Kaysville currently has low tax rates, and is constantly growing. There aren't many vacant lots left to create subdivision developments, and they have been working to address redevelopment of the city. Throughout 2019, Code Enforcement has responded to about 175 ordinance complaints, and sent out 753 letters regarding problems with trees within the right-of-way blocking vehicle and pedestrian traffic. There were about 550 building permits issued through the year. Kaysville has about 500 commercial businesses of different size and scale, as well as about 600 home businesses. There are likely many more home businesses, but small home businesses are not required to obtain a business license anymore. As part of the Community Development department, we work with the Planning Commission who holds meetings twice a month. The Planning Commission reviewed and presented an updated General Plan to the City Council to approve in anticipation of further growth commercially and residentially within our city. The General Plan will continue to be further reviewed through the 2020 year, and their department is also working to find and implement a new digital application review process.

Mayor Witt commented that she relies a lot on Lyle and his department because she knows that whatever she asks will get done. They always do well to accomplish the task set before them. Lyle has been a great help with the Strategic Plan and figuring out the best way to get it accomplished. We have a great group of employees here and we appreciate their diligence.

DECLARATION OF ANY CONFLICTS OF INTEREST

No conflicts were disclosed.

CONSENT ITEMS

Council Member Adams made a motion to accept the following consent items:

- a. Approval of the Minutes of the January 23, 2020 meeting.
- b. Approval of materials purchase, underground primary wire – Power Department.
- c. Award of Bid for chip seal subcontract – Public Works Department.

- d. Approval of water tank chlorine injectors and analyzers purchase – Public Works Department.

The motion was seconded by Council Member Tran.

The vote on the motion was as follows:

Council Member Adams, yea
Council Member Barber, yea
Council Member Lortz, yea
Council Member Tran, yea
Council Member Blackham, yea

The motion passed unanimously.

ACTION ITEMS

AN ORDINANCE ENACTING SECTION 17-4-7, APPOINTMENT OF PLANNING COMMISSION ALTERNATES, OF TITLE 17, PLANNING AND ZONING

Lyle Gibson explained that the City Council recently approved new Planning Commission members to fill the vacancy of two positions. In addition to the two regular appointments, the Council appointed two additional members to serve as alternates in the event that a regular member of the Planning Commission is unable to attend. To solidify this option, an ordinance has been drafted as part of Title 17 and is being proposed for approval tonight.

Council Member Lortz made a motion to approve an Ordinance enacting Section 17-4-7, Appointment of Planning Commission Alternates, of Title 17, Planning and Zoning, seconded by Council Member Blackham.

The vote on the motion was as follows:

Council Member Barber, yea
Council Member Lortz, yea
Council Member Tran, yea
Council Member Blackham, yea
Council Member Adams, yea

The motion passed unanimously.

AN ORDINANCE AMENDING SECTION 17-25-6, PROJECTIONS INTO REQUIRED YARDS, EXEMPTIONS OR MODIFICATIONS, OF TITLE 17, PLANNING AND ZONING

Lyle Gibson explained that the Planning Commission recently gave direction to city Staff to put together a draft ordinance which would allow for some flexibility in the city's ordinances to help provide an alternate option to the variance process for items the Commission has dealt with recently, and determined to be acceptable but not legal under the existing code. An ordinance has been prepared which proposed language to address these projections into side yards on corner lots.

Mayor Witt asked for public comment.

Bryce Huff commented that he feels that proposed ordinance is reasonable because it will allow those, such as himself, with unique yards to be able to further utilize their property. The variance request process is very hard to get approved, and this helps to provide other alternates. These types of odd lot layouts are occurring more frequently and the city is running out of buildable space. This will help residents to find creative ways to be able to fit additions into buildable areas of their land. It will still preserve the safety and visual requirements that the setbacks offer.

There were no other comments or questions from the public. Mayor Witt closed public comment for this item.

Council Member Adams asked about setback requirements.

Lyle Gibson responded that having the twenty-foot side yard setback on the side of a home nearest the street is not only for esthetics giving a subdivision a more consistent feel, but it also helps with fire protection. There is also the issue of a building blocking the view of oncoming traffic as you approach a corner.

Council Member Adams commented that he is concerned that, if approved, this ordinance could somehow be manipulated as written.

Lyle Gibson commented that it's a valid concern, but it's very uncommon situation where this would be allowed.

Council Member Blackham said that we need to make sure that this ordinance is enforceable by Staff. What types of acute angles or curves would be allowed and how much? How would it be measured? This proposed ordinance also states that "no more than twenty square feet of building or structure encroaches into the required yard", but is this measuring one floor or multiple floors? Is this for one area or for multiple sides of the house? There needs to be more clarity made before this is approved.

Council Member Barber made a motion to table the consideration of an Ordinance amending Section 17-25-6, Projections into Required Yards, Exemptions or Modifications, of Title 17, Planning and Zoning, so that Staff can alter the language of the Ordinance based on comments made tonight to help add clarification. The motion was seconded by Council Member Lortz.

The vote on the motion was as follows:

Council Member Lortz, yea
Council Member Tran, yea
Council Member Blackham, yea
Council Member Adams, yea
Council Member Barber, yea

The motion passed unanimously.

ADOPTION OF THE KAYSVILLE CITY STRATEGIC PLAN

Josh King, with The Langdon Group, said that the proposed Strategic Plan has been in the works for several months and was most recently presented to the City Council in January for their initial introduction to the draft. Based on some final input and comments, a mission statement, vision statement, and final guiding principles have been proposed. There were a few formatting and grammatical changes to the proposed plan since the draft was presented to the Council in January, but the content of the plan did not change.

Mayor Witt said that this plan is something we can refer to as we move forward. It's something that we will continue to review to make sure it's what we want for our community. Mayor Witt commented that she is appreciative of the community members that participated in creating this Plan and spent time to give their feedback. This has been worked on for over a year now and there were many who participated in it. This was built from the ground up by the people and not at the direction of the Council.

Council Member Tran made a motion to approve the adoption of the Kaysville City Strategic Plan, seconded by Council Member Lortz.

The vote on the motion was as follows:

Council Member Tran, yea
Council Member Blackham, yea
Council Member Adams, yea
Council Member Barber, yea
Council Member Lortz, yea

The motion passed unanimously.

REZONE OF 3.98 ACRES OF PROPERTY AT 700 SOUTH DESERET DRIVE FROM R-2 (ONE TO TWO FAMILY RESIDENTIAL) TO THE LI (LIGHT INDUSTRIAL) ZONING DISTRICT – PRIVET BARROW

Lyle Gibson explained that this property was recently rezoned based on a concept plan tied to a development agreement. As details of the actual development have shaped out, it has been determined that the recent zoning boundary placement does not match the expected use. The applicant is rezoning to adjust the 3.98 acres at 700 South Deseret Drive to match the development which is actually occurring. This adjustment is still within the parameters of the development agreement which has been previously approved.

Council Member Adams asked if this changes anything within the development agreement and if it says if the commercial or residential portion needs to be developed first.

Lyle Gibson responded that it does not change the development agreement. The development agreement sets a minimum amount of commercial required on the property. It does not state which type of development, commercial or residential, is required to be developed first. Previously there was a portion of the property that was planned to be used for storage units and the development agreement stated that the storage units had to be developed first, but since the use has changed it

is no longer a part of this development. Part of the concern back then was that the residential portion would be completed, and then the previous developer would try to rezone the rest of the property to a multi-family residential use.

Phil Holland, with Privet Barrow, said that the rezone for this requested rezone is to accommodate the commercial developments and match the expected boundary. They plan to develop the entire parcel together.

Council Member Adams made a motion to approve the request to rezone 3.98 acres of property at 700 South Deseret Drive from R-2 (One to Two Family Residential) to the LI (Light Industrial) zoning district for Privet Barrow, seconded by Council Member Blackham.

The vote on the motion was as follows:

Council Member Blackham, yea
Council Member Adams, yea
Council Member Barber, yea
Council Member Lortz, yea
Council Member Tran, yea

The motion passed unanimously.

REZONE AND CONSIDERATION OF A DEVELOPMENT AGREEMENT TO ADD THE PRUD (PLANNED RESIDENTIAL UNIT DEVELOPMENT) OVERLAY ZONE TO 1.5 ACRES OF PROPERTY AT 191 SOUTH FLINT STREET – PHIL HOLLAND

PRELIMINARY PLAT APPROVAL FOR THE ELMS ON FLINT SUBDIVISION AT 191 SOUTH FLINT STREET – PHIL HOLLAND

Lyle Gibson explained that the Planning Commission and City Council recently reviewed a proposal at 191 South Flint Street for a five lot subdivision in the R-1-10 PRUD zone. The City Council voted to deny the request, stating that five homes were too many for this property. The applicant is back with a proposal that works under the existing R-1-20 zone where all lots are at least 20,000 square feet in size. The subdivision is a private street subdivision which requires the PRUD overlay zone. The proposal would utilize the existing street and infrastructure on site. A development agreement has been created which allows for the PRUD overlay and private street type development. The agreement would keep all yards the same as a standard R-1-20 subdivision, however the developer has asked to be able to put portions of the home as close as fifteen feet to the private street rather than twenty feet. This would effectively allow a front porch to be closer to the private street. The garage must be at least twenty feet from the street.

Council Member Blackham said that he feels that it would be a violation for the council to approve a fifteen foot front yard setback because it seems to go against city ordinances. The PRUD overlay is a subzone for the zone that already exists on the property. There are multiple places in the city ordinances that states that no building shall be closer than twenty feet to any street improvement. It also says that private lane subdivisions must meet the requirements of the zone district, including the setback requirements. The PRUD allows for specific allowances, but it doesn't seem right to

be able to change the specific requirements of zones and subzones through a development agreement.

Nic Mills said that in Section 17-34-4 it states that the City Council may approve variations from applicable development standards in the underlying zone through a development agreement, which is why Staff feels that the Council could consider approving a smaller setback than what is required by the zone.

Council Member Blackham said that he feels that by approving a setback smaller than the standard setbacks of the zone and of our private street subdivision ordinance we are discrediting our standards. We are giving the impression that they can be changed easily and could be altered anywhere in the city.

Council Member Barber said that any time we are considering a PRUD and development agreement we are taking unique action to a development.

Council Member Tran commented that if we approve this setback variation we might be setting a precedence. We might want to take a closer look at our ordinances to make sure they are clear in what alterations to our ordinances would be appropriate in unique situations.

Council Member asked about why the developer is requesting a smaller front yard setback.

Phil Holland responded that the fifteen foot setback helps with a better aesthetic look because it puts the living area out front and sets the cars further back into the lot. The twenty foot setback for the garage will give the allowance for cars to park in the driveway. The reduced setback will also help to give the properties a bigger backyard.

Council Member Barber asked if the city has allowed a reduced front yard setback in other areas of the city.

Lyle Gibson responded that the Hill Farms Subdivision has reduced setbacks in certain areas of their subdivision.

Phil Holland added that the Jamestown Subdivision also has reduced setbacks.

Mayor Witt commented that this seems to be a changing trend and is what the consumer wants.

Council Member Lortz made a motion to approve a Development Agreement to add the PRUD (Planned Residential Unit Development) overlay zone to 1.5 acres of property at 191 South Flint Street for Phil Holland, seconded by Council Member Tran.

Council Member Tran commented that she appreciates the work that the developer has done in communicating with the neighbors through this process, and feels that this development agreement will help allow for flexibility to give a different product to consumers.

The vote on the motion was as follows:

Council Member Adams, yea

Council Member Barber, yea
Council Member Lortz, yea
Council Member Tran, yea
Council Member Blackham, nay

The motion passed with a vote of four to one.

Council Member Barber made a motion to approve the request to rezone 1.5 acres of property at 191 South Flint Street to add the PRUD (Planned Residential Unit Development) overlay zone for Phil Holland, seconded by Council Member Adams.

Council Member Blackham said that he has nothing against this property being developed, but feels that we need to follow our set ordinances.

The vote on the motion was as follows:

Council Member Barber, yea
Council Member Lortz, yea
Council Member Tran, yea
Council Member Blackham, nay
Council Member Adams, yea

The motion passed with a vote of four to one.

Council Member Adams asked if there is a requirement for a turnaround at the end of the private street and if the plat meets the requirements of the fire code.

Council Member Blackham said that he believes that it does. If there needs to be a turnaround it will be included on the final plat.

Council Member Tran made a motion to approve the preliminary plat for The Elms on Flint Subdivision at 191 South Flint Street for Phil Holland, seconded by Council Member Barber.

The vote on the motion was as follows:

Council Member Lortz, yea
Council Member Tran, yea
Council Member Blackham, nay
Council Member Adams, yea
Council Member Barber, yea

The motion passed with a vote of four to one.

REZONE OF 2.22 ACRES OF PROPERTY AT 1422 SOUTH SUNSET DRIVE FROM THE R-A (RESIDENTIAL AGRICULTURE) TO THE R-1-LD (SINGLE FAMILY LOW DENSITY) ZONING DISTRICT TO INCLUDE THE PRUD (PLANNED RESIDENTIAL UNIT DEVELOPMENT) OVERLAY ZONE – CARL HORNE

PRELIMINARY PLAT APPROVAL FOR THE HORNE FLAG LOT SUBDIVISION AT 1422 SOUTH SUNSET DRIVE – CARL HORNE

Lyle Gibson explained that the property located at 1422 South Sunset Drive is 2.23 acres and is zoned R-A (Residential Agriculture). The owner, Carl Horne, desires to create a flag lot. For now there will be one lot in front, but eventually he would like to split the front lot creating another additional building lot where the existing home sits now. A rezone to R-1-LD with a PRUD overlay would allow him to do so. The flag lot created will include a thirty-foot projection for access onto Sunset Drive and will measure approximately 56,864 square feet. The R-1-LD zoning will allow for the eventual split of the front lot into two lots measuring at approximately 20,000 square feet.

Council Member Lortz asked if the back lot could be split as well.

Lyle Gibson responded that either the front or back lots could be split, but not both. Under the R-1-LD zoning they would only be allowed a total of three lots on the property because they do not have the frontage required for the three lots.

Council Member Adams asked if there was a restriction on how close a building could be built to the nearby rail trail.

Lyle Gibson responded that dwellings have to meet the setback requirements of the zone or of the flag lot standards. Accessory structures do not have to meet the same requirements and could potentially be built one foot away from the property line. If the Council wanted to create a stipulation about the setbacks of accessory structures on the property then they would want to do so before approving a rezone request. However, the west side of this property is fairly steep and it is unlikely that anything would be built along the eastern edge of the property.

Council Member Lortz made a motion to recommend approval of the request to rezone 2.22 acres of property at 1422 South Sunset Drive from the R-A (Residential Agriculture) to the R-1-LD (Single Family Low Density) zoning district to include the PRUD (Planned Residential Unit Development) overlay zone for Carl Horne, seconded by Council Member Blackham.

The vote on the motion was as follows:

Council Member Tran, yea
Council Member Blackham, yea
Council Member Adams, yea
Council Member Barber, yea
Council Member Lortz, yea

The motion passed unanimously.

Council Member Barber made a motion to approve the preliminary plat for the Horne Flag Lot Subdivision at 1422 South Sunset Drive for Carl Horne, seconded by Council Member Lortz.

The vote on the motion was as follows:

Council Member Blackham, yea
Council Member Adams, yea
Council Member Barber, yea
Council Member Lortz, yea
Council Member Tran, yea

The motion passed unanimously.

REZONE OF 23.3 ACRES OF PROPERTY AT 1300 EAST 1084 NORTH FROM A-1 (LIGHT AGRICULTURE) TO THE R-1-8 (RESIDENTIAL SINGLE FAMILY) ZONING DISTRICT – MORTON DEVELOPMENT

Lyle Gibson explained that Dave and Keaton Morton with Morton Development are seeking a rezone at 1300 East 1084 North to accommodate future residential development. The existing zoning is A-1 (Light Agriculture), which allows for one residential unit per acre. The abutting property to the north is zoned R-1-10 (Single Family Residential), and the property to the south and east is 140 acres of the Kaysville Wilderness Park, zoned PU (Public Use). The Planning Commission held a Public Hearing for this item in December 2019, and the applicant chose to wait until now to bring it before the City Council in order to be able to meet with the neighbors about this proposal.

Dave Morton, with Morton Development, said that this development will be a great opportunity for the property owners and for the city. They have been working on this project for over six months because this property is very unique. There have been meetings with Staff and with neighbors to help get an understanding of the unique aspects of the property and to help address concerns. Some of those concerns include: densities, infrastructure, grading next to adjoining lots, UDOT timing and maintaining trail access. Meetings with city Staff has helped them to understand what density would be allowed here, as well as what kind of access and utility stubs they would need. They have also been coordinating with UDOT to see how the Highway 89 expansion would affect their development. Weber Basin Water District has been working with them in regards to the aqueduct on this property, and Central Davis Sewer District has been helping them figure out proper connections points needed with the Highway 89 expansion work being done. The property also has a fault line running through a portion of it, and they are in the process of having a fault study done to see how it will affect their property and what setbacks will be needed. This property has been in the Talbot family for years. UDOT recently purchased the right-of-way area from the Talbots, and there is also a transmission line owned by Rocky Mountain Power on this property. They are asking for the R-1-8 zoning to have the flexibility to be able to work around these attributes of the property in order to build the homes. There are several areas on the property that no habitable structure will be able to be built. A concept layout of the property has been provided help show how they would like to see the development laid out. The easternmost part of the property will have large estate lots, with the smallest lots abutting Highway 89. The homes north of the aqueduct will have to be accessed with driveways running over the aqueduct. A horseshoe road and trail will provide connectivity to the open space areas. There will be various lot sizes throughout the development. They have also considered proposing private streets, but haven't decided for sure. These homes will be high quality homes and will have a nice look to them.

Council Member Blackham asked if these homes would have access to pressure irrigation.

Dave Morton responded that if it is available, yes.

Council Member Adams commented that he appreciates that the developer took time to involve the neighbors.

Joleen Talbot, the owner of the property, said that she grew up into a family that had the tradition of farming. She raised her kids here on this property in Kaysville and has farmed the property for over forty years. They would have liked to have remained here but with UDOT expanding Highway 89 this property is no longer conducive to farming. They feel strongly that Morton Development will build a beautiful neighborhood that the neighbors will be able to make long lasting relationships with the owners of these new homes.

Council Member Barber asked about including a development agreement with the property.

Dave Morton said that they would be happy to include a development agreement, but hadn't included one yet because they wanted to see how the Council felt about their proposed rezone request. They are also still waiting on the final study for the fault line which might alter the concept plan for the development somewhat.

Council Member Blackham commented that he attended the Planning Commission meeting where this rezone was being reviewed and there were many neighbors in attendance who expressed concern about allowing the R-1-8 zone here because it might allow the developer to build over one-hundred homes. Council Member Blackham said that he is glad to see that they are only looking at eighty-two homes, but would like to see that there be a limitation outlined in a development agreement and that pressure irrigation be required.

Nic Mills said that a limit on the number of lots could be outlined as part of the rezone approval.

Dave Morton said that he doesn't think that pressure irrigation is available to this area right now and can't promise to provide it if it's not available.

Council Member Adams made a motion to approve the request to rezone 23.3 acres of property at 1300 East 1084 North from A-1 (Light Agriculture) to the R-1-8 (Residential Single Family) zoning district for Morton Development, with the stipulation that there be no more than eighty-two lots allowed, seconded by Council Member Tran.

Council Member Blackham asked that the motion include pressure irrigation being required if available.

Council Member Blackham made a substitute motion to approve the request to rezone 23.3 acres of property at 1300 East 1084 North from A-1 (Light Agriculture) to the R-1-8 (Residential Single Family) zoning district for Morton Development, with the stipulations that there be no more than eighty-two lots allowed, and that pressure irrigation be provided to the homes if available. Council Member Adams seconded the motion.

The vote on the motion was as follows:

Council Member Adams, yea

Council Member Barber, nay
Council Member Lortz, nay
Council Member Tran, nay
Council Member Blackham, yea

The motion failed with a vote of two to three.

The vote on the original motion was as follows:

Council Member Barber, yea
Council Member Lortz, yea
Council Member Tran, yea
Council Member Blackham, nay
Council Member Adams, yea

The motion passed with a vote of four to one.

PRELIMINARY PLAT APPROVAL FOR THE ANGEL PLACE SUBDIVISION AMENDED
AT 37 SOUTH ANGEL STREET – STEVEN AND SHERRILEE EINFELDT

Lyle Gibson explained that the City Council recently approved a rezone of the property at 37 South Angel Street for the purpose of accommodating as many as five lots on a private street. The applicant is now ready to move forward with the development and has submitted a preliminary subdivision plat for review. The proposed subdivision plat shows a five lot subdivision, similar to the concept plan, with Lots 101 and 102 anticipated to be developed first. The remainder of the property may develop into an additional three lots under a future phase. There is a four-foot landscape buffer between the private road and the neighboring property on the north side of the street. All lots in the proposed plat are at least 14,000 square feet in size and meet the ninety-foot frontage requirement required by the R-1-14 zone.

Council Member Blackham made a motion to approve the Preliminary Plat for the Angel Place Subdivision Amended at 37 South Angel Street for Steven and Sherrilee Einfeldt, seconded by Council Member Lortz.

The vote on the motion was as follows:

Council Member Lortz, yea
Council Member Tran, yea
Council Member Blackham, yea
Council Member Adams, yea
Council Member Barber, yea

The motion passed unanimously.

WORK ITEMS

CONSIDERATION OF AN INTERLOCAL COOPERATION AGREEMENT WITH FARMINGTON REGARDING THE CONNECTOR ROADS PROJECT

Mayor Witt explained that this item would not be discussed at tonight's meeting, but will be discussed at a future meeting.

CONSIDERATION OF INCENTIVES FOR BIGSHOTS GOLF

Lyle Gibson explained that recently the owner of BigShots Golf came before the City Council to present their proposed business plans for a Kaysville location, and received positive feedback from the Council members. The Council asked Staff and the Economic Development Committee to consider how we might be able to accommodate this business and possibly provide some kind of incentive. Kaysville's Incentive Policy states that the purpose of it is "to assist in attracting and retaining high quality development that offers desirable services and employment to the community. Approved project types will be able to follow a predictable path to obtaining predictable incentives. We strive to work collaboratively with our business community to ensure long-term positive outcomes for all parties. Kaysville will consider offering incentives for projects that demonstrate a return to the city. Such projects should be extraordinary, significantly enhance the community, and meet the goals and objectives of the city." The policy is very specific and creative in dealing with possible incentives on a case-by-case basis. An incentive agreement would be written up and agreed upon with both parties. It is estimated that there will be about \$16,000 for property tax generated per year to Kaysville City from this use, with about \$40,000 coming to Kaysville from annual sales tax. This business will open 120 jobs to the community, and will bring an estimated 800,000 guests from a forty-mile radius whom will likely support other businesses as well within our city. BigShots Golf is considered a desirable use because of the recreational use and full-service restaurant. After meeting, the Economic Development Committee has proposed a list of incentives for the Council to consider approving. Some of those incentives include expedited permit review, tax increment financing, sales tax reimbursements, monetary or in-kind project contribution, deferred city impact fees or reductions in fees, material or labor participation, County tourism advertising, directional signage from I-15, "BigShots Drive" road name, or promotion in the City newsletter. A conditional use permit has already been given for their desired pole height and alcohol sales. The city has reached out to other taxing entities to ask if they would be interested in participating in an incentive package to bring this business here, but they felt that based on the scale of the project it wasn't enough for them to participate. Staff is looking for direction from the Council on the overall incentive package and would like to hear if there is any specific feedback in regards to changes they would like to see before the creation of an incentive agreement. If participation with sales tax is of interest, the Council needs to direct Staff to conduct the appropriate study (10-8-2) and hold necessary meetings and public hearings as part of it. This item will need to return to the Council at a future meeting as an Action Item for consideration of an incentives agreement.

Council Member Blackham asked if the city had ever provided a sales tax incentive previously.

Shayne Scott responded that the city has not.

Council Member Blackham responded that he would prefer that any incentives be given one-time

or up-front so that it's not drawn out over a long period of time. Council Member Blackham added that he is concerned about giving an incentive that has never been given before.

Council Member Adams asked if there were specific incentives that BigShots Golf is asking for.

Lyle Gibson responded that they are not requesting anything specific yet. BigShots Golf has been in the process of trying to find a new location in this area to locate their business and the city is trying to provide them incentives to help encourage them to consider our city over other locations. We asked them to give us a pro forma document so we could see what they anticipated bringing in financially. The numbers we have come up with for incentives were based off of that pro forma.

Council Member Adams said that he doesn't like the idea of having to give up sales tax revenue.

Council Member Tran commented that this property has been vacant for a long time with no one interested in developing it. We need to be strategic with what incentives we offer because this will greatly benefit the community.

Council Member Blackham commented that he is not against providing incentives, but would like to have a better idea of exactly how much we would be giving up. We already know how much impact fees are, and therefore would know how much we'd be giving up if we didn't require those.

Council Member Adam commented that he would be more willing to consider a sales tax incentive if there was a limit on the amount we give.

Council Member Lortz made a motion to extend the meeting to 10:30 p.m., seconded by Council Member Barber. The motion passed unanimously.

Council Member Barber commented that she would be interested in the City Council creating a recommendation for what incentives we'd be willing to give, and then presenting that to residents to get feedback from them to see how they feel about it. We need to be transparent about it so residents know of the Council's plans.

CALL TO THE PUBLIC

Nothing was brought under this item.

COUNCIL MEMBER REPORTS

Council Member Barber commented that they have received several applications for both the Parks and Recreation Advisory Board, as well as for the Citizens Committee which will work towards possibly putting fiber on the ballot this year.

Council Member Adams made a motion to take a break at 10:03 p.m., seconded by Council Member Tran and passed unanimously.

CLOSED SESSION

Council Member Lortz made a motion to adjourn to the City Council meeting at 10:08 p.m. and reconvene into a closed meeting for a strategy session to discuss the purchase, sale or lease of real property, seconded by Council Member Tran. The motion passed unanimously.

Council Member Barber made a motion to adjourn the closed meeting at 10:30 p.m. and reconvene into the City Council meeting, seconded by Council Member Adams. The motion passed unanimously.

Council Member Barber made a motion to extend the meeting to the end of their closed meeting discussion, seconded by Council Member Lortz. The motion passed unanimously.

Council Member Lortz made a motion to adjourn the City Council meeting at 10:30 p.m. and reconvene into the closed meeting, seconded by Council Member Adams and passed unanimously.

Council Member Barber made a motion to adjourn the closed meeting at 10:50 p.m. and reconvene into the City Council meeting, seconded by Council Member Lortz. The motion passed unanimously.

ADJOURNMENT

Council Member Lortz made a motion to adjourn the City Council meeting at 10:51 p.m., seconded by Council Member Barber and passed unanimously.

STAFF REPORT



COUNCIL MEETING DATE: March 19, 2020

TYPE OF ITEM: Consent Item

PRESENTED BY: Josh Belnap

SUBJECT/AGENDA TITLE: Agreement with UDOT for EFR work

EXECUTIVE SUMMARY:

As part of UDOT's highway 89 project, a significant amount of City infrastructure will be impacted and require relocation to accommodate the new design, particularly along the new East Frontage Road (EFR). In association with UDOT's installation of the EFR, the City has requested a betterment from UDOT to install over 1000 ft of new water line so that we can create a "loop" with the recently annexed Orchard Ridge property and Crestwood Rd. This loop will serve as an important means of safeguarding water quality as well as providing a measure of delivery redundancy.

The City also planned and bid out a project to install automated valves at our tank sites so that we can remotely monitor and control our tank levels, but the price to have UDOT install those valves as a betterment was over \$100,000 less than our bid, because of benefits from economy of scale and UDOT's unit rates.

This agreement permits UDOT to demolish our west Crestwood tank and relocate our existing water lines, with UDOT covering the cost of relocating/replacing any existing infrastructure (the cost for replacing the tank is covered in a separate agreement). UDOT will also reimburse the City \$30,560.63 to cover the cost of our SCADA company to make their necessary changes and upgrades. This agreement also states that the City has requested the betterments, and has agreed to pay their associated costs.

The City has been working closely with UDOT on the design details and City requirements for the last 18 months and we feel confident in the details of this agreement to help protect the needs of our system and residents, while accommodating an important regional project. The betterments have been budgeted for as part of the FY20 budget, and those funds would come from the water enterprise fund.

Council Options: Approve/Disapprove

Recommended Options: Approve

Fiscal Impact & Fund Source for Recommended Action: Water Enterprise Funds

Attachments: UDOT EFR Agreement

**KAYSVILLE CITY CORPORATION
THIRD-PARTY RELOCATION AGREEMENT
KVCY-03_EFR**

THIS RELOCATION AGREEMENT, is made by and between the Utah Department of Transportation ("UDOT"), and Kaysville City Corporation ("Third-Party"), a Municipality in the State of Utah. Each as party, ("Party") and together as parties, ("Parties").

RECITALS

WHEREAS, UDOT will award a contract for the highway project identified as US-89; Farmington to I-84 in Davis and Weber Counties, Utah ("Project"); and

WHEREAS, UDOT's design-build contractor ("Design-Builder") will complete the design and administer construction of the Project; and

WHEREAS, Project construction necessitates relocating, adjusting or protecting the Third-Party facilities ("Third-Party Work").

THIS AGREEMENT is made to set out the terms and conditions where under the Third-Party work shall be performed.

AGREEMENT

Now therefore, the Parties agree as follows:

1. Contact Information

UDOT's Resident Engineer is Bret Krebs, telephone number (435) 994-9064, and email bkrebs@utah.gov, or their designated representative, as assigned.

UDOT's Utility Leader is J Tucker Doak telephone number (801) 648-5425, and e-mail jdoak@utah.gov.

UDOT's Field Representative contact person is Brandon Wilson, telephone number (385) 235-0800, and e-mail brandon@dserio.com.

Design-Builder's contact person is Ryan Pittson, telephone number (385) 268-3669, and e-mail rpittson@wadsco.com.

Third-Party's contact person is Josh Belnap, telephone number (801) 544-8112, and e-mail jbelnap@kaysvillecity.com.

2. Scope of Third-Party Work

- a. A copy of the detailed Third-Party Work plans, including specifications, is included in Exhibit "A" that is incorporated by reference.



This agreement covers:

1. Abandonment of existing Third-Party pipelines, as shown throughout Exhibit A.
2. Protection in place of existing Third-Party pipelines and the Davis Aqueduct, as shown throughout Exhibit A.
3. Solution S0104
 - a. Installation of a 16-inch IPS DR-11 HDPE water line, including a 24-inch steel casing, across US-89 at Oakmont Lane.
 - b. Installation of a 12-inch C900 DR-18 PVC water line, and associated appurtenances, along the East Frontage Road, from Oakmont Lane to approximately 1,150 feet north of Oakmont Lane (US-89 Mainline Sta. 1186+28.97).
 - c. Temporary connection to the Third-Party existing 12-inch water line along the West Frontage Road will be replaced with a permanent connection as part of the 400 North, Oak Hills, Gordon (4OG) design package. The removal of the temporary connection and work associated with the 4OG package will be covered under a separate relocation agreement.
4. Solution S2026
 - a. Installation of a 12-inch DI CL250 water line, and associated appurtenances, within the Crestwood Water Tank Site.
 - b. 12-inch DI Booster Intertie.
 - c. West Tank Demolition
5. Solution S0125
 - a. Installation of a 12-inch C900 DR-18 PVC water line, and associated appurtenances, along the East Frontage Road from US-89 Mainline Sta. 1186+17.89 to the north side of the Crestwood Water Tank Site.
6. Solution S0126
 - a. Installation of a 12-inch C900 DR-18 PVC water line, and associated appurtenances, along the East Frontage Road from US-89 Mainline Sta. 1186+05.61 to the south side of the Crestwood Water Tank Site.
 - b. Installation of the Crestwood East Reservoir Meter Vault with meter.
 - c. Installation of an isolation valve at the Crestwood East Reservoir Meter Vault
 - d. Installation of supports for electrical equipment at the Crestwood East Reservoir Meter Vault.
 - e. Installation of a flow control valve and vault at the Crestwood Water Tank Site
7. Solution S2027A
 - a. Installation of an 8-inch PVC C900 DR-18 drain line, and associated appurtenances, along the East Frontage Road from approximately 500 feet south of Crestwood Drive to the south side of the Crestwood Water Tank Site.
8. Solution S2027B
 - a. Installation of an 18-inch PVC C900 DR-18 drain line, and associated appurtenances, across the East Frontage Road, approximately 500 feet south of Crestwood Drive.
9. Solution S0130



- a. Installation of a 12-inch C900 DR-18 PVC water line, and associated appurtenances, along the north side of the Crestwood Water Tank Site.
- 10. Solution S2069
 - a. Installation of a 12-inch C900 DR-18 PVC water line, and associated appurtenances, from the north side of the Crestwood Water Tank Site (US-89 mainline Sta. 1199+77.27) to US-89 mainline Sta. 1219+62.20; a portion of this line is betterment work, see sections 2 and 3 below for betterment details.
- 11. Solution S2031 - see WPP-07 and WPP-11
 - a. KVCY/Weber Basin Water Conservancy District Tie at Crestwood Tank.
- 12. Solution S2032 – see WPP-02
 - a. KVCY/Weber Basin Water Conservancy District Tie at Lower Pasture Tank Site.
 - b. Installation of the Lower Pasture Reservoir Meter Vault with meter.
 - c. Installation of supports for electrical equipment at the Lower Pasture Reservoir Meter Vault.
 - d. Installation of a flow control valve and vault at Lower Pasture
 - e. Installation of an isolation valve at the Lower Pasture Reservoir Meter Vault

The design plans shown in Exhibit A include the following Third-Party Betterment Work:

- 1. Installation of an isolation valve (Double Eccentric Butterfly Valve) at the Crestwood East Reservoir Meter Vault
 - a. As shown on Sheets KVCY-EFR-WPP-11 and KVCY-EFR-DT-13 in Exhibit A.
- 2. Installation of a new 12-inch C900 DR-18 PVC water line (and associated appurtenances) from the north side of the Crestwood Water Tank Site (US-89 Mainline Sta. 1199+77.27) to Plan Sta. 22+60.56
 - a. As shown on Sheets KVCY-EFR-WPP-15 and 16 in Exhibit A.
- 3. Up-size existing 8-inch C900 DR-18 PVC water line (and associated appurtenances) to 12-inch C900 DR-18 PVC water line (and associated appurtenances) from Plan Sta. 22+60.56 to US-89 Mainline Sta. 1219+62.20
 - a. As shown on Sheets KVCY-EFR-WPP-16 and 17 in Exhibit A.
- 4. Installation of a flow control valve and vault at the Crestwood Water Tank Site
 - a. As shown on Sheets KVCY-EFR-DT-13 and DT-17 in Exhibit A.
- 5. Installation of a flow control valve and vault at Lower Pasture
 - a. As shown on Sheets KVCY-EFR-DT-18 and DT-19 in Exhibit A.
- 6. Installation of an isolation valve at the Lower Pasture Reservoir Meter Vault
 - a. As shown on Sheets KVCY-EFR-DT-18 and DT-19 in Exhibit A.

The lump sum cost of the Third-Party Betterment Work is included as Exhibit “B” that is incorporated by reference.



The Third-Party Performed Work will include:

1. Installation of electrical control box with circuit breakers and electrical controls for operating the meter at the Crestwood East Reservoir Meter Vault.
2. Installation of electrical control box with circuit breakers and electrical controls for operating the meter at the Lower Pasture Reservoir Meter Vault.
3. Installation of electrical conduit, and electrical cables related to the tank level measuring device at the Crestwood East Reservoir.
4. Connect Third-Party Power to Crestwood East Reservoir Meter Vault and Lower Pasture Reservoir Meter Vault.

The lump sum cost of the Third-Party performed work is included as Exhibit "C" that is incorporated by reference

The Third-Party will perform the following Betterment Work:

1. Installation of electrical controls to the Isolation Valves at the two-meter vaults, and to the two Flow Control Valve Vaults.

Cost for the Third-Party performed Betterment Work is not included in this agreement and is not billable since it is Betterment Work,

3. Third-Party Work Schedule

- a. UDOT will perform Third-Party Work between February 10, 2020 and November 13, 2020. A schedule for Third-Party Work is included as Exhibit "D" that is incorporated by reference.

4. Project-Specific Special Provisions

- a. Design-Builder is responsible to obtain Bureau of Reclamation Encroachment Permits for any Third-Party work that encroaches on existing (that will remain) or proposed Bureau of Reclamation easements. Work within the BOR Easements will not begin until Bureau of Reclamation Permits have been obtained (see Exhibit A for Bureau of Reclamation easement locations).
- b. As part of this project, UDOT has granted a deviation from Utah Administrative Code Rule R930-7 Utility Accommodation regarding the casing limits as shown on Sheet KVCY-EFR-WPP-01 in Exhibit A.

5. Conformance with Utah Administrative Code R930-7

The design and construction of the Third-Party Work, access for future maintenance and servicing of Third-Party's property located on the right-of-way of the Project, will be in conformance with Utah Administrative Code R930-7, and any supplements or amendments.

6. Design-Builder to Notify UDOT and the Third-Party Before Beginning Third-Party Work and Upon Completion of Third-Party Work

The Design-Builder will notify the Third-Party and UDOT's Field Representative at least **2 business days** in advance of beginning Third-Party Work described in this Agreement. The Design-Builder will give subsequent notifications of when and where the Design-Builder will be performing Third-Party Work to the Third-Party on a day-to-day basis. Such subsequent notifications can be informal. Upon completion of the Third-Party Work the Design-Builder will



provide notification to the Third-Party and UDOT's Field Representative within **2 business days**.

7. Traffic Control and Flagging

UDOT will provide Maintenance of Traffic and traffic control for Third-Party Work at no cost to the Third-Party. Except in the case of emergencies, Third-Party Work will be scheduled and comply with the requirements of the Limitation of Operations contained in UDOT's contract with respect to lane closures, peak hour work restrictions, holiday and special event limitations, etc.

8. Discovery of Historical Objects

The Third-Party, while engaged in the relocation of its Facilities, shall comply with UDOT's Standard Specifications, Section 01355, Subpart 3.8, Discovery of Historical, Archeological or Paleontological Objects, Features, Sites, or Human Remains.

9. Daily Record Keeping

UDOT and the Third-Party will each keep daily records of onsite activities. The Third-Party's daily records will be completed on a form that has been preapproved by UDOT's Contracts, Compliance and Certification Manager. The daily records shall be signed by UDOT's Field Representative or their authorized representatives and by the Third-Party or its authorized representatives. Copies of the daily records shall be retained by the Parties to this Agreement. When emergencies occur, requiring the Third-Party's work forces to leave the job, the record keeping shall be resumed upon return to the Project.

10. Reimbursement for Third-Party Work

The Third-Party shall be reimbursed by UDOT for 100% of the actual costs incurred by the Third-Party for performing the Third-Party Work as required by Utah Code §72-6-116. The estimate described below is based upon the prices of materials and labor current as of the date of the estimate attached as Exhibit "C" that is incorporated by reference. The estimate does not account for increases due to unknown and unforeseen hardships in accomplishing the Third-Party Work.

Total Cost of UDOT-Performed Third-Party Betterment Work	\$339,662.05
Total Cost of Third-Party Performed Third Party Work	\$30,560.63
Total Amount of Third-Party Participation for Betterment Work @ 100%	\$339,662.05
Total Amount of UDOT Participation for Third-Party Performed Work @ 100%	\$30,560.63

Note: The above are estimates only. Total payment to the Third-Party by UDOT will be based on the actual costs incurred as determined after completion of construction.



11. Inspection

The Third-Party shall provide on-call engineering support by the Third-Party engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during Third-Party Work, and to perform the necessary inspection on the Third-Party's Facilities installed by UDOT.

- a. The Third-Party engineer and/or inspector shall work with and through UDOT's Field Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Third-Party Work covered herein on Third-Party's Facilities in accordance with the plans and specifications provided and/or approved by the Third-Party, including changes or additions to the plans and specifications, which are approved by the Parties hereto.
- b. The Third-Party shall immediately notify UDOT's Field Representative of any deficiencies in the Third-Party Work on the Third-Party's Facilities. The Third-Party shall follow up with written detail to UDOT's Project Representative of its findings within 24-hours of making its initial notification.
- c. UDOT will respond to Third-Party's concerns within 24-hours of written notification.
- d. The Third-Party, through its inspection of the Third-Party Work, will provide UDOT's Field Representative with information covering any problems or concerns the Third-Party may have with acceptance of the facilities upon completion of the Third-Party Work.

Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Third-Party Work does not relieve the Third-Party of its duty in the performance of the Third-Party Work or to ensure compliance with applicable standards.

12. Changes in the Third-Party Work

In the event there are changes in the scope of the Third-Party Work, extra Third-Party Work, or changes in the planned Third-Party Work covered by this Agreement, a modification to this Agreement signed by the Parties is required prior to the start of Third-Party Work on the changes or additions.

13. Billing and Payment

The Third-Party shall submit itemized bills covering its actual costs incurred for performing the Third-Party Work bearing the Project number, this Agreement number, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates within **60 days** following completion of the Third-Party Work by the Third-Party on the Project. Otherwise, previous payments to the Third-Party may be considered final, except as agreed to between the Parties in advance. The Third-Party shall submit one final and complete bill incorporating previous billing details within 6 months following completion of the Third-Party Work by the Third-Party on UDOT's Project to:



UDOT's Construction Division
Attention: Contracts and Compliance Specialist
4501 South 2700 West, Box 148220
Salt Lake City, Utah 84114-8220

UDOT's Resident Engineer will review the billings, give verification of the Third-Party Work performed and forward the billings to UDOT's Construction Office for processing. UDOT will reimburse the Third-Party within **60 days** after receipt of the billings, but only for those items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the Third-Party to submit the billings within 6 months of the completion of the Third-Party Work will result in UDOT's disallowance of reimbursement for that portion of Third-Party Work. Any Third-Party Work performed without proper notification to UDOT's Resident Engineer's office will be cited to the Third-Party and may be deducted from the reimbursement.

14. Costs Differ by More than 10%

If Third-Party's actual costs incurred for its force account Third-Party Work differs more than 10% plus or minus per line item from its detailed estimates shown in Exhibit "B" then the Third-Party is required to submit a letter of explanation with its billings indicating why and how the difference in costs occurred. The Third-Party is required to match its billings of completed Third-Party Work with its detailed estimates.

15. Right to Audit

UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the Company pertaining to the Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. §645, subpart A. Should this audit disclose that the Company has been underpaid, UDOT will reimburse the Company upon submission of additional billing to cover the underpayment. The Company shall submit the additional billing within **60 days** from the date of the notification of the underpayment. Should this audit disclose that the Company has been overpaid, the Company will reimburse UDOT in the amount of the overpayment within **60 days** of notification of audit findings. For the purpose of audit the Company is required to keep and maintain its records of Utility Work covered herein for a minimum of **3 years** after final payment is received by the Company from UDOT.

16. Access and Maintenance

Access for maintenance and servicing of Third-Party's Facilities located on the right-of-way of the Project will be allowed only by permit issued by UDOT. The Third-Party will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

17. Miscellaneous

- a. The permitted use and occupancy of right-of-way for non-highway purposes is subordinate to the primary and highest interest for transportation and safety of the traveling public.



- b. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this agreement.
- c. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of the Agreement at the request of the other Party.
- d. This Agreement does not create any type of agency relationship, joint venture, or partnership between UDOT and Third-Party.
- e. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party.
- f. If any provision or part of a provision of this Agreement is held invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision. Each provision shall be deemed to be enforceable to the fullest extent under applicable law.
- g. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.
- h. This Agreement shall constitute the entire agreement and understanding of the Parties with respect to the subject matter hereof, and shall supersede all offers, negotiations and other agreements with respect thereto. Any amendment to this Agreement must be in writing and executed by authorized representatives of each Party.
- i. The date of this Agreement is the date this Agreement is signed by the last Party.



Project No. S-0089 (406)398; Davis and Weber Counties
US-89; Farmington to I-84
Kaysville City Corporation
CID No. 72194 PIN 13821

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers.

Kaysville City Corporation

Title: _____

Date: _____

.....

Recommended for Approval

Utah Department of Transportation

Title: Utility and Railroad Leader

Title: Project Director

Date: _____

Date: _____

UDOT Comptroller Office

Title: Contract Administrator

Date: _____

SHEET NO.
KVCY-EFR 1-A

ALL UNITS IN FEET UNLESS
OTHERWISE NOTED

DAVIS COUNTY

KAYSVILLE: 12" WATER- ID# S2069

THIS SEAL APPLIES TO ALL SHEETS
CONTAINING THIS SIGNATURE

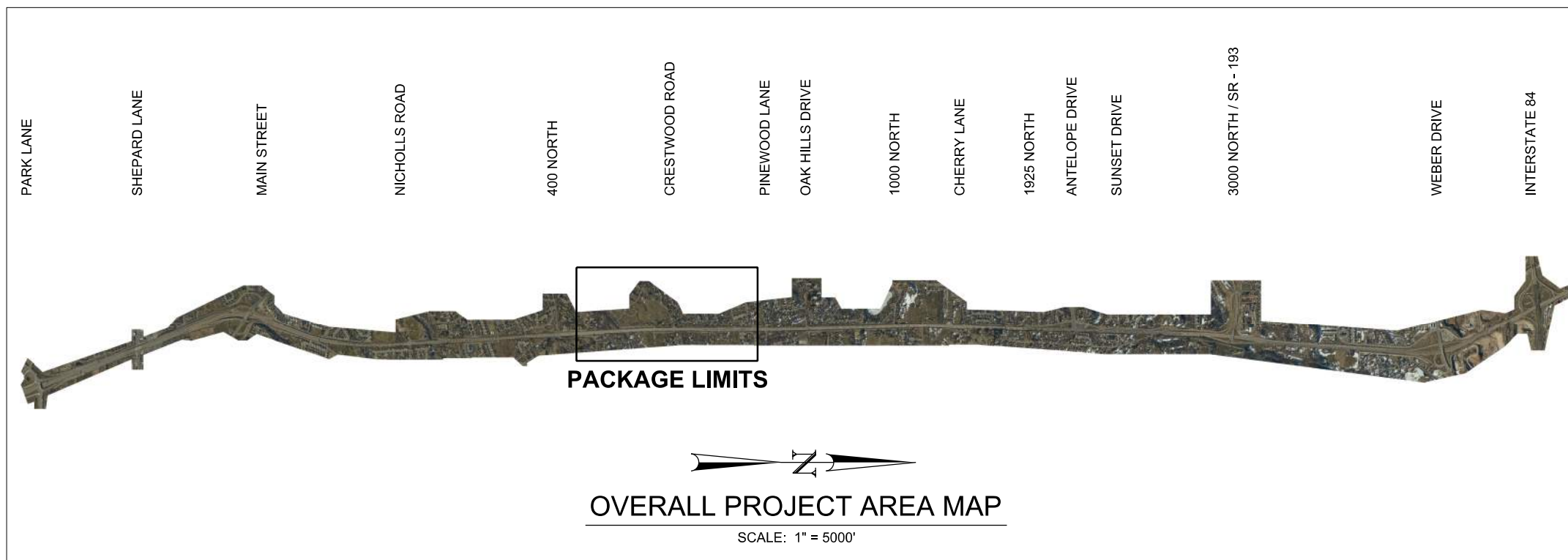
VERIFIED FOR SUBMISSION FOR ADVERTISEMENT

DESIGN ENGINEER

UTAH DEPARTMENT OF TRANSPORTATION

APPROVED FOR USE BY UDOT

MICHAEL ROMERO, PROJECT DIRECTOR



12/19/2019 2:27:10 PM

PROJECT		US-89; FARMINGTON TO I-84		UTAH DEPARTMENT OF TRANSPORTATION										REVISED			
PROJECT NUMBER		KAYSVILLE CITY PACKAGE EFR - AFC		HORROCKS ENGINEERS													
PROJECT NUMBER		S-0089(406)398		PIN		13821		APPROVED				DRAWN BY		JDS			
INDEX TO SHEETS & UTILITY CONTACTS												QC CHECKED BY		RJB			
												MM/DD/YY		DATE		1	
												PROFESSIONAL ENGINEER		APPROVED BY		NO.	
																DATE	
																REMARKS	

PROPOSED LINE STYLES

	BCTV	CABLE TV BURIED
	CTV	CABLE TV OVERHEAD
	BTEL	TELEPHONE BURIED
	TEL	TELEPHONE OVERHEAD
	BE	ELECTRICAL BURIED
	E	ELECTRICAL OVERHEAD
	BFO	FIBER OPTICS BURIED
	FO	FIBER OPTICS OVERHEAD
	G	GAS
	SWR	SEWER
	SD	STORM DRAIN
	WTR	WATER
	IR	IRRIGATION

EXISTING LINE STYLES

	bctv	cable tv buried
	ctv	cable tv overhead
	btel	telephone buried
	tel	telephone overhead
	be	electrical buried
	e	electrical overhead
	bfo	fiber optics buried
	fo	fiber optics overhead
	g	gas
	swr	sewer
	sd	storm drain
	wtr	water
	ir	irrigation

PROPOSED "SIZED" LINE STYLES

	X" GAS	GAS
	X" SWR	SEWER
	X" SD	STORM DRAIN
	X" WTR	WATER
	X" IRR	IRRIGATION

EXISTING "SIZED" LINE STYLES

	x" gas	gas
	x" swr	sewer
	x" sd	storm drain
	x" wtr	water
	x" irr	irrigation

TOPO SURFACE FEATURES

	CUT	CUT CATCH LINE
	FILL	FILL CATCH LINE
	PAVE CUT	PAVEMENT CUTTING
		Buildings
		Curb
		Curb & Gutter
		Curb Flowline
		Driveway
		Edge of Concrete
		Fence, Chain Link Existing
		Fence, Wood Existing
		Median Barrier
		Sidewalk
		GRAVEL DRIVEWAY
		ROADWAY BREAKLINE
		SIDEWALK BREAKLINE
		NOISE WALL
		RETAINING WALL
		RETAINING CURB

SYMBOLS

	COMMUNICATIONS VAULT		JUNCTION BOX
	CONTROLLER BOX		LIGHT POLE
	Bench Mark		PS POWER SOURCE
	Cable TV Box		MAIL BOX
	Electrical Transformer		MANHOLE ELECTRIC
	Center Line		MANHOLE GAS
	Section Corner Found		MANHOLE TELEPHONE
	Section Corner Not Found		MANHOLE STORM DRAIN
	CORNER QUARTER SECTION FOUND		MANHOLE SANITARY SEWER
	CORNER QUARTER SECTION NOT FOUN		MANHOLE WATER
	TREE		RIGHT OF WAY MARKER
	Fire Hydrant		SIGN (SINGLE POST)
	Valve		SIGN (DOUBLE POST)
	Guy Wire or Anchor		UNDERGROUND SERVICE PED
	HORIZONTAL/VERTICAL P.I.		SIGNAL CABINET
	HORIZONTAL/VERTICAL CURVE POINT		Exist Signal Cabinet
	"TYPE III-POLYMER CONCRETE JUNCTION BOX"		WATER METER
	"TYPE II-POLYMER CONCRETE JUNCTION BOX"		AIR-VACUUM RELIEF STATION
	CCTV CAMERA/PTZ/POLE AND FOUNDATION		
	Exist "Type III-Polymer Concrete Junction Box"		
	Exist "Type I-Polymer Concrete Junction Box"		

ABBREVIATIONS

AC	ASBESTOS CONCRETE
BOR	BUREAU OF RECLAMATION
CIP	CAST IRON PIPE
DI	DUCTILE IRON
HDPE	HIGH DENSITY POLYETHYLENE
MJ	MECHANICAL JOINT
PRV	PRESSURE REDUCING VAULT
PVC	POLYVINYL CHLORIDE
STL	STEEL
TB	THRUST BLOCK
WBWCD	WEBER BASIN WATER CONSERVANCY DISTRICT
WTR	WATERLINE

REVISIONS

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NO.	DATE	APPROVED BY			REMARKS

UTAH DEPARTMENT OF TRANSPORTATION

HORROCKS ENGINEERS

DRAWN BY	JDS
QC CHECKED BY	RJB

MM/DD/YY

DATE

US-89; FARMINGTON TO I-84

KAYSVILLE CITY PACKAGE EFR - AFC

13821

S-0089(406)398

ABBREVIATIONS AND LEGEND

GENERAL NOTES:

BASIS OF DESIGN AND CONSTRUCTION THIRD-PARTY REQUIREMENTS

1. ALL WORK IS TO CONFORM TO UDOT STANDARDS AND TO THE THIRD-PARTY STANDARDS. IN ADDITION, ALL WORK SHALL COMPLY WITH THE PROJECT DRAWINGS, PROJECT SPECIFICATIONS, AND GEOTECHNICAL REPORT. IF CONFLICTS ARE NOTED, CONTRACTOR SHALL CONTACT ENGINEER PRIOR TO START OF WORK.
2. NOTIFY THE DEPARTMENT AND EACH THIRD-PARTY 48 HOURS IN ADVANCE OF ANY PROJECT OR THIRD-PARTY WORK IN THE VICINITY OF THEIR FACILITIES, INCLUDING SERVICE SHUTDOWNS AND DIVERSIONS THAT COULD AFFECT A THIRD-PARTY FACILITY
3. PROVIDE SURVEY-GRADE (X, Y AND Z COORDINATES) AS-BUILT LOCATIONS AND ATTRIBUTES FOR THIRD-PARTY WORK PERFORMED BY THE DESIGN-BUILDER.
4. NOTIFY THE DEPARTMENT AND THIRD-PARTY REPRESENTATIVE AT LEAST 2 BUSINESS DAYS IN ADVANCE OF BEGINNING ANY THIRD-PARTY WORK PRIOR TO STARTING ANY PLANNED THIRD-PARTY WORK.
5. CONTACT THE DEPARTMENT AND THIRD-PARTY’S(IES’) REPRESENTATIVE WITHIN ONE HOUR FOR ALL UNFORESEEN THIRD-PARTY INTERRUPTIONS. KEEP A DETAILED RECORD OF EVENTS INCLUDING BUT NOT LIMITED TO, TIME AND DATE OF THE EVENT, PERSONS ON SITE, THIRD-PARTY FACILITY OWNER NOTIFICATION AND CONTACT INFORMATION, PHOTOGRAPHS OF THE AFFECTED FACILITY AND THE BLUE STAKE MARKINGS IN THE AFFECTED AREA, DURATION OF OUTAGE, AND RESOLUTION. PROVIDE A COPY OF THE DETAILED RECORD TO THE DEPARTMENT WITHIN 48 HOURS OF THE EVENT.
6. THIRD-PARTIES HAVE THE RIGHT TO INSPECT AND TEST THE THIRD-PARTY WORK PERFORMED BY THE DESIGN-BUILDER ON THEIR FACILITIES. THE DESIGN-BUILDER SHALL KEEP DAILY RECORDS OF THE THIRD-PARTY WORK PERFORMED INCLUDING RECORDS OF THIRD-PARTY INSPECTORS ON SITE AND ANY TIME. THE DESIGN-BUILDER SHALL RETAIN A COPY OF DAILY RECORDS AND UPON REQUEST SUPPLY A COPY OF EACH RECORD TO THE DEPARTMENT. INSPECTION AND ACCEPTANCE OF THE THIRD-PARTY WORK BY THE THIRD-PARTY SHALL NOT RELIEVE THE DESIGN-BUILDER FROM THE OBLIGATION TO PERFORM ALL THIRD-PARTY WORK IN COMPLIANCE WITH SPECIFICATIONS AND ANY OTHER OBLIGATIONS IN THE THIRD-PARTY AGREEMENTS. DO NOT BURY OR CONCEAL ANY PORTION OF THE THIRD-PARTY WORK THAT HAS NOT BEEN INSPECTED, SURVEYED FOR INCLUSION IN AS-BUILT PLANS, AND ACCEPTED BY THE THIRD-PARTY. ANY DESIGN-BUILDER PERFORMED THIRD-PARTY WORK BURIED OR CONCEALED WITHOUT BEING INSPECTED, SURVEYED, AND ACCEPTED BY THE THIRD-PARTY SHALL BE EXPOSED BY THE DESIGN-BUILDER AT NO ADDITIONAL COST TO THE DEPARTMENT OR THIRD-PARTY.
7. FOR UNDERGROUND THIRD-PARTIES, CASINGS, AND PIPES THAT ARE TO BE LEFT IN PLACE AND ARE LARGER THAN SIX INCHES IN EQUIVALENT DIAMETER, ABANDON THEM BY PLACING OR PUMPING IN CONCRETE SLURRY, SAND SLURRY, OR OTHER MATERIAL APPROVED BY THE DEPARTMENT AND THEN CAPPING ALL OPEN ENDS WITH CONCRETE; FOR PIPES EIGHT INCHES OR GREATER IN DIAMETER, THE CAP MUST BE AT LEAST 24 INCHES THICK. DESIGN-BUILDER SHALL SURVEY ABANDONED PIPES AND PROVIDE DEPARTMENT THE LOCATIONS IN A .CSV FILE.
8. FOR ALL THIRD-PARTY WORK CONSTRUCTED BY THE DESIGN-BUILDER, PROVIDE THIRD-PARTY AS-BUILT PLANS TO THE DEPARTMENT AND TO EACH THIRD-PARTY IN THE APPROVED FORMAT SPECIFIED BY THE THIRD-PARTY. OBTAIN WRITTEN OR EMAIL ACCEPTANCE FOR EACH THIRD-PARTY AS-BUILT PLAN PREPARED BY THE DESIGN-BUILDER. SHOW THE LOCATIONS OF EXISTING THIRD-PARTIES, STRUCTURES, TREES, STREETS, AND HIGHWAY ROW LIMITS ON THE PLANS. OBTAIN SIGNATURE OR EMAIL ACCEPTANCE OF THIRD-PARTIES ON AS-BUILT PLANS AND ALL OTHER AS-BUILT REQUIREMENTS STIPULATED IN THE DEPARTMENT’S THIRD-PARTY REGULATIONS.

WATER NOTES:

1. BEFORE DIGGING CALL BLUE STAKES FOR LOCATION OF UNDERGROUND UTILITIES. 1(800) 662-4111 OR 811.
2. ALL EXISTING UTILITY LOCATIONS ARE FOR REFERENCE ONLY. CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATIONS IN FIELD.
3. PROTECT IN PLACE ALL EXISTING UTILITIES UNLESS MARKED RELOCATE OR ABANDON.
4. MAXIMUM JOINT DEFLECTION FOR FULL LENGTH OF WATER LINE PIPE NOT TO EXCEED 1° PER JOINT.
5. ALL WORK SHALL CONFORM TO THE PROJECT WIDE SWPPP.
6. SURFACE FEATURES SUCH AS GATE VALVE BOXES, FIRE HYDRANTS, AND AIR RELIEF VALVES/PIPING SHALL BE REMOVED AND BACKFILLED. REMOVED VALVES AND PIPE MAY NOT BE REUSED.
7. TRACING WIRE SHALL BE INSTALLED PER GOVERNING AUTHORITY STANDARD DETAILS.
8. RAISE UTILITY SUFRACE FEATURES, SUCH AS MANHOLES AND WATER VALVE LIDS TO PROJECT FINISHED GRADE.
9. ALL VERTICAL BENDS SHALL HAVE THRUST BLOCKS AS SHOWN ON DETAIL A ON SHEET KVCY-EFR-DT-21.

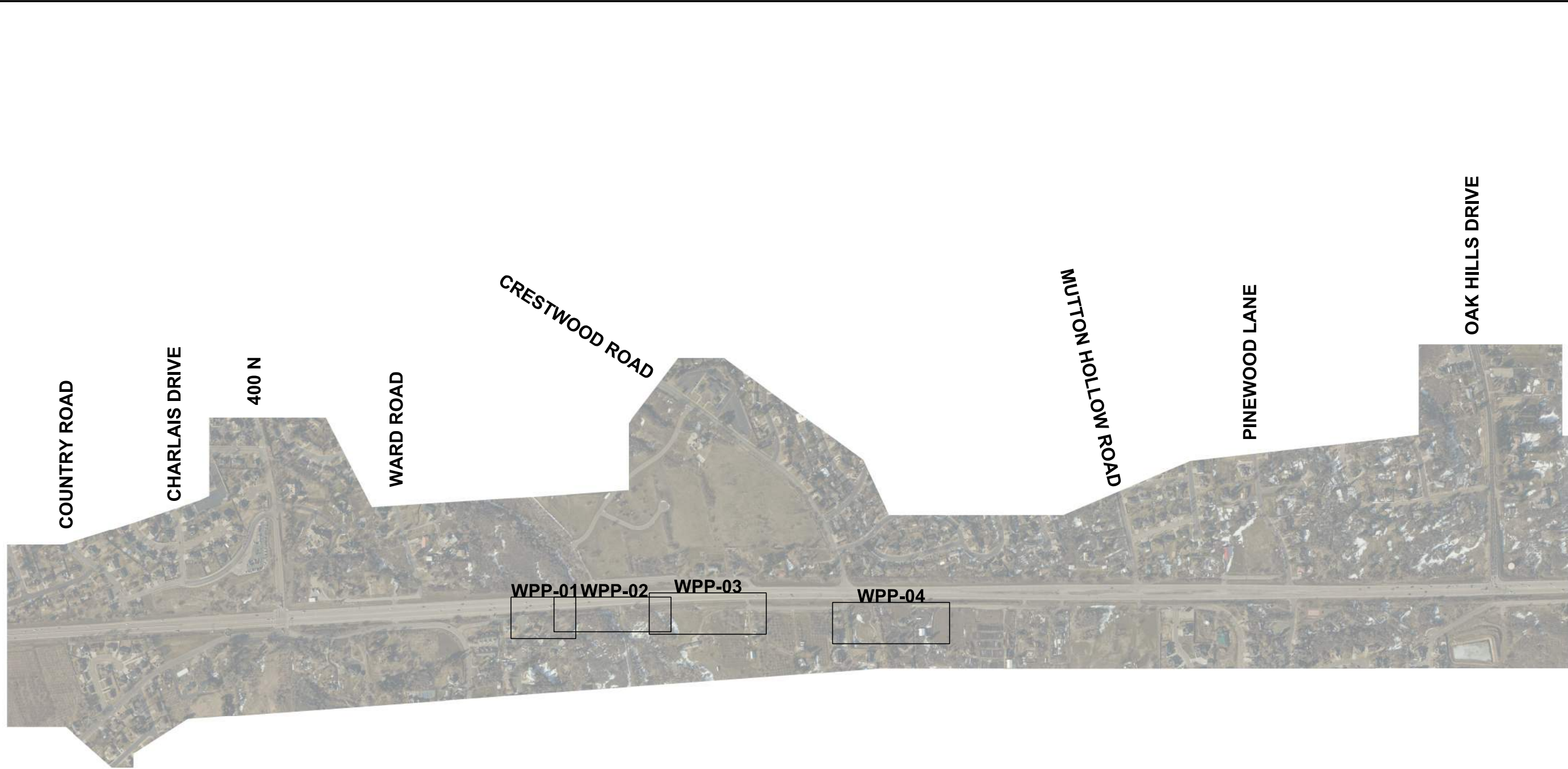
CONSTRUCTION NOTES:

- TO PERSERVE KAYSVILLE CITY WATER SYSTEM OPERATION, CONTRACTOR SHALL CONSTRUCT AND RELOCATE WATER FACILITIES IN THE FOLLOWING SEQUENCE:
1. CONSTRUCT SOLUTION ID# S2026 PER INSTRUCTIONS ON SHEET KVCY-EFR-DT-15. EAST CRESTWOOD TANK WILL NO LONGER FILL FROM WEBER BASIN CONNECTION AND WILL FLOAT ON THE LOWER PASTURE TANK.
2. DEMOLISH WEST CRESTWOOD WATER TANK (SOLUTION ID# S0126 PER INSTRUCTIONS ON SHEET KVCY-EFR-DT-16.
3. CONSTRUCT SOLUTION ID# S2069. INSTALL EASTERN 12" BUTTERFLY VALVE AT BOOSTER STATION (SOLUTION ID# S0130). INSTALLTION OF THE VALVE WILL REQUIRE CUTTING SERVICES TO HOMES ON THE UPPER PRESSURE ZONE.
4. CONSTRUCT SOLUTIONS ID# S0125, S0126, AND S2027.
5. CONSTRUCT SOLUTIONS ID# S0130.
6. CONSTRUCT SOLUTION ID# S0104.
7. AFTER WEBER BASIN FACILITIES ARE AVAILABLE AT CRESTWOOD TANK, CONSTRUCT SOLUTION ID# S2031. COMPLETION OF S2031 WILL ALLOW DISCONNECTION FROM WEBER BASIN AT LOWER PASTURE TANK. LOWER PASTURE TANK WILL FLOAT ON CRESTWOOD TANK.
8. CONSTRUCT SOLUTION ID# S2032.

THIRD-PARTY: KAYSVILLE CITY

PROJECT		US-89; FARMINGTON TO I-84		KAYSVILLE CITY PACKAGE EFR - AFC		13821		GENERAL NOTES		REVISIONS									
										6									
PROJECT NUMBER		S-0089(406)398		PIN		13821		APPROVED		DRAWN BY		JDS	QC CHECKED BY		RJB	DATE		APPROVED BY	REMARKS

EXHIBIT A

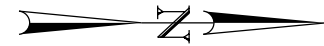


INDEX SHEET MAP

SCALE: 1" = 800'

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UTAH DEPARTMENT OF TRANSPORTATION HORROCKS ENGINEERS APPROVED _____ DRAWN BY _____ TAS _____ QC CHECKED BY _____ MM/DD/YY _____ DATE _____ PROFESSIONAL ENGINEER _____ NO. _____ DATE _____ APPROVED BY _____ REMARKS _____										

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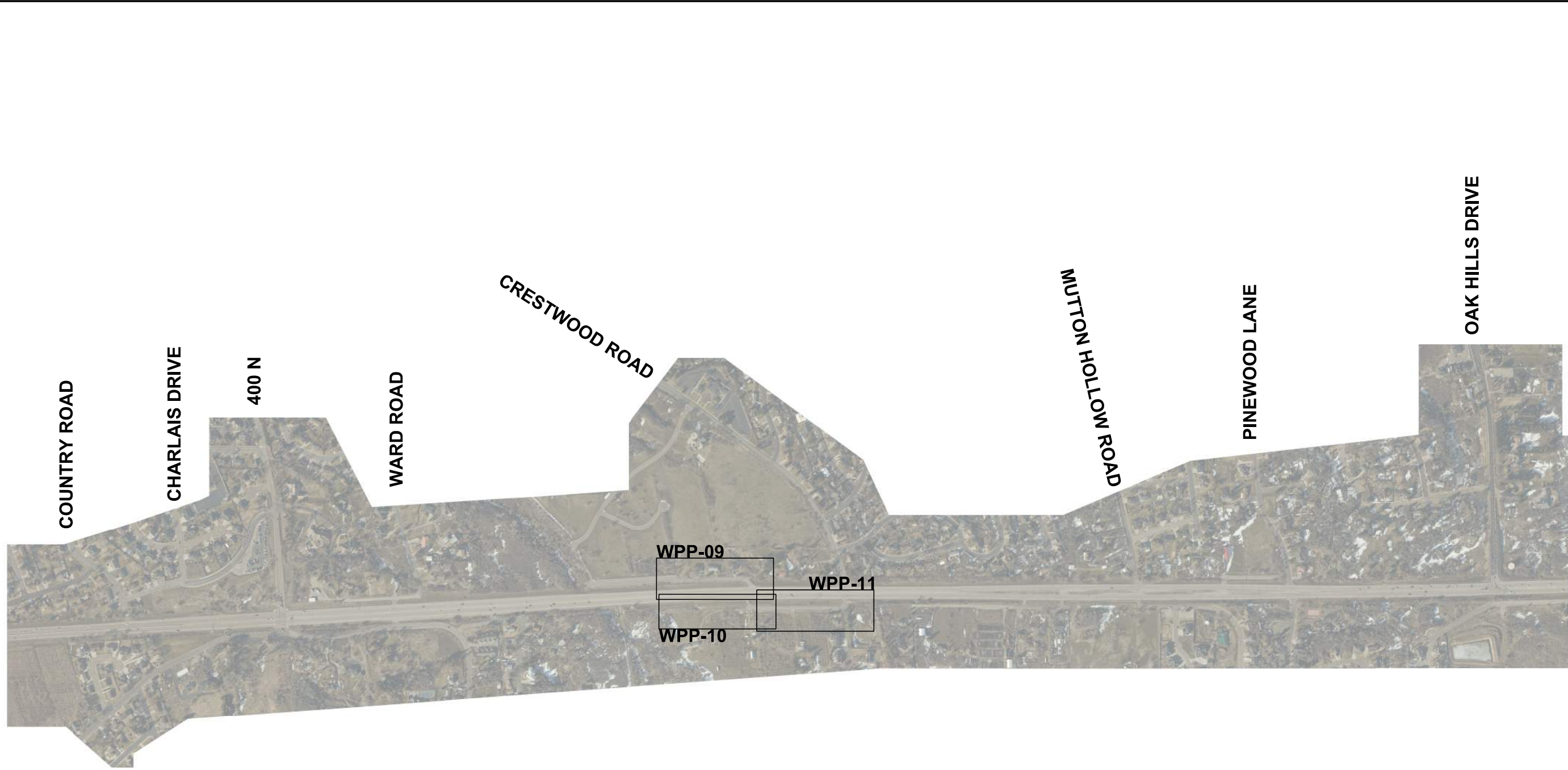


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REVISIONS			

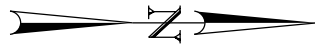
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WPP-09
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WPP-10

WPP-11

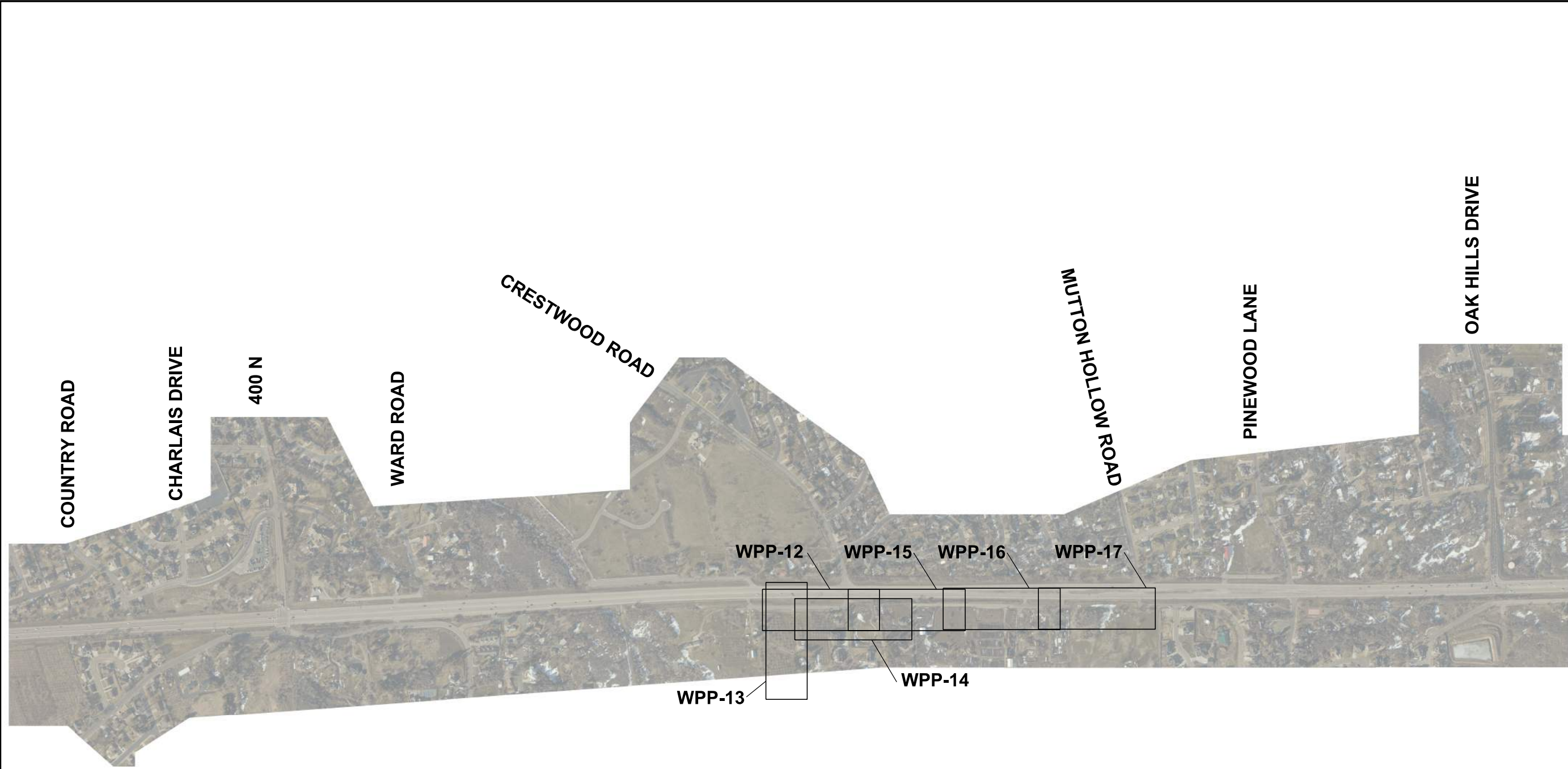


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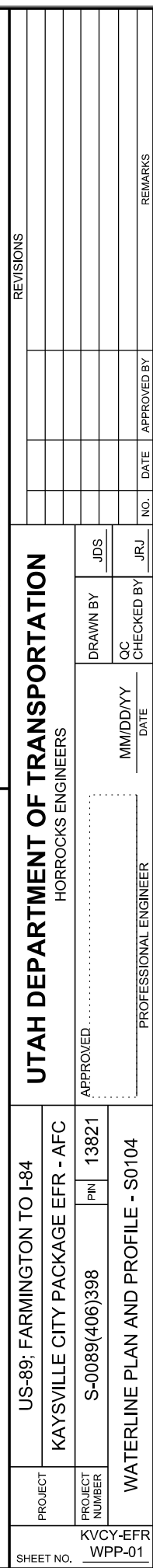
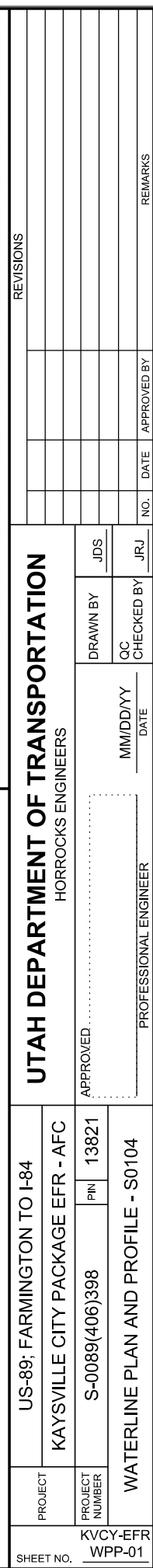
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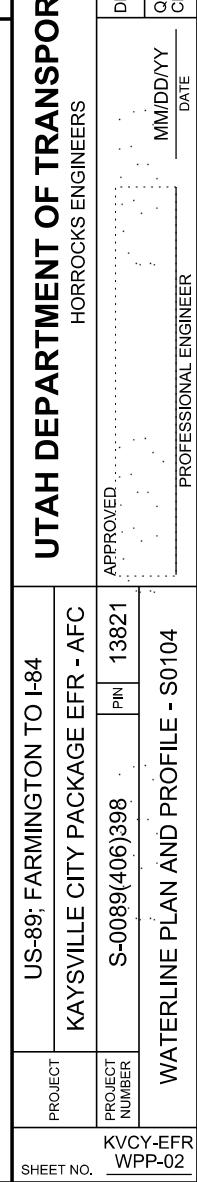
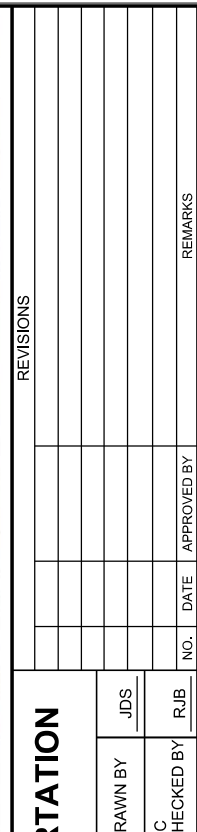


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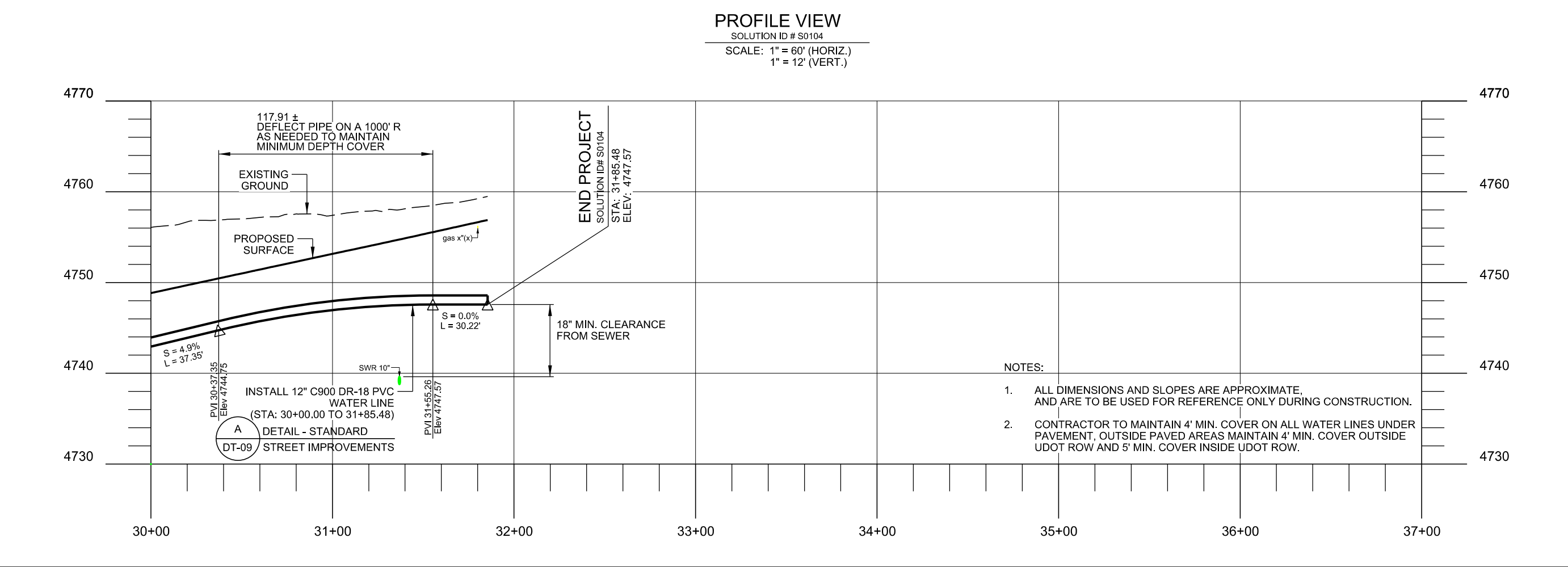
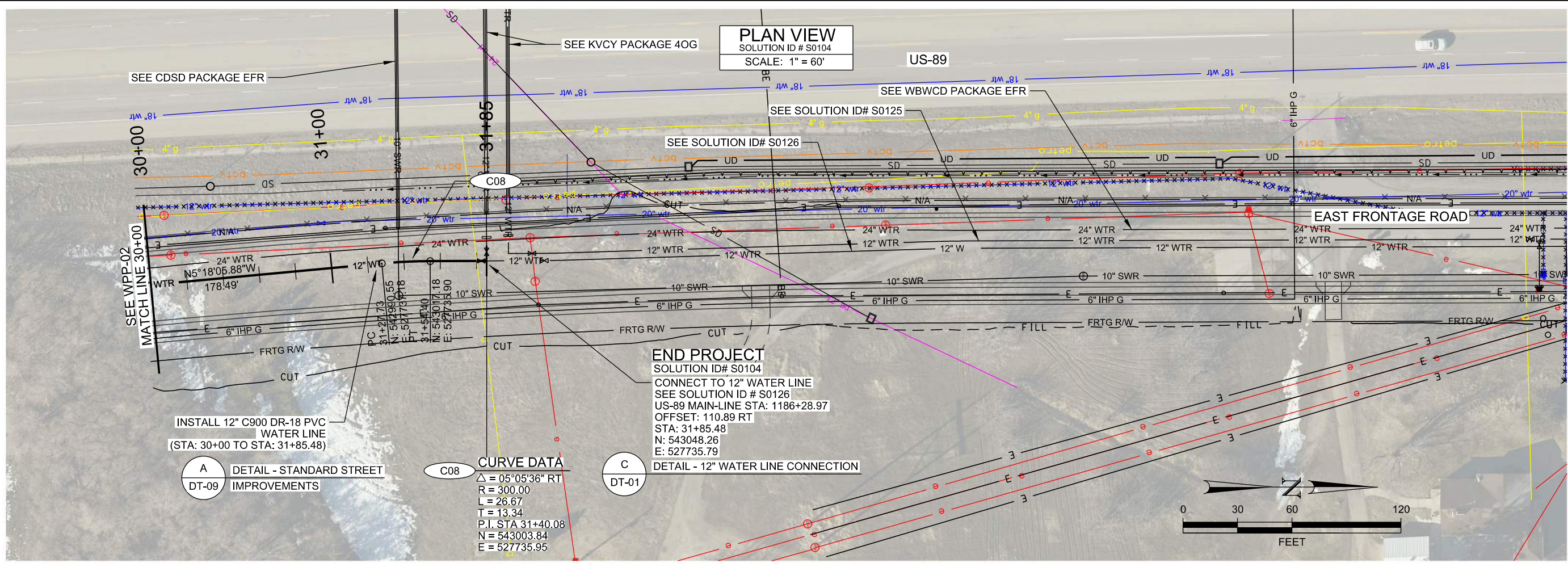
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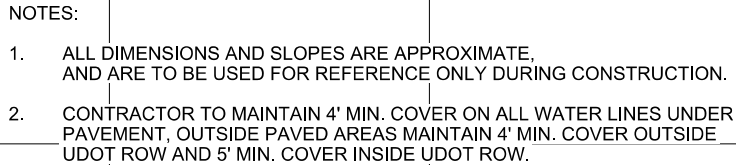
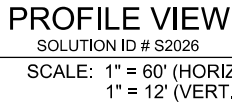




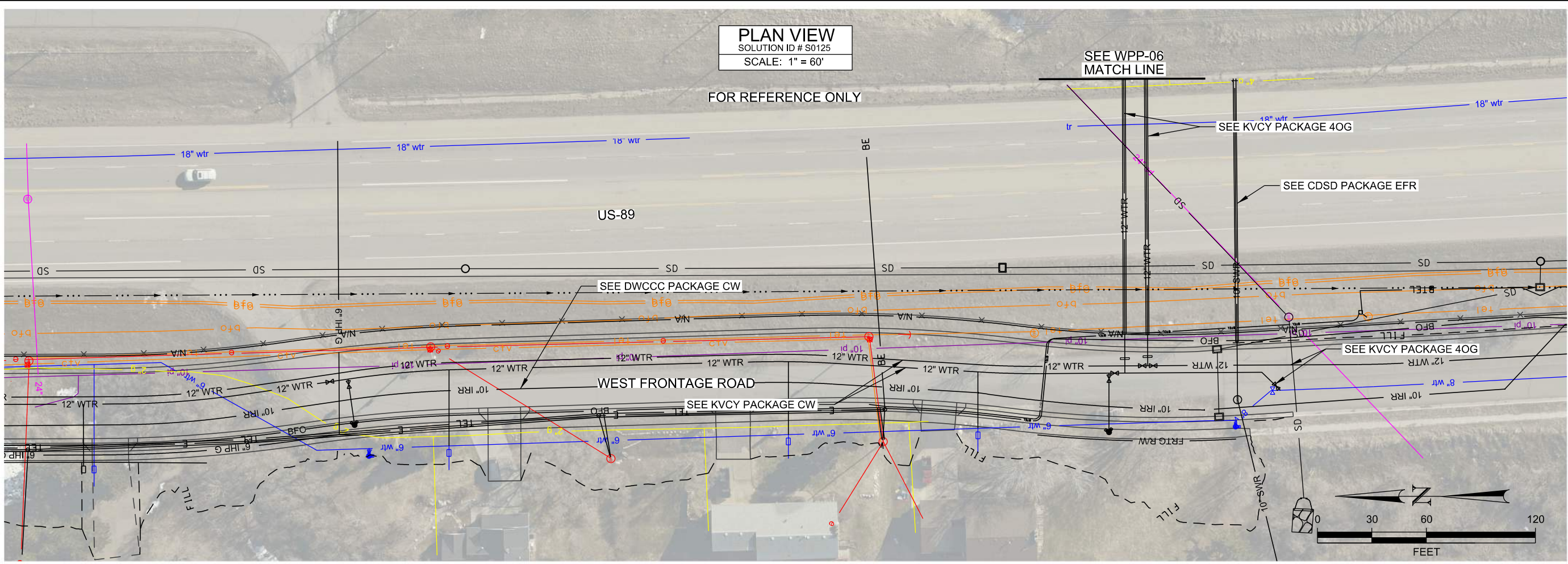
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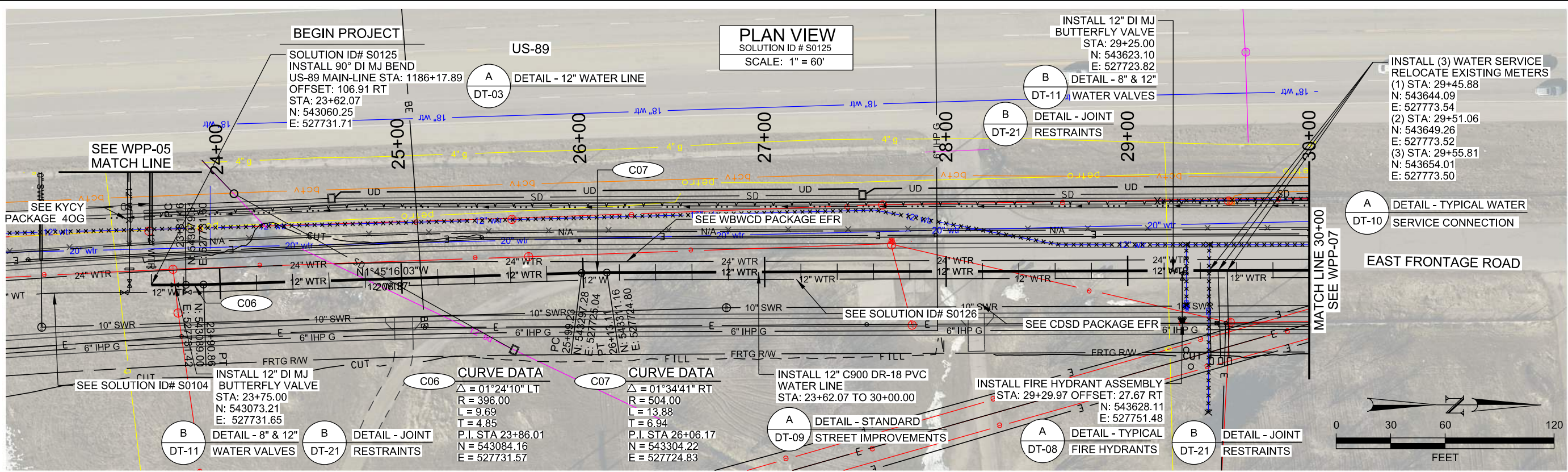
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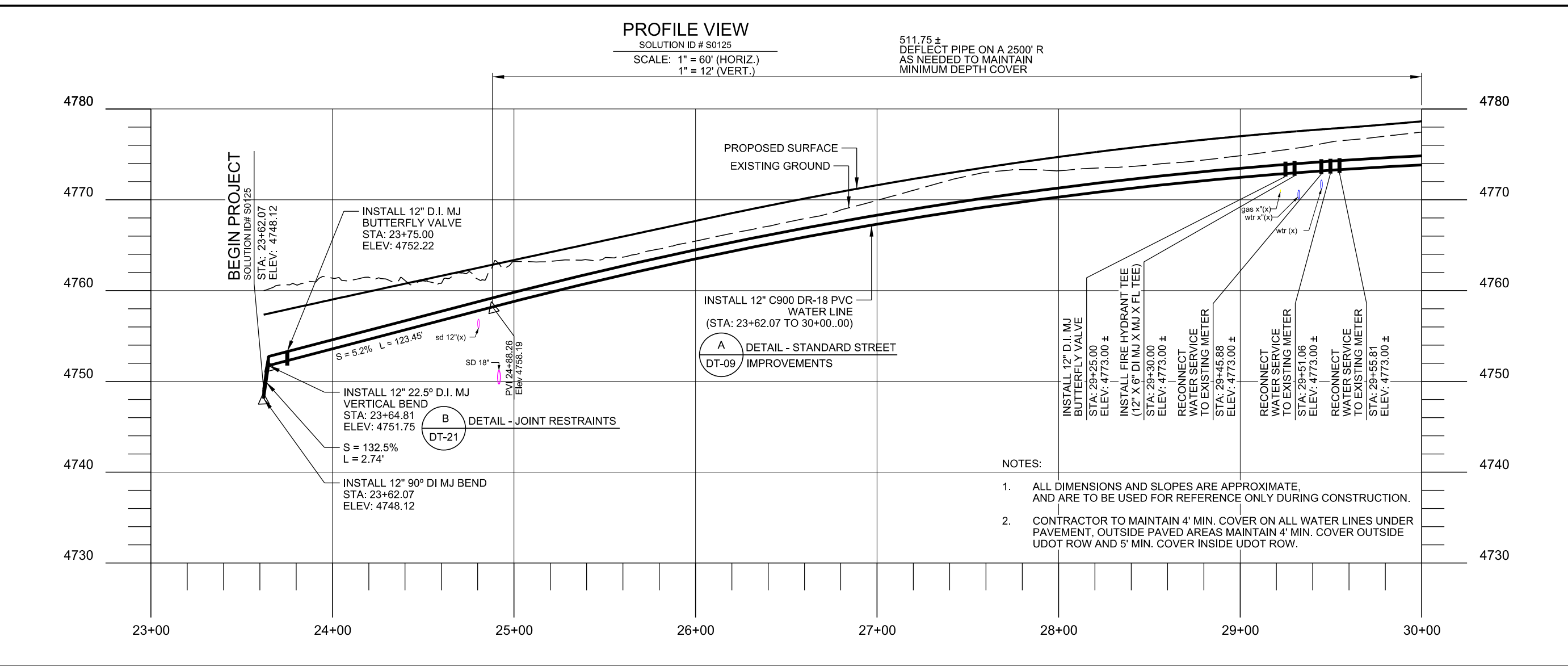
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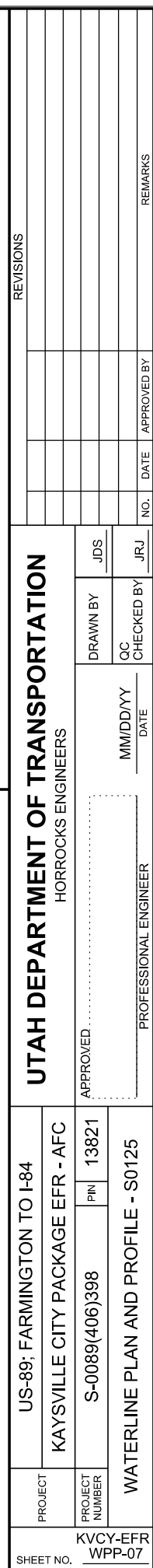
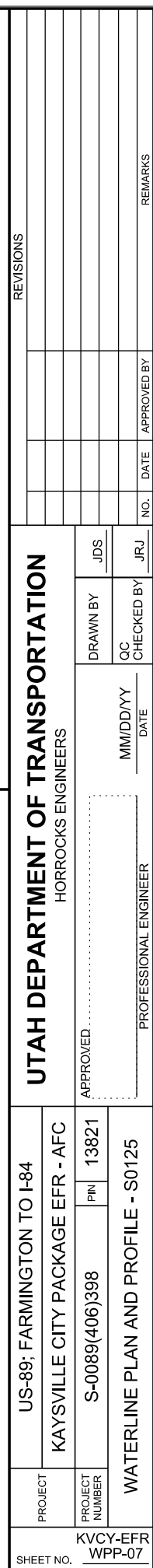
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HORROCKS ENGINEERS					
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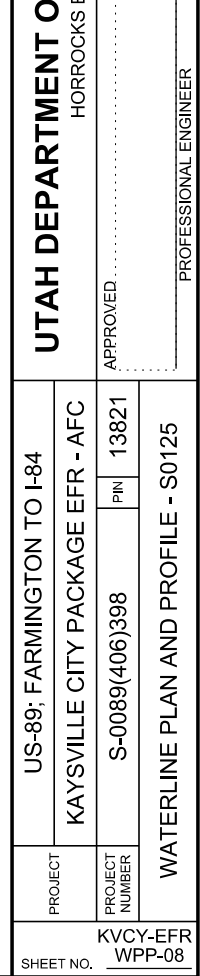
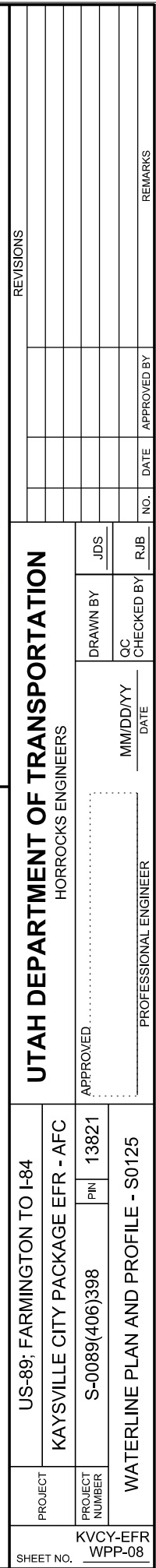
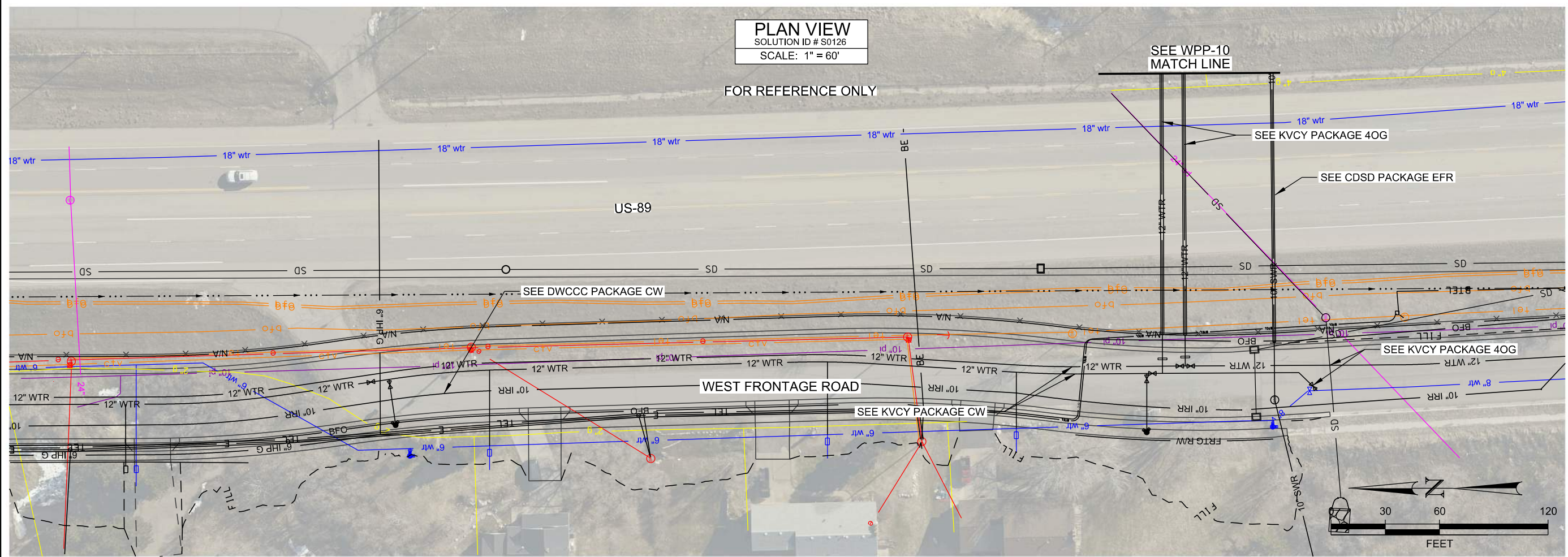


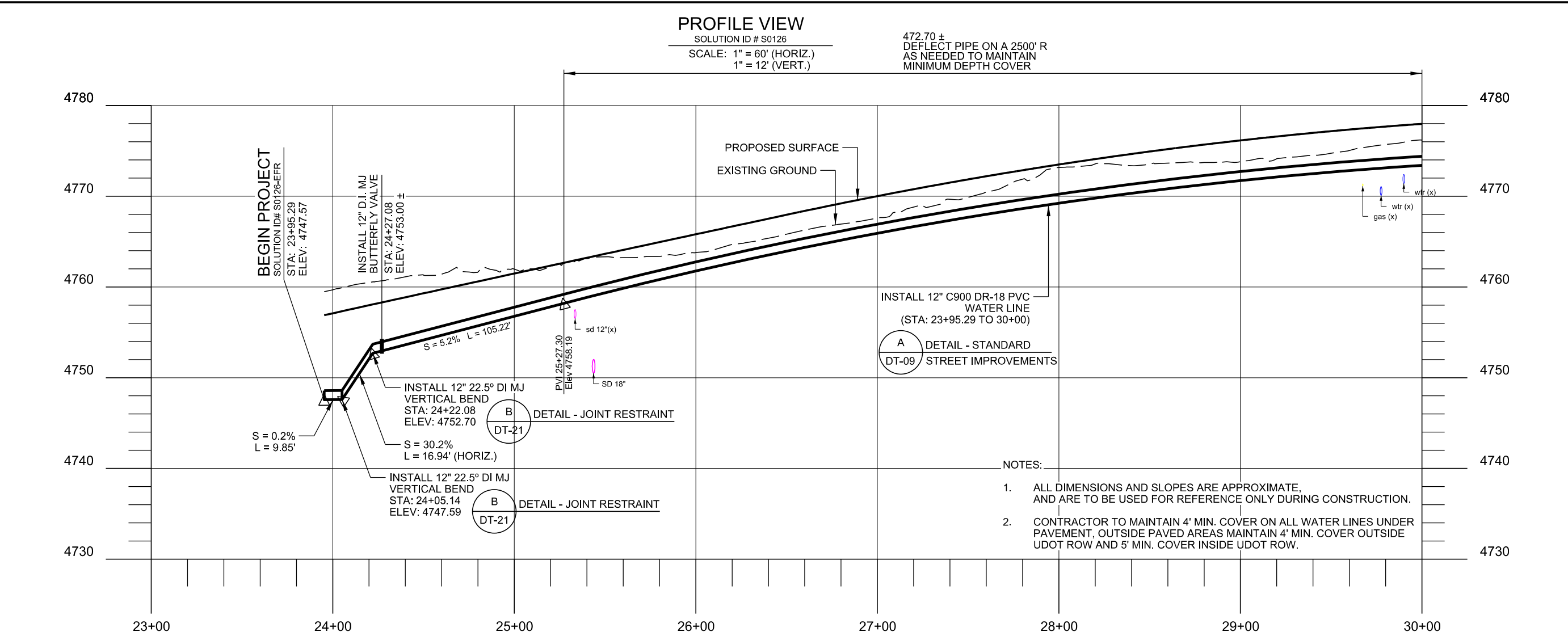
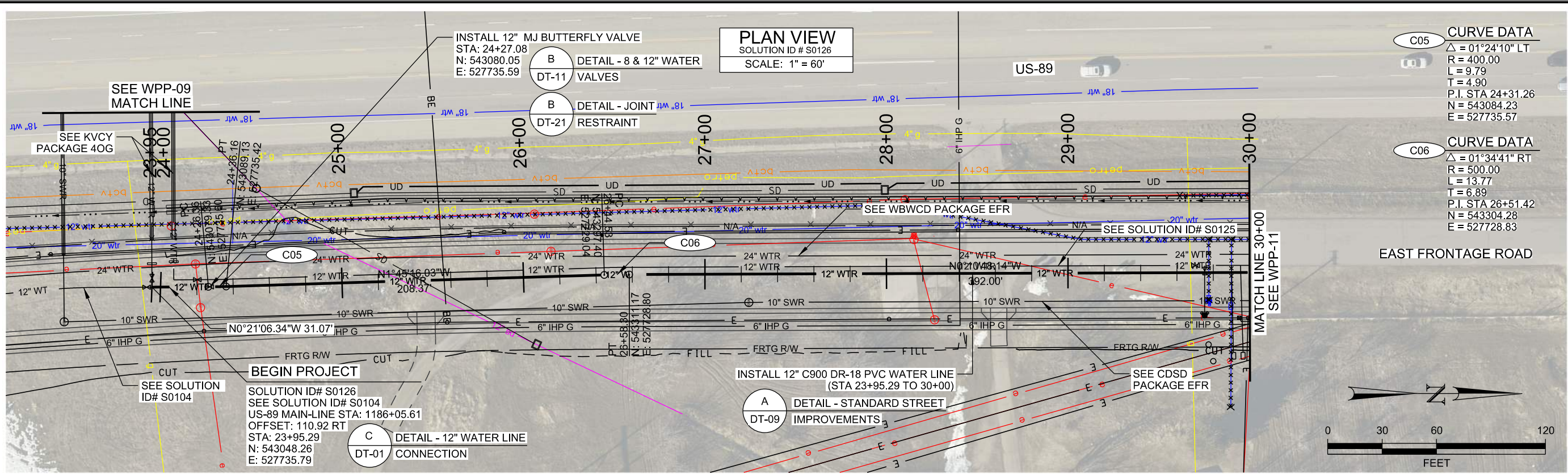
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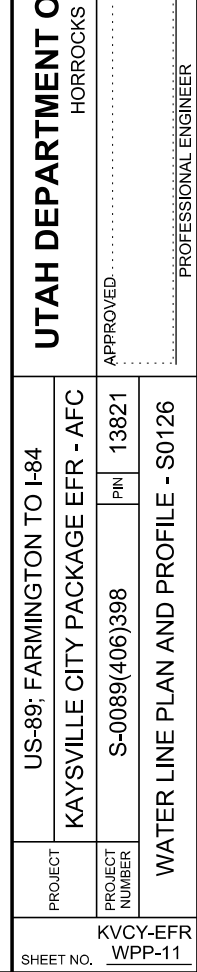
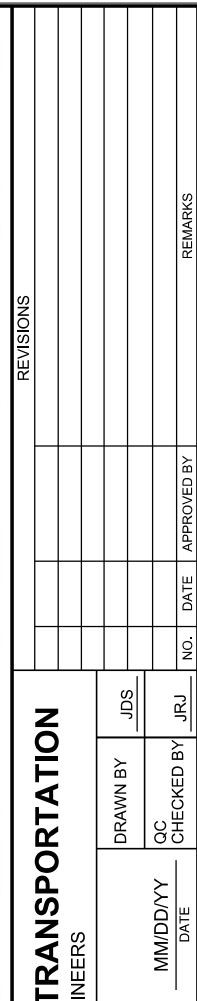
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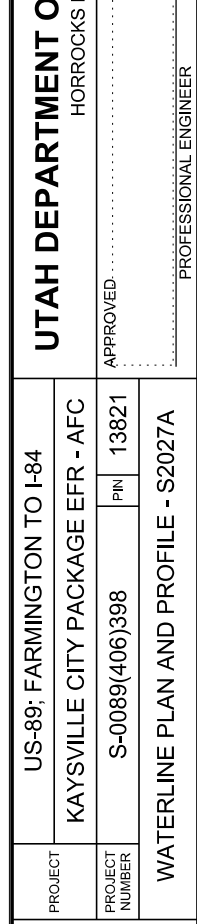
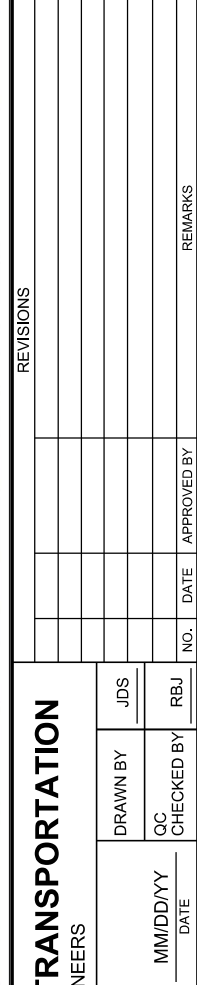
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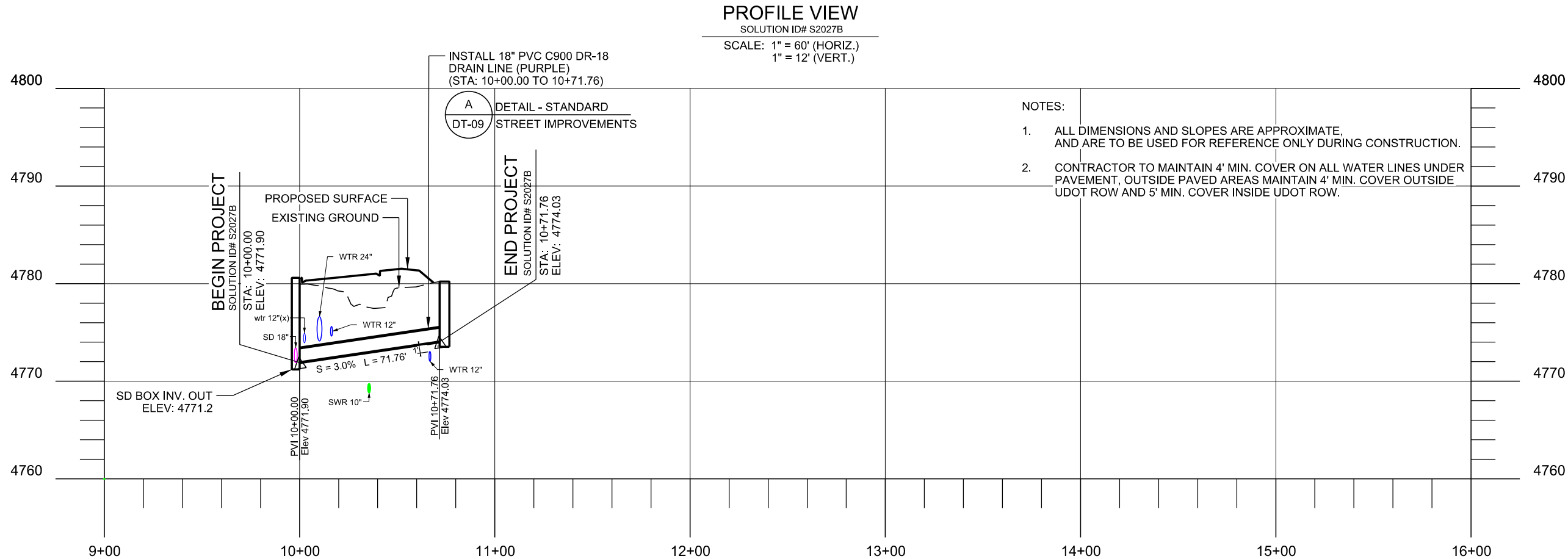
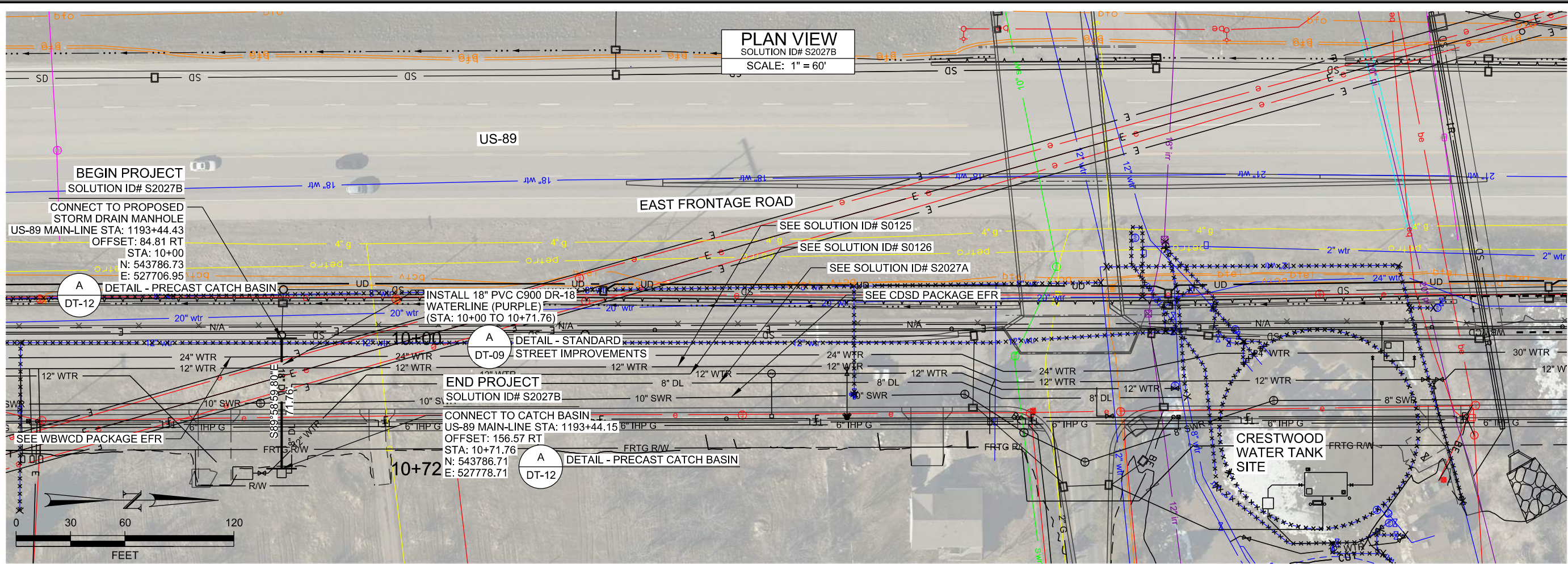


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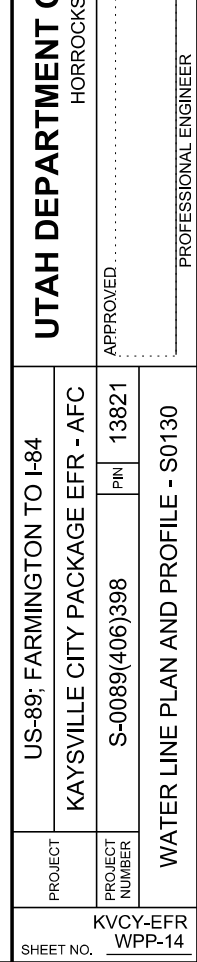
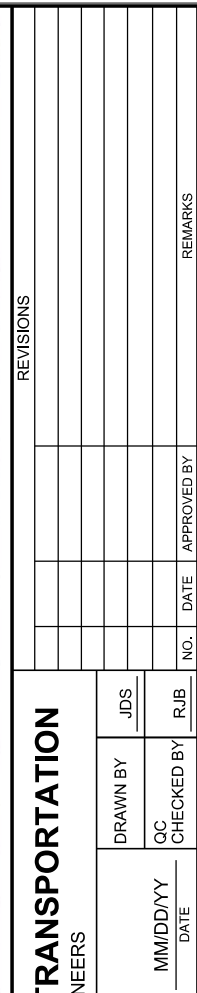


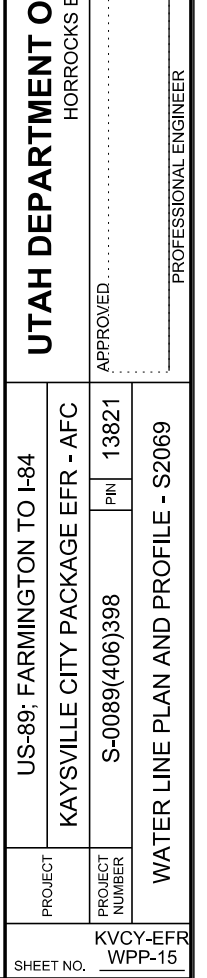
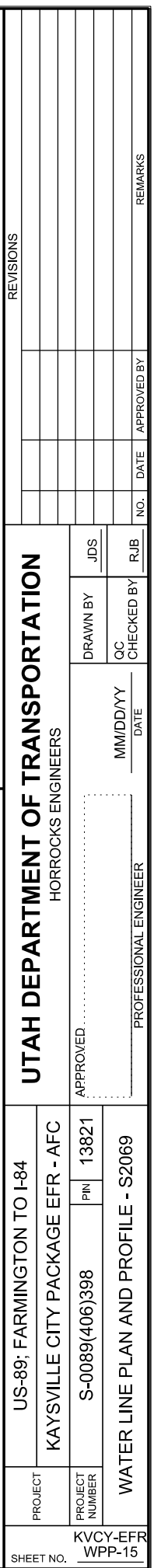


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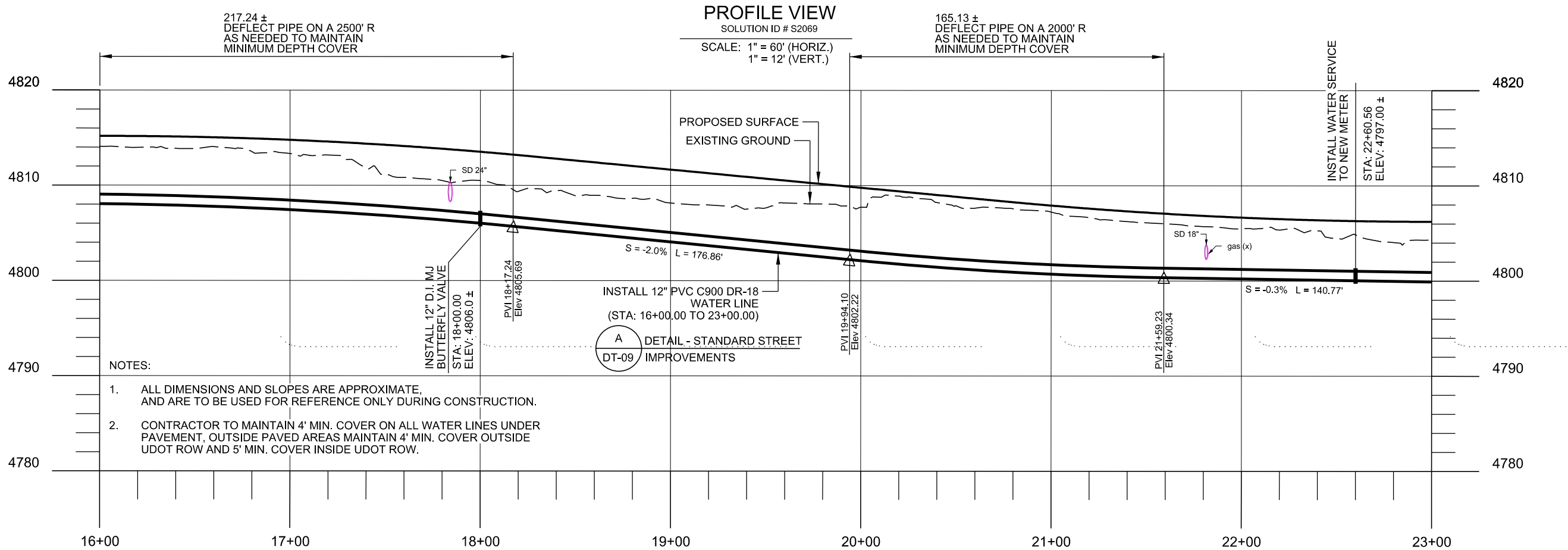
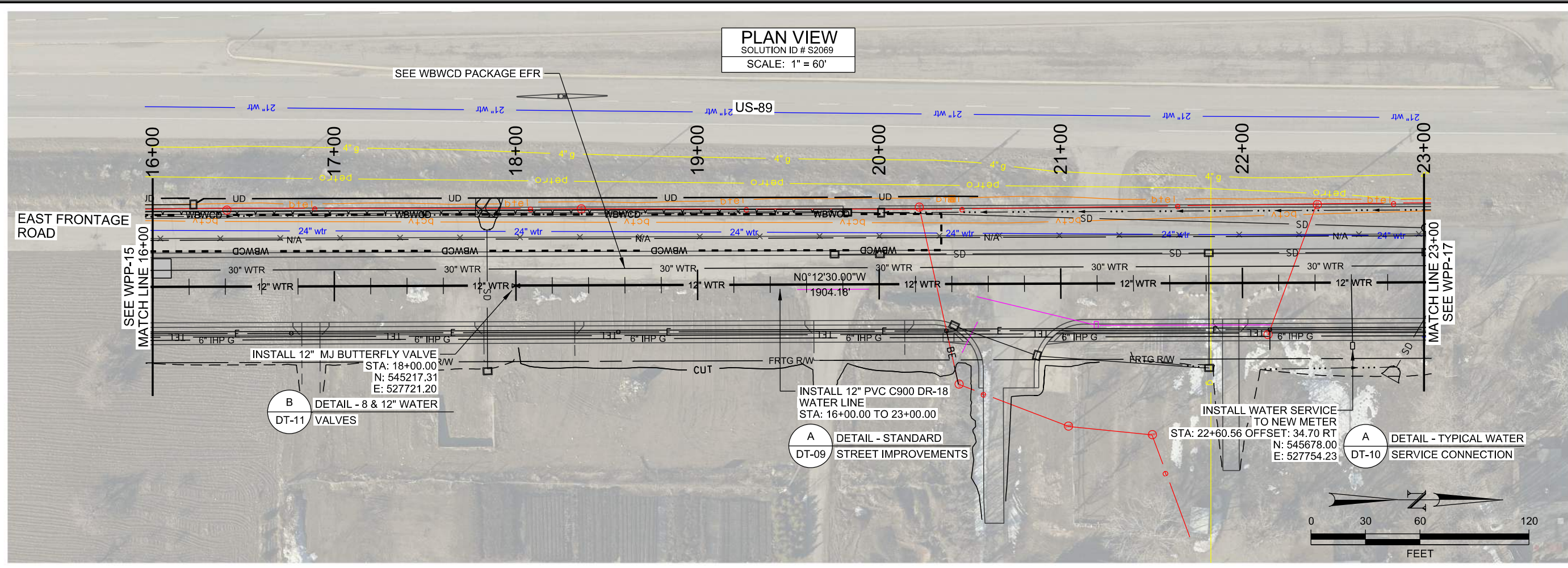


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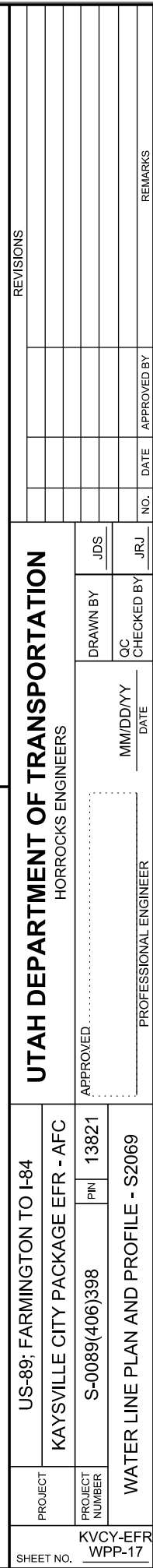
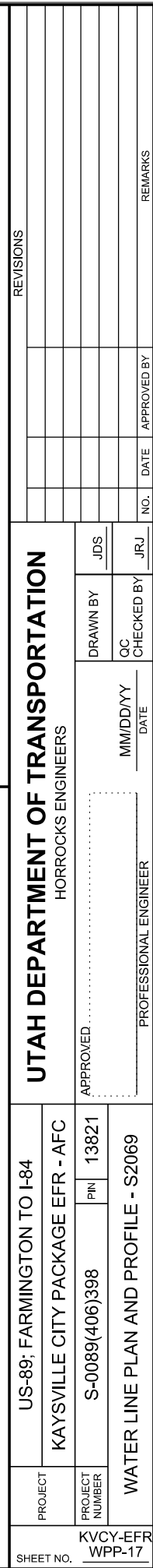




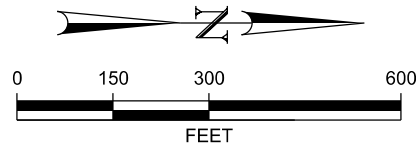
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REVISIONS				UTAH DEPARTMENT OF TRANSPORTATION			
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				13821			
				WATER LINE PLAN AND PROFILE - S2069			
				KVCY-EFR			
				WPP-16			
				SHEET NO.			
				DRAWN BY			
				JDS			
				QC			
				CHECKED BY			
				RJB			
				DATE			
				NO.			
				APPROVED BY			
				REMARKS			

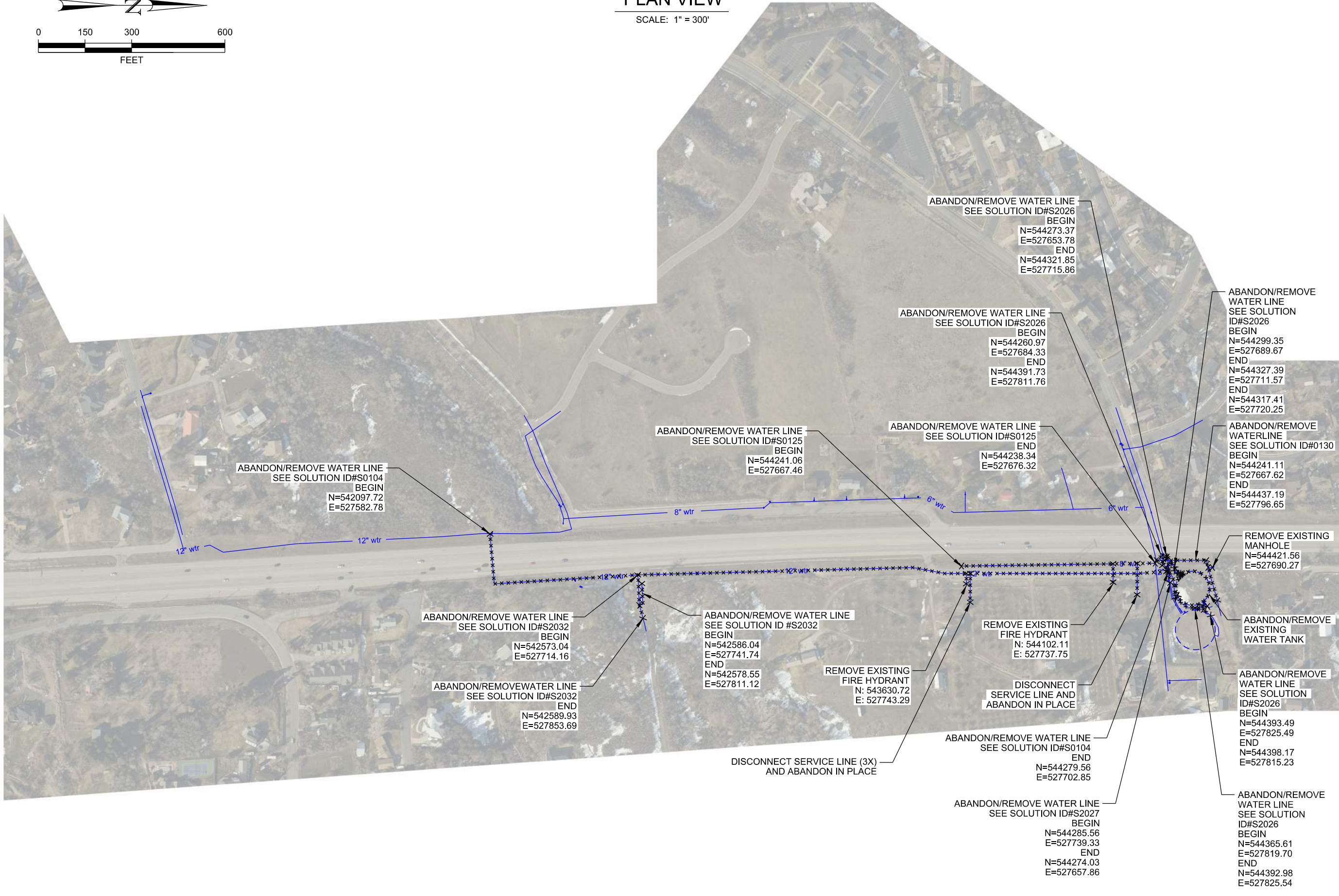


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PLAN VIEW

SCALE: 1" = 300'

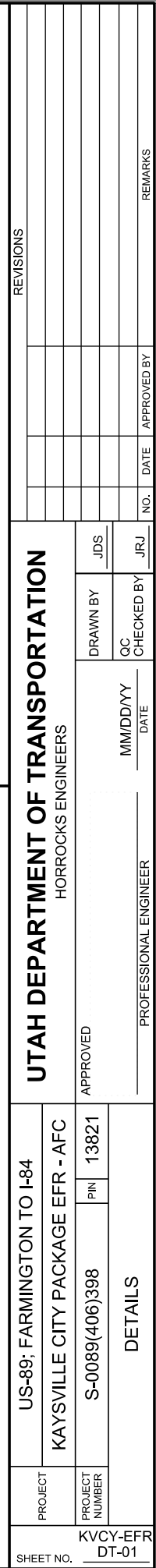


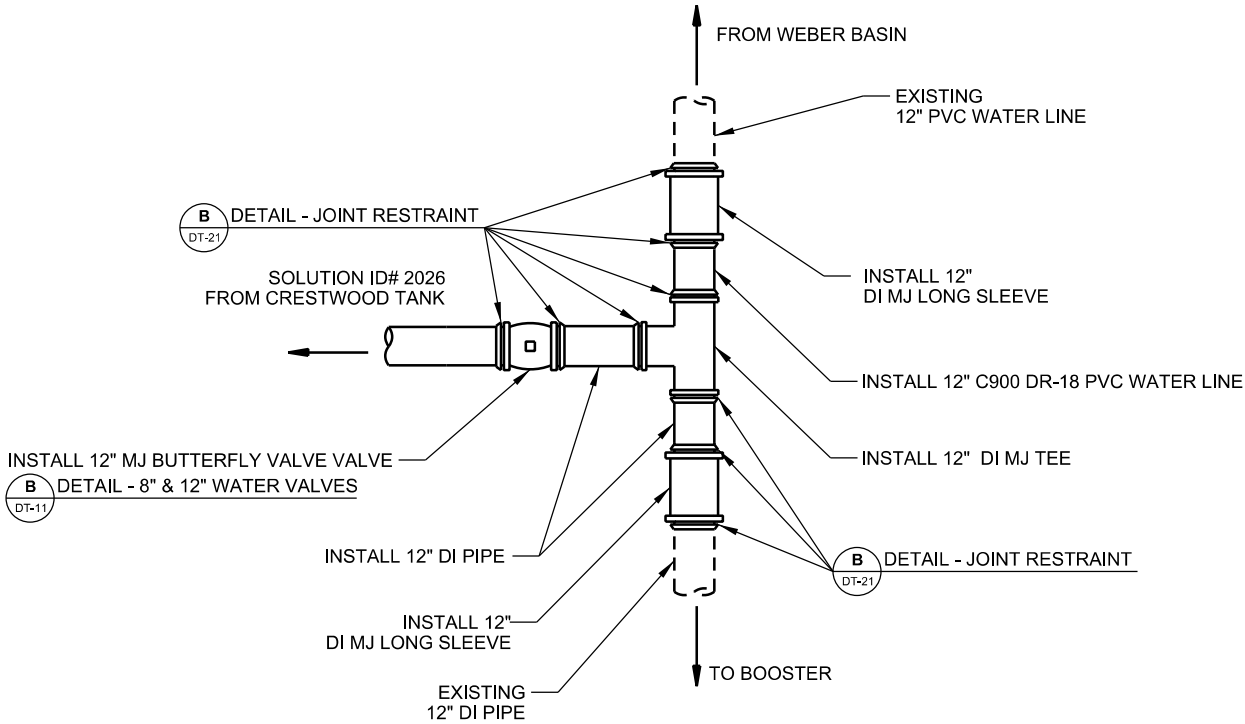
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PROJECT NUMBER		S-0089(406)398		PIN		13821		APPROVED		MM/DD/YY		QC CHECKED BY		JRU		NO.		DATE		APPROVED BY		REMARKS	
WATERLINE ABANDON/REMOVE										PROFESSIONAL ENGINEER		DATE											

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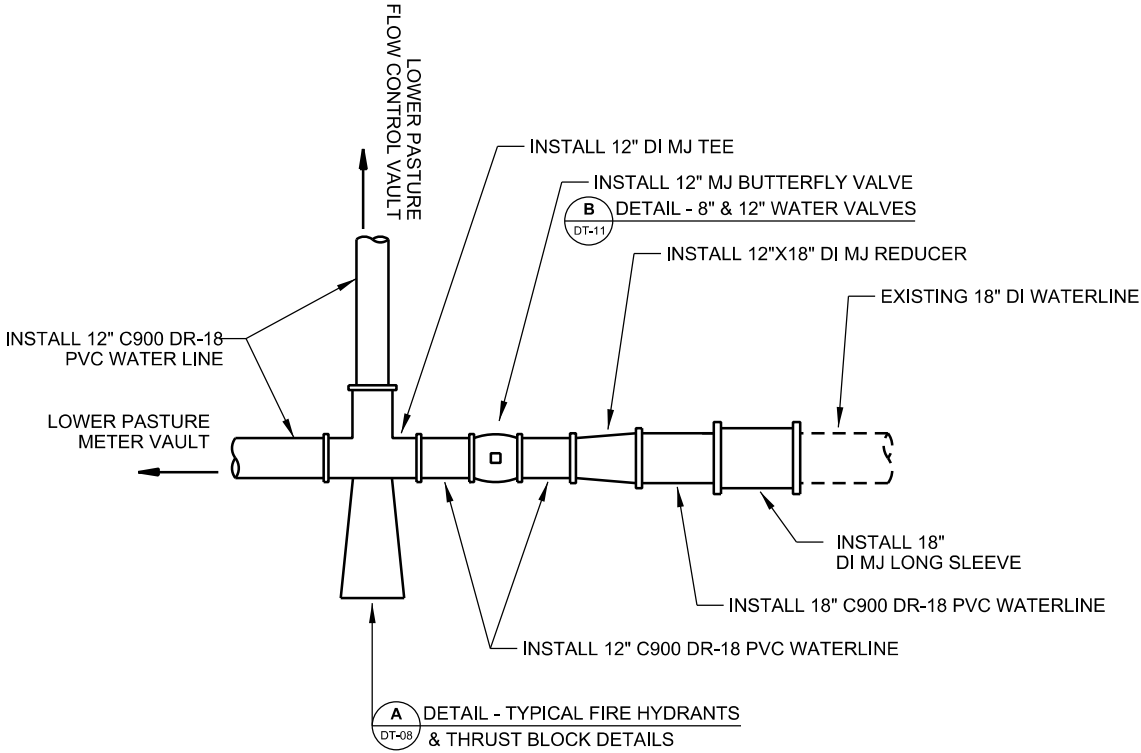


SHEET NO.	PROJECT	US-89; FARMINGTON TO I-84		UTAH DEPARTMENT OF TRANSPORTATION HORROCKS ENGINEERS	APPROVED	DRAWN BY	TAS	QC	CHECKED BY	RJB	NO.	DATE	APPROVED BY	REMARKS	
											</				





C **DETAIL - 12" WATER LINE CONNECTION**
DT-02 SCALE: NO SCALE
STA 11+00.54 ID# S2026 WPP-04

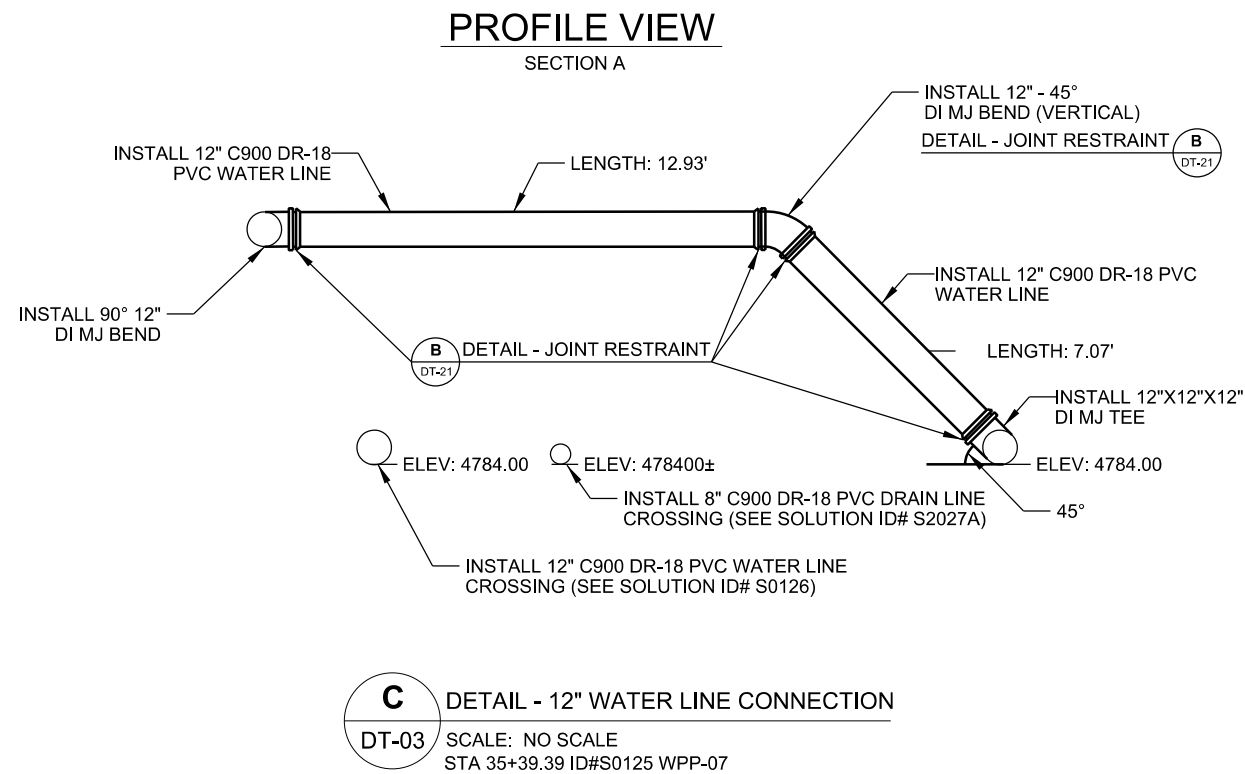
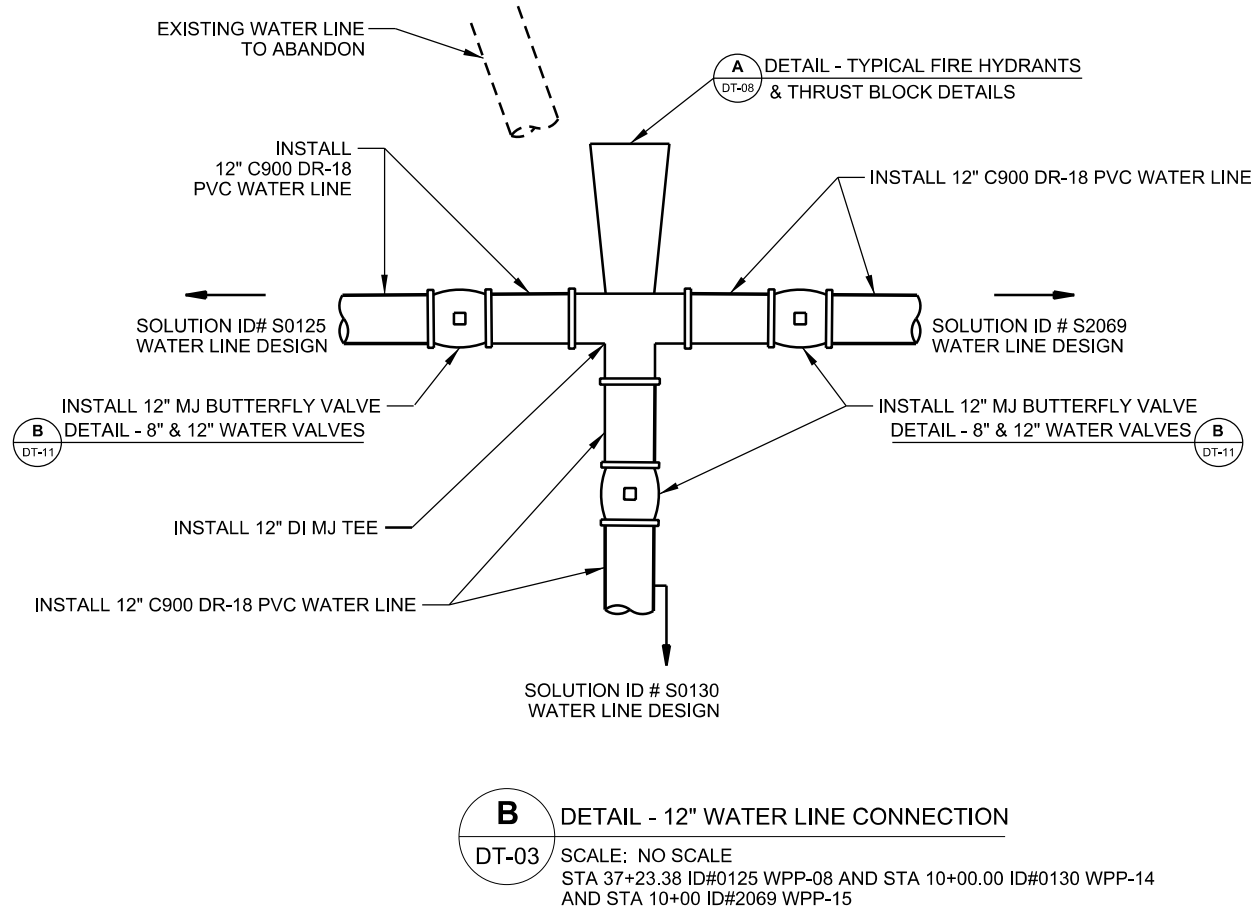


B **DETAIL - 12" WATER LINE CONNECTION**
DT-02 SCALE: NO SCALE
STA N/A ID# 2032 DT-18

D **INTENTIONALLY LEFT BLANK**
DT-02

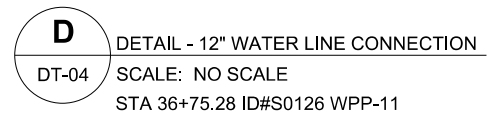
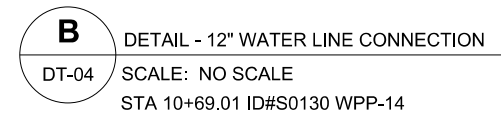
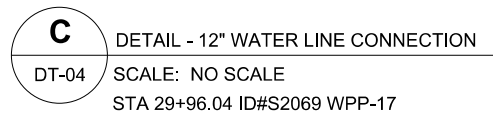
REVISIONS				UTAH DEPARTMENT OF TRANSPORTATION				US-89; FARMINGTON TO I-84				PROJECT
6				HORROCKS ENGINEERS				KAYSVILLE CITY PACKAGE EFR - AFC				KVCY-EFR
5				DRAWN BY JDS	QC CHECKED BY JRJ	MM/DD/YY DATE	PROFESSIONAL ENGINEER	APPROVED	PROJECT NUMBER S-0089(406)398	PIN 13821	DETAILS	DT-02
4												
3												
2												
1												
				NO.	DATE	APPROVED BY	REMARKS					

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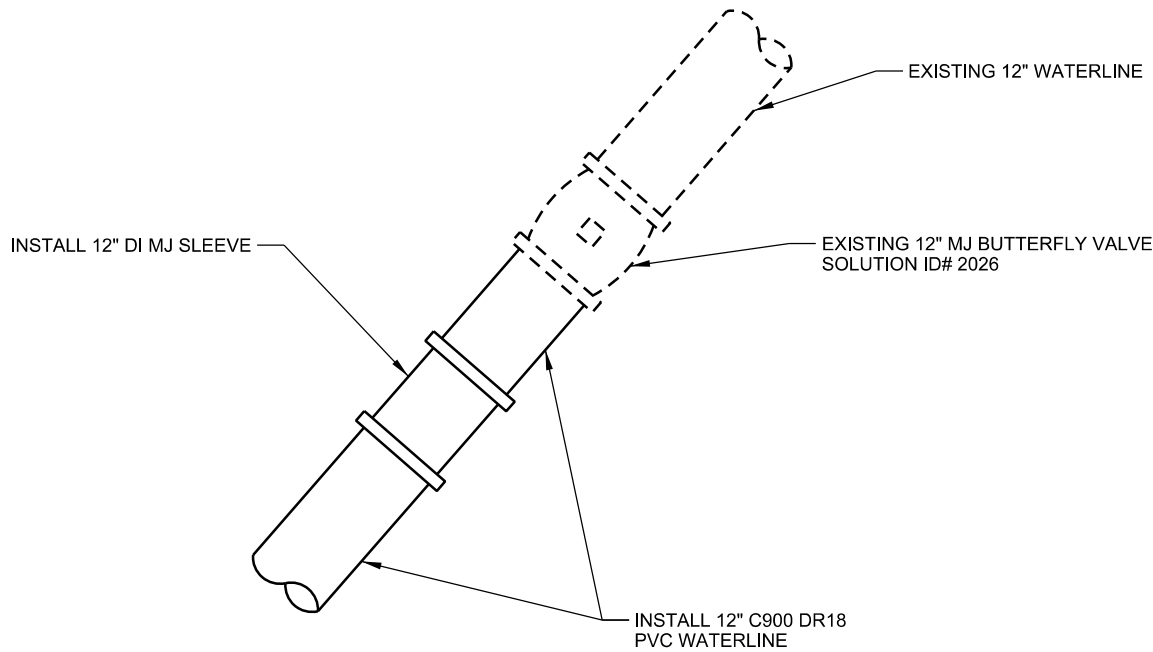


PROJECT		US-89; FARMINGTON TO I-84		UTAH DEPARTMENT OF TRANSPORTATION HORROCKS ENGINEERS					REVISIONS				
		KAYSVILLE CITY PACKAGE EFR - AFC											
PROJECT NUMBER	S-0089(406)398	PIN 13821		APPROVED		DRAWN BY JDS							
		DETAILS		PROFESSIONAL ENGINEER		OC CHECKED BY		MM/DD/YY		DATE		APPROVED BY	
												REMARKS	

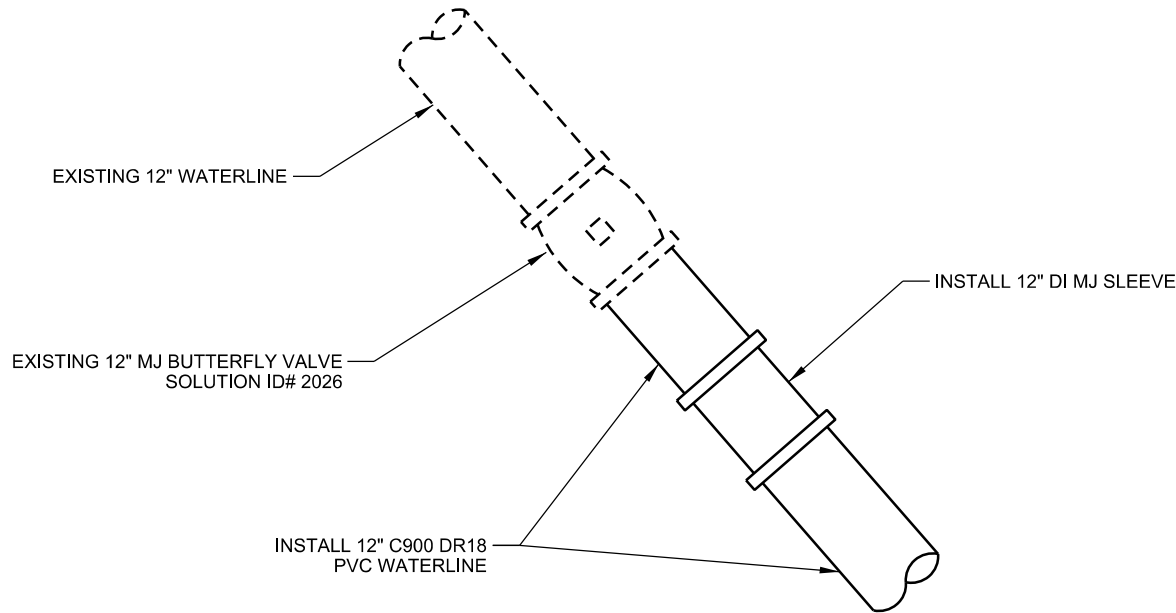
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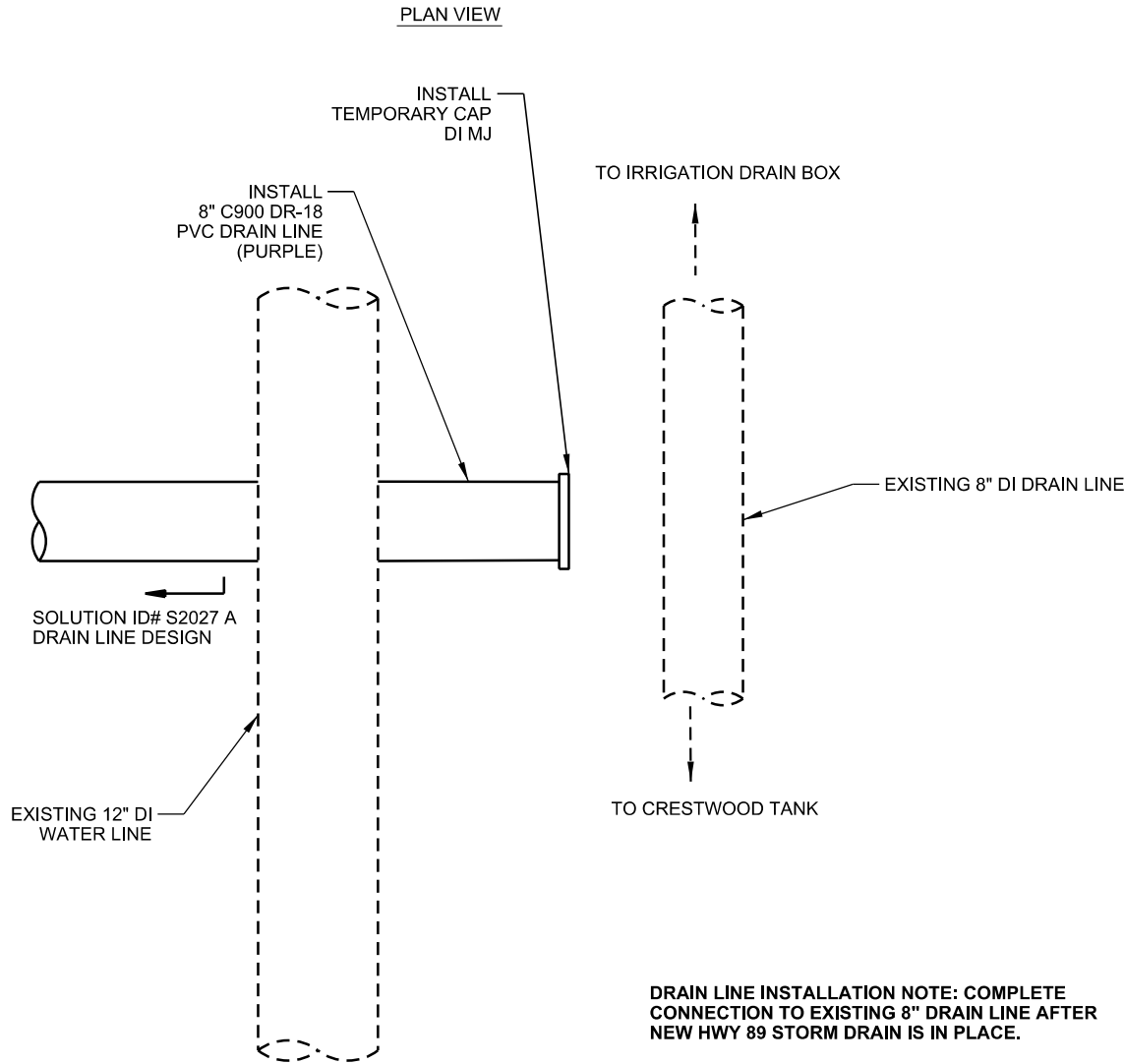
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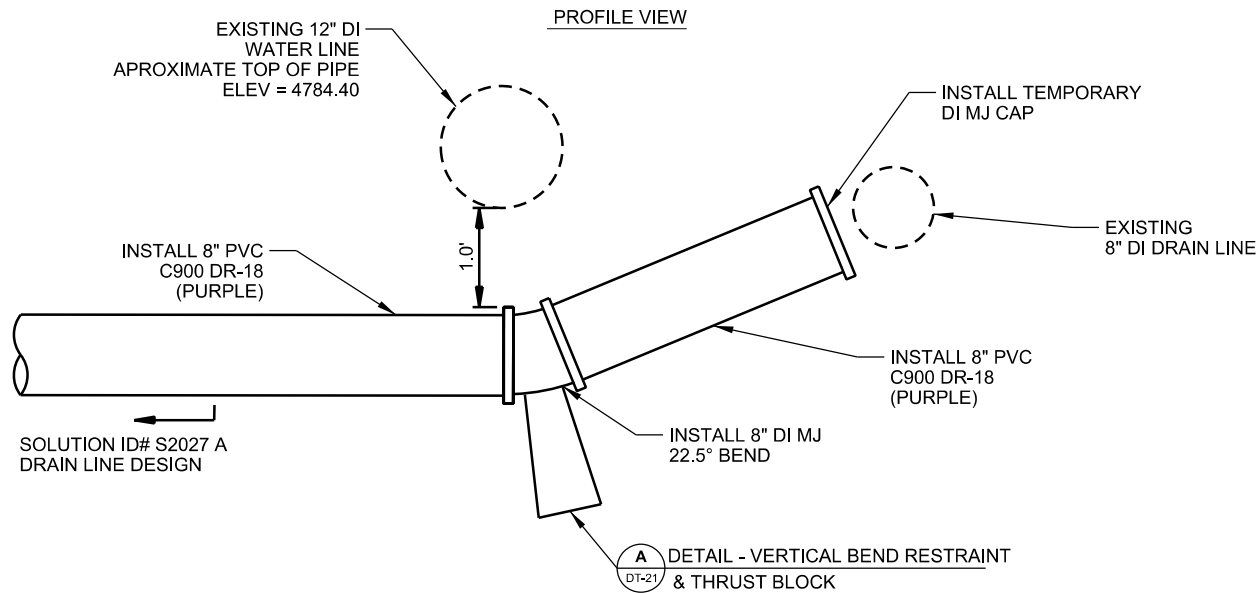
A DETAIL - 12" WATER LINE CONNECTION
DT-05 SCALE: NO SCALE
STA N/A ID#S2031DT-17



C DETAIL - 12" WATER LINE CONNECTION
DT-05 SCALE: NO SCALE
STA N/A ID#S2031 DT-17



DRAIN LINE INSTALLATION NOTE: COMPLETE CONNECTION TO EXISTING 8" DRAIN LINE AFTER NEW HWY 89 STORM DRAIN IS IN PLACE.



B DETAIL - 8" DRAIN LINE CONNECTION
DT-05 SCALE: NO SCALE
STA 15+44.12 ID#S2027A WPP-12

REVISIONS				UTAH DEPARTMENT OF TRANSPORTATION				US-89; FARMINGTON TO I-84				KAYSVILLE CITY PACKAGE EFR - AFC				PROJECT			
				HORROCKS ENGINEERS				13821				S-0089(406)398				KVCY-EFR			
				APPROVED				PIN				DETAILS				DT-05			
				DRAWN BY				13821				S-0089(406)398				PROJECT			
				QC				S-0089(406)398				S-0089(406)398				PROJECT			
				CHECKED BY				S-0089(406)398				S-0089(406)398				PROJECT			
				DATE				S-0089(406)398				S-0089(406)398				PROJECT			
				APPROVED BY				S-0089(406)398				S-0089(406)398				PROJECT			
				DATE				S-0089(406)398				S-0089(406)398				PROJECT			
				REMARKS				S-0089(406)398				S-0089(406)398				PROJECT			

DETAIL - JOINT RESTRAINT

B DT-21

EXISTING 12" DI WATER LINE

INSTALL 12" DI MJ LONG SLEEVE

INSTALL 12" CL250 WATER LINE

INSTALL 12" DI MJ TEE

INSTALL 12" CL250 WATERLINE

INSTALL 12" DI MJ LONG SLEEVE

EXISTING 12" CL250 WATER LINE

INSTALL 12" DI WATER LINE

12" DI MJ STA 10+10.00 45° BEND (VERTICAL)

INSTALL 12" DI CL250 WATER LINE

SOLUTION ID# 2026 WATER LINE DESIGN

EXISTING 8" DI DRAIN LINE

B DT-21

DETAIL - JOINT RESTRAINT

DT-06 SCALE: NO SCALE
STA 10+00.00 ID#S2026 WPP-04

DT-06 SCALE: NO SCALE
STA N/A ID#S2031 DT-17

DT-06 SCALE: NO SCALE
STA N/A ID#S2032 DT-18

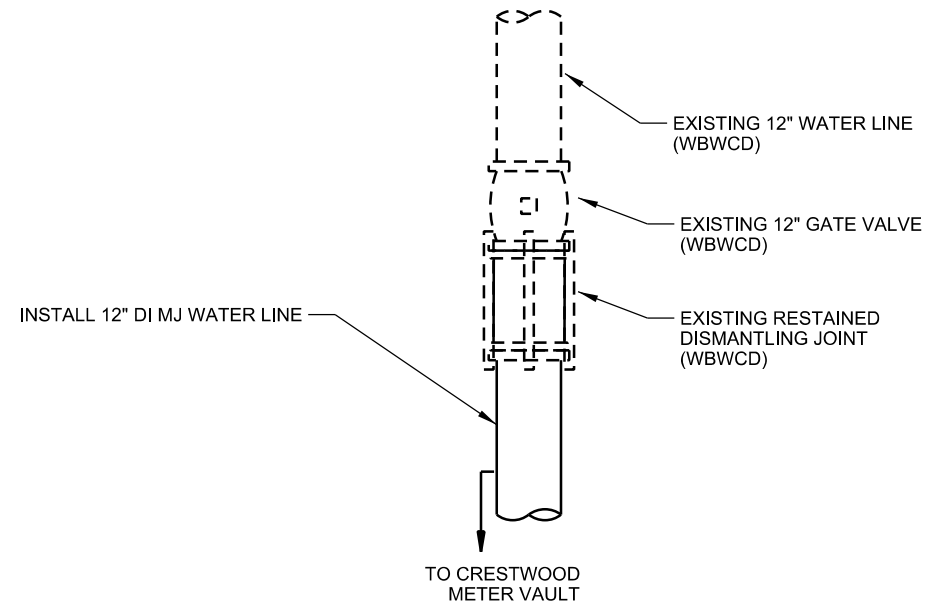
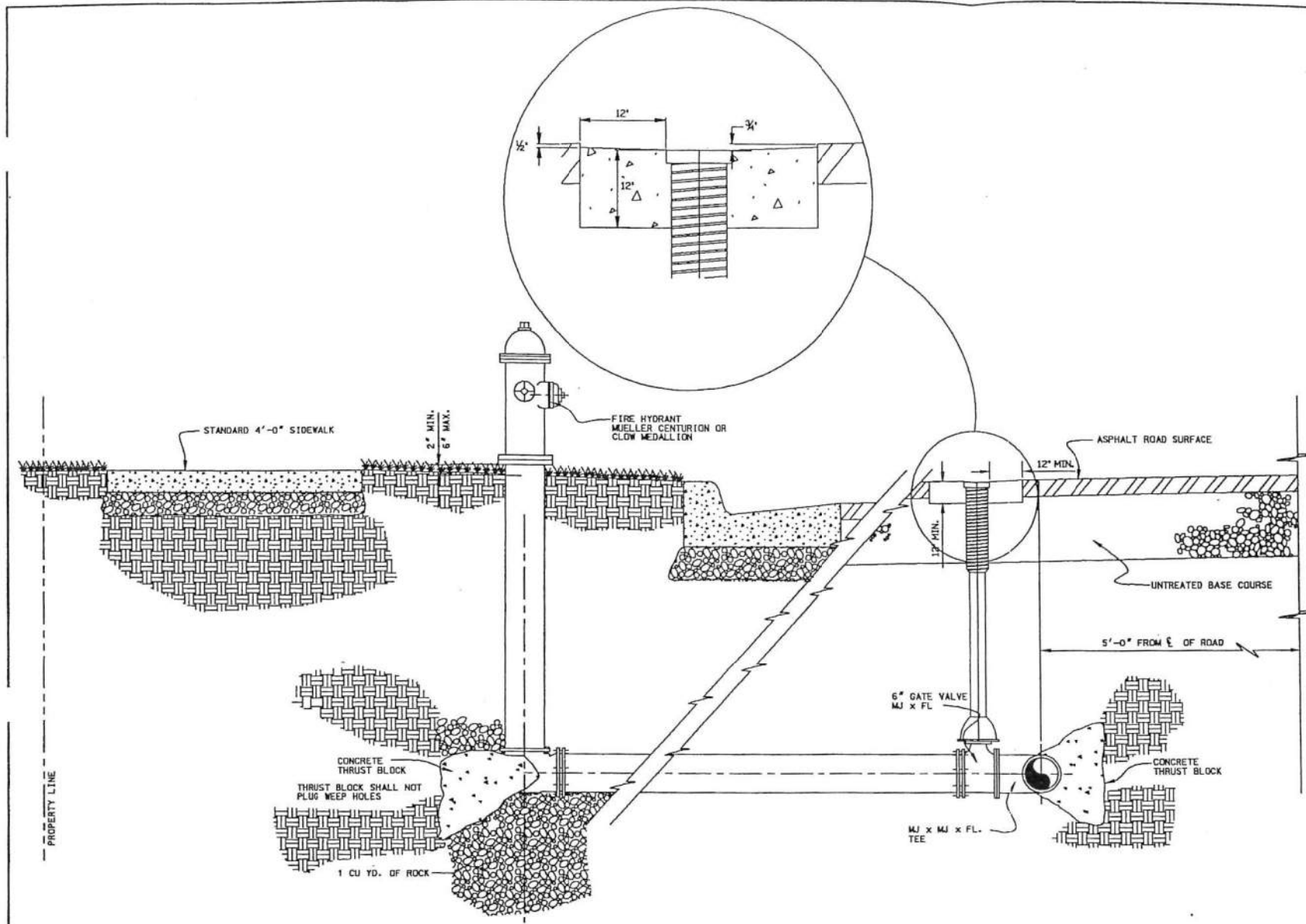


Diagram illustrating the installation of a new 12" C900 DR18 PVC water line. The diagram shows an existing 12" water line (WBWCD) and an existing 12" gate valve (WBWCD). The new line is installed below the existing gate valve, connecting to an existing restrained dismantling joint (WBWCD). The new line is labeled "INSTALL 12" C900 DR18 PVC WATER LINE". The existing line is labeled "EXISTING 12" WATER LINE (WBWCD)". The gate valve is labeled "EXISTING 12" GATE VALVE (WBWCD)". The dismantling joint is labeled "EXISTING RESTAINED DISMANTLING JOINT (WBWCD)". The new line is shown extending downwards to a "TO LOWER PASTURE METER VAULT".

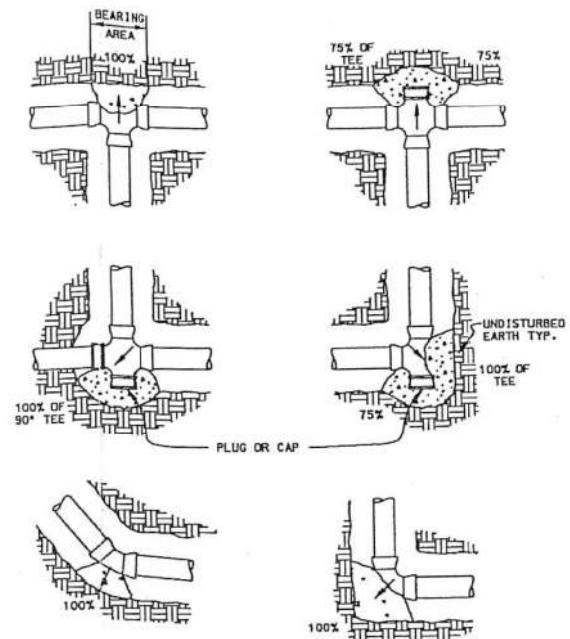
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		KAYSVILLE CITY PACKAGE EFR - AFC												
PROJECT NUMBER		S-0089(406)398		PIN		13821								
DETAILS														
SHEET NO.				KVQY-EFR DT-06										

PROJECT	PROJECT NUMBER	
SHEET NO.		KVCY-EFR DT-07





TYPICAL FIRE HYDRANT CONNECTION



NOTE:
ALL MJ AND FLANGED FITTINGS TO BE WRAPPED WITH POLYEHTYLENE
WRAP PRIOR TO POURING THRUST BLOCK.

DETAIL NOTES:
FIGURE (100%) AT THRUST BLOCK INDICATES PER CENT OF TOTAL THRUST
TO BE APPLIED FOR BEARING AREA.
ARROW (—) INDICATES THRUST DIRECTION
CONCRETE FOR THRUST BLOCKS TO BE 2000 P.S.I.

SIDE THRUST PER 100 LB./SQ. IN. PRESSURE PER DEGREE OF DEFLECTION			
PIPE SIZE	SIDE THRUST-LB.	PIPE SIZE	SIDE THRUST-LB.
4	35	14	377
6	72	16	486
8	122	18	665
10	197	20	790
12	278	24	1150

MULTIPLY THRUST BY DEGREE OF DEFLECTION TO OBTAIN TOTAL THRUST

PIPE SIZE	DEAD END OR TEE	90° ELBOW	45° ELBOW	22-1/2° ELBOW
4	19	27	15	7
6	39	55	30	15
8	67	94	51	26
10	109	154	84	43
12	155	218	119	61
14	210	296	161	82
16	272	383	209	106
18	351	494	269	137
20	434	611	333	169
24	623	878	478	244

EXAMPLE:
 8-INCH 90° ELBOW. PRESSURE = 200 lb. / SQ. IN.
 FROM TABLE: THRUST = $94 \times 200 = 18,800$ lb.
 ASSUME BEARING STRENGTH OF SOIL = 2000 lb. / SQ. FT.
 $\frac{18,800}{2000} = 9.4$ SQ. FT. = AREA OF BEARING REQUIRED
 2000 FOR THRUST BLOCK.

TABLE NOTES:
IN USING THE ABOVE TABLES, USE THE MAXIMUM INTERNAL PRESSURE ANTICIPATED (I.E. HYDROSTATIC TEST PRESSURE, POSSIBLE SURGE PRESSURE DUE TO PUMP SHUT-OFF, ETC.)
SEE SOILS REPORT FOR BEARING STRENGTH OF SOIL IN THE ABSENCE OF A SOILS REPORT. AN AVERAGE SOIL (SPADABLE MEDIUM CLAY) CAN BE ASSUMED TO HAVE A BEARING STRENGTH OF 2000 P.S.F.

THRUST BLOCK DETAILS

LICENSE CITY ENGINEER		5 4 3 2 1 12/94 REV. DATE APPR. REVISIONS PER KAYSVILLE CITY	DESIGNED DRAFTSMAN CHECKED DATE 7-21-94	KAYSVILLE CITY 23 EAST CENTER KAYSVILLE, UTAH	KAYSVILLE CITY CORPORATION DEVELOPMENT STANDARDS TYPICAL FIRE HYDRANT & THRUST BLOCK DETAILS	SHEET NO. 5 of 11 SHEETS
---	--	---	---	--	--	---

A

DETAIL - TYPICAL FIRE HYDRANTS & THRUST BLOCK DETAILS

DT-08

SCALE: NO SCALE

FOR INFORMATION ONLY

US-89; FARMINGTON TO I-84

KAYSVILLE CITY PACKAGE EFR - AFC

S-0089(406)398	PIN	13821
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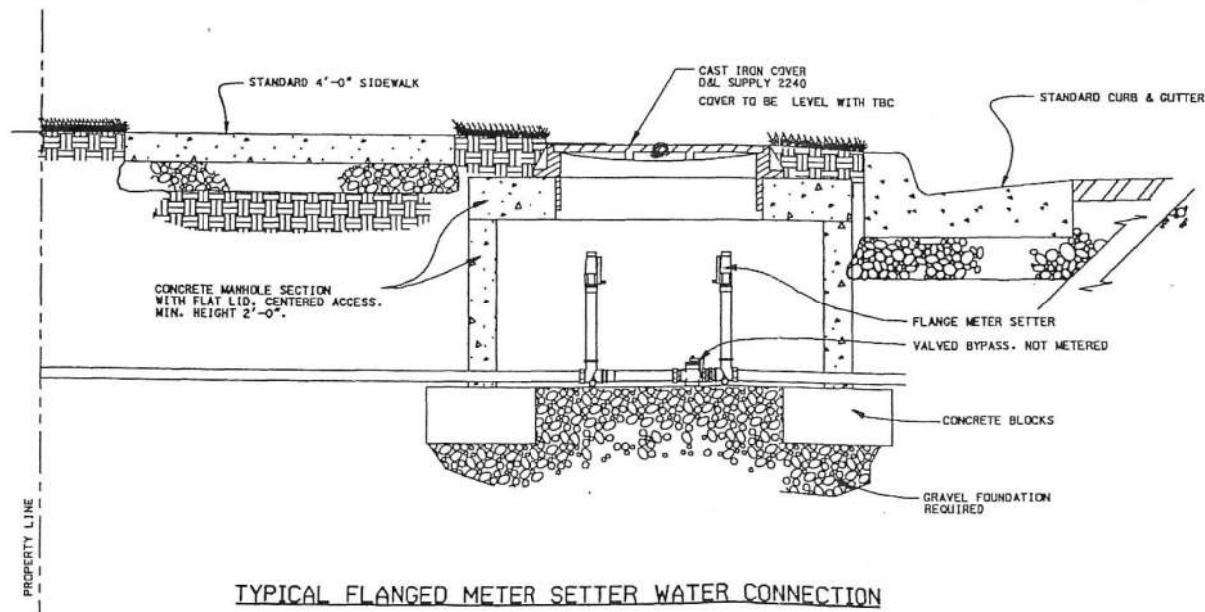
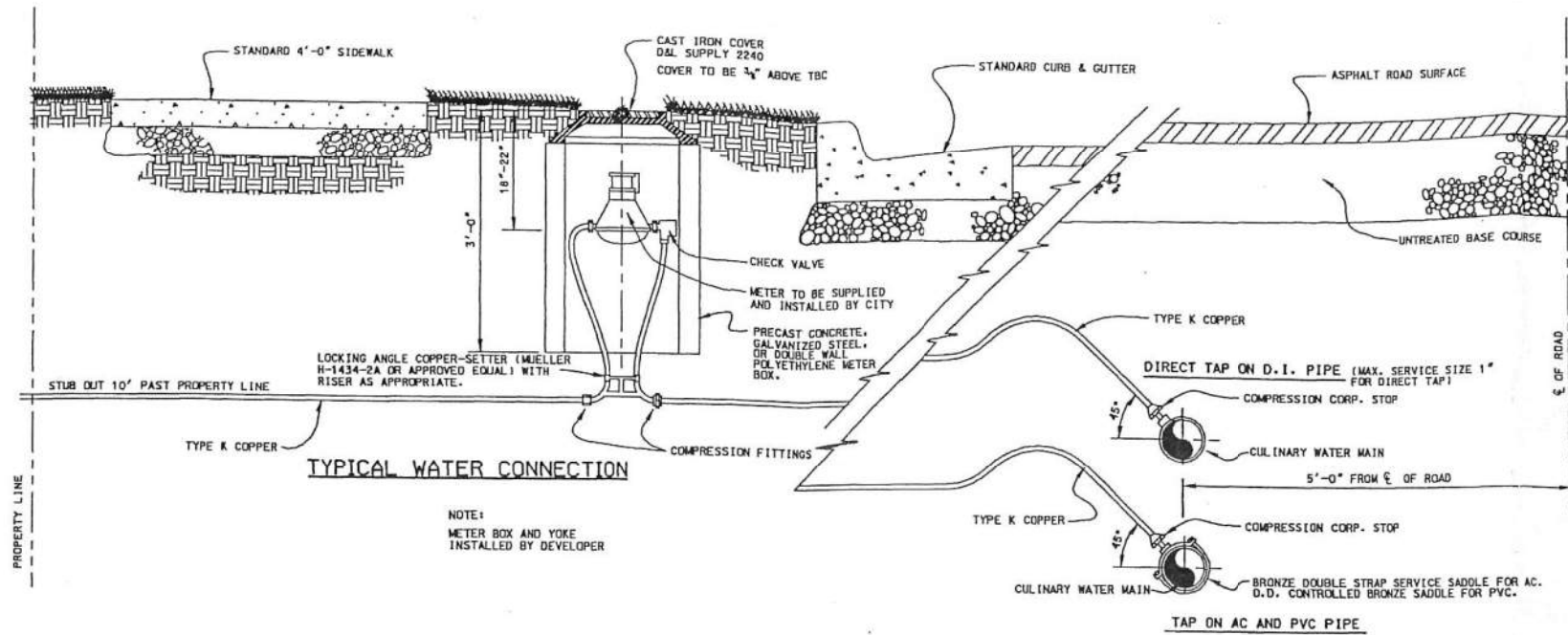
DETAILS

SHEET NO. KVCY-EFR
DT-08

FOR INFORMATION ONLY



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KAYSVILLE CITY CORPORATION WATER SERVICE INFORMATION					
SERVICE SIZE	METER BOX SIZE	TYPE OF MATERIAL FOR METER BOX	WATER METER	CONNECTION TYPE	BYPASS
3/4"	18" DIA	CONCRETE, GALVANIZED, POLYETHYLENE	BY CITY	NPT	NO
1"	24" DIA.	CONCRETE, GALVANIZED, POLYETHYLENE	BY CITY	NPT	NO
1 1/2"	48" DIA.	CONCRETE	BADGER RECORDALL MOD. 120	FLANGE	NO
2"	48" DIA.	CONCRETE	COMPOUND METER	FLANGE	*
3"	60" DIA.	CONCRETE	COMPOUND METER	FLANGE	1"
4"	4' X 6' BOX	CONCRETE	COMPOUND METER	FLANGE	2"

* DETERMINED BY USE

NOTES:
WATER SERVICE LINE FITTINGS SHALL BE FORD OR MUELLER.
EXISTING METER TO BE RELOCATED AS INDICATED.

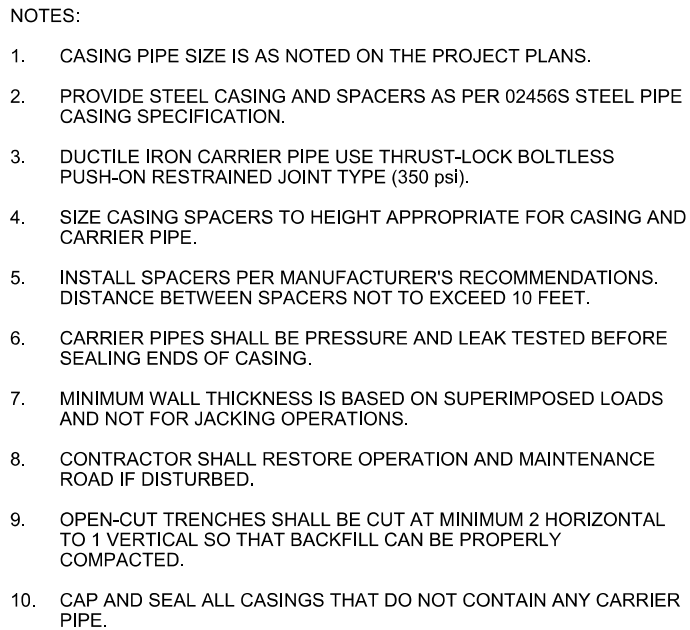
* 151/4
AS per Larry
8-29-99

LICENSE	CITY ENGINEER	DESIGNED	DRAFTSMAN	CHECKED	DATE	7-21-94	KAYSVILLE CITY 23 EAST CENTER KAYSVILLE, UTAH	KAYSVILLE CITY CORPORATION DEVELOPMENT STANDARDS TYPICAL WATER SERVICE CONNECTION DETAILS	SHEET NO. 4 OF 11 SHEETS
REV.	DATE	APPR.	REVISIONS PER KAYSVILLE CITY						

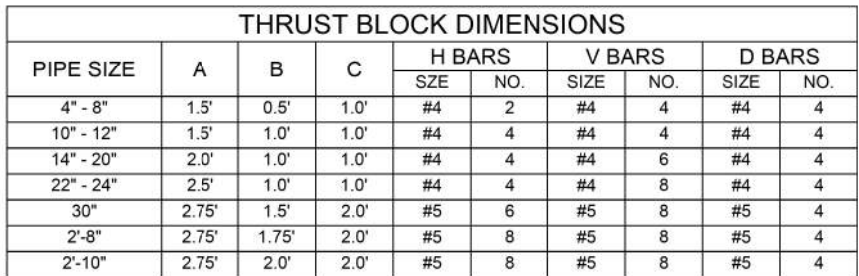
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DETAIL - TYPICAL WATER SERVICE CONNECTION DETAILS
DT-10 SCALE: NO SCALE

FOR INFORMATION ONLY

US-89; FARMINGTON TO I-84		KAYSVILLE CITY PACKAGE EFR - AFC	
PROJECT	PROJECT NUMBER	S-0089(406)398	13821
SHEET NO.		DETAILS	
KVCY-EFR DT-10			



B DETAIL - 8" & 12" WATER VALVES
DT-11 SCALE: NO SCALE



C DETAIL - CONCRETE HDPE PIPE ANCHOR
DT-11 SCALE: NO SCALE

SHEET NO.	KVCCY-EFR DT-11		PROJECT		US-89; FARMINGTON TO I-84		UTAH DEPARTMENT OF TRANSPORTATION HORROCKS ENGINEERS										REVISONS							
	PROJECT NUMBER		S-0089(406)398		PIN		13821		APPROVED		MM/DD/YY DATE		DRAWN BY		JDS		NO.		DATE		APPROVED BY		REMARKS	
													QC CHECKED BY		JRJ									
													PROFESSIONAL ENGINEER											
DETAILS																								



A DETAIL - PRECAST CATCH BASIN
DT-12 SCALE: NO SCALE

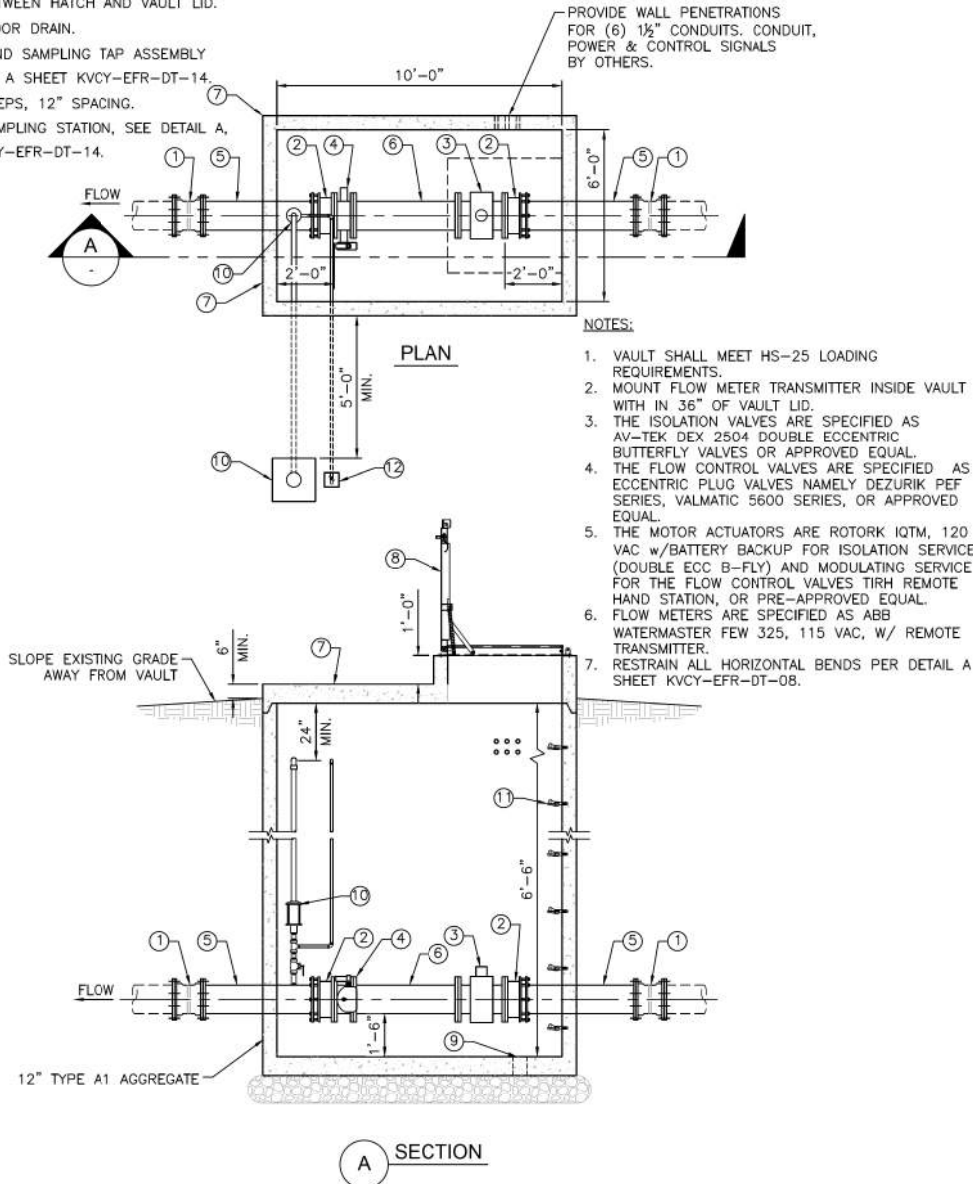


SHEET NO.	PROJECT	US-89; FARMINGTON TO I-84		UTAH DEPARTMENT OF TRANSPORTATION HORROCKS ENGINEERS										APPROVED PROFESSIONAL ENGINEER DATE				DRAWN BY		TAS		NO. DATE APPROVED BY REMARKS			
		PROJECT NUMBER	S-0089(406)398															PIN	13821	QC CHECKED BY	RJB				

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KEYED NOTES

- 1 12" DI SLEEVE, MJxMJ, CONNECT TO NEW 12" C900 PVC.
- 2 12" RESTRAINED FLANGE COUPLING ADAPTER.
- 3 12" ELECTROMAGNETIC FLOW METER, FLxFL.
- 4 12" DOUBLE ECCENTRIC BUTTERFLY VALVE WITH MOTOR ACTUATOR AND REMOTE HAND STATION.
- 5 12" DI PIPE SPOOL, PEXPE.
- 6 12" DI PIPE SPOOL, FLxFL.
- 7 10'x6' PRE-CAST CONCRETE VAULT. PROVIDE STRUCTURAL CALCULATIONS FOR ENGINEER'S REVIEW.
- 8 48"x48" ALUMINUM ACCESS HATCH WITH EXTERNAL FRAME, SHOE BOX LID AND GASKET. PROVIDE WITH CONCEALED PADLOCK HASP. ANCHOR AND SEAL TO CONCRETE WITH GASKET BETWEEN HATCH AND VAULT LID.
- 9 6" DIA. FLOOR DRAIN.
- 10 AIR-VAC AND SAMPLING TAP ASSEMBLY SEE DETAIL A SHEET KVCY-EFR-DT-14.
- 11 ACCESS STEPS, 12" SPACING.
- 12 INSTALL SAMPLING STATION, SEE DETAIL A, SHEET KVCY-EFR-DT-14.

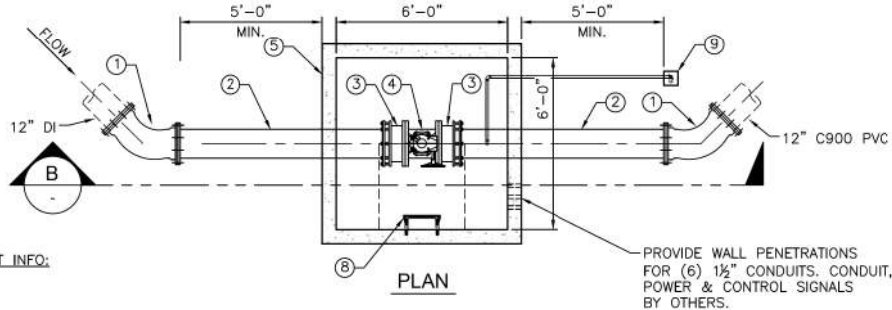


D1 CRESTWOOD RESERVOIR ISOLATION VALVE/METER VAULT
SCALE: 3/8" = 1'-0"

A DETAIL - CRESTWOOD EAST RESERVOIR ISOLATION VALVE/METER VAULT
DT-13 SCALE: NO SCALE

KEYED NOTES

- 1 12" DI 45° BEND, MJxMJ, CONNECT TO EXISTING.
- 2 12" DI PIPE SPOOL, PEXPE.
- 3 12" RESTRAINED FLANGE COUPLING ADAPTER.
- 4 12" PLUG VALVE WITH MOTOR ACTUATOR AND REMOTE HAND STATION.
- 5 6'x6' PRE-CAST CONCRETE VAULT. PROVIDE STRUCTURAL CALCULATIONS FOR ENGINEER'S REVIEW.
- 6 48"x48" ALUMINUM ACCESS HATCH WITH EXTERNAL FRAME, SHOE BOX LID AND GASKET. PROVIDE WITH CONCEALED PADLOCK HASP. ANCHOR AND SEAL TO CONCRETE WITH GASKET BETWEEN HATCH AND VAULT LID.
- 7 6" DIA. FLOOR DRAIN.
- 8 ACCESS STEPS, 12" SPACING.
- 9 INSTALL OWNER SUPPLIED SAMPLING STATION, SEE DETAIL A, SHEET KVCY-EFR-DT-14.



SUPPLIER CONTACT INFO:

1. VALVES:
Mason Lewis
Rocky Mountain Valves and Automation
1310 So. Swamer Rd.
Salt Lake City, Utah 84104
(801)438-1038

2. METERS:
Mike Franklin
VFC Controls
90 Cutler Drive
North Salt Lake, Utah 84054
(801)677-1453

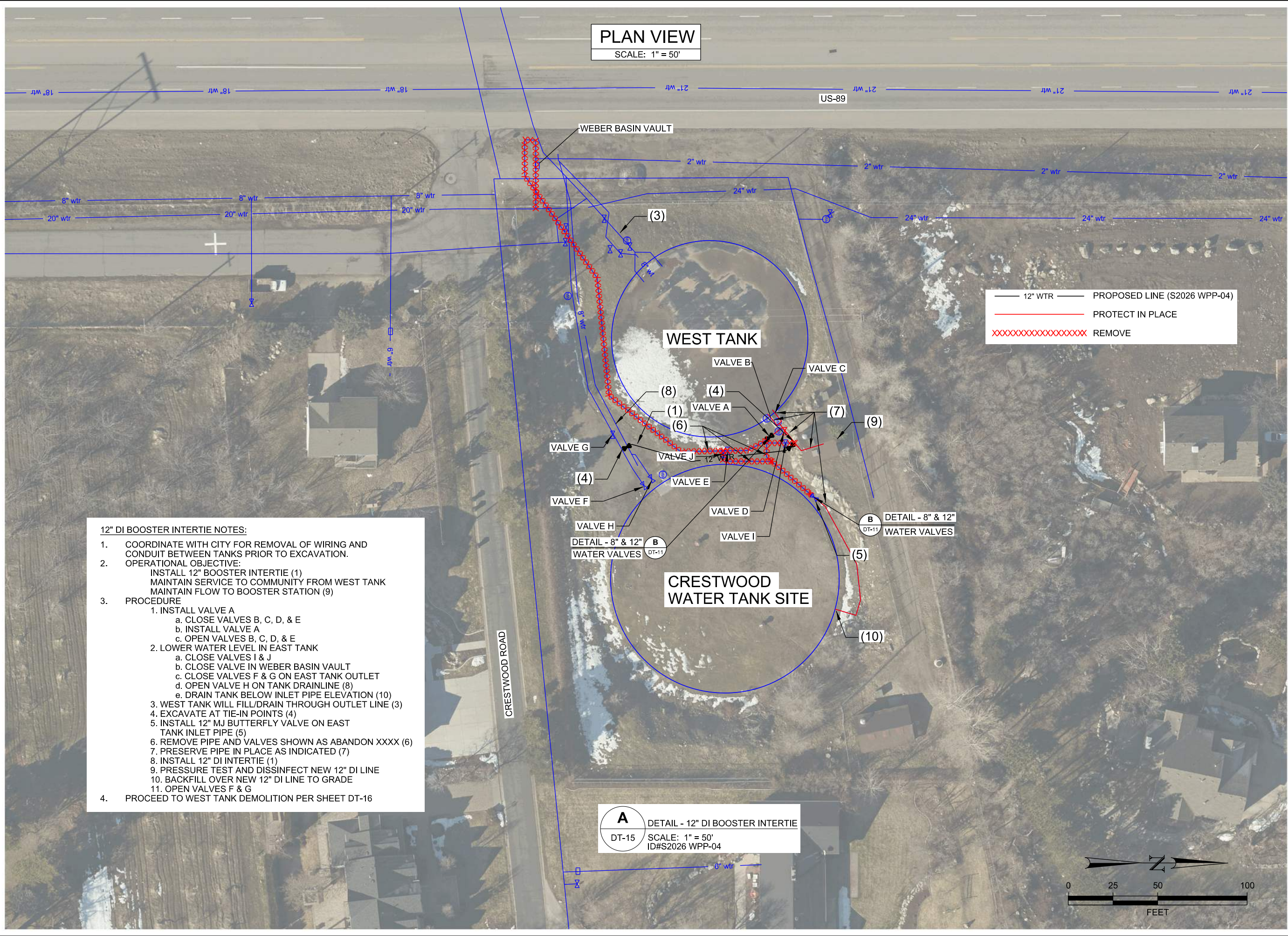
D3 CRESTWOOD RESERVOIR FLOW CONTROL VALVE VAULT
SCALE: 3/8" = 1'-0"

PROJECT		US-89; FARMINGTON TO I-84		UTAH DEPARTMENT OF TRANSPORTATION HORROCKS ENGINEERS				APPROVED		DRAWN BY		JDS		REVISIONS					
		KAYSVILLE CITY PACKAGE EFR - AFC								QC CHECKED BY		RJB							
PROJECT NUMBER		S-0089(406)398		PIN		13821		MM/DD/YY DATE		PROFESSIONAL ENGINEER		NO.		DATE		APPROVED BY		REMARKS	
																</			



SHEET NO.	US-89; FARMINGTON TO I-84				UTAH DEPARTMENT OF TRANSPORTATION										REVISIONS			
	PROJECT	KAYSVILLE CITY PACKAGE EFR - AFC			HORROCKS ENGINEERS													
PROJECT NUMBER	S-0089(406)398		PIN	13821	APPROVED.....		DRAWN BY		JDS	MM/DD/YY		DATE		APPROVED BY		REMARKS		
	DETAILS				PROFESSIONAL ENGINEER		OC		RJB									

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12" DI BOOSTER INTERTIE NOTES:

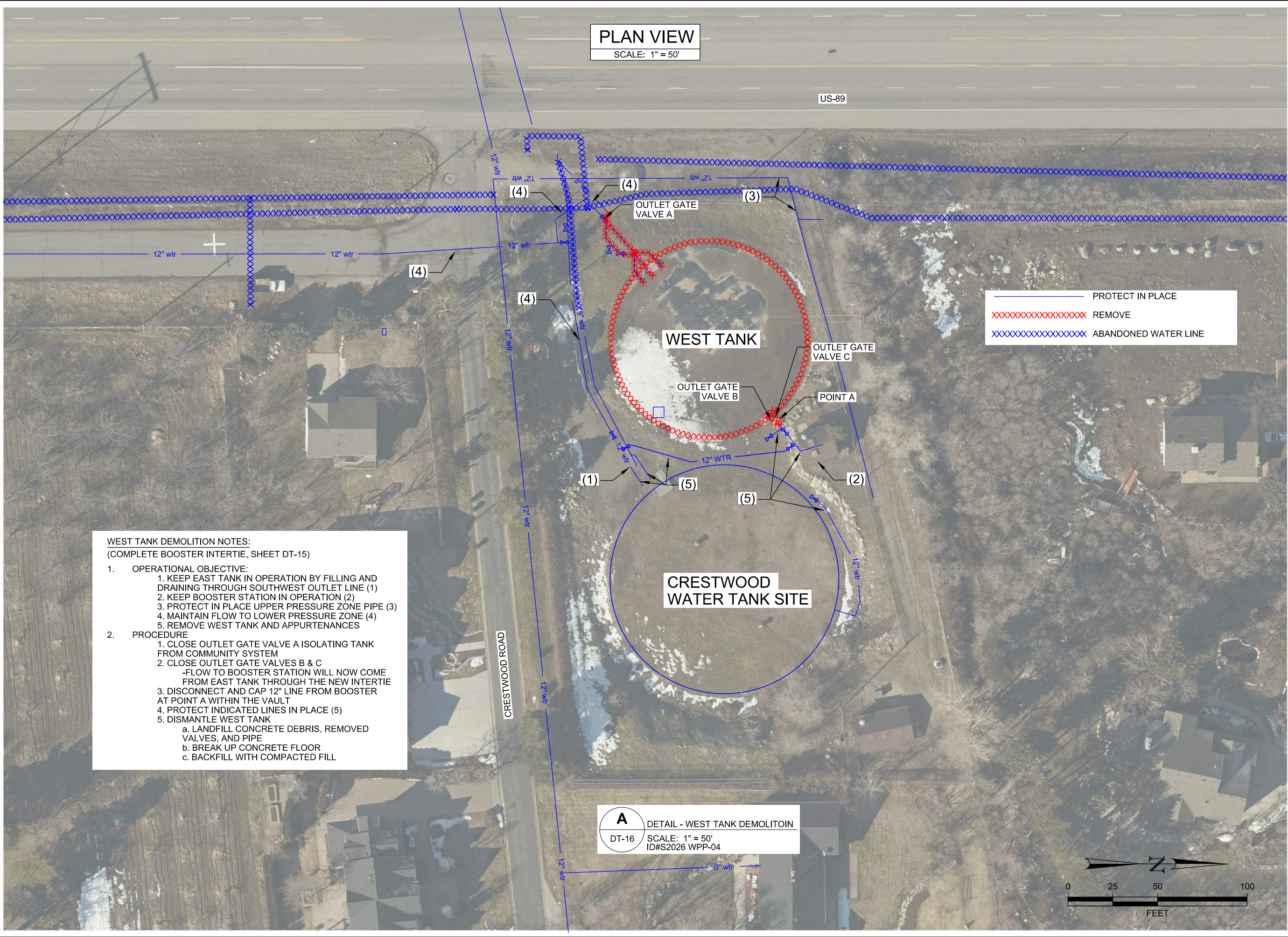
- COORDINATE WITH CITY FOR REMOVAL OF WIRING AND CONDUIT BETWEEN TANKS PRIOR TO EXCAVATION.
- OPERATIONAL OBJECTIVE:
 - INSTALL 12" BOOSTER INTERTIE (1)
 - MAINTAIN SERVICE TO COMMUNITY FROM WEST TANK
 - MAINTAIN FLOW TO BOOSTER STATION (9)
- PROCEDURE
 - INSTALL VALVE A
 - CLOSE VALVES B, C, D, & E
 - INSTALL VALVE A
 - OPEN VALVES B, C, D, & E
 - LOWER WATER LEVEL IN EAST TANK
 - CLOSE VALVES I & J
 - CLOSE VALVE IN WEBER BASIN VAULT
 - CLOSE VALVES F & G ON EAST TANK OUTLET
 - OPEN VALVE H ON TANK DRAINLINE (8)
 - DRAIN TANK BELOW INLET PIPE ELEVATION (10)
 - WEST TANK WILL FILL/DRAIN THROUGH OUTLET LINE (3)
 - EXCAVATE AT TIE-IN POINTS (4)
 - INSTALL 12" MJ BUTTERFLY VALVE ON EAST TANK INLET PIPE (5)
 - REMOVE PIPE AND VALVES SHOWN AS ABANDON XXXX (6)
 - PRESERVE PIPE IN PLACE AS INDICATED (7)
 - INSTALL 12" DI INTERTIE (1)
 - PRESSURE TEST AND DISSINFECT NEW 12" DI LINE
 - BACKFILL OVER NEW 12" DI LINE TO GRADE
 - OPEN VALVES F & G
- PROCEED TO WEST TANK DEMOLITION PER SHEET DT-16

A DT-15
DETAIL - 12" DI BOOSTER INTERTIE
SCALE: 1" = 50'
ID#S2026 WPP-04



PROJECT		US-89; FARMINGTON TO I-84		UTAH DEPARTMENT OF TRANSPORTATION					REVISIONS									
		KAYSVILLE CITY PACKAGE EFR - AFC																
PROJECT NUMBER	S-0089(406)398		PIN	13821	APPROVED		DRAWN BY		TAS		NO.		DATE		APPROVED BY		REMARKS	
	DETAILS																	
KVCY-EFR DT-15				PROFESSIONAL ENGINEER		MM/DD/YY		QC CHECKED BY		RJB								

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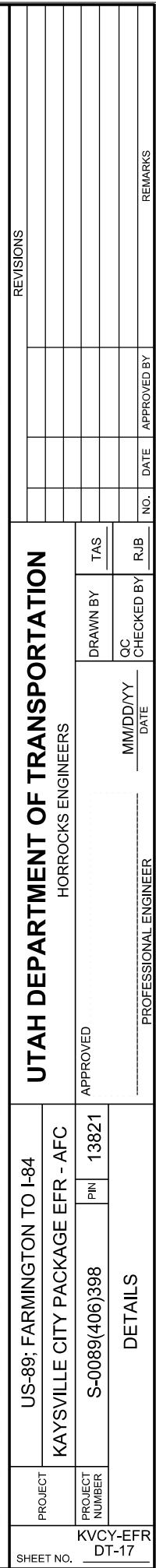


- WEST TANK DEMOLITION NOTES:**
(COMPLETE BOOSTER INTERTIE, SHEET DT-15)
1. OPERATIONAL OBJECTIVE:
 1. KEEP EAST TANK IN OPERATION BY FILLING AND DRAINING THROUGH SOUTHWEST OUTLET LINE (1)
 2. KEEP BOOSTER STATION IN OPERATION (2)
 3. PROTECT IN PLACE UPPER PRESSURE ZONE PIPE (3)
 4. MAINTAIN FLOW TO LOWER PRESSURE ZONE (4)
 5. REMOVE WEST TANK AND APPURTENANCES
 2. PROCEDURE
 1. CLOSE OUTLET GATE VALVE A ISOLATING TANK FROM COMMUNITY SYSTEM
 2. CLOSE OUTLET GATE VALVES B & C
-FLOW TO BOOSTER STATION WILL NOW COME FROM EAST TANK THROUGH THE NEW INTERTIE
 3. DISCONNECT AND CAP 12" LINE FROM BOOSTER AT POINT A WITHIN THE VAULT
 4. PROTECT INDICATED LINES IN PLACE (5)
 5. DISMANTLE WEST TANK
 - a. LANDFILL CONCRETE DEBRIS, REMOVED VALVES, AND PIPE
 - b. BREAK UP CONCRETE FLOOR
 - c. BACKFILL WITH COMPACTED FILL

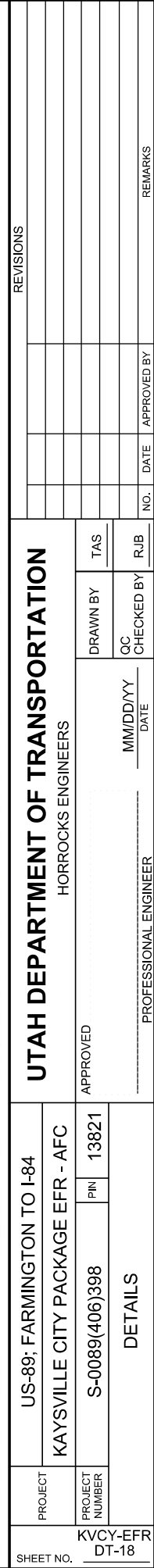
A DETAIL - WEST TANK DEMOLITION
DT-16 SCALE: 1" = 50'
ID#S2026 WPP-04



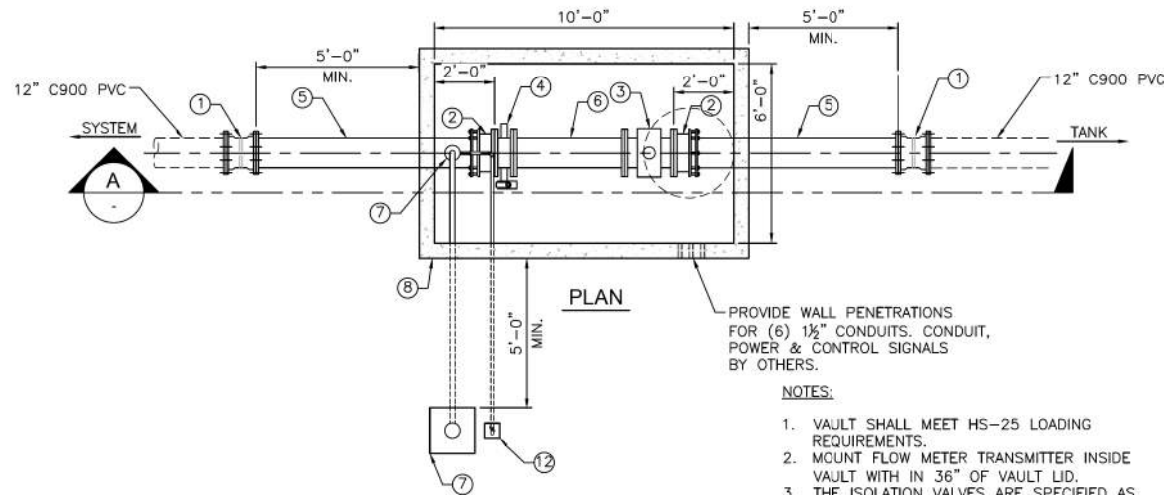
US-89; FARMINGTON TO I-84		UTAH DEPARTMENT OF TRANSPORTATION		HORROCKS ENGINEERS		REVISIONS	
PROJECT	KAYSVILLE CITY PACKAGE EFR - AFC	APPROVED	DRAWN BY	TAS	QC	NO.	
PROJECT NUMBER	S-0089(406)398	PROFESSIONAL ENGINEER	CHECKED BY	RJB	DATE	APPROVED BY	REMARKS
DETAILS							
KVCCY-EFR DT-16							
SHEET NO.							



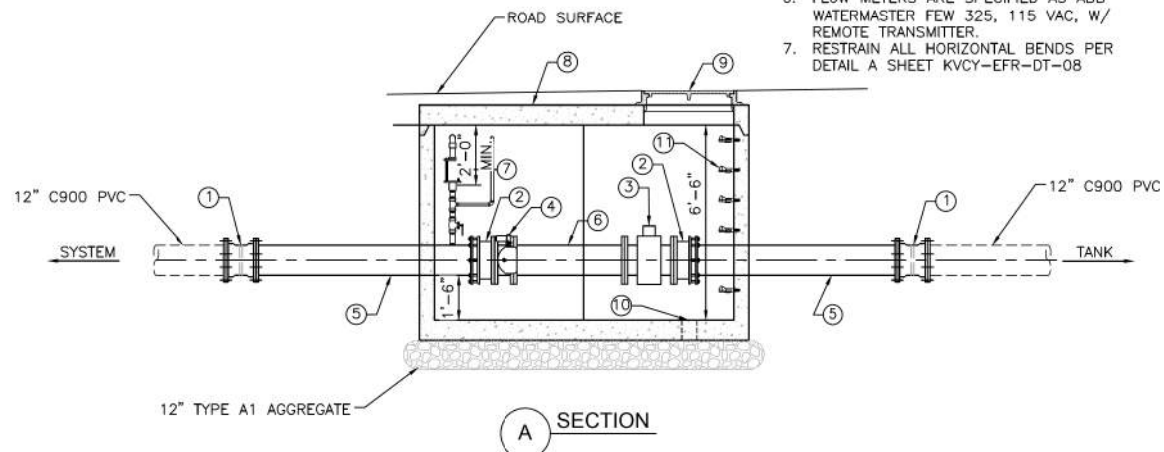
12/19/2019 2:38:18 PM p:\p\low.horrocks.com\PWP\mary\Documents\Projects\2018\UT-1311-1808 US-89 Farm\hngton to I-84\1382\Sheet_Files\Utilities\Plan Sets\Water\KVCY-EFFR\13821 UT_KVCY-01_DT18.dgn



- ① 12" DI SLEEVE, WJxMJ.
- ② 12" RESTRAINED FLANGE COUPLING ADAPTER.
- ③ 12" ELECTROMAGNETIC FLOW METER, FLxFL.
- ④ 12" DOUBLE ECCENTRIC BUTTERFLY VALVE WITH MOTOR ACTUATOR AND REMOTE HAND STATION.
- ⑤ 12" DI PIPE SPOOL, PEXPE.
- ⑥ 12" DI PIPE SPOOL, FLxFL.
- ⑦ AIR-VAC, AND SAMPLING TAP ASSEMBLY, SEE DETAIL A, SHEET KVCY-EFR-DT-14.
- ⑧ 10'x6' PRE-CAST CONCRETE VAULT. PROVIDE STRUCTURAL CALCULATIONS FOR ENGINEER'S REVIEW.
- ⑨ 36" MANHOLE RING AND NON-VENTILATED COVER MARKED "WATER", WITH GRADE RINGS AS NECESSARY.
- ⑩ 6" DIA. FLOOR DRAIN.
- ⑪ ACCESS STEPS, 12" SPACING.
- ⑫ INSTALL SAMPLING STATION, SEE DETAIL A, SHEET KVCY-EFR-DT-14.



- NOTES:**
1. VAULT SHALL MEET HS-25 LOADING REQUIREMENTS.
 2. MCUNT FLOW METER TRANSMITTER INSIDE VAULT WITH IN 36" OF VAULT LD.
 3. THE ISOLATION VALVES ARE SPECIFIED AS AV-TEK DEX 2504 DOUBLE ECCENTRIC BUTTERFLY VALVES OR APPROVED EQUAL.
 4. THE FLOW CONTROL VALVES ARE SPECIFIED AS ECCENTRIC PLUG VALVES NAMELY DEZURIC PEF SERIES, VALMATIC 5600 SERIES, OR APPROVED EQUAL.
 5. THE MOTOR ACTUATORS ARE ROTORK IQTM, 120 VAC w/BATTERY BACKUP FOR ISOLATION SERVICE (DOUBLE ECC B-FLY) AND MODULATING SERVICE FOR THE FLOW CONTROL VALVES TIRH REMOTE HAND STATION, OR PRE-APPROVED EQUAL.
 6. FLOW METERS ARE SPECIFIED AS ABB WATERMASTER FEW 325, 115 VAC, W/ REMOTE TRANSMITTER.
 7. RESTRAIN ALL HORIZONTAL BENDS PER DETAIL A SHEET KVCY-EFR-DT-08

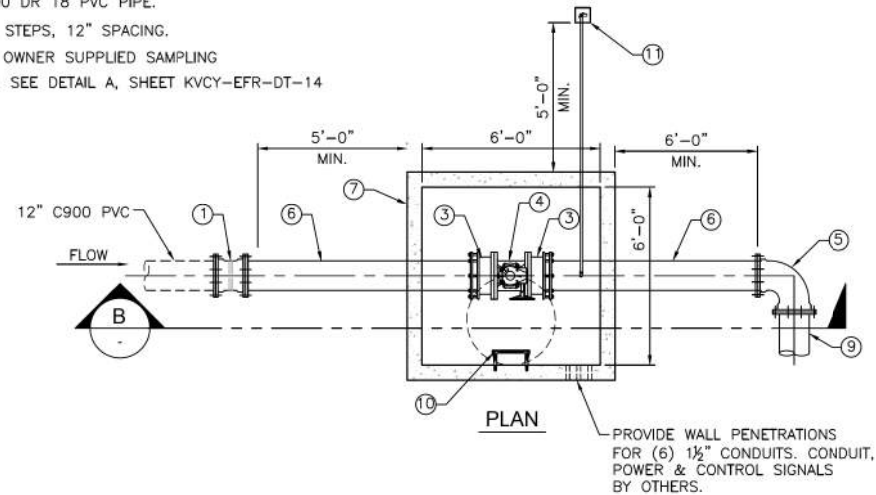


D1 LOWER PASTURE RESERVOIR ISOLATION VALVE & METER VAULT
SCALE: 3/8" = 1'-0"

A DETAIL - LOWER PASTURE RESERVOIR ISOLATION VALVE/METER VAULT
DT-19 SCALE: NO SCALE

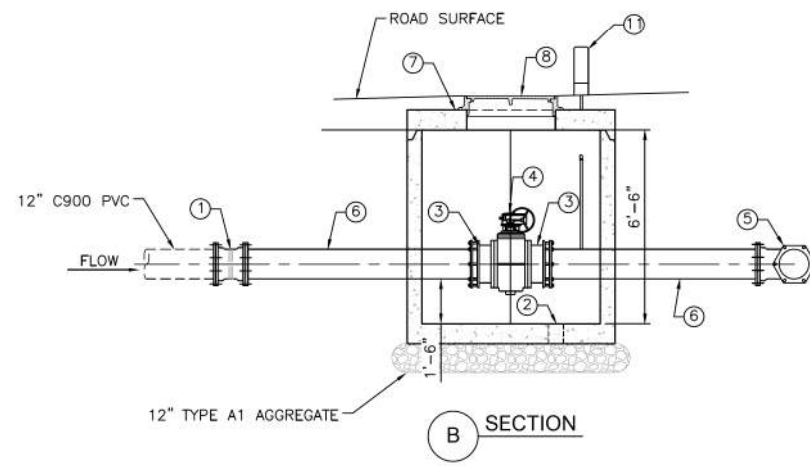
KEYED NOTES

- ① 12" DI SLEEVE, MJxMJ.
- ② 6" DIA. FLOOR DRAIN.
- ③ 12" RESTRAINED FLANGE COUPLING ADAPTER.
- ④ 12" PLUG VALVE WITH MOTOR ACTUATOR AND REMOTE HAND STATION.
- ⑤ 12" DI 90° BEND, MJxMJ.
- ⑥ 12" DI PIPE SPOOL, PEXPE.
- ⑦ 6'x6' PRE-CAST CONCRETE VAULT. PROVIDE STRUCTURAL CALCULATIONS FOR ENGINEER'S REVIEW.
- ⑧ 36" MANHOLE RING AND NON-VENTILATED COVER MARKED "WATER", W/ GRADE RINGS AS NECESSARY.
- ⑨ 12" C900 DR 18 PVC PIPE.
- ⑩ ACCESS STEPS, 12" SPACING.
- ⑪ INSTALL OWNER SUPPLIED SAMPLING STATION, SEE DETAIL A, SHEET KVCY-EFR-DT-14



SUPPLIER CONTACT INFO:

1. VALVES:
 Mason Lewis
 Rocky Mountain Valves and Automation
 1310 So. Swanner Rd.
 Salt Lake City, Utah 84104
 (801)438-1038
2. METERS:
 Mike Franklin
 VFC Controls
 90 Cutler Drive
 North Salt Lake, Utah 84054
 (801)677-1453



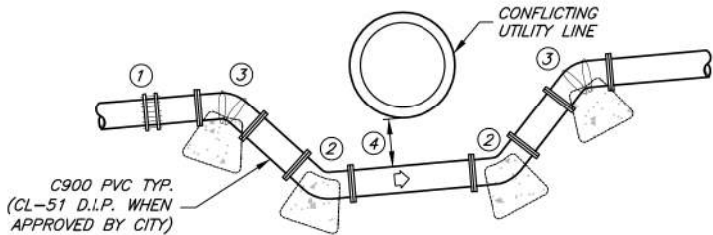
D3 LOWER PASTURE RESERVOIR FLOW CONTROL VALVE VAULT
SCALE: 3/8" = 1'-0"

A DETAIL - LOWER PASTURE RESERVOIR ISOLATION VALVE/METER VAULT
DT-19 SCALE: NO SCALE

[illegible]



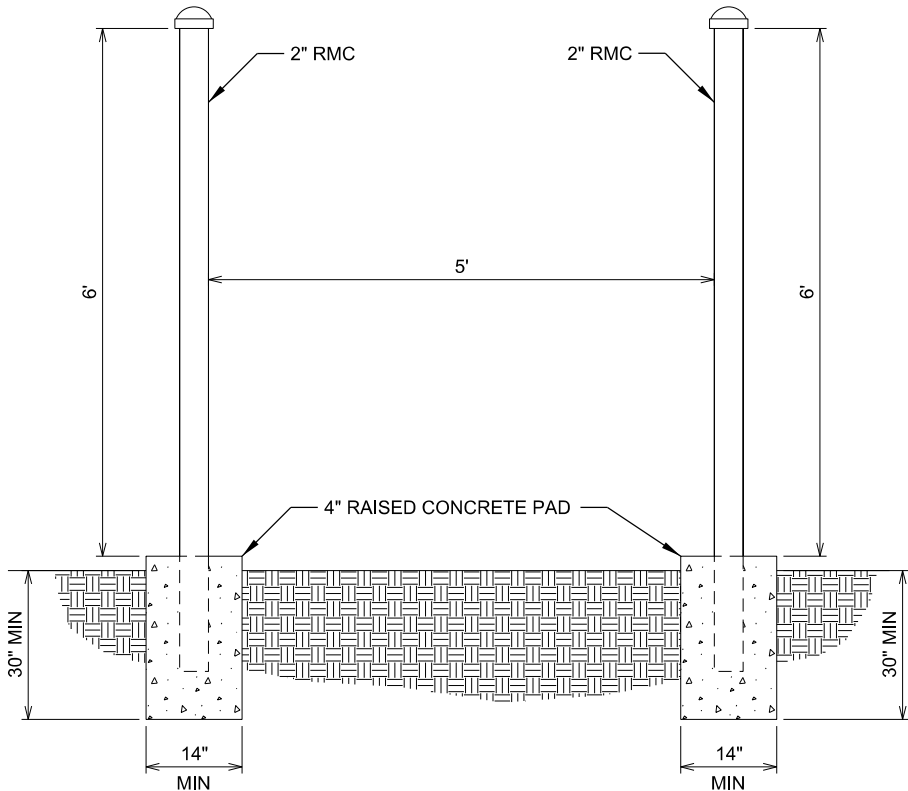
12/19/2019 2:30:27 PM p:\p\horrocks.com\DWG\Drawings\Documents\Projects\2018\UT-1311-1808 US-89 Farmington to I-84\13821\Sheet_EPlan\Utilities\Plan_Sets\Water\KVCY-EFR\13821_UT_KVCY-01_DT22.dgn



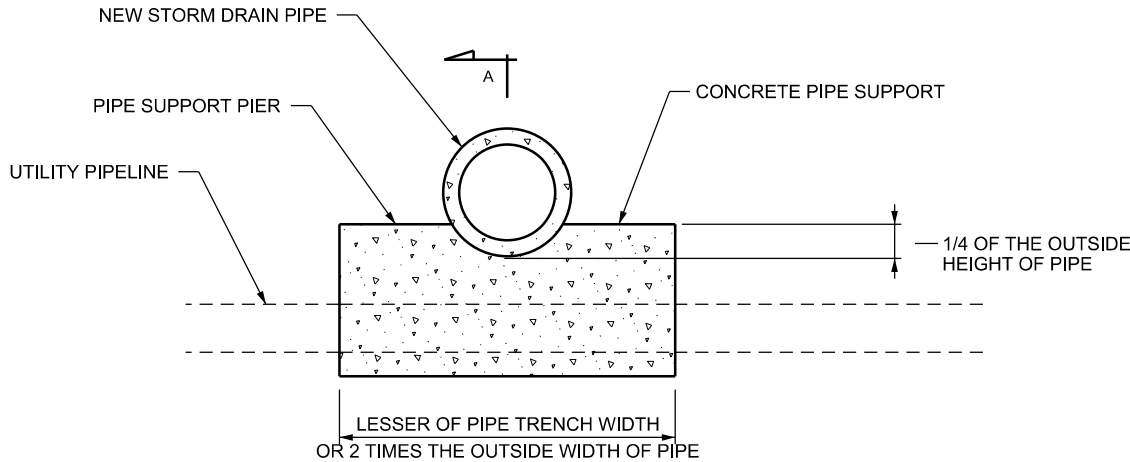
TYPICAL WATERLINE LOOP

- 1 TRANSITION COUPLING; ROMAC MODEL 501.
- 2 MJ 45° BEND W/JOINT RESTRAINT
- 3 CONSTRUCT THRUST BLOCK AT EACH 45° BEND PER DETAIL A, SHEET KVCY-EFR-DT-21.
- 4 MINIMUM OF 12" COVER BETWEEN WATER LINE AND CONFLICTING UTILITY LINE TO BE CROSSED. NO LOOPS UNDER SEWER.

A DETAIL - WATER LINE LOOP
DT-22 SCALE: NO SCALE
FOR REFERENCE



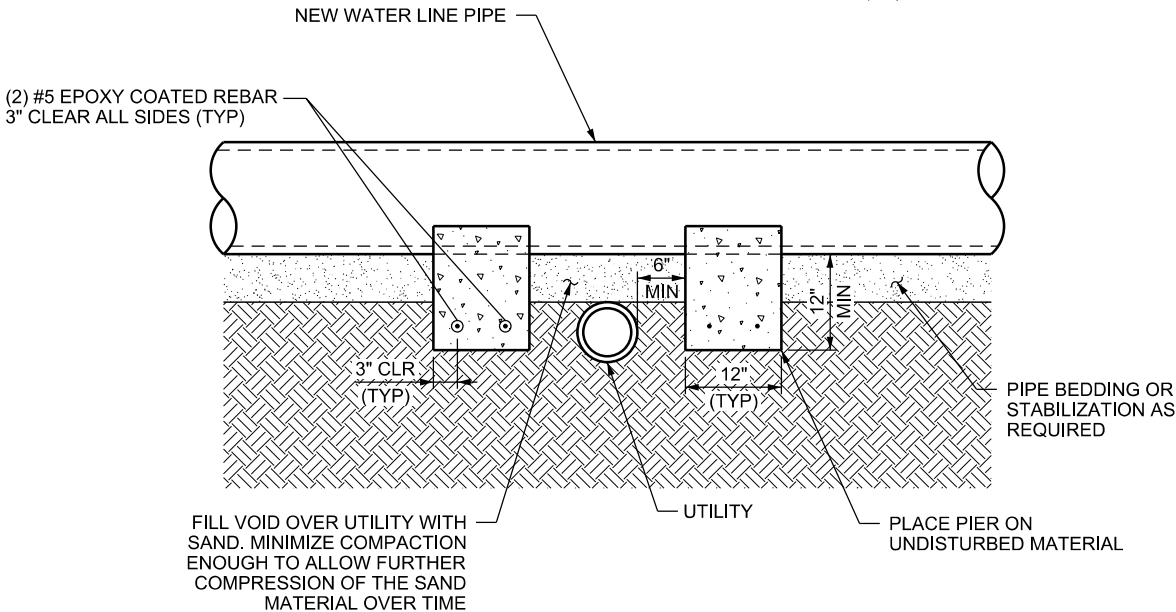
B ELECTRICAL PANEL FOOTING AND SUPPORT
DT-22 SCALE: NO SCALE



PROFILE

NOTES:

1. USE CAUTION WHEN CROSSING OVER BURIED PIPELINE. THE PURPOSE FOR PROVIDING THE PIPE SUPPORT SHOWN IN THIS DRAWING IS TO PROTECT THE UNDERLYING PIPELINE FROM CONSTRUCTION AND FUTURE LOADS.
2. IF THERE IS LESS THAN 2 INCHES OF SEPARATION BETWEEN THE UTILITY PIPELINE AND PROPOSED WATER LINE, INSTALL A 1/2 INCH THICK LAYER OF 40 DUROMETER NEOPRENE PAD OVER UTILITY PIPELINE AND BETWEEN PIPE SUPPORTS AT A WIDTH 1 FOOT WIDER THAN THE WATER LINE PIPE.
3. DO NOT POSITION ANY PIPE JOINTS BETWEEN THE PIPE SUPPORT PIERS.
4. PLACE CONCRETE PIERS AS CLOSE TO THE UTILITY PIPELINE AS IS REASONABLE, BUT NO CLOSER THAN 6 INCHES.
5. USE CLASS AA (AE) CONCRETE.



SECTION A-A

C CONCRETE PIPE SUPPORT DETAIL
DT-22 SCALE: NO SCALE

USE WHERE VERTICAL CLEARANCE BETWEEN UTILITY AND WATER LINE IS LESS THAN 12 INCHES

REVISIONS				UTAH DEPARTMENT OF TRANSPORTATION			
				HORROCKS ENGINEERS			
				APPROVED		PROFESSIONAL ENGINEER	
				US-89; FARMINGTON TO I-84		DETAILS	
				KAYSVILLE CITY PACKAGE EFR - AFC			
				PROJECT		PIN	
				PROJECT NUMBER			
				KVCY-EFR DT-22			
				SHEET NO.			
				DRAWN BY		QC CHECKED BY	
				JDS		RJB	
				DATE		DATE	
				NO.		APPROVED BY	
				REMARKS			

EXHIBIT B



Prepared on January 21, 2020

Kaysville City Betterment Pricing-EFR Package (Kaysville City Portion)					
ITEM NO.	DESCRIPTION	Quantity	Unit	Unit Rate	Cost
1	12" Ecc. BV with Motor & Remote, Air Vac and Sample Station (Kaysville City's Cost)	2	EA	\$ 38,472.00	\$ 76,944.00
	<i>Note: Complete Isolation Valve/ Meter Vault is \$74,000 EA</i>				
2	Kaysville City Flow Control Vault	2	EA	\$ 58,395.00	\$ 116,790.00
3	New 12" Waterline	1100	LF	\$ 89.87	\$ 98,854.80
4	New 12" Bends	2	EA	\$ 1,868.32	\$ 3,736.63
5	New 12" BFV	2	EA	\$ 3,331.96	\$ 6,663.91
6	New Air Vac Release	1	EA	\$ 6,100.56	\$ 6,100.56
7	New Fire Hydrant	1	EA	\$ 10,783.93	\$ 10,783.93
8	Upsize 8" Waterline to 12"	970	LF	\$ 15.74	\$ 15,271.68
9	Upsize 8" Bends to 12"	6	EA	\$ 648.89	\$ 3,893.33
10	Upsize 8" Valves to 12"	1	EA	\$ 623.21	\$ 623.21
					\$ 339,662.05

EXHIBIT C



**Contact us
for Nationwide Service**

90 Cutler
Drive • P.O. Box 540445
North Salt Lake, UT 84054-0445
Phone: (800) 825-1948 • Fax: (801) 292-4164

www.vfcinc.com

www.z-pen.com

Email: quotesrm@vfcinc.com

QUOTATION #201909-134

DATE: September 9, 2019

PAGE: 1 of 1

PROJECT: Kaysville City Hwy89 Project
Kaysville, UT

SALESPERSON: Mike F.

ESTIMATOR: Mike F.

SCOPE: **INSTRUMENTATION and CONTROLS - LABOR AND MATERIALS**

Accept

☐	INSTRUMENTATION and CONTROLS PRICE	\$29,836.56
☐	SALES TAX	\$724.08
☐	TOTAL QUOTE	\$30,560.63

VFC Controls is pleased to provide you with a bid for the above referenced project.

DESCRIPTION, SCOPE, AND NOTES

All **Labor, Materials** and Sales Tax are included where applicable. Quotation based on Drawings 5821805_E-04, also based on the conversations and meetings with Young Living Farms Management. Quotation as per VFC's Standard Terms and Conditions. Payment and Performance Bond is not included.

Quotation Includes

- 1) All submittals, drawings and O&M Manuals.
- 2) All Panels built by VFC to receive a UL508 Label
- 3) Conduit and Wire
- 4) Breaker panels

Crestwood Site

- 1) Pull electric wiring from conduit prior to construction of waterline.
- 2) Install new conduit after waterline is installed
- 3) Install wiring and reconnect water level sensing devices

Crestwood Meter Site

- 1) Establish Meter power, pull power from Kaysville Power pole.
- 2) Install panel for electrical controls including breaker panel.
- 3) Install wiring and conduit to bring power to site.
- 4) Install wiring and conduit to connect meter.
- 5) Install RTU.

Lower Pasture Site

- 1) Install panel for electrical controls including breaker panel.
- 2) Re-establish power from existing electric service line.
- 3) Install conduit and wiring to connect meter.

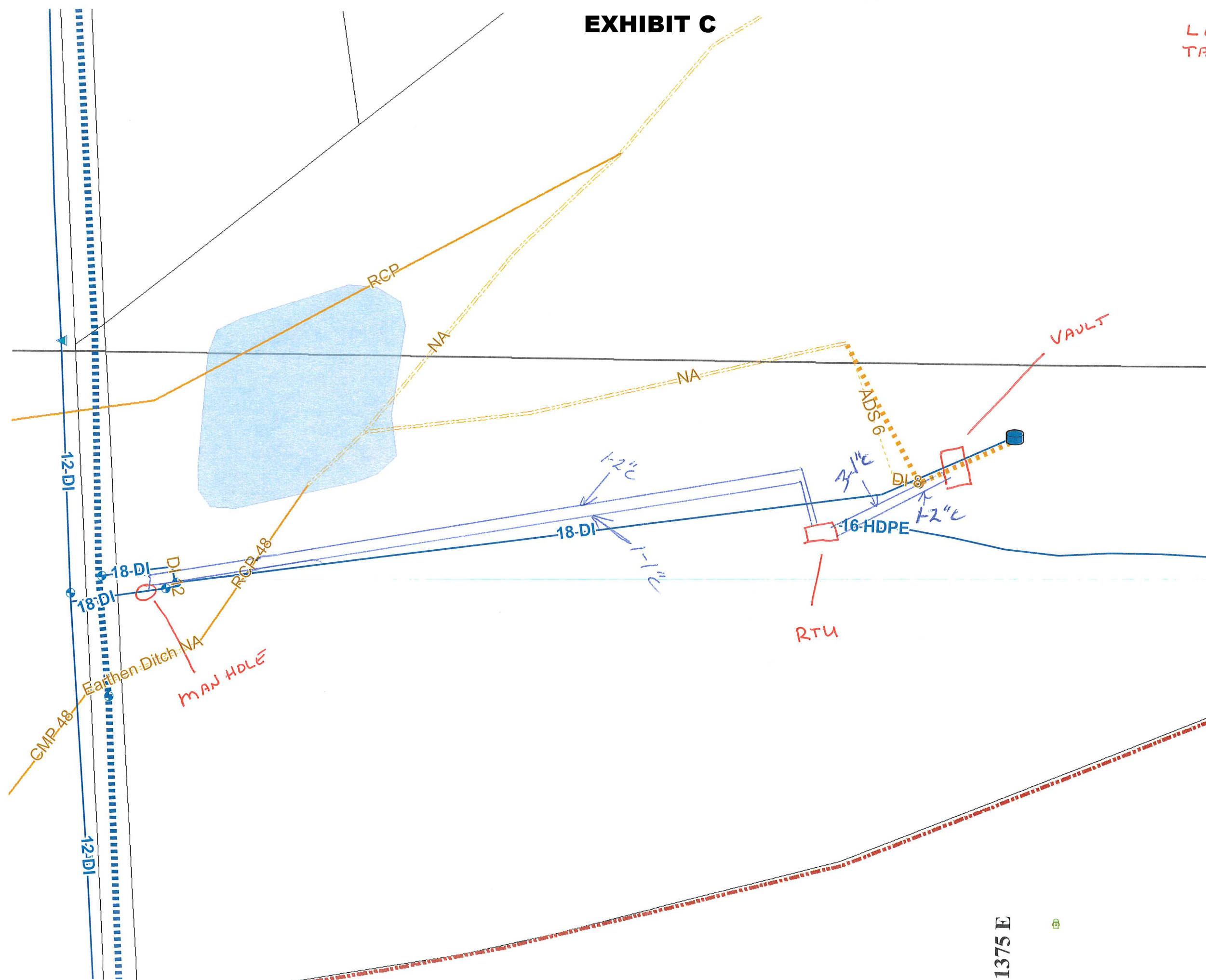
QUOTATION EXCLUSIONS

- Valves (by others)
- All Actuators (by others)
- Concrete pad for Panel racks

“Process Control Solutions for Industry”

EXHIBIT C

LOWER PASTURE
TANK



1375 E

1375 E

CRESTWOOD
TANK

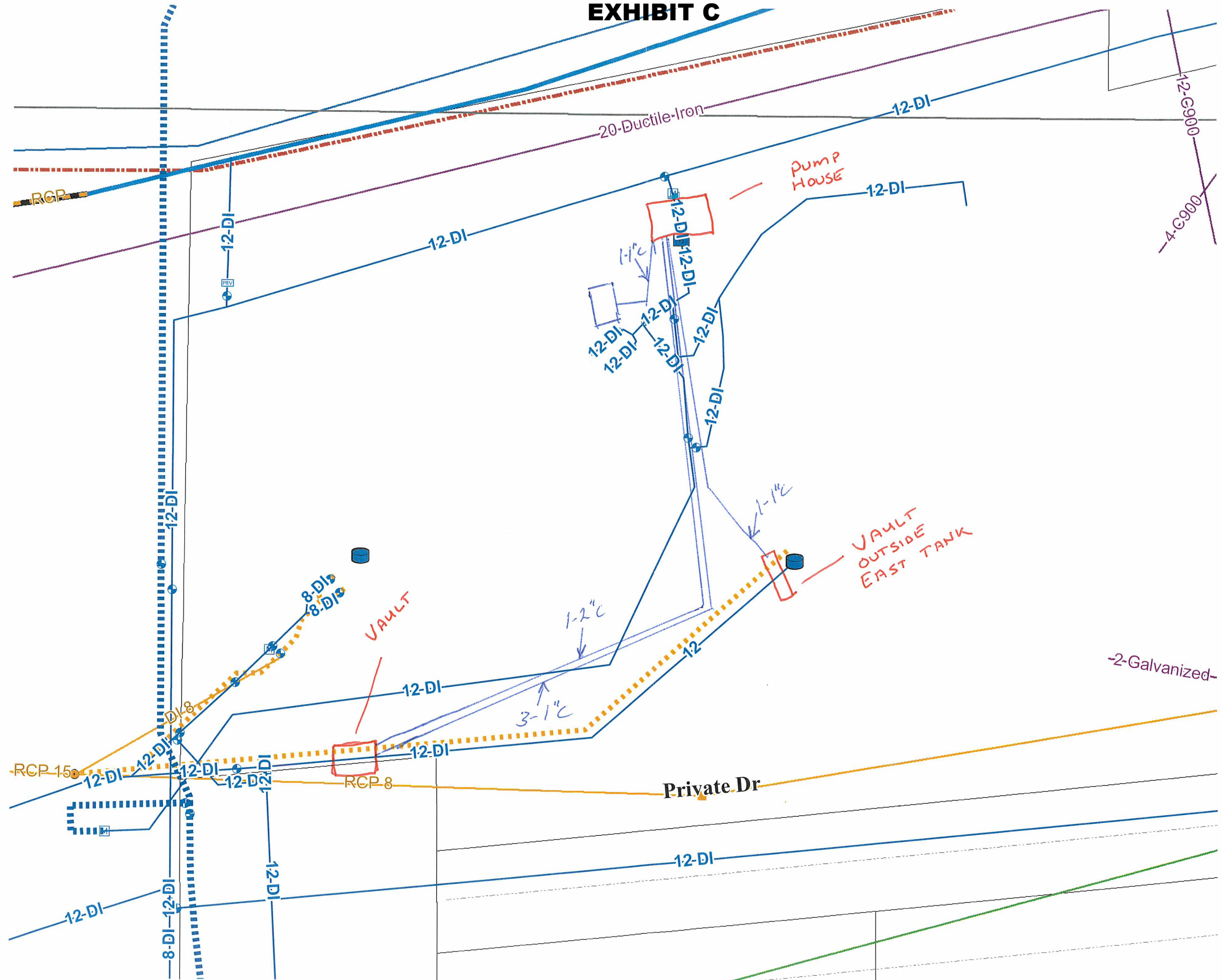


EXHIBIT D



US-89; Farmington to I-84

Agreement: 13821_UT_Agree_KVCY-03_EFR

Task Name	Month of											
	Jan. 2020	Feb. 2020	Mar. 2020	Apr. 2020	May. 2020	Jun. 2020	Jul. 2020	Aug. 2020	Sep. 2020	Oct. 2020	Nov. 2020	Dec. 2020
UDOT Work												
Solution S0104								Aug. 3			Nov. 13	
Solution S0125		Feb. 10									Nov. 13	
Solution S0126		Feb. 10									Nov. 13	
Solution S0130								Aug. 3			Nov. 13	
Solution S2026		Feb. 10									Nov. 13	
Solution S2027A/B								Aug. 3			Nov. 13	
Solution S2031		Feb. 10									Nov. 13	
Solution S2032		Feb. 10									Nov. 13	
Solution S2069						Jun. 29					Nov. 13	

Note: Durations shown above include time for UDOT to obtain applicable permits (BOR Encroachment, etc.) required by relocation design and for ROW acquisition.

STAFF REPORT



COUNCIL MEETING DATE: March 19, 2020

TYPE OF ITEM: Consent Item

PRESENTED BY: Josh Belnap

SUBJECT/AGENDA TITLE: Agreement with UDOT for West Crestwood Tank Reimbursement

EXECUTIVE SUMMARY:

As part of UDOT's highway 89 project, the new East Frontage Road (EFR) installation will require the demolition of the west Crestwood water tank. The City has designed a replacement tank to be installed on the far east end of the Orchard Ridge development, and UDOT has agreed to cover the costs associated with the water tank replacement. This new tank site will require additional piping and a pumphouse, which UDOT will not be covering the costs for. These costs will be covered by the developer of Orchard Ridge, as they had requested the tank to be located there to help serve their development, as detailed in the development agreement.

As part of this agreement, UDOT will provide 75% of the tank work costs up front (\$2,005,192.50), and the remaining 25% will be reimbursed via a series of progress payments, including a \$228,789.00 contingency (to help cover unforeseen issues or difficulties with the tank construction).

In total, UDOT has agreed to pay up to \$2,820,879.00 to the City ("up to" because the contingency may not be needed). The remaining costs (\$1,491,884.00) would be reimbursed to the City by the developer. In addition, as part of the UDOT total, \$160,000 will go to the developer to cover the cost of the property needed for the tank and pumphouse.

Council Options: Approve/Disapprove

Recommended Options: Approve

Fiscal Impact & Fund Source for Recommended Action: UDOT funds, Developer Contributions

Attachments: Water Tank Reimbursement Agreement

KAYSVILLE CITY WATER TANK REIMBURSEMENT AGREEMENT

THIS REIMBURSEMENT AGREEMENT, is made by and between the Utah Department of Transportation (“UDOT”), and Kaysville City (“Third-Party”), a Political Subdivision in the State of Utah. Each as party, (“Party”) and together as parties, (“Parties”).

RECITALS

WHEREAS, UDOT will award a contract for the highway project identified as US-89; Farmington to I-84 in Davis and Weber Counties, Utah (“Project”); and

WHEREAS, UDOT’s design-build contractor (“Design-Builder”) will complete the design and administer the construction of the Project; and

WHEREAS, the Third-Party’s west water storage tank (“West Tank”) at the Crestwood tank site is impacted by Project Work; and

WHEREAS, the Third-Party will perform the necessary work to complete engineering design, acquire property, and construct a new water storage tank (“Third-Party Work”) to replace the West Tank; and

WHEREAS, UDOT will reimburse the Third-Party for a portion of the Third-Party Work as outlined herein.

THIS AGREEMENT is made to set out the terms and conditions where under reimbursement for the Third-Party Work will be made.

AGREEMENT

Now, therefore, the Parties agree as follows:

1. Contact Information

UDOT’s Resident Engineer is Bret Krebs, telephone number (435) 245-6151, and email bkrebs@utah.gov.

UDOT’s Utility Leader is J Tucker Doak telephone number (801) 648-5452, and e-mail jdoak@utah.gov.

UDOT’s Field Representative contact person is Brandon Wilson, telephone number (385) 268-3669, and e-mail brandon@dserio.com.

Design-Builder’s contact person is Ryan Pittson, telephone number (385) 268-3669, and e-mail rpittson@wadsco.com.



Third-Party's contact person is Josh Belnap, telephone number (801) 544-8112, and e-mail jbelnap@kaysvillecity.com.

2. Scope of Third-Party Work

The West Tank is shown on the location map marked Exhibit "A," that is incorporated by reference. The West Tank will be replaced by means of design and construction of a new water storage tank, booster station, and transmission lines from the new tank to the existing water distribution system as shown on the Third-Party design plans included as Exhibit "B," that is incorporated by reference, and as outlined in the construction contract documents and specifications included as Exhibit "C," that is incorporated by reference.

This agreement covers:

- a. Engineering Design:
 - i. The Third-Party has completed all engineering design required for the Third-Party Work as shown in Exhibit "D," that is incorporated by reference.
- b. Property Acquisition:
 - i. The Third-Party will acquire all property and easements required for the new water storage tank at the location shown in Exhibit "B".
 - ii. The Third-Party will retain ownership of the portions of the existing Crestwood tank site property that are required for the Project right-of-way and allow UDOT to construct required Project improvements within said right-of-way.
- c. Construction:
 - i. The Third-Party will construct a new water storage tank, booster station, and transmission lines from the new water storage tank to the existing water distribution system, as shown in Exhibit "B" and Exhibit "C."
 - ii. The Third-Party will complete all construction engineering required during construction of the Third-Party Work as shown in Exhibit "E", that is incorporated by reference.

3. Third-Party Work Schedule:

- a. The Third-Party will perform Third-Party Work between March 30, 2020 and December 1, 2020 (Substantial Completion) per the schedule included in Exhibit "C."

4. Third-Party to Perform Third-Party Work

The Third-Party, with its regular engineering and construction forces at its standard schedule of wages and working hours, or through its qualified contractor(s), and in accordance with 23 C.F.R. §645, subpart A, shall perform the necessary property acquisition, field and office engineering, furnish all materials, and perform the Third-Party Work covered herein. The Third-Party shall not perform any Third-Party Work until authorized in writing by UDOT.

5. Third-Party to Notify UDOT and the Design-Builder Before Beginning Third-Party Work and Upon Completion of Third-Party Work

The Third-Party will notify the Design-Builder and UDOT's Field Representative at least **2 business days** in advance of beginning Third-Party Work described in this Agreement. The Third-Party will give subsequent notifications of when and where the Third-Party Work will impact or be impacted by the Project to UDOT's Field Representative on a day-to-day basis. Such subsequent notifications can be informal. Upon completion of the Third-Party Work, the Third-Party will provide notification to UDOT's Field Representative within **2 business days**.

Failure on the part of the Third-Party to give proper notification to UDOT's Field Representative will be cited to the Third-Party and that portion of the Third-Party Work performed may be deducted from the reimbursement to the Third-Party at UDOT's discretion.

6. Discovery of Historical Objects

The Third-Party, while engaged in the relocation of its Facilities, shall comply with UDOT's Standard Specifications, Section 01355, Subpart 3.8, Discovery of Historical, Archeological or Paleontological Objects, Features, Sites, or Human Remains.

7. Daily Record Keeping

UDOT and the Third-Party will each keep detailed records of onsite activities. Copies of the records shall be retained by the Parties to this Agreement. When emergencies occur, requiring the Third-Party's work forces to leave the job, the record keeping shall be resumed upon return to the Project.

Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Third-Party Work does not relieve the Third-Party of its duty in the performance of the Third-Party Work or to ensure compliance with applicable standards.

8. Reimbursement for Third-Party Work

UDOT will reimburse the Third-Party for shares of actual costs incurred by the Third-Party for design engineering, property acquisition, tank construction, contingency and construction engineering as shown in Table 1 (UDOT Share).



TABLE 1: COST SHARES

PRE-CONSTRUCTION	Total	UDOT Share	Third-Party Share
Design Engineering			
Work Release No. 2018-1	\$ 42,000.00	\$ 42,000.00	\$ -
Work Release No. 2018-2	\$ 12,100.00	\$ 12,100.00	\$ -
Work Release No. 2018-3	\$ 67,200.00	\$ 3,800.00	\$ 63,400.00
Work Release No. 2019-1	\$ 22,200.00	\$ 9,500.00	\$ 12,700.00
Work Release No. 2020-1	\$ 22,300.00	\$ 13,500.00	\$ 8,800.00
Work Release No. 2020-2	\$ 12,500.00	\$ 3,600.00	\$ 8,900.00
Design Engineering Totals	\$ 178,300.00	\$ 84,500.00	\$ 93,800.00
Property Acquisition	\$ 160,000.00	\$ 160,000.00	\$ -
Totals (Pre-Construction)	\$ 338,300.00	\$ 244,500.00	\$ 93,800.00
CONSTRUCTION	Total	UDOT Share	Third-Party Share
1.0 MG Tank	\$2,287,890.00	\$2,287,890.00	\$ -
Booster Station	\$ 434,990.00	\$ -	\$ 434,990.00
Transmission Line	\$ 805,450.00	\$ -	\$ 805,450.00
Contingency (10% of total construction)	\$ 352,833.00	\$ 228,789.00 (64.84%)	\$ 124,044.00 (35.16%)
Construction Engineering	\$ 93,300.00	\$ 59,700.00	\$ 33,600.00
Totals (Construction)	\$3,974,463.00	\$2,576,379.00	\$1,398,084.00
GRAND TOTALS	\$4,312,763.00	\$2,820,879.00	\$1,491,884.00

9. Changes in the Third-Party Work

In the event there are changes in the scope of the Third-Party Work, extra Third-Party Work, or changes in the planned Third-Party Work covered by this Agreement, a modification to this Agreement signed by the Parties is required prior to the start of Third-Party Work on the changes or additions.



10. Billing and Payment

UDOT will make an initial payment to the Third-Party for the full UDOT share of design engineering and property acquisition, and seventy-five percent (75%) of the UDOT share of the new water storage tank construction and construction engineering, as shown in Table 2 within **60 days** of execution of this Agreement.

INITIAL PAYMENT	
UDOT Share of Design Engineering	\$ 84,500.00
UDOT Share of Property Acquisition	\$ 160,000.00
UDOT Share of 1.0 MG Tank X 75%	\$ 1,715,917.50
UDOT Share of Construction Engineering X 75%	\$ 44,775.00
TOTAL UDOT INITIAL PAYEMENT	\$ 2,005,192.50

Third-Party will submit all itemized bills to UDOT covering its actual costs incurred for performing the Third-Party Work bearing the Project number, this Agreement number, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates within **60 days** following completion of the Third-Party Work by the Third-Party. UDOT and Third-Party will meet to reconcile final Third-Party Work actual cost, including one final and complete bill incorporating previous billing details and the amount of construction contingency.

Third-Party will submit itemized bills to:

UDOT's Construction Division
Attention: Contracts and Compliance Specialist
4501 South 2700 West, Box 148220
Salt Lake City, Utah 84114-8220

UDOT's Resident Engineer will review the billings, give verification of the Third-Party Work performed and forward the billings to UDOT's Construction Office for processing. UDOT will reimburse the Third-Party within **60 days** after receipt of final billings, but only for those items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the Third-Party to submit the billings within 6 months of the completion of the Third-Party Work will result in UDOT's disallowance of reimbursement for that portion of Third-Party Work.

11. Right to Audit

UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the Third-Party pertaining to the Third-Party Work in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. §645, subpart A. Should this audit disclose that the Third-Party has been underpaid, UDOT will reimburse the Company upon submission of additional billing to cover the underpayment. The Third-Party shall submit the additional billing within **60 days** from the date of the notification of the underpayment. Should this audit disclose



that the Third-Party has been overpaid, the Third-Party will reimburse UDOT in the amount of the overpayment within **60 days** of notification of audit findings. For the purpose of audit the Third-Party is required to keep and maintain its records of Third-Party Work covered herein for a minimum of **3 years** after final payment is received by the Third-Party from UDOT.

12. Miscellaneous

- a. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this agreement.
- b. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.
- c. This Agreement does not create any type of agency relationship, joint venture, or partnership between UDOT and Third-Party.
- d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party.
- e. If any provision or part of a provision of this Agreement is held invalid, illegal or unenforceable in any respect, such invalidity, illegality or unenforceability shall not affect any other provision. Each provision shall be deemed to be enforceable to the fullest extent under applicable law.
- f. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.
- g. This Agreement shall constitute the entire agreement and understanding of the Parties with respect to the subject matter hereof, and shall supersede all offers, negotiations and other agreements with respect thereto. Any amendment to this Agreement must be in writing and executed by authorized representatives of each Party.
- h. The date of this Agreement is the date this Agreement is signed by the last Party.



US-89
FARMINGTON TO I-84

Project No. S-0089 (406)398; Davis and Weber Counties
US-89; Farmington to I-84
Kaysville City
CID No. 72194 PIN 13821

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers.

Kaysville City

Title: _____

Date: _____

.....

Recommended for Approval

Utah Department of Transportation

Title: Utility and Railroad Leader

Title: Project Director

Date: _____

Date: _____

UDOT Comptroller Office

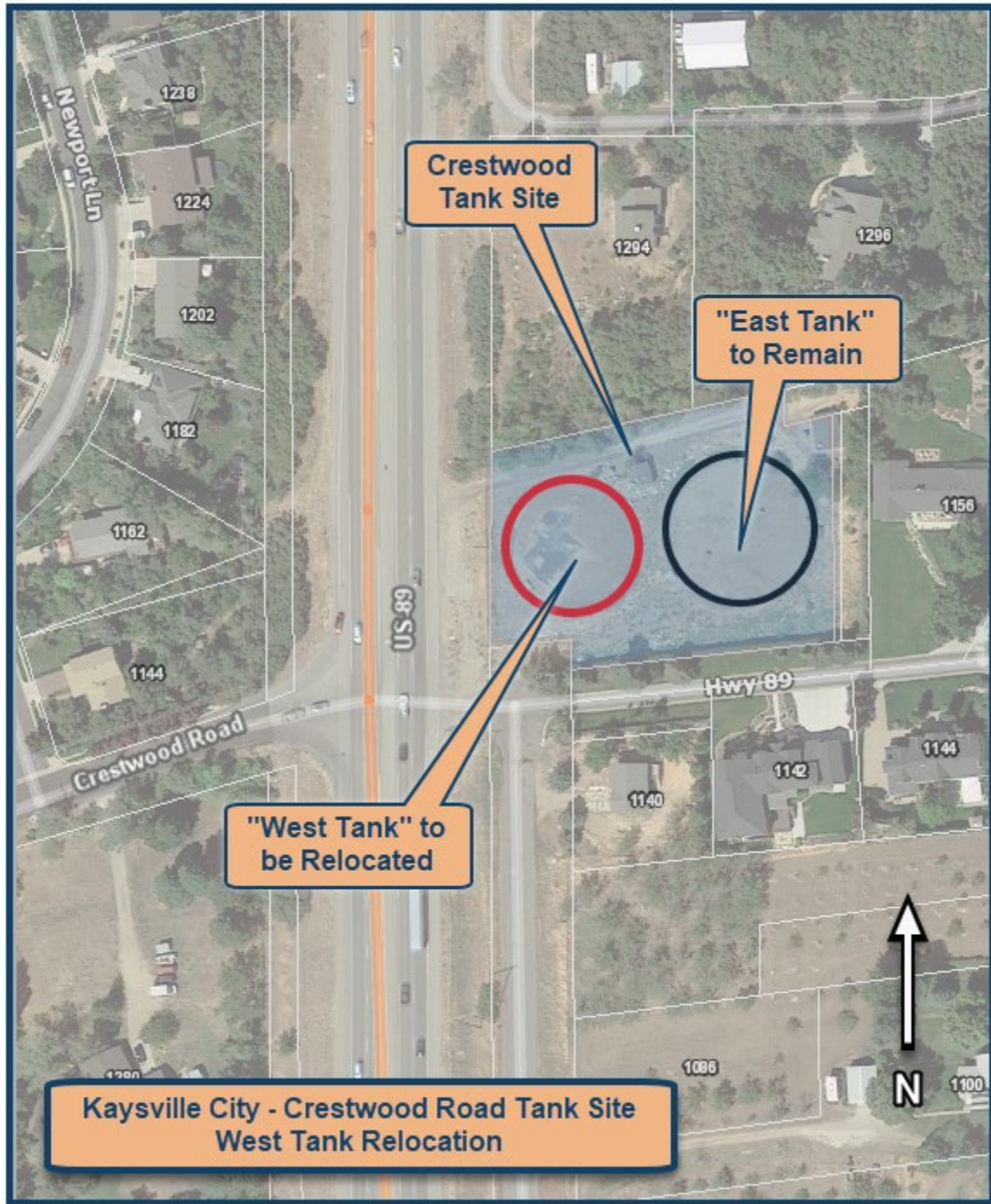
Title: Contract Administrator

Date: _____



US-89
FARMINGTON TO I-84

Exhibit A
Location Map



KAYSVILLE CITY

BOOSTER STATION & TRANSMISSION LINE
2020

KAYSVILLE

JOSH BELNAP, P.E. PUBLIC WORKS DIRECTOR



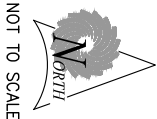
ENGINEERING CONSULTANTS (SEI)

STEVE HANSEN, P.E. 	PROJECT MANAGER
CLIFF LINFORD, P.E. 	PROJECT ENGINEER
MICHAEL MCFADDEN 	PROJECT ENGINEER
RANDY KNAPP, P.E. 	ELECTRICAL ENGINEER

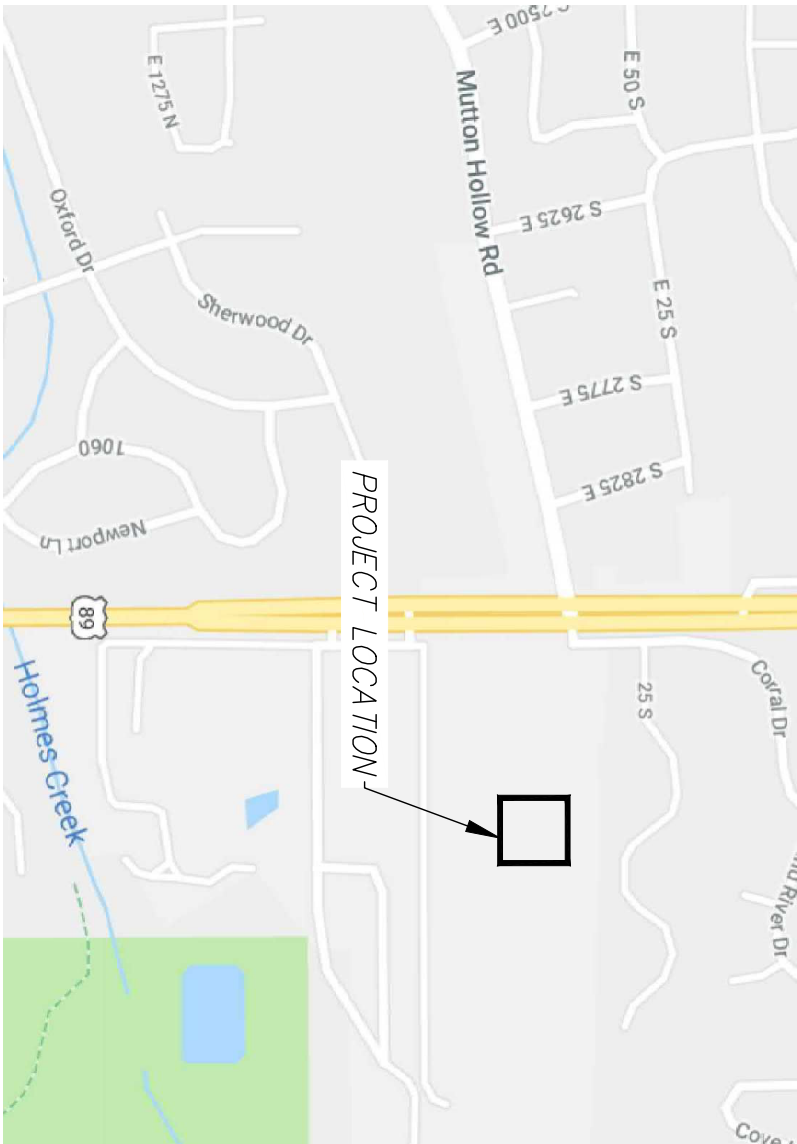


2036 LINCOLN AVENUE, SUITE 104
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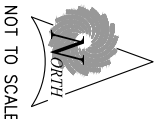
AREA MAP



NOT TO SCALE



LOCATION MAP



NOT TO SCALE



SHEET INDEX

1 - GENERAL:		DWG. NO.	SHEET NO.
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PROFESSIONAL ENGINEER
STATE OF UTAH
No. 24619
Exp. 01/07/2025
HANS J. HANSEN

SUNRISE
ENGINEERING

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OGDEN, UTAH 84401
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KANSVILLE CITY

BOOSTER STATION AND TRANSMISSION LINE
AREA MAP, LOCATION MAP
SHEET INDEX

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	TR	CL	2 of 44
				G2

GENERAL NOTES

GENERAL NOTES				
NOTES		APWA REFERENCES		
1. ALL CONSTRUCTION AND MATERIAL SHALL BE IN ACCORDANCE WITH THESE CONTRACT DOCUMENTS, INCLUDING ALL APPLICABLE SECTIONS OF THE MANUAL OF STANDARD SPECIFICATIONS 2012 EDITION (INCLUDING AMENDMENTS) AND MANUAL OF STANDARD PLANS 2012 EDITION PUBLISHED BY THE UTAH CHAPTER OF THE AMERICAN PUBLIC WORKS ASSOCIATION (APWA) AND THE UTAH CHAPTER OF THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA (AGC). THE SPECIFICATIONS AND THE STANDARD PLANS IN THE PROJECT MANUAL TAKE PRECEDENCE OVER THE MANUAL OF STANDARD SPECIFICATIONS AND STANDARD PLANS 2012 EDITIONS. REFERENCE SPECIFICATION SECTIONS ARE GIVEN FOR INFORMATION ONLY AND MAY NOT BE INCLUSIVE OF ALL APPLICABLE SECTIONS. 2. COORDINATION: CONTRACTOR TO NOTIFY AFFECTED AGENCIES, RESIDENTS, BUSINESSES, SCHOOLS, AND PROPERTY OWNERS 14 DAYS PRIOR TO CONSTRUCTION. 3. SCHEDULE: CONTRACTOR WILL PROVIDE AND UPDATE A CONSTRUCTION SCHEDULE IN ACCORDANCE WITH THE SPECIFICATIONS AND THE REGULATIONS OF THE GOVERNING AGENCY FOR WORKING IN THE PUBLIC WAY PRIOR TO CONSTRUCTION. 4. SOIL TESTING: CONTRACTOR TO PROVIDE MARSHALL AND/OR PROCTOR TEST DATA 24 HOURS PRIOR TO USE. CERTIFIED IN WRITING FROM A LAB RECOGNIZED AND ACCEPTED BY CITY OF LAYTON AND THE RIGHT-OF-WAY GOVERNING AGENCY, AS APPLICABLE. 5. UTILITY LOCATIONS: - ALL UTILITY LOCATIONS ARE APPROXIMATE. - CONTRACTOR TO VERIFY DEPTHS OF UTILITIES IN THE FIELD BY POT-HOLING A MINIMUM OF TWO WEEKS TIME OR 300- FEET AHEAD OF PIPELINE CONSTRUCTION TO AVOID CONFLICTS WITH DESIGNED PIPELINE GRADE AND ALIGNMENT. IF A CONFLICT ARISES RESULTING FROM THE CONTRACTOR NEGLECTING TO POT-HOLE UTILITIES, THE CONTRACTOR IS TO RESOLVE THE CONFLICT WITHOUT ADDITIONAL COST OR CLAIM TO THE OWNER. - CONTRACTOR SHALL POT-HOLE CRITICAL LOCATIONS AND OBTAIN ALL EXISTING PIPE O.D. PRIOR TO ORDERING OR OBTAINING MATERIALS REQUIRED FOR CONNECTIONS TO EXISTING PIPING. UTILITY SHUT-DOWNS AND OTHER WORK WILL NOT BE SCHEDULED OR ALLOWED UNTIL THIS IS ACCOMPLISHED AND MATERIALS ARE ON SITE AND APPROVED FOR USE BY THE ENGINEER. - IRRIGATION PIPELINES MAY NOT BE LOCATED THROUGH THE NORMAL BLUE STAKE PROCESS. CONTACT IRRIGATION COMPANIES AS DETAILED IN SECTION 01 31 13 PRIOR TO CONSTRUCTION. 6. CHANGES: NO CHANGE IN DESIGN LOCATION OR GRADE WILL BE MADE BY THE CONTRACTOR WITHOUT THE WRITTEN APPROVAL OF THE PROJECT ENGINEER. 7. SURVEY CONTROL: - ENGINEER TO PROVIDE INITIAL CONSTRUCTION STAKEOUT SURVEY. CONTRACTOR IS RESPONSIBLE FOR ADDITIONAL STAKEOUT AS NECESSARY AND ALL AS-BUILT SURVEY. - CONTRACTOR SHALL PRESERVE AND PROTECT ALL MONUMENTS AND MONUMENT REFERENCE MARKS WITHIN THE PROJECT SITE. IF A MONUMENT MUST BE DISTURBED DURING CONSTRUCTION, CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF SECTION 0 17 28. - THE LOCATION AND DEPTH OF ALL FITTINGS, BENDS, CONNECTIONS, OR COUPLINGS ARE TO BE ACCURATELY AND PRECISELY RECORDED BY THE CONTRACTOR PRIOR TO BACKFILLING. THESE ITEMS SHALL BE THOROUGHLY PHOTOGRAPHED BY THE CONTRACTOR AND PHOTOS PROVIDED TO THE ENGINEER AT THE END OF EACH WEEK. THE CONTRACTOR SHALL BE REQUIRED TO EXCAVATE AND EXPOSE ALL MATERIALS BURIED WITHOUT PRIOR AUTHORIZATION OF THE PROJECT ENGINEER OR SURVEYOR, AT HIS OWN COST. ALL COST OF RESTORATION OF EXCAVATED AREAS SHALL BE BORNE BY THE CONTRACTOR. 8. ASPHALT GUARANTEE: THE CONTRACTOR SHALL FURNISH AND PLACE PERMANENT ASPHALT PER APWA STANDARDS, EQUAL TO THE THICKNESS REQUIREMENTS OF THE GOVERNING AGENCY. THE CONTRACTOR SHALL GUARANTEE ALL ASPHALT INSTALLATIONS FOR A MINIMUM PERIOD OF THREE YEARS FROM THE DATE OF THE COMPLETED PROJECT'S ACCEPTANCE. 9. TEMPORARY ASPHALT: IF THE CONTRACTOR CHOOSES TO WORK ON THE PROJECT IN COLD WEATHER, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING APPROVAL FROM THE APPROPRIATE GOVERNING AGENCY PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL FURNISH AND INSTALL TEMPORARY ASPHALT WHEN WEATHER PERMITS. THE CONTRACTOR SHALL REMOVE THE TEMPORARY ASPHALT, FURNISH AND INSTALL THE PERMANENT ASPHALT AT NO ADDITIONAL COST TO THE OWNER. 10. CONTRACTOR RESPONSIBILITIES: - CONTRACTOR IS RESPONSIBLE FOR SECURING ALL NECESSARY PERMITS. - ALL DEBRIS RESULTING FROM WORK ON THE PROJECT SHALL BE DISPOSED OF OFF-SITE BY THE CONTRACTOR AT SITES WHICH DEBRIS MAY BE LAWFULLY DISPOSED. - CONTRACTOR SHALL NOT ALLOW GROUNDWATER OR DEBRIS TO ENTER THE NEW PIPE DURING CONSTRUCTION. THE OPEN END OF ALL PIPES ARE TO BE COVERED AND SEALED AT THE END OF EACH DAY. - CONTRACTOR TO INSTALL INVERT COVERS IN ALL SANITARY SEWER AND STORM DRAIN MANHOLES AFFECTED BY THE PROJECT PRIOR TO STARTING CONSTRUCTION. - THE CONTRACTOR SHALL PROVIDE MEANS OF MANAGING ANY STORMWATER, GROUNDWATER, OR NUISANCE WATER FROM INTERFERING WITH THE CONSTRUCTION OPERATION. COST OF CONTROLLING ALL WATER SHALL BE INCLUDED IN THE CONTRACT PRICE FOR RELATED BID ITEMS. - CONTRACTOR WILL BE RESPONSIBLE FOR DUST CONTROL ACCORDING TO GOVERNING AGENCY STANDARDS: WET DOWN DRY MATERIALS AND RUBBISH TO CONTAIN ALL LOOSE MATERIALS. - ALTHOUGH SOME SURFACE FEATURES (FENCES, RETAINING WALLS, TREES, ETC.) HAVE BEEN CALLED OUT ON THE DRAWINGS FOR THE CONTRACTOR'S CONVENIENCE, NOT ALL ARE SHOWN OR IDENTIFIED. CONTRACTOR SHALL WALK THROUGH CONSTRUCTION AREA PRIOR TO BIDDING TO IDENTIFY SURFACE FEATURES THAT MUST BE PROTECTED OR REPLACED AS PART OF THE WORK. - CONTRACTOR SHALL TAKE PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS. ALL IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED AT THE EXPENSE OF THE CONTRACTOR TO ORIGINAL OR BETTER CONDITION TO THE SATISFACTION OF THE OWNER. - THE CONTRACTOR SHALL BE REQUIRED TO KEEP ALL CONSTRUCTION ACTIVITIES WITHIN ESTABLISHED PUBLIC RIGHT-OF-WAYS, AND TEMPORARY CONSTRUCTION EASEMENTS AS SHOWN, IF ANY. THIS SHALL INCLUDE BUT NOT LIMITED TO VEHICLES AND EQUIPMENT, LIMITS OF TRENCH EXCAVATION, EXCAVATED MATERIAL AND BACKFILL STORAGE. IF THE CONTRACTOR REQUIRES ADDITIONAL CONSTRUCTION EASEMENTS, IT SHALL BE SOLELY HIS RESPONSIBILITY TO OBTAIN THESE EASEMENTS. 11. STORM WATER MANAGEMENT PLAN: CONTRACTOR TO PROVIDE A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) OR EROSION SEDIMENT CONTROL PLAN TO ENGINEER FOR REVIEW BEFORE CONSTRUCTION BEGINS. 12. WATER AND SANITARY SEWER SEPARATION: FOLLOW REQUIREMENTS OF THE DIVISION OF DRINKING WATER OF THE UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY. THE HORIZONTAL DISTANCE BETWEEN PRESSURE WATER MAINS AND SANITARY SEWER LINES SHALL BE AT LEAST TEN FEET, WHERE WATER MAINS AND SEWER LINES CROSS. THE WATER MAIN SHALL BE AT LEAST 18-INCHES ABOVE THE SEWER LINE. WATER LINES AND SEWER LINES SHALL NOT BE INSTALLED IN THE SAME TRENCH. EXCEPTIONS TO THESE REQUIREMENTS MUST BE APPROVED BY THE PROJECT ENGINEER. 13. THRUST RESTRAINTS: - ALL THRUST BLOCKS SHALL BE PLACED AS DESCRIBED IN THE SPECIFICATIONS AND SHOWN ON THE STANDARD DRAWINGS. - ALL MATERIALS USED FOR WATER PROJECTS SHALL BE RATED FOR A MINIMUM 200 PSI WORKING PRESSURE. 01 31 13 01 32 16 01 45 00 31 05 13 32 11 23 33 05 20 31 23 26 01 31 13 00 72 00 4.3 01 31 13 1.20 00 72 00 10.1 00 72 00 6.2A 01 71 23 00 72 00 4.4 01 71 34 00 72 00 13.5 33 05 25 32 01 91 32 01 93 33 11 00 1.3 32 92 00 3.5 33 08 00 3.3 B.1 UTAH DEQ REGULATION R309--550-2 APWA STD. PLAN NO. 561 APWA STD. PLAN NO. 562 LANDSCAPING: - EXISTING GRADE AND NOT OVERLAP EXISTING GROUND. CONTRACTORS TO SATURATE SOD AND KEEP MOIST. - PARK STRIP ON BOTH SIDES OF SIDEWALK SHALL BE LANDSCAPED IN XERISCAPE STYLE WITH SOUTHWEST COBBLE, BUSHES, AND DRIP IRRIGATION AT THE DIRECTION OF THE CITY. SOIL IN AREAS TO RECEIVE DECORATIVE STONE SHALL BE EXCAVATED TO 3" BELOW ADJACENT GRADE. 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GENERAL DESIGN CRITERIA

ALL DESIGN DRAWINGS AND CONSTRUCTION MATERIALS HEREIN PROPOSED MEET OR EXCEED THE REQUIREMENTS OF THE UTAH DIVISION OF DRINKING WATER DEPARTMENT OF ENVIRONMENTAL QUALITY.

BOOSTER STATION DESIGN CRITERIA

THERE WILL BE A TOTAL OF (3) PUMPS HOUSED IN THE BOOSTER STATION
(3) 30 HP PUMPS AT 500 GPM

ANY 2 OF THE 3 PUMPS MAY BE RUN SIMULTANEOUSLY. THE THIRD PUMP IS FOR REDUNDANCY PURPOSES. THE TOTAL PUMPING CAPACITY IS ASSUMED TO BE 1,000 GPM MAX.

SYSTEM DESIGN CRITERIA	
1-0 MG TANK ELEVATION	5161.14 FT
TRANSMISSION LINE LENGTH	2000 FT
PUMPHOUSE ELEVATION	4862.50 FT
ELEVATION DIFFERENCE	298.64 FT
FRICTION LOSS AT 1,000 GPM	16 FT
TOTAL DYNAMIC HEAD	185 FT
STATIC HEAD DIFFERENCE	299 FT
SUCTION PRESSURE SYSTEM	56 PSI
SUCTION PRESSURE HEAD	4992.00 FT

CHLORINATION SYSTEM DESIGN CRITERIA

THERE WILL BE A CHLORINATION SYSTEM HOUSED IN THE BOOSTER STATION. THE CHLORINATION SYSTEM WILL UTILIZE A 12% SOLUTION OF SODIUM HYPOCHLORITE TO DISINFECT WATER PASSING THROUGH THE BOOSTER PUMPS. THE SYSTEM IS DESIGNED TO DISINFECT WATER AT A MAX FLOW RATE OF 1,000 GPM AT A DOSAGE OF 2 PPM.

THE CHLORINATION SYSTEM CONSISTS OF THE FOLLOWING:

- 1- 200 GALLON VERTICAL TANK
- 2- 2" PVC INLET AND VENT PIPE
- 3- 1" PVC OUTLET PIPE
- 4- CHLORINE DOSING METER & PUMP
- 5- CHLORINE RESIDUAL ANALYZER





2036 LINCOLN AVENUE, SUITE 104
CODEN, UTAH 84401
TEL 801.692.6315 • FAX 801.692.7167
WWW.SUNRISE-ENG.COM

KANSVILLE CITY

BOOSTER STATION AND TRANSMISSION LINE
DESIGN CRITERIA

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	G4
07062	SH	TR	CL	4 of 44	

ABBREVIATIONS

AB	ANCHOR BOLT	HB	HOSE BIB
ALUM.	ALUMINUM	IN. OR "	INCH
∟	ANGLE	ID	INSIDE DIAMETER
APPROX.	APPROXIMATELY	INSUL.	INSULATION
ASSY.	ASSEMBLY	INV.	INVERT
⊙	AT	IPS	IRON PIPE SIZE
AV	ALTITUDE VALVE	IRR	IRRIGATION
B.M.	BENCH MARK	K	CURVE COEFFICIENT
BF	BUTTERFLY VALVE	L	LENGTH
BW	BACK OF WALL	LC	LENGTH OF CHORD ON HORIZONTAL CURVE
B.W.	BOTH WAYS	LF	LINEAR FEET
BTM.	BOTTOM	LVC	LENGTH OF VERTICAL CURVE
BLDG.	BUILDING	MH	MANHOLE
BVCS	BEGINNING VERTICAL CURVE STATION	MFR.	MANUFACTURER
BUCE	BEGINNING VERTICAL CURVE ELEVATION	MAX.	MAXIMUM
CB	CHORD BEARING	MECH.	MECHANICAL
CI	CAST IRON	MGD.	MILLION GALLONS PER DAY
Q	CENTER LINE	MIN.	MINIMUM
CLR.	CLEAR	MID.	MIDDLE POINT OF HORIZONTAL CURVE
CONC.	CONCRETE	NO. OR #	NUMBER
CFM	CUBIC FEET per MINUTE	O.C.	ON CENTER
CFS	CUBIC FEET per SECOND	OD	OUTSIDE DIAMETER
CV	CONTROL VALVE	OF	OVERFLOW
CW	CONCRETE WALL	PC	POINT OF CURVATURE
CY	CUBIC YARD	PT (ROAD)	POINT OF TANGENT
DEG. OR °	DEGREE	PL	PLATE
DIA. OR ø	DIAMETER	PE	POLYETHYLENE
DL	DRAIN LINE	PT	POINT
DWG.	DRAWING	PVI	POINT OF VERTICAL INTERSECTION
DI	DUCTILE IRON	PRV	PRESSURE REDUCING VALVE
EA.	EACH	PVC	POLYVINYL-CHLORIDE
EC	EDGE OF CONCRETE	LB. OR #	POUND
EP	EDGE OF PAVEMENT	PSF	POUNDS per SQUARE FOOT
E.F.	EACH FACE	PSI	POUNDS per SQUARE INCH
ELL.	ELBOW	R	PROPERTY LINE
ELEV.	ELEVATION	R	RADIUS OF HORIZONTAL CURVE
ETC.	ETCETERA	R	RADIUS
ENCE	END OF VERTICAL CURVE ELEVATION	RAD	RADIUS
EVCS	END OF VERTICAL CURVE STATION	RD	RING DRAIN
EX.	EXISTING	RCP	REINFORCED CONCRETE PIPE
EXST.	EXISTING	REINF.	REINFORCEMENT
EXP.	EXPANSION	REQD.	REQUIRED
E.G.	EXISTING GROUND	REV.	REVISION
F	FOOTING OR FOUNDATION SLAB	R/W	RIGHT-OF-WAY
F.F.	FINISH FLOOR	SCH.	SCHEDULE
FT OR '	FEET	SPEC.	SPECIFICATION
F.G.	FINISH GRADE	SQ.	SQUARE
FTG.	FITTING	SF	SQUARE FEET
FLG	FLANGE	SI	SQUARE INCHES
GAL.	GALLON	ST. STL.	STAINLESS STEEL
GALV.	GALVANIZED	STD.	STANDARD
GB	GRADE BREAK	STA	STATION
GSP OR GS	GALVANIZED STEEL PIPE	T	TANGENT OF HORIZONTAL CURVE
GI	GALVANIZED IRON PIPE	TC	TOP OF CURB
GA.	GAUGE	TW	TOP OF WALL
GPM	GALLONS per MINUTE	TRP.	TYPICAL
GSN	GENERAL STRUCTURAL NOTES	△	ANGLE BETWEEN TANGENTS HOR. CURVE
GV	GATE VALVE	UBC	UNTREATED BASE COURSE
HORIZ.	HORIZONTAL	UN.O.	UNLESS OTHERWISE NOTED
		VERT.	VERTICAL
		W/	WITH

EXISTING

WATERLINE	-----w-----w-----
GAS	-----g-----g-----
FIBER OPTIC	-----fo-----fo-----
TELEVISION	-----utv-----t-----
TELEPHONE	-----t-----t-----
POWER LINE	-----uge-----s-----
SEWER LINE	-----s-----s-----
STORM DRAIN	-----sd-----sd-----
FENCE	-----x-----x-----x-----
CENTERLINE	-----
EDGE OF PAVEMENT	-----
PROPERTY LINE	-----
CURB & GUTTER	=====
LANDSCAPED AREA	=====
DIRTROAD	***** ***** *****
EXISTING GATE VALVE	
STORM DRAIN MANHOLE	
WATER MANHOLE	
FIRE HYDRANT	
IRRIGATION BOX	
CATCH BASIN	
WATER METER	
SEWER MANHOLE	
POWERSPOLE	
STREET LIGHT	
ELECTRIC BOX	

LEGEND

PROPOSED

18" STORM LINE	-----18"S-----
18" OVERFLOW LINE	-----18"OF-----
16" WATER LINE	-----16"W-----
10" DRAIN LINE	-----10"DL-----
10" STORM LINE	-----10"S-----
6" RING DRAIN LINE	-----6"RD-----
CURB & GUTTER	=====
CURB & GUTTER, REVERSE PITCH	=====
LANDSCAPED AREA	***** ***** *****
BUTTERFLY VALVE	
GATE VALVE	
11.25" ELBOW	
22.5" ELBOW	
45° ELBOW	
90° ELBOW	
TEE (SIZED BY WATER LINE)	
CROSS (SIZE AS REQ'D ON PLAN)	
FIRE HYDRANT	
AIR VAC	
BLOW OFF	
REDUCER (SIZE AS REQ'D ON PLAN)	
CHAIN LINK FENCE	-----o-----
METAL GUARDRAIL	-----x-----

CROSS REFERENCING	
CONSTRUCTION NOTES	
DETAIL DESIGNATION	
DRAWING NUMBER	
TYPICAL OR ADDITIONAL NOTE	
CONSTRUCTION NOTE #	

R.O.W. MARKER	
PROPERTY CORNER	
ALUM CAP U.E.L.S	

PROFESSIONAL SEAL

01/07/2020

NO. 5481902308

HAUSER

STATE OF UTAH

SUNRISE

ENGINEERING

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OGDEN, UTAH 84401

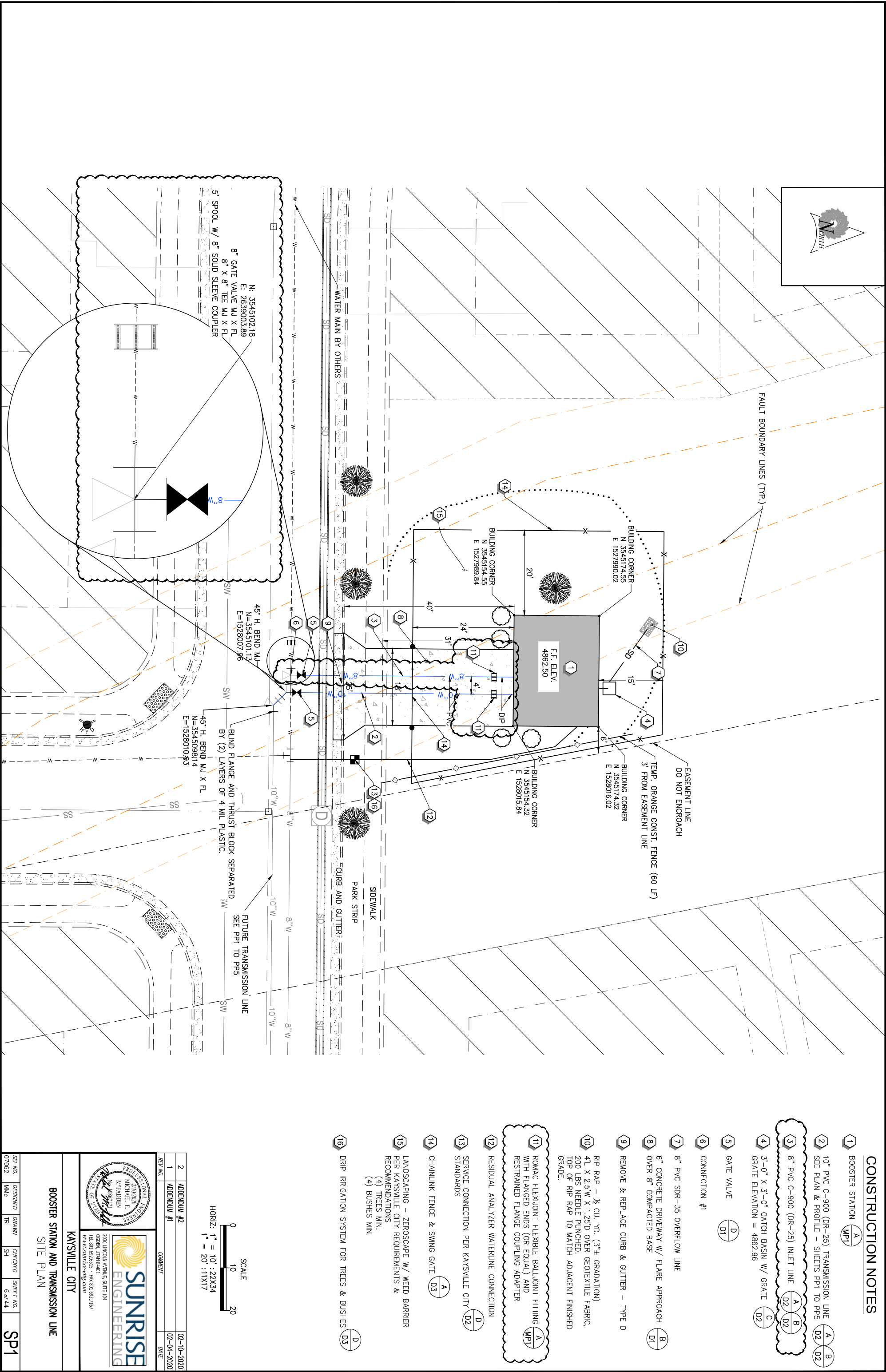
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BOOSTER STATION AND TRANSMISSION LINE

ABBREVIATIONS AND LEGEND

SHEET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	G5
07062	SH	TR	CL	5 of 44	



CONSTRUCTION NOTES

- 1 BOOSTER STATION (A/MP1)
- 2 10" PVC C-900 (DR-25) TRANSMISSION LINE (A/D2, B/D2)
SEE PLAN & PROFILE - SHEETS PP1 TO PP5
- 3 8" PVC C-900 (DR-25) INLET LINE (A/B, D2/D2)
- 4 3'-0" X 3'-0" CATCH BASIN W/ GRATE (C/D2)
GRATE ELEVATION = 4862.96
- 5 GATE VALVE (D/D1)
- 6 CONNECTION #1
- 7 8" PVC SDR-35 OVERFLOW LINE
- 8 6" CONCRETE DRIVEWAY W/ FLARE APPROACH (B/D1)
OVER 8" COMPACTED BASE
- 9 REMOVE & REPLACE CURB & GUTTER - TYPE D
- 10 RIP RAP - 1/2 CU. YD. (3"± GRADATION)
4L X 2.5"W X 1.25'D OVER GEOTEXTILE FABRIC,
200 LBS NEEDLE PUNCHED,
TOP OF RIP RAP TO MATCH ADJACENT FINISHED
GRADE.
- 11 ROMAC FLEXIJUNT FLEXIBLE BALLJOINT FITTING (A/MP1)
WITH FLANGED ENDS (OR EQUAL) AND
RESTRAINED FLANGE COUPLING ADAPTER
- 12 RESIDUAL ANALYZER WATERLINE CONNECTION
- 13 SERVICE CONNECTION PER KAYSVILLE CITY (D/D)
STANDARDS
- 14 CHAINLINK FENCE & SWING GATE (A/D3)
- 15 LANDSCAPING - ZEROSCAPE W/ WEED BARRIER
PER KAYSVILLE CITY REQUIREMENTS &
RECOMMENDATIONS
(4) TREES MIN.
(4) BUSHES MIN.
- 16 DRIP IRRIGATION SYSTEM FOR TREES & BUSHES (D/D3)



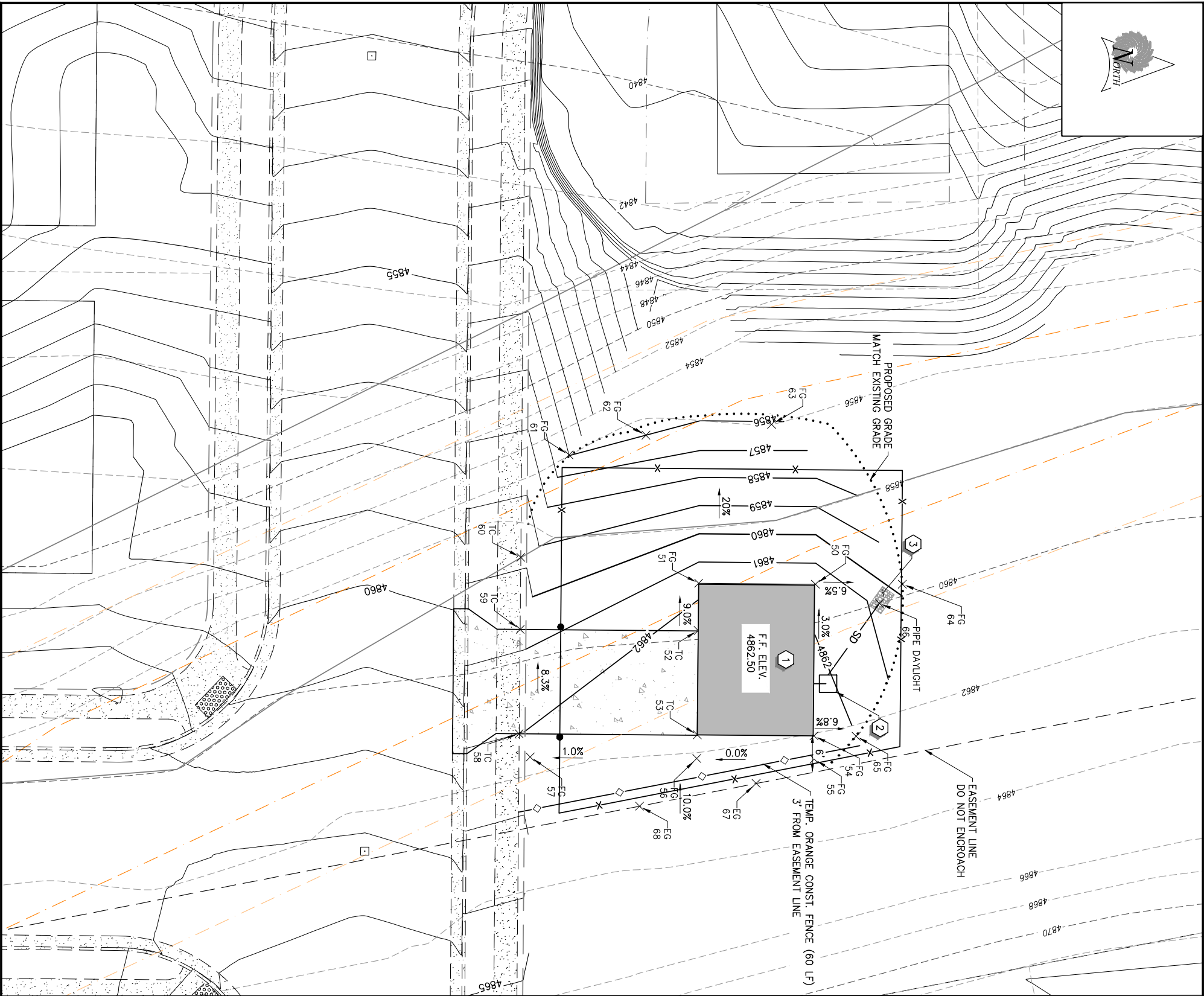
REF. NO.	ADDENDUM #2	COMMENT	DATE
1	ADDENDUM #1		02-04-2020
2	ADDENDUM #2		02-10-2020

PROFESSIONAL ENGINEER
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210020
2020
STATE OF OHIO
LICENSE NO. 158512

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KAYSVILLE CITY
BOOSTER STATION AND TRANSMISSION LINE
SITE PLAN

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	MMC	IR	SH	6 of 44
				SP1



Point Table			
Point #	Elevation	Northing	Eastng
50	4861.75	3545164.71	1527989.86
51	4861.75	3545144.55	1527989.68
52	4862.50	3545144.48	1527997.85
53	4862.50	3545144.32	1528015.84
54	4862.50	3545164.48	1528016.02
55	4862.30	3545164.44	1528020.02
56	4862.30	3545144.28	1528019.84
57	4862.00	3545125.48	1528019.67
58	4862.00	3545123.56	1528015.66
59	4860.50	3545123.76	1527997.66
60	4859.75	3545123.86	1527985.22
61	4856.00	3545132.18	1527967.55
62	4856.00	3545144.80	1527961.68
63	4856.00	3545167.14	1527962.29
64	4859.50	3545179.71	1527989.86
65	4862.00	3545171.74	1528016.09
66	4860.00	3545177.30	1527991.00
67	4862.73	3545164.48	1528024.22
68	4832.88	3545144.35	1528028.16

LEGEND:
FG = FINISH GRADE
EG = EXISTING GRADE
TC = TOP OF CONCRETE

CONSTRUCTION NOTES

- 1 BOOSTER STATION (A) (MP1)
- 2 3'-0" X 3'-0" CATCH BASIN W/ GRATE (C) (D2)
GRATE ELEVATION = 4862.96
- 3 RIP RAP - 1/2 CU. YD. (3"± GRADATION)
41" X 2.5" W X 1.25" D OVER GEOTEXTILE FABRIC,
200 LBS NEEDLE PUNCHED,
TOP OF RIP RAP TO MATCH ADJACENT FINISHED
GRADE.

07062

DESIGNED

TR

MMG

CHECKED

SH

DRAWN

TR

SHEET NO.

7 of 44

GR

REF. NO.

COMMENT

DATE

PROFESSIONAL ENGINEER

1/7/2020

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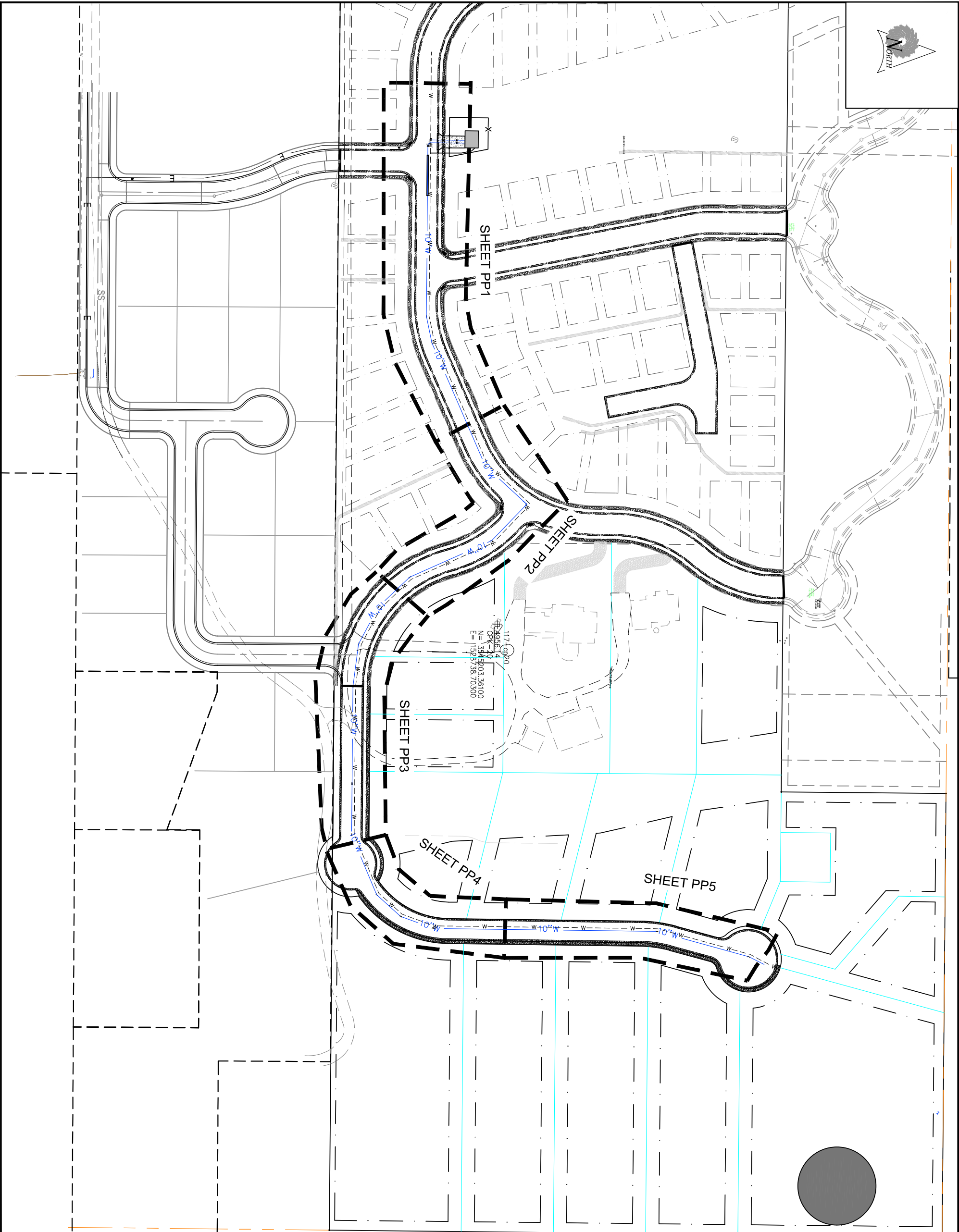
ENGINEERING

KANSVILLE CITY

BOOSTER STATION AND TRANSMISSION LINE

GRADING PLAN

P:\Kaysville\00000 Booster Station\Civil Design Drawings\Sheets\KCBS-2-SP.dwg Jan 07, 2020 3:28pm troberts



SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	PP-1
07062	SH	TR	CL	8 of 44	

PROFESSIONAL ENGINEER
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1-4-2020
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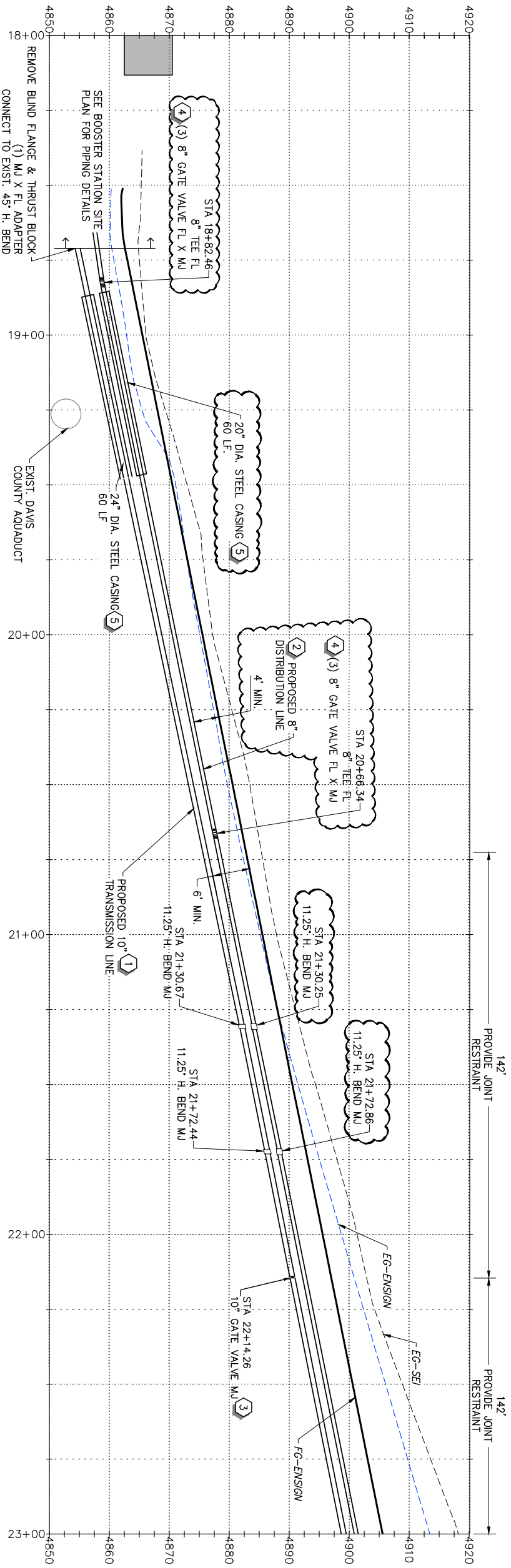
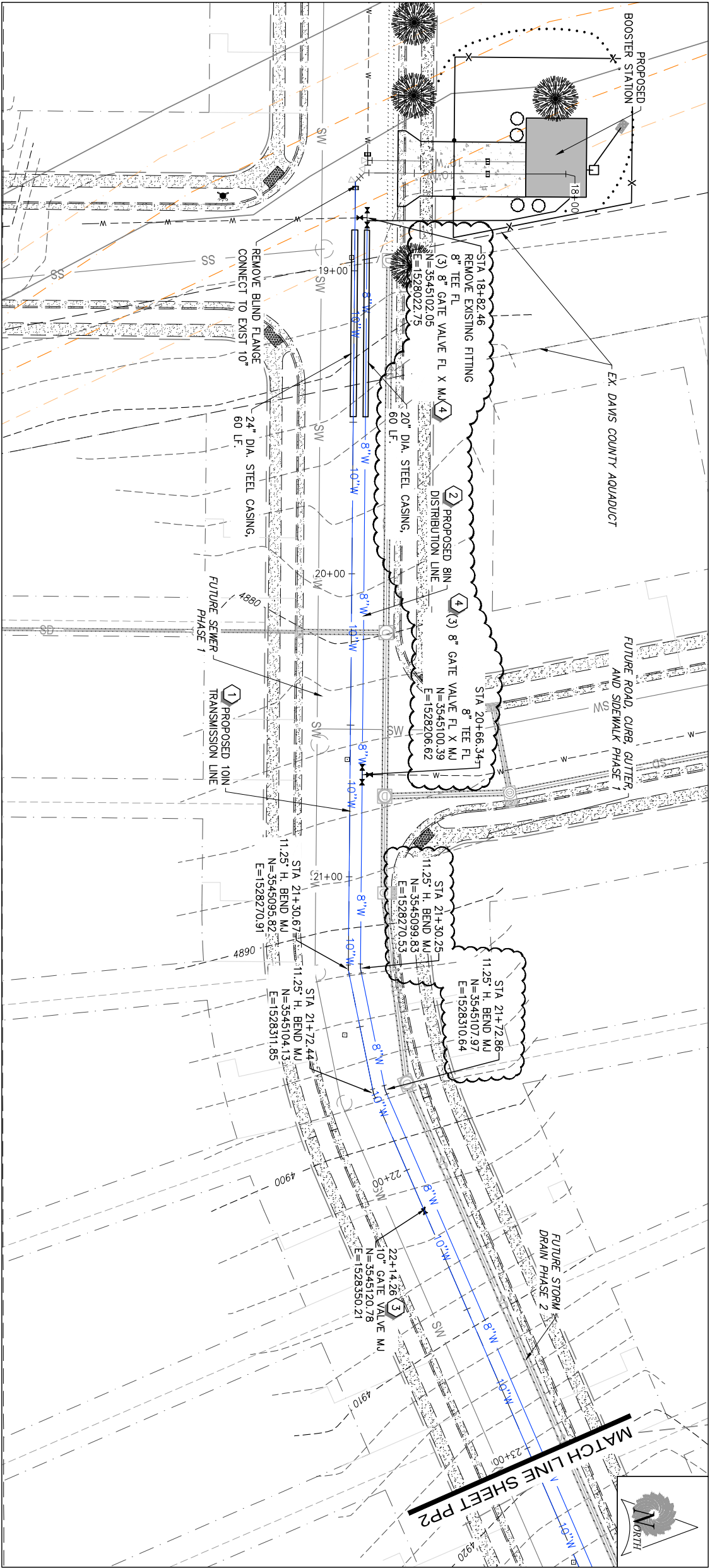
KANSVILLE CITY

BOOSTER STATION AND TRANSMISSION LINE

PLAN & PROFILE

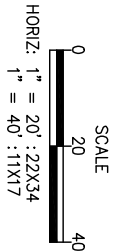
SHEET INDEX

REF. NO.	COMMENT	DATE



- CONSTRUCTION NOTES**
- 1. 10" PVC C-900 (DR-25) (A) (D2)
 - 2. 8" PVC C-900 (DR-25) (A) (D2)
 - 3. 10" GATE VALVE (CLASS 350) (D) (D1)
 - 4. 8" GATE VALVE (CLASS 350) (D) (D1)
 - 5. 24" STEEL CASING (C) (D3)

- NOTES**
1. THE MAXIMUM ANGULAR DEFLECTION AT JOINT FOR 10-INCH PVC (C-900) IS 1 DEGREE.
 2. THE VERTICAL DESIGN OF THE TRANSMISSION LINE IS BASED ON THE VERTICAL DESIGN OF THE ROADWAY PROVIDED BY ENSIGN ENGINEERING (FG-ENSGN). SET'S SURVEY (EG-SEI) OF THE PROPOSED CORRIDOR DID NOT MATCH THE EXISTING GROUND SURFACE PROVIDED BY ENSIGN (EG-ENSGN). IT IS REQUIRED THAT THE ROAD WILL BE ROUGH GRADED IN PRIOR TO THE TRANSMISSION LINE BEING INSTALLED AND ALL VERTICAL ELEVATIONS WILL BE RELATIVE TO THE ROADWAY.
 3. TRANSMISSION LINE CONTRACTOR RESPONSIBLE FOR POSITIVELY LOCATING BLIND FLANGE AT STA 18+72 FOR DEPTH AND ALIGNMENT. LOCATION MAY VARY FROM PLAN.

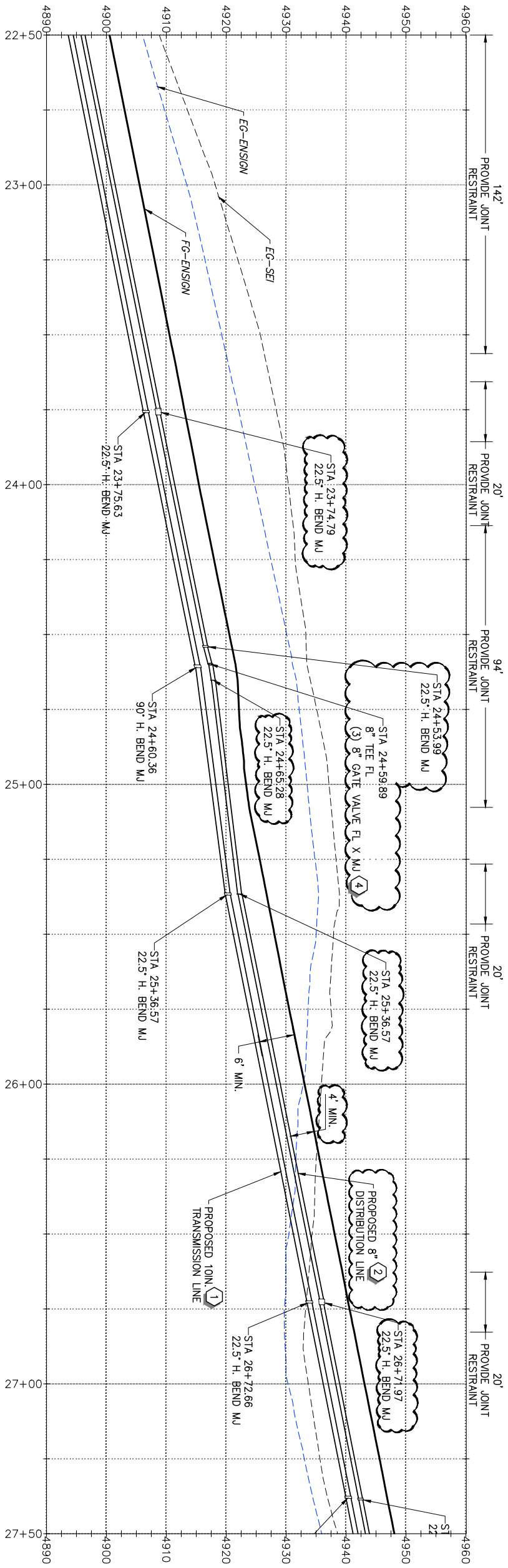
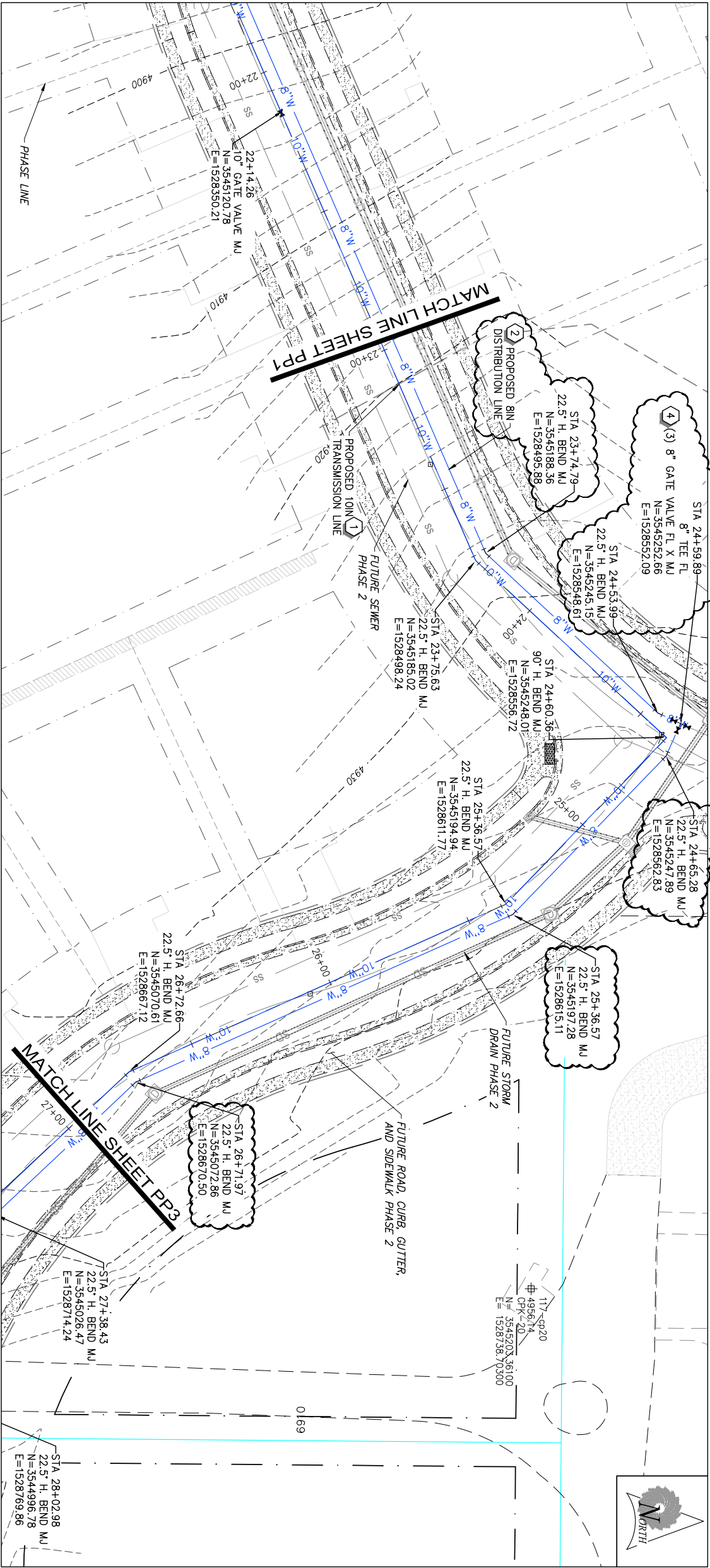


REV NO.	ADDENDUM #1	COMMENT	DATE
1			02-04-2020

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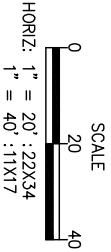
BOOSTER STATION AND TRANSMISSION LINE PLAN AND PROFILE				
SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	TR	CL	9 of 44
				PP1



CONSTRUCTION NOTES

- 1 10" PVC C-900 (DR-25) (A) (D2)
- 2 8" PVC C-900 (DR-25) (A) (D2)
- 3 10" GATE VALVE (CLASS 350) (D) (D1)
- 4 8" GATE VALVE (CLASS 350) (D) (D1)
- 5 24" STEEL CASING (C) (D3)

- NOTES
1. THE MAXIMUM ANGULAR DEFLECTION AT JOINT FOR (A) (D3) 10-INCH PVC (C-900) IS 1 DEGREE.
 2. THE VERTICAL DESIGN OF THE TRANSMISSION LINE IS BASED ON THE VERTICAL DESIGN OF THE ROADWAY PROVIDED BY ENSIGN ENGINEERING (EG-ENSIGN), SET'S SURVEY (EG-SEI) OF THE PROPOSED CORRIDOR DID NOT MATCH THE EXISTING GROUND SURFACE PROVIDED BY ENSIGN (EG-ENSIGN). IT IS REQUIRED THAT THE ROAD WILL BE ROUGH GRADED IN PRIOR TO THE TRANSMISSION LINE BEING INSTALLED AND ALL VERTICAL ELEVATIONS WILL BE RELATIVE TO THE ROADWAY.



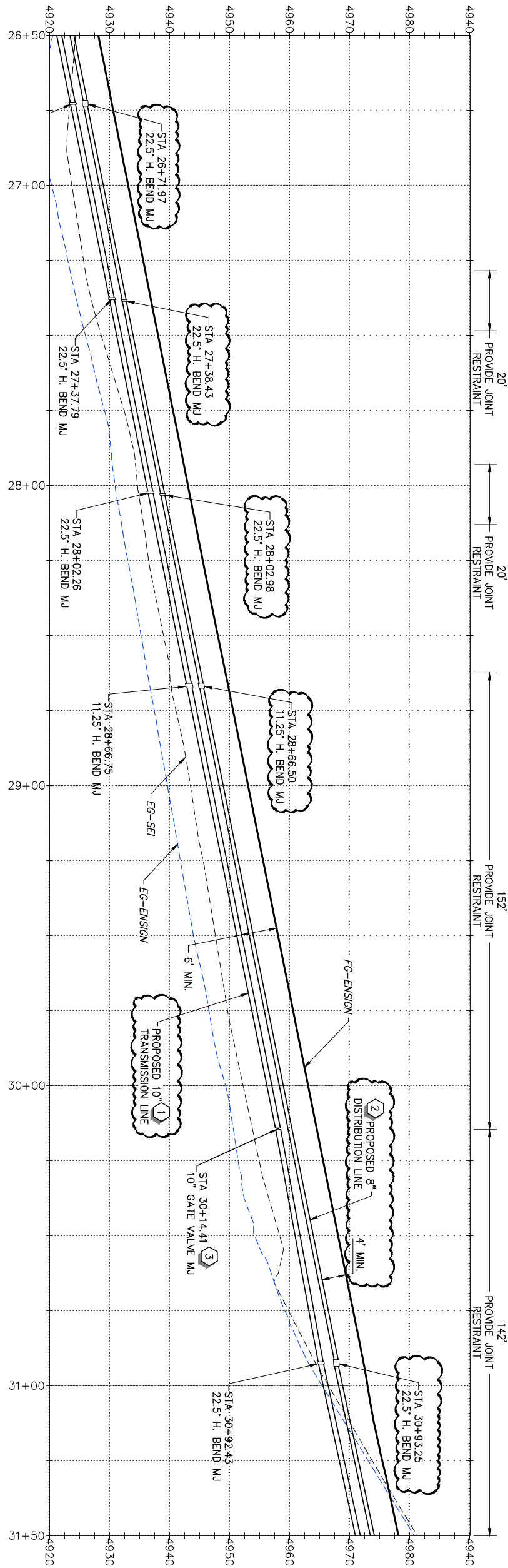
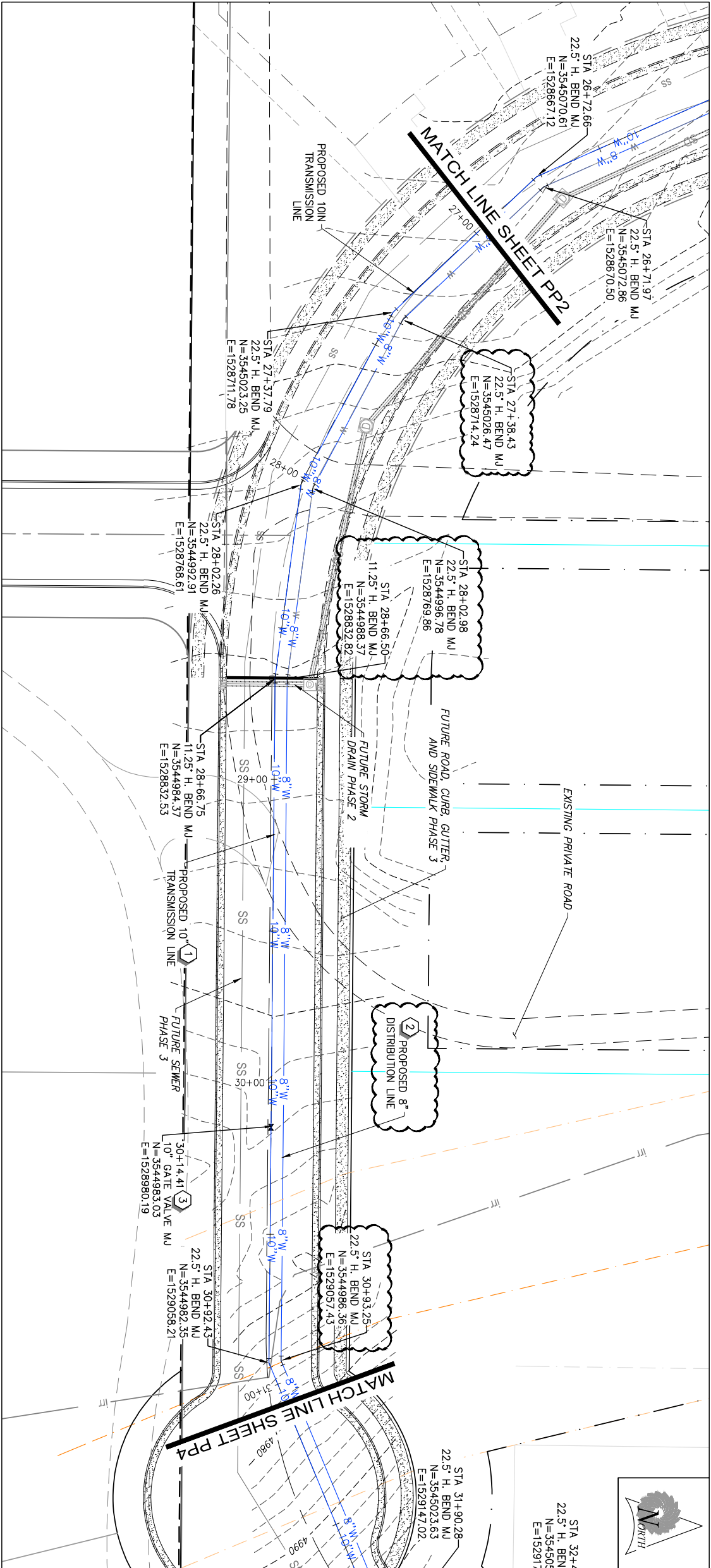
REF. NO.	ADDENDUM #1	COMMENT	DATE
1			02-04-2020

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KANSYVILLE CITY

BOOSTER STATION AND TRANSMISSION LINE
PLAN AND PROFILE

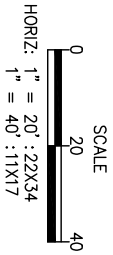
SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	TR	CL	10 of 44
				PP2



CONSTRUCTION NOTES

- 1 10" PVC C-900 (DR-25) (A) (D2)
- 2 8" PVC C-900 (DR-25) (A) (D2)
- 3 10" GATE VALVE (CLASS 350) (D) (D1)
- 4 8" GATE VALVE (CLASS 350) (D) (D1)
- 5 24" STEEL CASING (C) (D3)

- NOTES
1. THE MAXIMUM ANGULAR DEFLECTION AT JOINT FOR 10-INCH PVC (C-900) IS 1 DEGREE.
 2. THE VERTICAL DESIGN OF THE TRANSMISSION LINE IS BASED ON THE VERTICAL DESIGN OF THE ROADWAY PROVIDED BY ENSIGN ENGINEERING (FG-ENSIGN). SETS SURVEY (EG-SET) OF THE PROPOSED CORRIDOR DID NOT MATCH THE EXISTING GROUND SURFACE PROVIDED BY ENSIGN (EG-ENSIGN). IT IS REQUIRED THAT THE ROAD WILL BE ROUGH GRADED IN PRIOR TO THE TRANSMISSION LINE BEING INSTALLED AND ALL VERTICAL ELEVATIONS WILL BE RELATIVE TO THE ROADWAY.



REV. NO.	ADDENDUM #1	COMMENT	DATE
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STATE OF UTAH

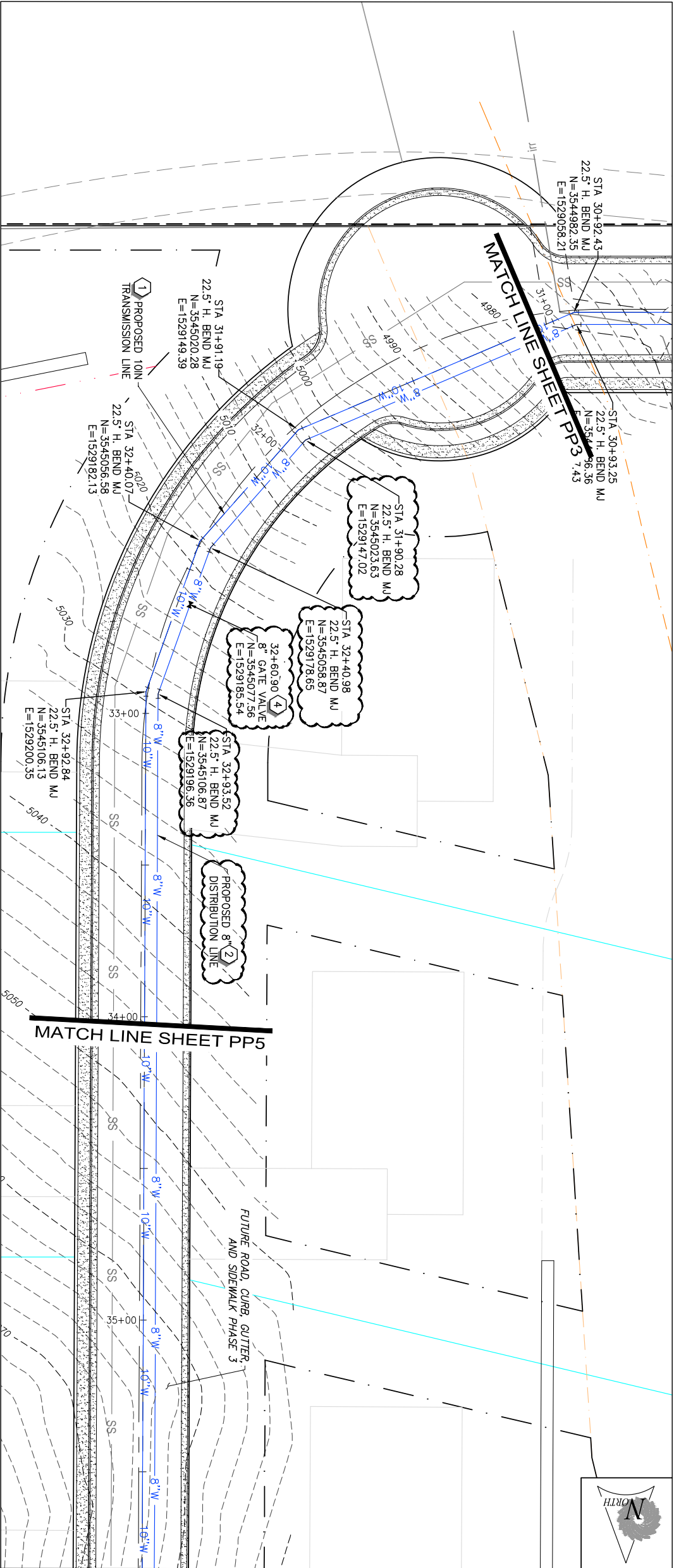
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BOOSTER STATION AND TRANSMISSION LINE
PLAN AND PROFILE

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	TR	CL	11 of 44

PP3



- CONSTRUCTION NOTES**
- 1 10" PVC C-900 (DR-25)

A	D2
---	----
 - 2 8" PVC C-900 (DR-25)

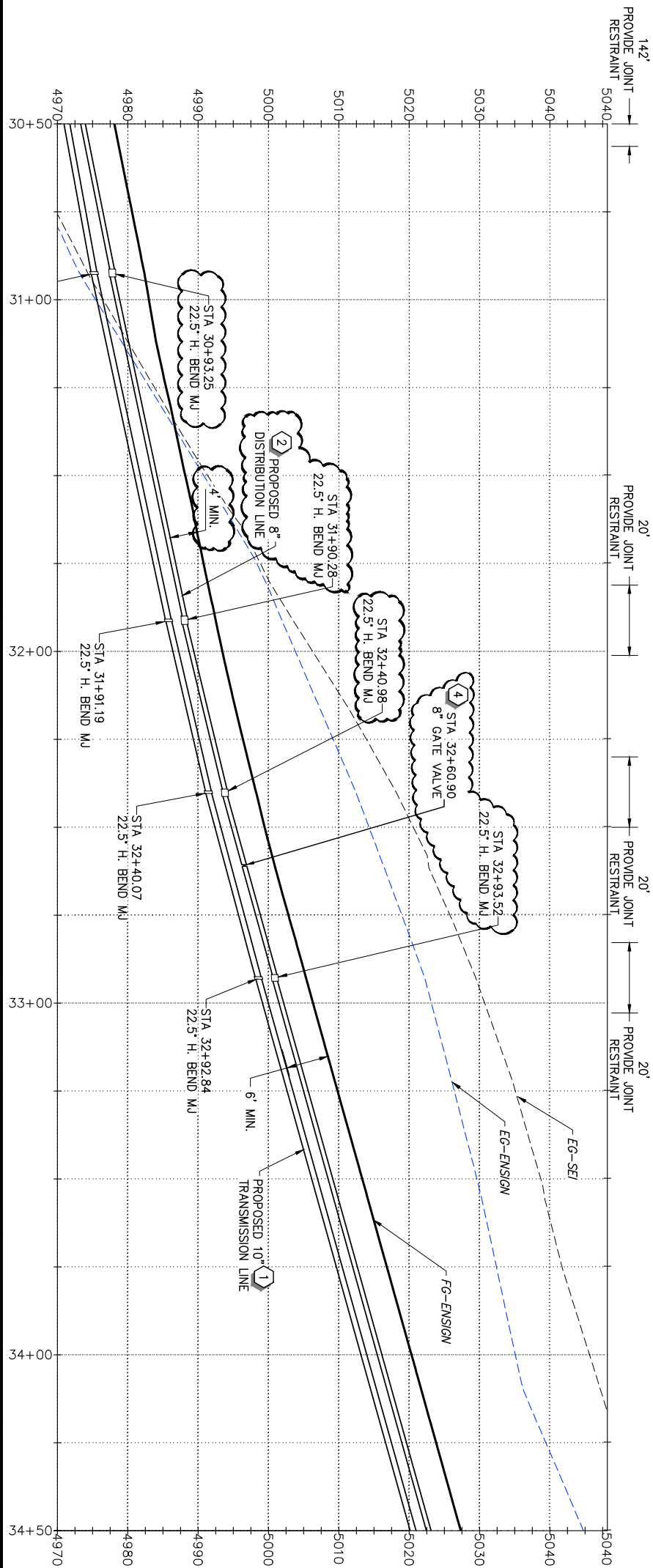
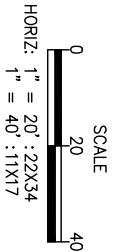
A	D2
---	----
 - 3 10" GATE VALVE (CLASS 350)

D	D1
---	----
 - 4 8" GATE VALVE (CLASS 350)

D	D1
---	----
 - 5 24" STEEL CASING

C	D3
---	----

- NOTES**
1. THE MAXIMUM ANGULAR DEFLECTION AT JOINT FOR 10-INCH PVC (C-900) IS 1 DEGREE.
 2. THE VERTICAL DESIGN OF THE TRANSMISSION LINE IS BASED ON THE VERTICAL DESIGN OF THE ROADWAY PROVIDED BY ENSIGN ENGINEERING (EG-ENSIGN). SETS SURVEY (EG-SEI) OF THE PROPOSED CORRIDOR DID NOT MATCH THE EXISTING GROUND SURFACE PROVIDED BY ENSIGN (EG-ENSIGN). IT IS REQUIRED THAT THE ROAD WILL BE ROUGH GRADED IN PRIOR TO THE TRANSMISSION LINE BEING INSTALLED AND ALL VERTICAL ELEVATIONS WILL BE RELATIVE TO THE ROADWAY.



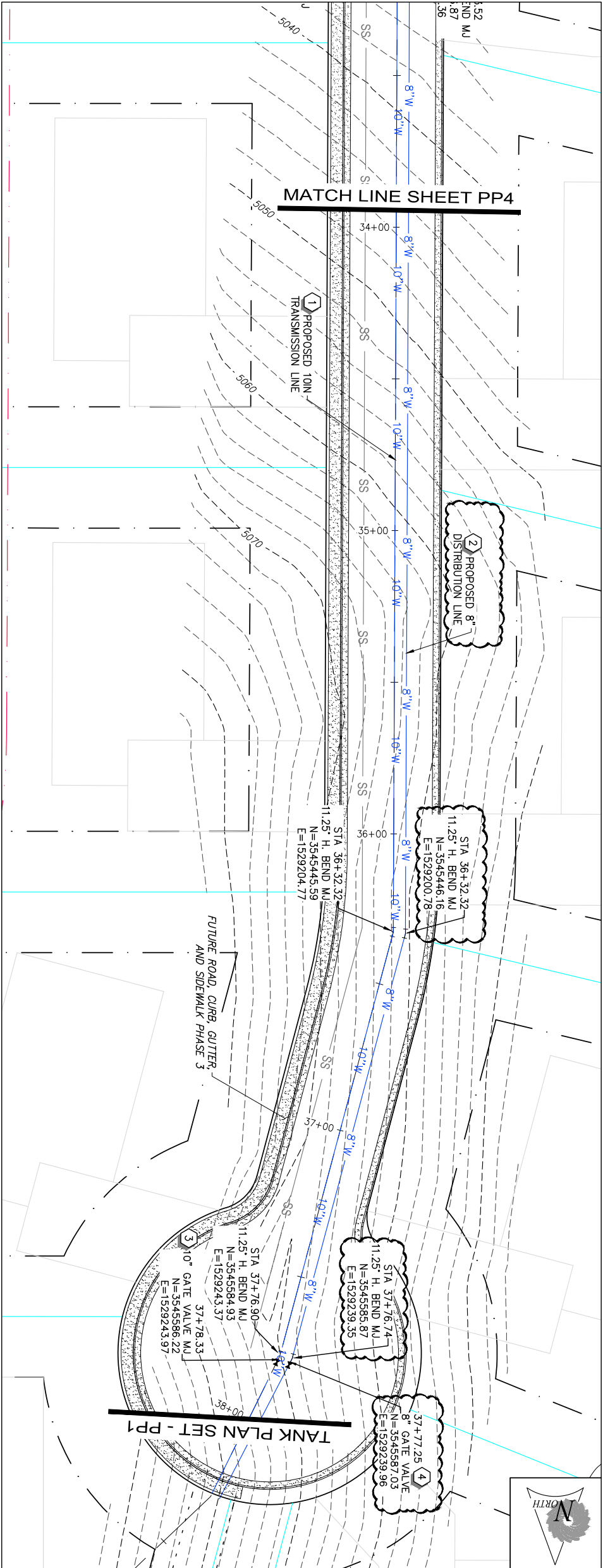
REV. NO.	ADDENDUM #1	COMMENT	DATE
1			02-04-2020

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KANSVILLE CITY			
BOOSTER STATION AND TRANSMISSION LINE PLAN AND PROFILE			

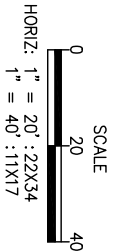
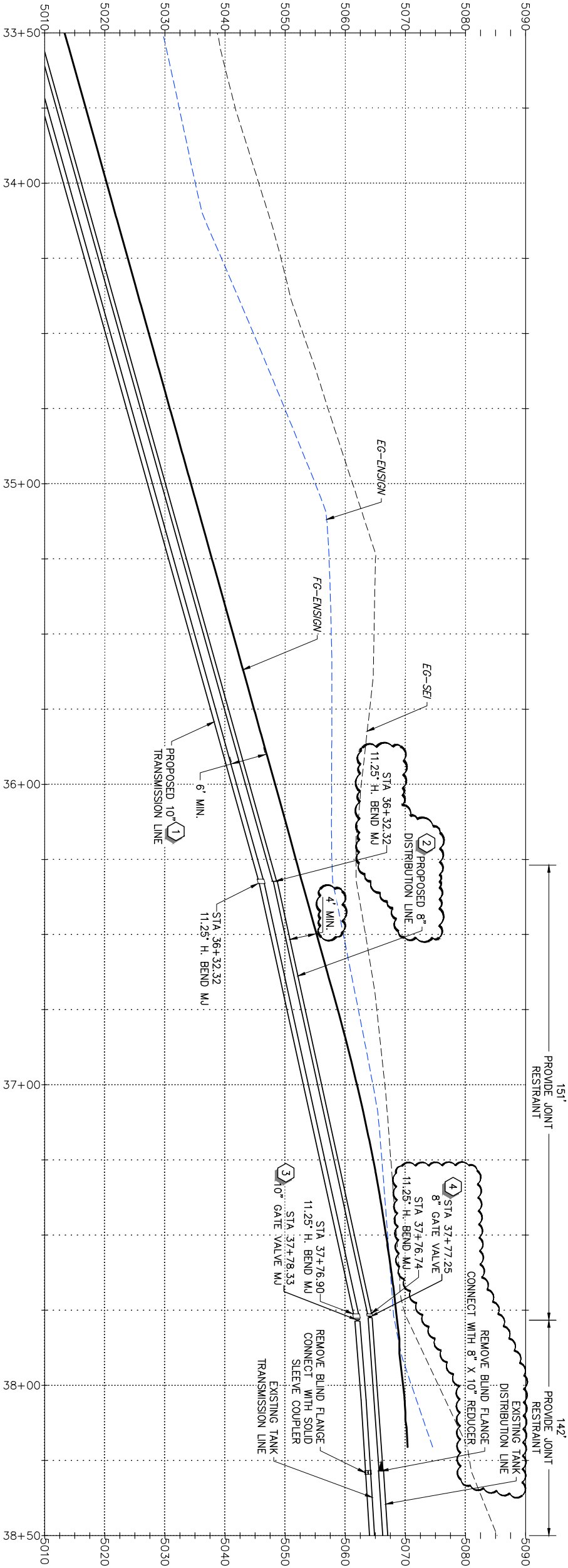
SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	IR	CL	12 of 44

PP4



- CONSTRUCTION NOTES**
- 1 10" PVC C-900 (DR-25) (A) (D2)
 - 2 8" PVC C-900 (DR-25) (A) (D2)
 - 3 10" GATE VALVE (CLASS 350) (D) (D1)
 - 4 8" GATE VALVE (CLASS 350) (D) (D1)
 - 5 24" STEEL CASING (C) (D3)

- NOTES**
1. THE MAXIMUM ANGULAR DEFLECTION AT JOINT FOR 10-INCH PVC (C-900) IS 1 DEGREE.
 2. THE VERTICAL DESIGN OF THE TRANSMISSION LINE IS BASED ON THE VERTICAL DESIGN OF THE ROADWAY PROVIDED BY ENSIGN ENGINEERING (FG-ENSIGN). SET'S SURVEY (EG-SEI) OF THE PROPOSED CORRIDOR DID NOT MATCH THE EXISTING GROUND SURFACE PROVIDED BY ENSIGN (EG-ENSIGN). IT IS REQUIRED THAT THE ROAD WILL BE ROUGH GRADED IN PRIOR TO THE TRANSMISSION LINE BEING INSTALLED AND ALL VERTICAL ELEVATIONS WILL BE RELATIVE TO THE ROADWAY.



REV. NO.	ADDENDUM #1	COMMENT	DATE
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PROFESSIONAL ENGINEER
CLIFTON G. LINFORD
No. 631187

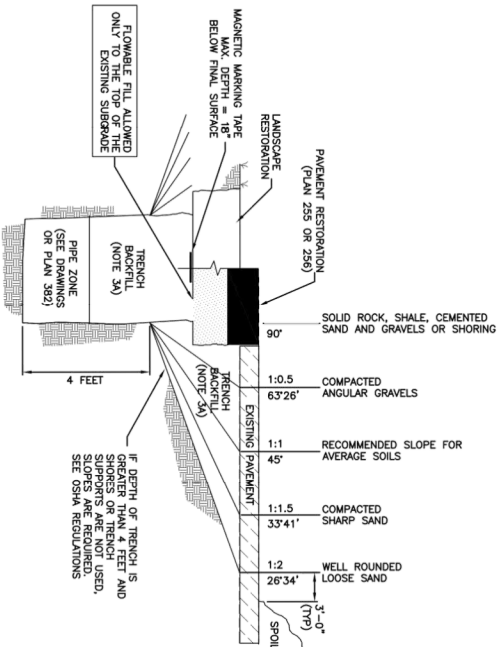
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BOOSTER STATION AND TRANSMISSION LINE PLAN AND PROFILE				
SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	IR	CL	13 of 44
				PP5

Trench backfill

1. **GENERAL**
 - A. The drawing applies to backfilling the trench above the pipe zone.
2. **PRODUCTS**
 - A. Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 3-inches.
 - B. Flowable Fill: Target is 60 psi in 28 days with 90 psi maximum in 28 days. APWA Section 31 05 15. It must flow easily requiring no vibration for consolidation.
3. **EXECUTION**
 - A. Trench Backfill:
 - 1) DO NOT USE sewer rock, pea gravel, or recycled RAP aggregate as trench backfill.
 - 2) Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a standard proctor density. APWA Section 31 23 26.
 - 3) Water jetting is NOT allowed.
 - 4) Submission of quality control compaction test result data developed for launching areas may be requested by ENGINEER at any time. Provide results of tests immediately upon request.
 - B. Flowable Fill: When required, place controlled low strength material in the trench.
 - 1) APWA Section 31 05 15. Cure the fill before placing surface restorations.
 - C. Surface Restoration:
 - 1) Landscaped Surface: Rake to match existing grade. Replace vegetation to match pre-construction conditions. Follow APWA Section 32 92 00 (lurf or grass) or APWA Section 32 93 13 (ground cover) requirements.
 - 2) Paved Surface: Do not install asphalt or concrete surfacing until trench compaction is acceptable to ENGINEER. Follow APWA Section 33 05 25 (asphalt surfacing) or APWA Section 33 05 26 (concrete surfacing).



A) DETAIL - TRENCH BACKFILL

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January 2011

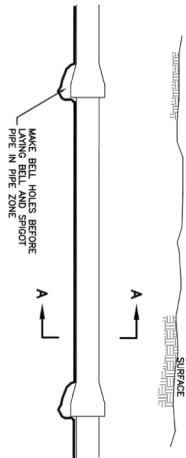
Trench backfill

203

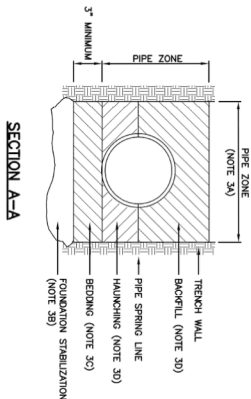
Plan
381

Pipe zone backfill

1. **GENERAL**
 - A. Install the pipe in the center of the trench or no closer than 6-inches from the wall of the pipe to the wall of the trench.
2. **PRODUCTS**
 - A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel.
 - B. Backfill: Common fill, ASEA ENGINEERS' Specification 31 05 13. Maximum particle size 2-inches.
 - C. Concrete: APWA Section 03 30 14.
 - D. Flowable fill: Target is 90 psi in 28 days with 90 psi maximum in 28 days, APWA Section 31 05 15. It must flow easily, requiring no vibration for consolidation.
 - E. Stabilization-separation Geotextile: Moderate or high at CONTRACTOR'S choice, APWA Section 31 05 19.



ELEVATION VIEW

A-A[illegible]

Pipe zone backfill

205

Plan
382

DETAIL - PIPE ZONE BACKFILL

2012 APWA

BACKREII

January 2011

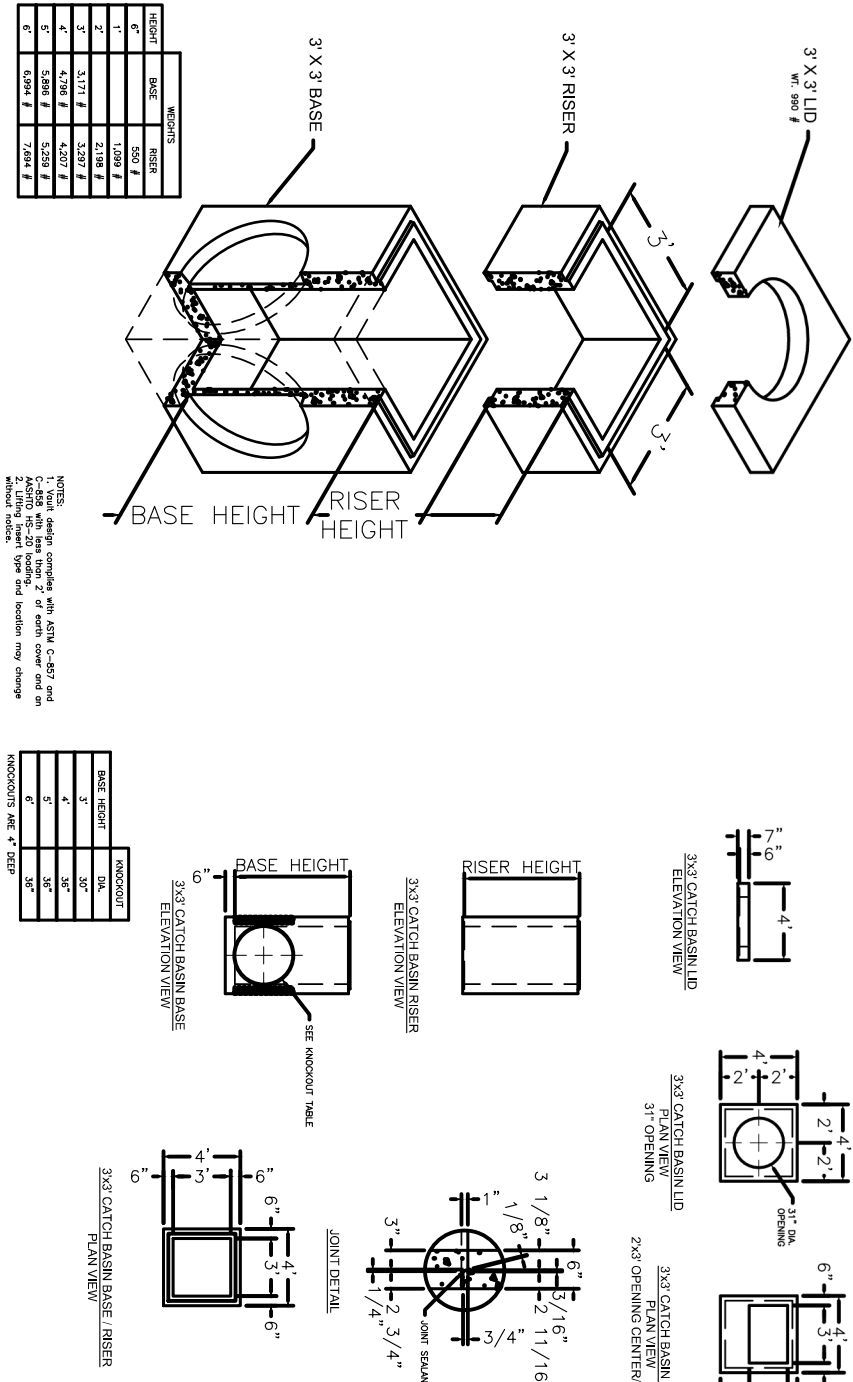
Pipe zone backfill

205

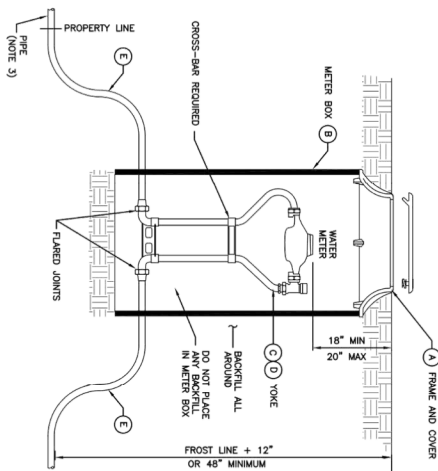
Plan
382

DETAIL - 3'X3' PRECAST BOX

OLDCASTLE PRECAST - NTS



DETAIL - 3/4" SERVICE CONNECTION W/ METER

2012 APWA
TYP /

SECTION

No.	* ITEM	DESCRIPTION
(A)	FRAME AND COVER	CAST IRON COVER (grass) DUCHE IRON COVER (driveway)
(B)	METER BOX (18" to 21" DIAMETER) (30" to 36" DEEP)	CORRUGATED PE, PVC, CUP OR PVC WITH 1" DIA. HOLES FOR OPTIMAL BACKFLOW PROTECTION
(C)	3/4" METER VALVE	PER AGENCY REQUIREMENTS FOR DESIGN REQUIREMENTS
(D)	1" METER YOKER	OPTIMAL BACKFLOW PROTECTION PER AGENCY REQUIREMENTS
(E)	COPPER PIPE	TYPE K (300') PER AGENCY REQUIREMENTS

- FURNISHED BY UTILITY AGENCY

3/4" and 1" meter

August 2001

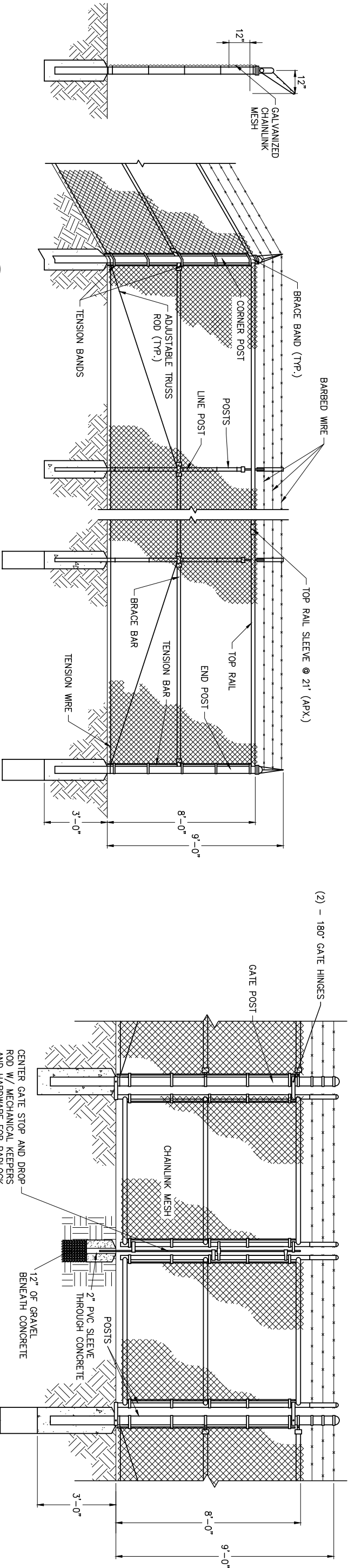
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BOOSTER STATION AND TRANSMISSION LINE CIVIL DETAILS

SEI NO. 07062	DESIGNED SH	DRAWN TR	CHECKED CL	SHEET NO. 15 of 44	D2



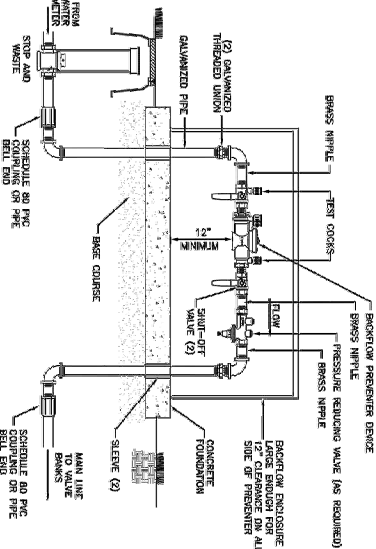
A CHAINLINK FENCE
NTS

B CHAINLINK GATE
NTS

Backflow Preventer

LESS THAN 3" DIAMETER

1. GENERAL
A. Test the backflow preventer within 10 days of installation by a licensed backflow device tester and report results to ENGINEER.
B. Tester is to assume CONTRACTOR and ENGINEER that the backflow preventer system meets the Utah Safe Drinking Water Act.
2. PRODUCTS
A. Brass Course: Unthreaded brass course, APWA Section 32.11.23. Do not use gravel base course with this product.
B. Backfill: Concrete with APWA Section 31.15.13. Maximum particle size 2-inches.
C. Concrete: Class 4000, APWA Section 03.30.04.
D. Concrete Curing Agent: Clear membrane forming compound with fugitive dye (Type ID Class A), APWA Section 03.39.00.
E. Paint: Epoxy based. Color to be selected by ENGINEER.
3. EXECUTION
A. Install per plumbing code. 1. Must not be susceptible to flooding and must be installed in a location that allows for inspection and testing.
B. Install backfill around concrete box. Compacted in 3-inch lifts to 85-percent or greater relative to a standard proctor density. (APWA Section 31.23.26).
C. Except machined surfaces, coat all items in atmosphere with epoxy paint.
D. Concrete placement, APWA Section 03.30.10. Provide 1/2-inch radius on edges. Apply a brown finish. Apply a curing agent.



- NOTES:
1. SPECIFIC SITE REQUIREMENTS MAY DICTATE ADJUSTMENTS IN STEEL CASING PIPE SIZE AND WALL THICKNESS.
 2. CARRIER PIPE IS DUCTILE IRON CLASS 92 (PVC C900 OR 14 - SEE WRITTEN SPECS), TYTON JOINT UNLESS OTHERWISE NOTED ON THE PROJECT PLANS.
 3. CASING PIPE IS A-252 GRADE B STEEL UNLESS OTHERWISE NOTED ON THE PROJECT PLANS.
 4. SEE APPROVED PLAN FOR CASING LAYOUT. OTHERWISE SEE STANDARD DETAIL OF CASING.
 5. CARRIER PIPE JOINTS SHALL BE RESTRAINED FOR A MINIMUM OF 60' EITHER SIDE OF CASING.
 6. WORKING PRESSURE RATING FOR THE RESTRAINED CARRIER PIPE, MIN. 211 SAFETY FACTOR IN ALL SIZES.

C STEEL CASING
NTS

296

Backflow preventer
299

Rev
631

Sheet 1 of 2

D BACKFLOW PREVENTER
APWA 2012

PROFESSIONAL ENGINEER
1-2020
CLIFTON G. LINFORD
No. 631187

SUNRISE
ENGINEERING

2036 LINCOLN AVENUE, SUITE 104
COPPER, UTAH 84401
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KANSVILLE CITY

BOOSTER STATION AND TRANSMISSION LINE
CIVIL DETAILS

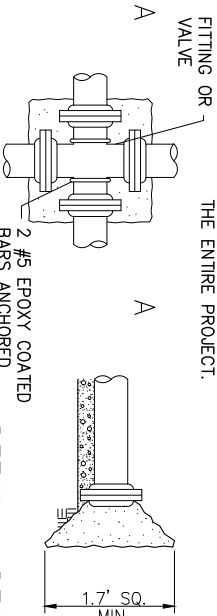
SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	TR	CL	16 of 44
				D3

P:\Kaysville\00000 Booster Station\Civil Design Drawings\Sheets\KCBS-2-SP.dwg Jan 07, 2020 2:50pm trobarts

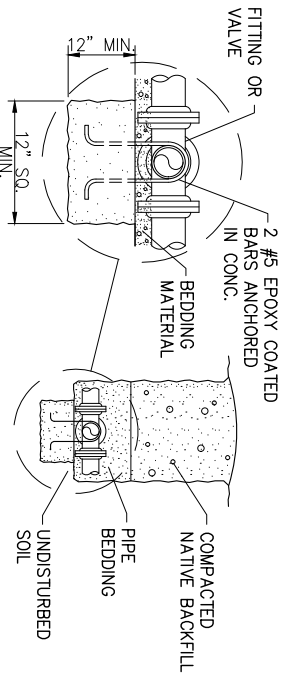
CONCRETE THRUST BLOCK

RESTRAINING SYSTEM DETAILS

NOTE:
CONTRACTOR SHALL USE EITHER MEGALUG OR CONCRETE THRUST RESTRAINING SYSTEM FOR THE ENTIRE PROJECT.



PLAN – THRUST BLOCK
DETAIL – DEAD END
THRUST BLOCK



SECTION A-A

THRUST BLOCK BEARING AREA IN SQ. FT.

PIPE SIZE	CROSS	TEE	WYE	DEAD END	VALVE	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4	2.4	1.7	1.7	1.7	–	2.4	1.3	1.0	1.0
6	5.4	3.8	3.8	3.8	–	5.4	2.9	1.5	1.0
8	9.6	6.8	6.8	6.8	–	9.6	5.2	2.7	1.4
10	15.0	10.6	10.6	10.6	–	15.0	8.1	4.2	2.1
12	21.5	15.2	15.2	15.2	15.2	21.5	11.7	6.0	3.0
14	29.3	20.7	20.7	20.7	20.7	29.3	15.9	8.1	4.1
16	38.2	27.0	27.0	27.0	27.0	38.2	20.7	10.6	5.3
18	48.4	34.2	34.2	34.2	48.4	26.2	13.4	13.4	6.7
20	59.7	42.2	42.2	42.2	59.7	32.3	16.5	16.5	8.3
24	85.9	60.8	60.8	60.8	85.9	46.5	23.7	23.7	11.9

REDUCER

D1	6	8	10	12	14	16	18	20	24
4	2.1	5.1	8.8	13.4	–	–	–	–	–
6	–	3.0	6.7	11.3	16.8	23.1	–	–	–
8	–	–	3.8	8.4	13.8	20.1	27.2	–	–
10	–	–	–	4.6	10.1	16.3	23.5	31.4	–
12	–	–	–	–	5.5	11.7	18.8	26.8	45.2
14	–	–	–	–	–	6.3	13.4	21.3	39.8
16	–	–	–	–	–	–	7.1	15.1	33.5
18	–	–	–	–	–	–	–	8.0	26.3
20	–	–	–	–	–	–	–	–	18.4

NOTE:

1. ALL THRUST BLOCK BEARING FACES SHALL BE PLACED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL.
2. SQUARE ALL EDGES TO RECEIVE CONCRETE.
3. CONCRETE SHALL BE CLASS C.
4. CALCULATED ON 250 PSI TEST PRESSURE AND ALLOWABLE BEARING PRESSURE OF 1500 LBS. PER SQ. FT.
5. IN POORER SOILS, SPECIAL DESIGN IS REQUIRED.
6. ALL FITTINGS AND VALVES SHALL BE ANCHORED WITH TWO EPOXY COATED #5 REBAR, ONLY ONE REQD FOR REDUCER.
7. CENTER ALL FITTINGS OVER THRUST BLOCKS.

VERTICAL BEND RESTRAINED LENGTHS, L, IN FT. (250 PSI TEST PRESS.)

BEND ANGLE	8	10	12	14	16	18	20
11.25	12/4	14/5	17/6	19/7	22/7	24/8	26/9
22.5	24/8	29/10	34/11	39/13	43/14	48/16	53/17
45	49/16	59/20	70/23	80/26	90/29	100/32	109/35

NOTES:

1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER SPECIFICATION.
2. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION ON GENERAL NOTES FOR USE OF RESTRAINED JOINT LENGTHS.

HORIZONTAL BEND RESTRAINED LENGTHS, L, IN FT. (250 PSI TEST PRESS.)

BEND ANGLE	8	10	12	14	16	18	20
11.25	4	5	6	7	7	8	9
22.5	8	10	11	13	14	16	17
45	16	20	23	26	29	32	35
90	39	47	54	62	69	76	83

NOTES:

1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER SPECIFICATION.
2. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION ON GENERAL NOTES FOR USE OF RESTRAINED JOINT LENGTHS.

THE RESTRAINED LENGTHS, L, IN FT. (250 PSI TEST PRESS.)

BRANCH SIZE Ø	8	10	12	14	16	18	20
6	*	*	*	*	*	*	*
8	*	*	*	*	*	*	*
10	*	*	*	*	*	*	*
12	*	*	*	*	*	*	*
14	*	*	*	*	*	*	*
16	*	*	*	*	*	*	*
18	*	*	*	*	*	*	*
20	*	*	*	*	*	*	*

* = FOR THIS CONDITION NEED ONLY RESTRAIN THE IMMEDIATE BRANCH OUTLET OF TEE FITTING AND THE TEE RUNS ACCORDING TO NOTE 1.

NOTES:

1. RESTRAIN THE TWO MECHANICAL JOINTS ON THE RUN SIDES OF THE TEE. THERE SHOULD BE A FULL 18' LENGTH OF PIPE INSTALLED ON EACH SIDE OF THE RUN. IF CONDITIONS DIFFER, CONSULT ENGINEER.
2. ALL JOINTS WITHIN THE LENGTH "L" ON THE BRANCH MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS ON PUSH-ON PIPE PER CITY SPECIFICATION.
3. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION ON GENERAL NOTES FOR USE OF RESTRAINED JOINT LENGTHS.

REDUCER RESTRAINED LENGTHS, L, IN FT. (250 PSI TEST PRESS.)

SMALL SIDE, D2	8	10	12	14	16	18	20
6	34	59	83	105	125	144	163
8	-	33	61	85	108	130	150
10	-	-	34	62	88	112	134
12	-	-	-	34	63	90	114
14	-	-	-	-	34	64	91
16	-	-	-	-	-	34	64
18	-	-	-	-	-	-	34

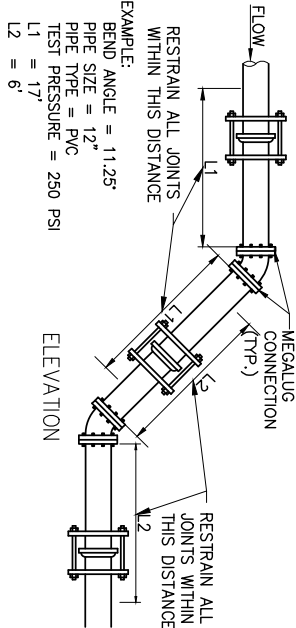
*ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DEAD END RESTRAINED LENGTHS, L, IN FT. (250 PSI TEST PRESS.)

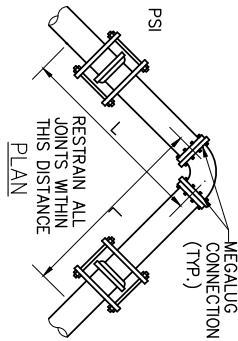
PIPE SIZE	8	10	12	14	16	18	20
117	142	167	192	216	240	263	283

NOTES:

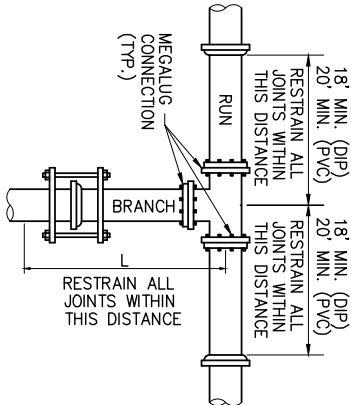
1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER CITY SPECIFICATION.
2. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION ON GENERAL NOTES FOR USE OF RESTRAINED JOINT LENGTHS.
3. LENGTH MAY BE REDUCED BY USING STATIC PRESSURE. COORDINATE WITH ENGINEER.



EXAMPLE:
BEND ANGLE = 11.25°
PIPE SIZE = 12"
PIPE TYPE = PVC
TEST PRESSURE = 250 PSI
L1 = 17'
L2 = 6'

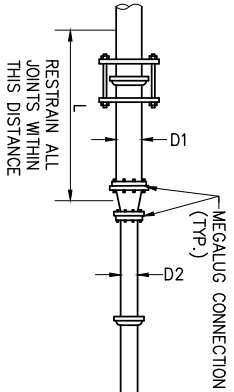


EXAMPLE:
BEND ANGLE = 45°
PIPE SIZE = 12"
PIPE TYPE = PVC
TEST PRESSURE = 250 PSI
L = 23'



EXAMPLE:
PIPE TYPE = PVC
PIPE SIZE = 12"
BRANCH SIZE = 12"
TEST PRESSURE = 250 PSI
L = *

PLAN



EXAMPLE:
PIPE TYPE = PVC
D1 = 12"
D2 = 8"
TEST PRESSURE = 250 PSI
L = 89'

ALLOWABLE PIPE DEFLECTION

MAXIMUM RECOMMENDED OFFSET/20' PIPE SECTION TO ACHIEVE MINIMUM CURVE RADIUS BY DEFLECTING A STRAIGHT LENGTH OF PIPE AT THE JOINT (FOR ALL DR AND CLASS RATINGS)
*PVC BY IPEX, DIP BY U.S. PIPE

PIPE SIZE	MAX. OFFSET	DEFLECTION ANGLE
*PVC	INCHES	DEGREES
8"	6	1.0
10"	5.5	1.0
12"	5	1.0
16"	4.5	1.0
24"	4	1.0
*DIP	INCHES	DEGREES
4"-36" (18' LENGTH)	9.5	2.5
4"-36" (20' LENGTH)	10.5	2.5

MEGALUG

THRUST RESTRAINING SYSTEM DETAILS

RESTRAINED JOINT LENGTHS USAGE GENERAL NOTES.
RESTRAINED LENGTH CALCULATIONS ARE BASED ON THE FOLLOWING DESIGN TYPICALLY USED WITH BACKFILL IN WASHINGTON.

1. FOUR (4) FEET MINIMUM DEPTH OF COVER.
2. A SAFETY FACTOR OF 2.0
3. SOIL WELL GRADED SAND
4. TYPE 5 TRENCH COMPACTION FROM FOUR (4) INCHES MINIMUM UNDER THE PIPE TO THE CENTER LINE OF THE PIPE, AND COMPACTED GRANULAR OR SELECTED MATERIAL FROM THE CENTER LINE OF THE PIPE TO THE TOP OF THE PIPE (90% STANDARD PROCTOR DENSITY, AASHTO T-99).
5. 250 PSI TEST PRESSURES FOR FOUR (4) THROUGH THIRTY SIX (36) INCH SIZE PIPES.

IF ACTUAL CONDITIONS DIFFER FROM THOSE LISTED ABOVE OR THE REQUIRED RESTRAINED LENGTH CANNOT BE MET, THE RESTRAINED JOINT LENGTH SHALL BE DETERMINED BY THE ENGINEER.

NOTES:

1. DIP, RESTRAINTS SHALL BE FIELD LOCK TYPE GASKETS, RESTRAINT HARNESSSES, OR APPROVED EQUAL THAT MEET PRESSURE REQUIREMENTS AND ACCOMMODATE DEFLECTION. CONTRACTOR TO VERIFY THAT DEFLECTIONS SHOWN ON THE PLANS CAN BE MADE WITH FIELD LOCK GASKETS (NO ADDITIONAL FITTINGS).

2. RESTRAINTS FOR INDIVIDUAL FITTINGS ARE SHOWN ON THE PLANS. THESE SHEETS ARE FOR USE WHEN A FITTING IS REQUIRED BUT NOT SHOWN ON THE PLANS.

3. THESE TABLES SHOW RESTRAINT LENGTHS FOR DIP AND PVC AT 250 PSI TEST RESULTS. USE THE REQUIRED TEST PRESSURE TABLE IN THE SPECIFICATIONS TO DETERMINE THE MAXIMUM REQUIRED TEST PRESSURE AND ROUND UP TO 250 PSI.

4. COORDINATE WITH ENGINEER FOR RESTRAINT LENGTH OF VALVES (MAY BE TREATED AS A DEAD END).

REF. NO.
DATE

COMMENT

PROFESSIONAL ENGINEER
1-1-2020
CLERTON G. LINFORD
No. 6311187
2036 LINCOLN AVENUE, SUITE 104
COPPER, UTAH 84401
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KAYSVILLE CITY
BOOSTER STATION AND TRANSMISSION LINE
CIVIL DETAILS

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	IR	CL	17 of 44
				D4

ARCHITECTURAL NOTES

V-B

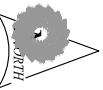
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ACTUAL	ALLOWABLE
1/12'-0"	1/40'-0"

CC.

017.

10

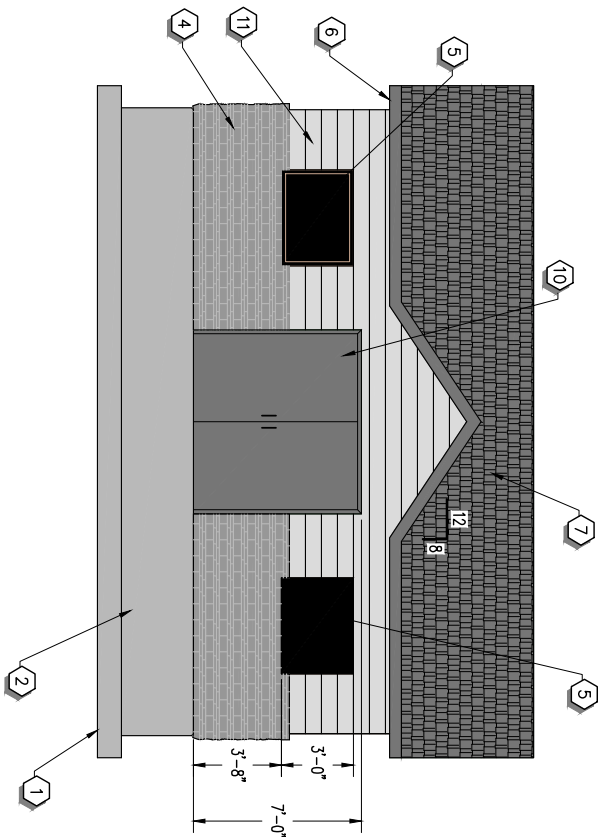


SCALE

HORIZ: 1" = 2' FULL SIZE
1" = 4' HALF SIZE

- 1 7'-0" x 7'-0" DOUBLE DOOR
 - 2 4'-0" x 3'-0" FALSE WINDOW
 - 3 EXTERIOR WOOD WALL ASSEMBLY
 - 4 INTERIOR FRAMED WALL 2x4 STUDS @ 16" O.C. WITH R-13 BATT INSULATION AND 5/8" MOISTURE RESISTANT GYPSUM BOARD ON ALL INTERIOR WALLS (TYP.).
 - 5 ROOF ASSEMBLY
 - 6 FLOOR DRAIN PER MECHANICAL PRING PLAN
 - 7 EAVE REQUIREMENTS
 - 8 22" x 30" ATTIC ACCESS

SEI NO.	DESIGNED	DATE	REVISION	DATE
07062	SH	IR	DR	DR
CHECKED	DATE	REVISION	DATE	REVISION
18.04.44	SH	IR	DR	DR
A1				

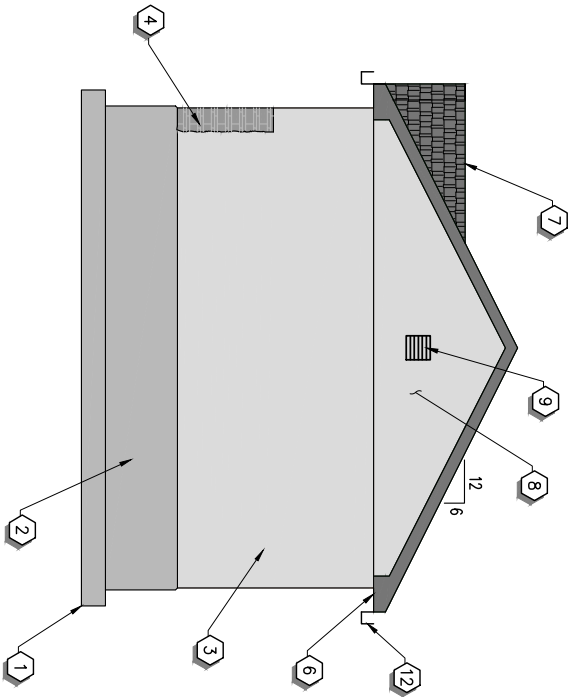


A
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NTS
ELEVATION - WEST SIDE

FINISHED CEILING ELEVATION: 4871.50'

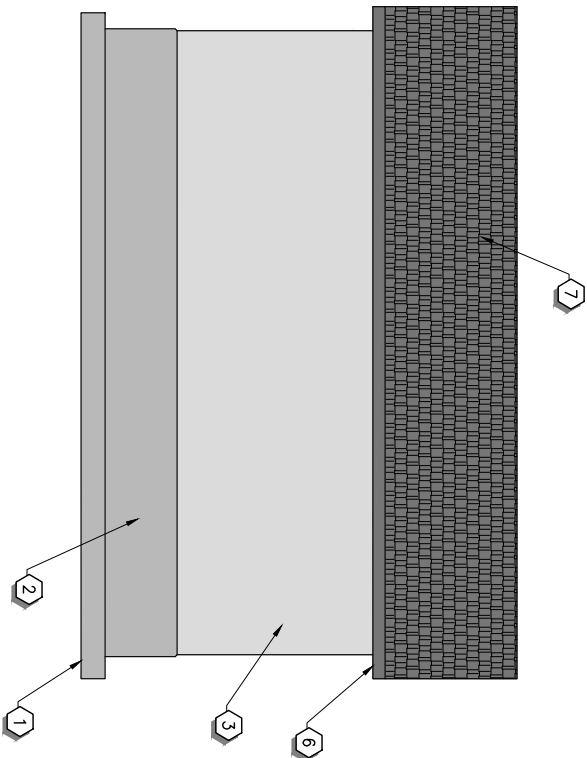
FINISHED FLOOR ELEVATION: 4862.50'

TOP OF FOOTING ELEVATION: 4859.50'



B
~
NTS
ELEVATION - SOUTH SIDE

- ARCHITECTURAL NOTES**
- 1 CONCRETE FOOTINGS
 - 2 CONCRETE FOUNDATION WALL WITH DAMP-PROOFING MEMBRANE
 - 3 STUCCO EXTERIOR WALL ASSEMBLY
 - 4 STONE EXTERIOR WALL ASSEMBLY
 - 5 (2) 4'-0" x 3'-0" SECURITY WINDOWS
 - 6 SOFFIT PER EAVE DETAIL
 - 7 ASPHALT SHINGLE ROOF ASSEMBLY
 - 8 STUCCO FINISH OVER PRE-FAB STRUSS
 - 9 STANDARD WALL VENT (10" x 10" MIN.)
 - 10 7'-4" x 7'-0" DOUBLE DOOR
 - 11 HARDY PANEL WALL ASSEMBLY
 - 12 ALUMINUM RAIN GUTTER SYSTEM PER BUILDING CODE AND INDUSTRY STANDARD PRACTICE
- Legend: 1/2" = 1'-0" (Scale)
- Section Lines: A-A, B-B, C-C, D-D, E-E

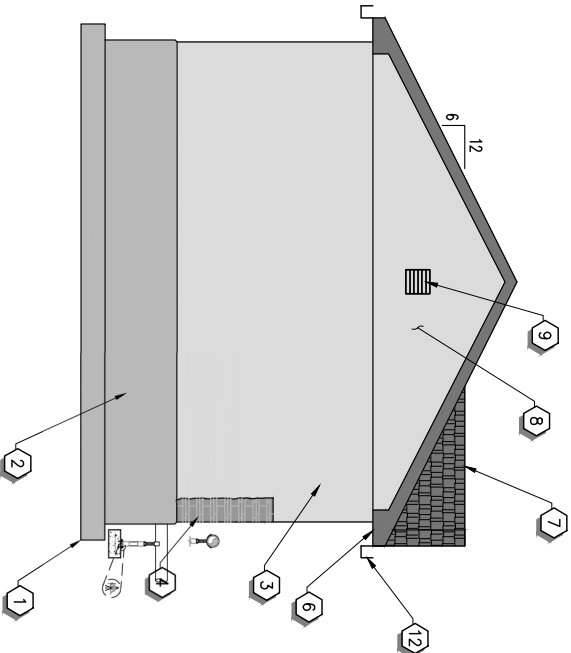


C
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NTS
ELEVATION - EAST SIDE

FINISHED CEILING ELEVATION: 4871.50'

FINISHED FLOOR ELEVATION: 4862.50'

TOP OF FOOTING ELEVATION: 4859.50'



D
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NTS
ELEVATION - NORTH SIDE

NOTE

COLOR SCHEME FOR ALL ITEMS CHOSEN BY CITY AND DEVELOPER

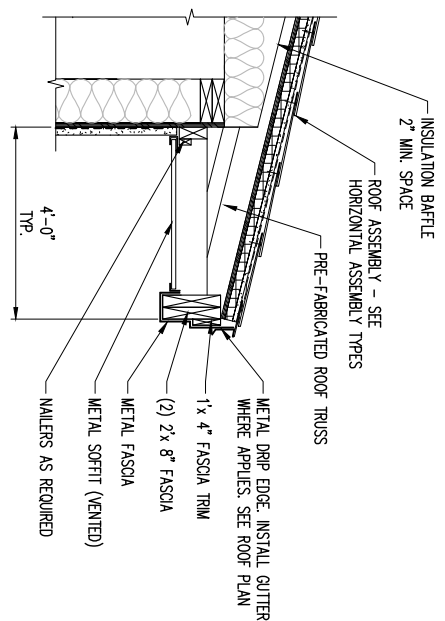
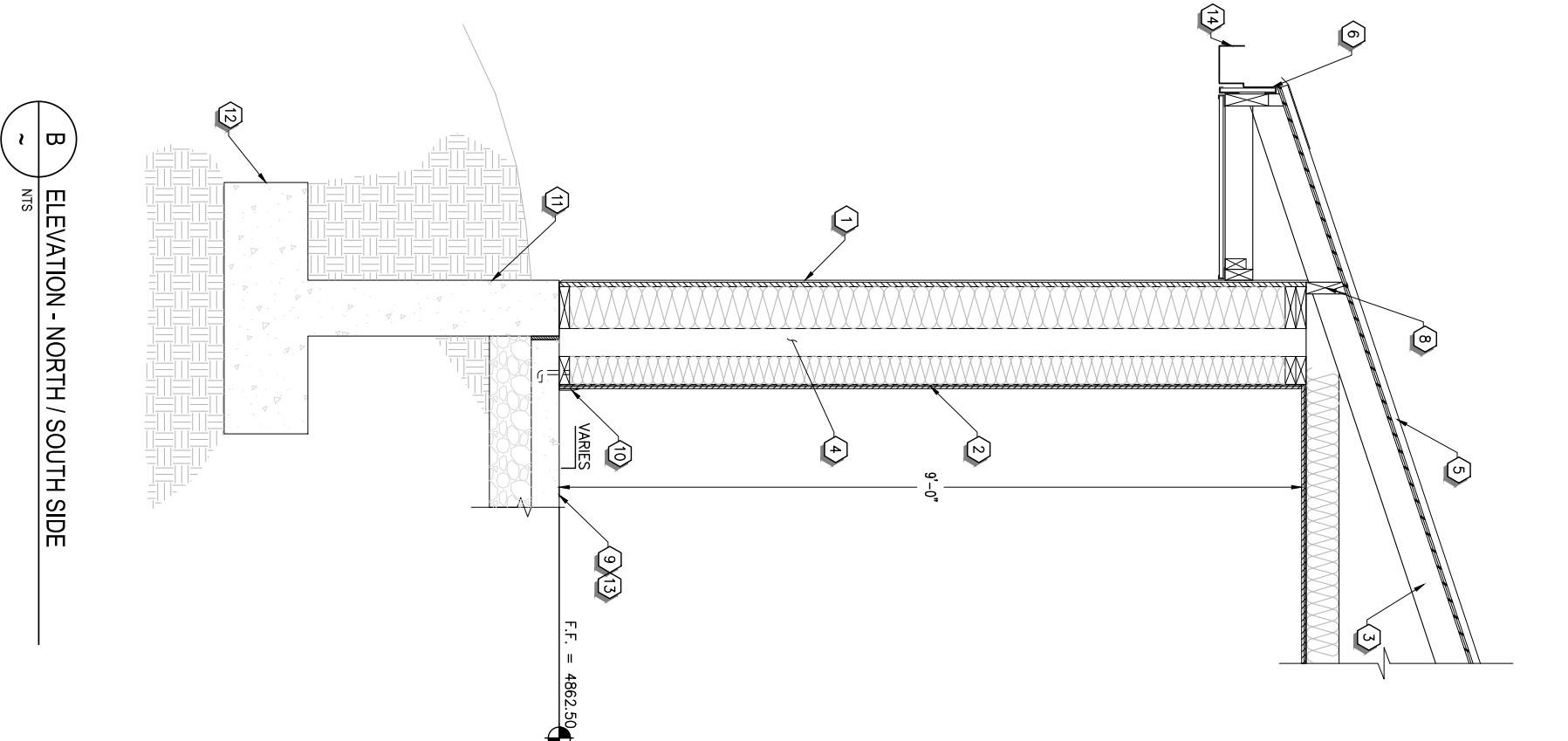
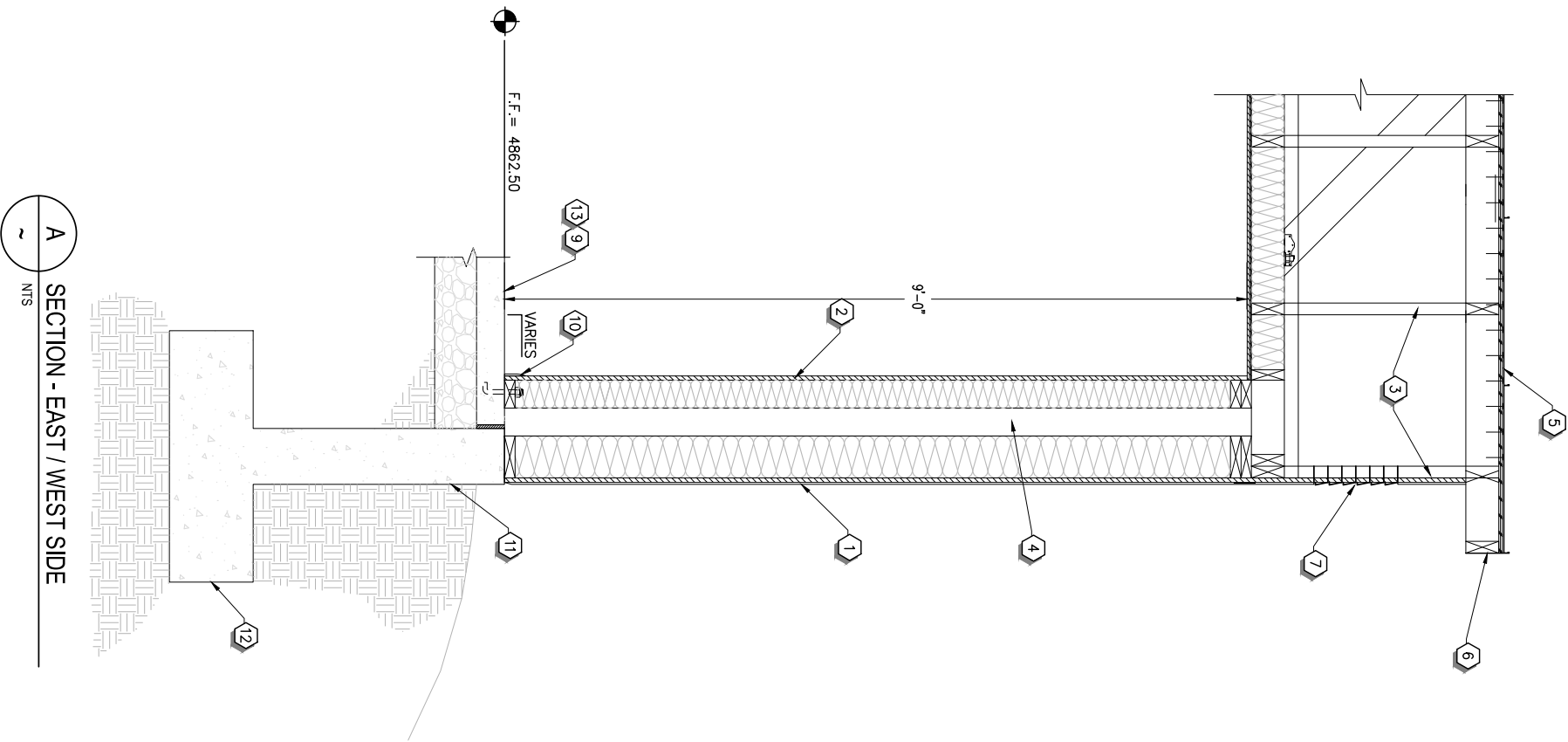
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KANSVILLE CITY

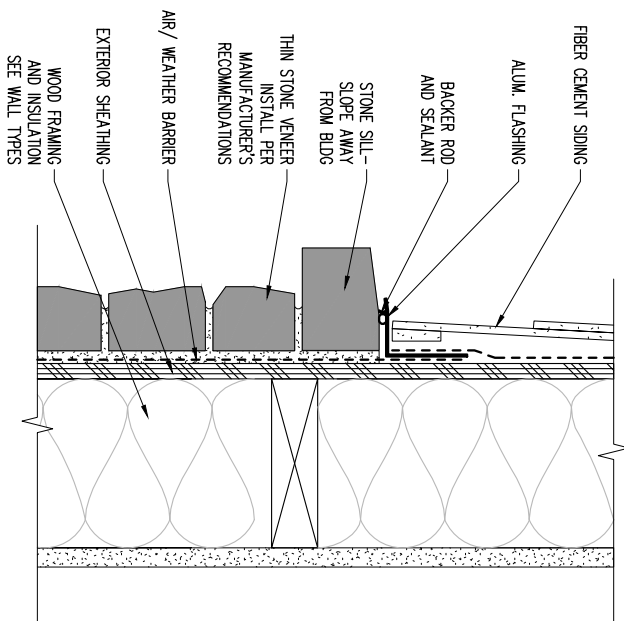
**BOOSTER STATION AND TRANSMISSION LINE
BOOSTER PUMP BUILDING**

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	A2
07062	SH	TR	SH	19 of 44	



C EAVE REQUIREMENTS

NOTE:
METAL SOFT AND FASCIA SHALL NOT BE
LESS THAN 26-GA. GALVANIZED STEEL WITH
INTERLOCKING FLUSH PANEL SEAMS.



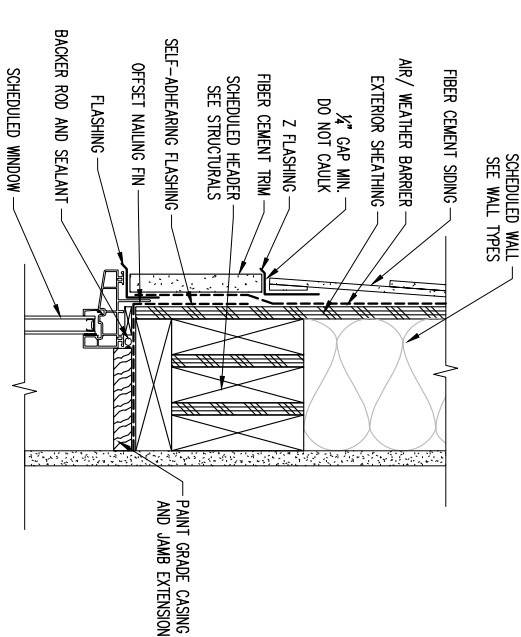
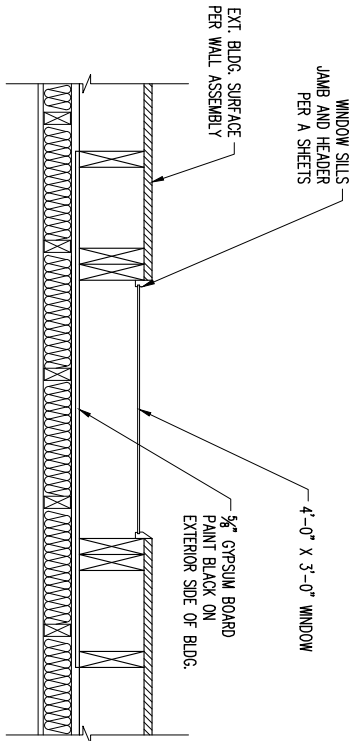
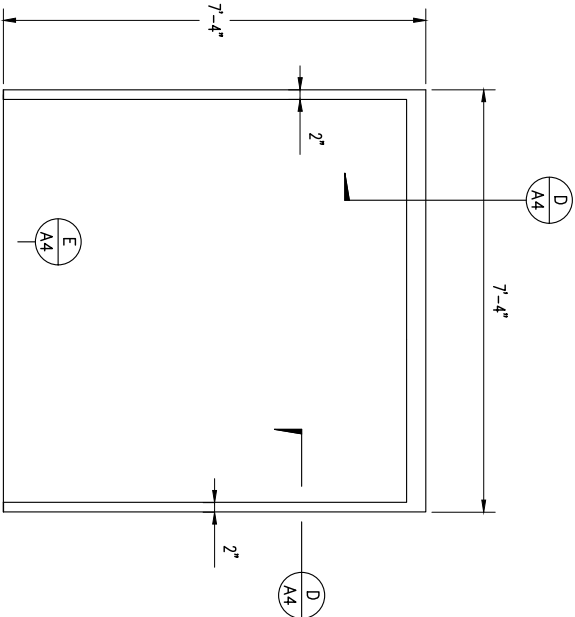
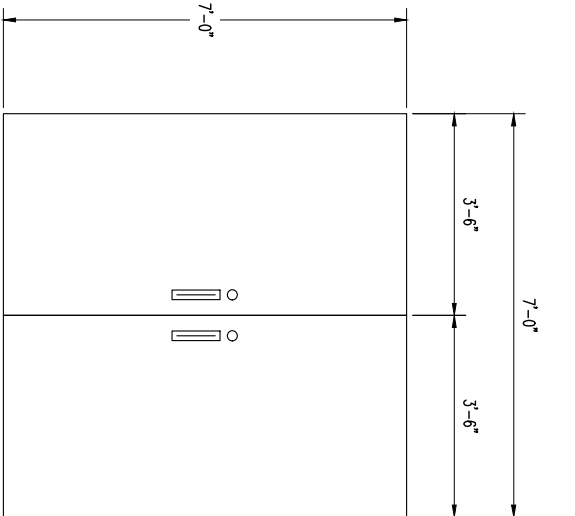
D SIDING TO STONE DETAIL

ARCHITECTURAL NOTES

- 1 EXTERIOR WALL ASSEMBLY (C) (D) (E) (A5) (A5) (A5)
- 2 INTERIOR WALL ASSEMBLY (F) (A5)
- 3 PRE-FABRICATED TRUSSES PER STRUCTURAL.
- 4 AIR GAP BETWEEN INTERIOR AND EXTERIOR WALL
- 5 ASPHALT SHINGLE ROOF ASSEMBLY (A) (A5)
- 6 EAVE REQUIREMENTS (C) (A3)
- 7 STANDARD ATTIC WALL VENT
- 8 OMIT 3 BLOCKS EACH SIDE OF BUILDING FOR VENTING
- 9 SLOPE FLOOR TO FLOOR DRAIN 1/8" PER FOOT
- 10 PLAS-TEX DfRo BASE BOARD OR APPROVED EQUAL ALONG INTERIOR OF WALL
- 11 CONCRETE FOUNDATION WALL WITH DAMP-PROOFING MEMBRANE MINIMUM 6" ABOVE FINISHED GRADE
- 12 CONCRETE FOOTING. SEE STRUCTURAL
- 13 INTERIOR FLOOR (B) (A5)
- 14 METAL RAIN GUTTER PER BUILDING CODE AND INDUSTRY STANDARD PRACTICE.

REV. NO.	COMMENT	DATE
2036 LINCOLN AVENUE, SUITE 104 OGDEN, UTAH 84401 TEL 801.592.5515 • FAX 801.592.7167 WWW.SUNRISE-ENG.COM		
KANSVILLE CITY		

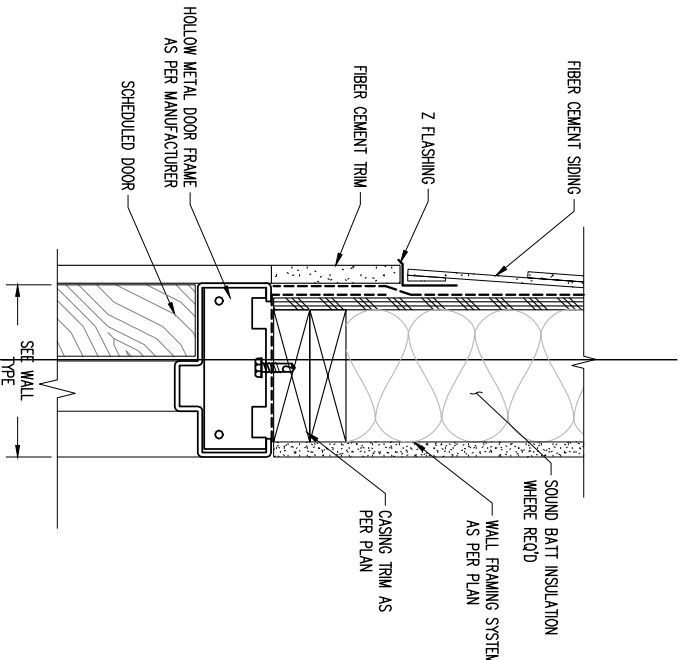
BOOSTER STATION AND TRANSMISSION LINE			
BOOSTER PUMP BUILDING			
TYPICAL WALL SECTIONS			
SHEET NO.	DESIGNED	DRAWN	CHECKED
07062	SH	TR	SH
SHEET NO.			A3
20 of 44			



A DOUBLE DOOR AND FRAME

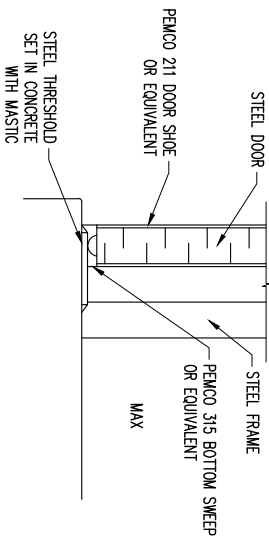
TYP NTS

- NOTES:
1. DOOR AND FRAME SHALL BE STEEL WITH OVEN BAKED FINISH
 2. FINISH COLOR: TO BE DETERMINED BY OWNER
 3. DOOR HEIGHT MAY BE RAISED TO MATCH FLUSH WITH CMU WALL AT CONTRACTORS EXPENSE



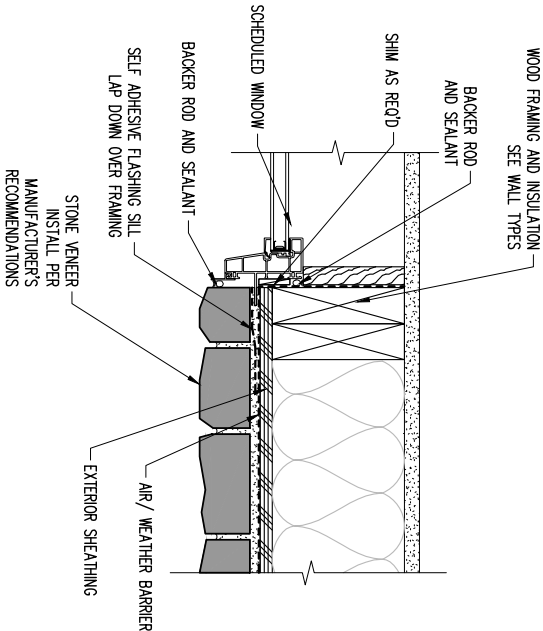
E DOOR THRESHOLD

NTS



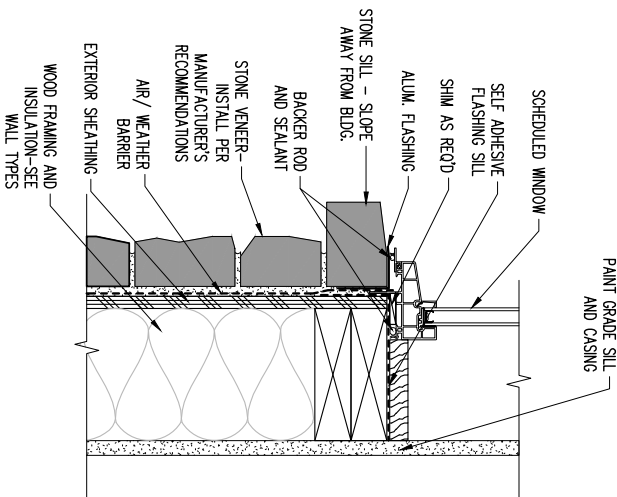
F WINDOW JAMB @ STONE

NTS



G WINDOW SILL @ STONE

NTS

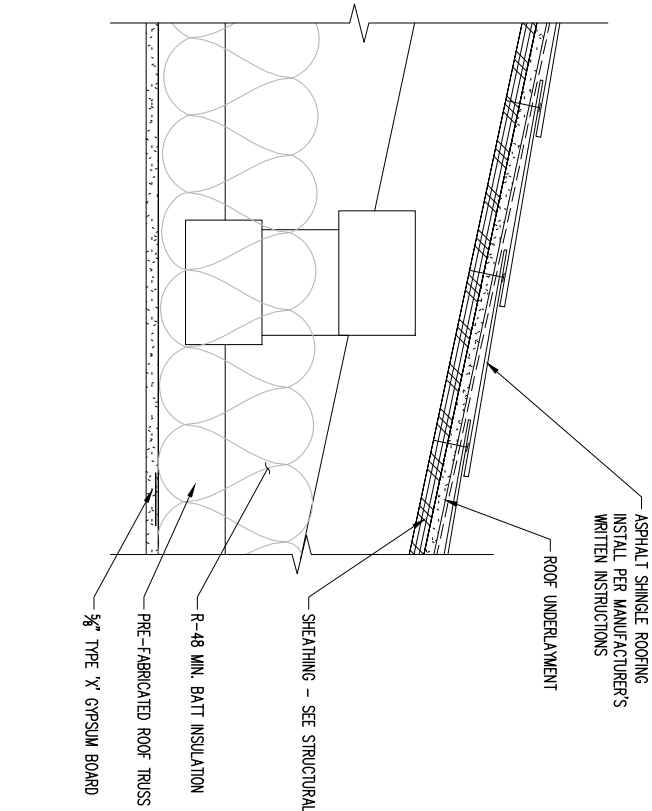


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SUNRISE
ENGINEERING

BOOSTER STATION AND TRANSMISSION LINE
BOOSTER PUMP BUILDING

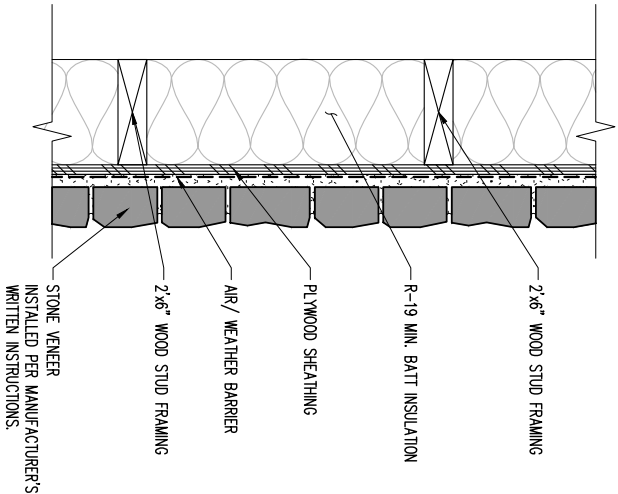
SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	A4
07062	SH	TR	SH	21 of 44	



A
TYP

ROOF ASSEMBLY

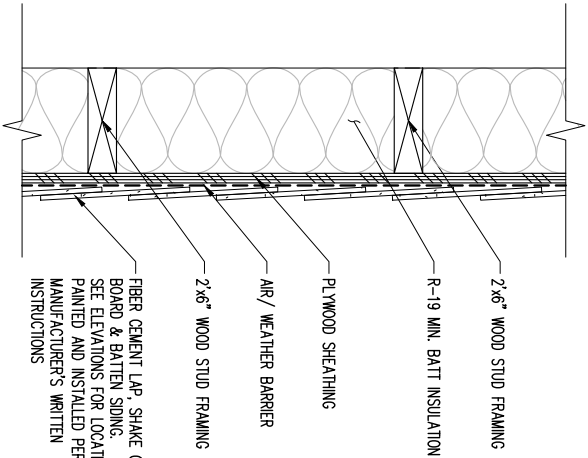
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C
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STONE EXTERIOR WALL ASSEMBLY

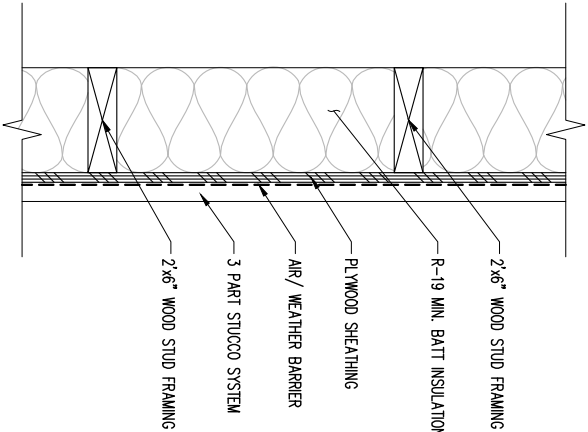
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D
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SIDING EXTERIOR WALL ASSEMBLY

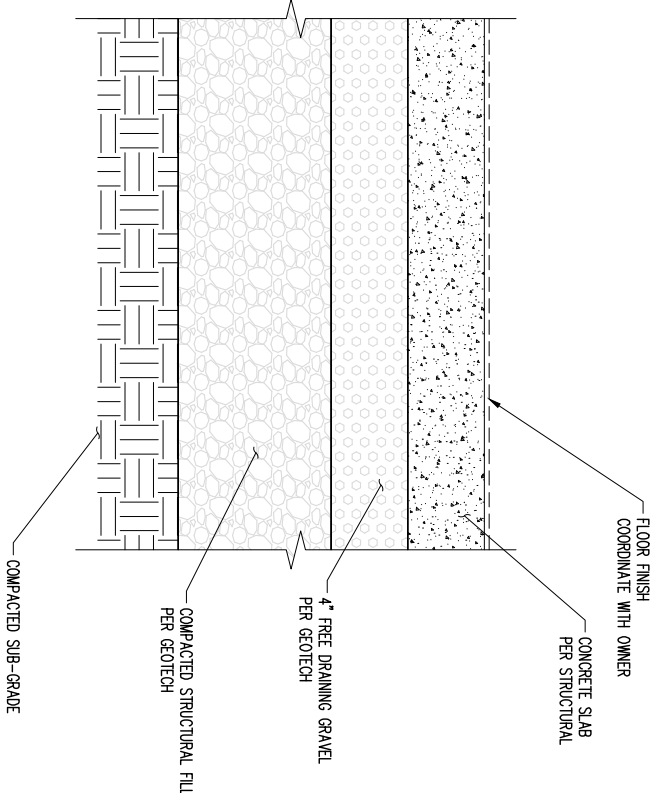
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E
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STUCCO EXTERIOR WALL ASSEMBLY

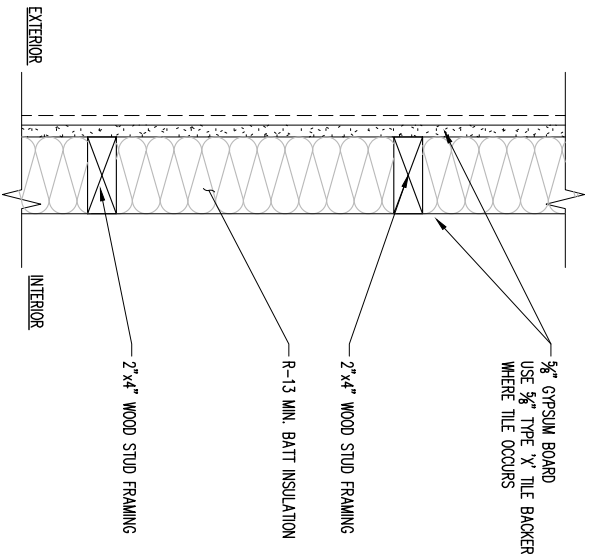
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B
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INTERIOR FLOOR ASSEMBLY

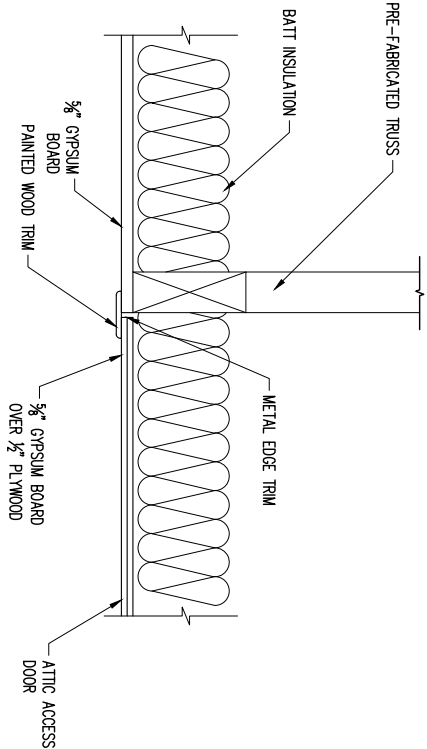
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F
TYP

INTERIOR WALL ASSEMBLY

NTS



G
~

ATTIC ACCESS

NTS

NOTE:
ATTIC ACCESS OPENING SHALL NOT BE LESS THEN 22'x30'
PROVIDE 30" CLEAR HEADROOM IN ATTIC SPACE AT OR ABOVE
THE ATTIC OPENING.

REV. NO.	COMMENT	DATE

PROFESSIONAL ENGINEER
HANSER
NO. 5486190230
STATE OF UTAH
EXPIRES 01/07/2024

SUNRISE
ENGINEERING

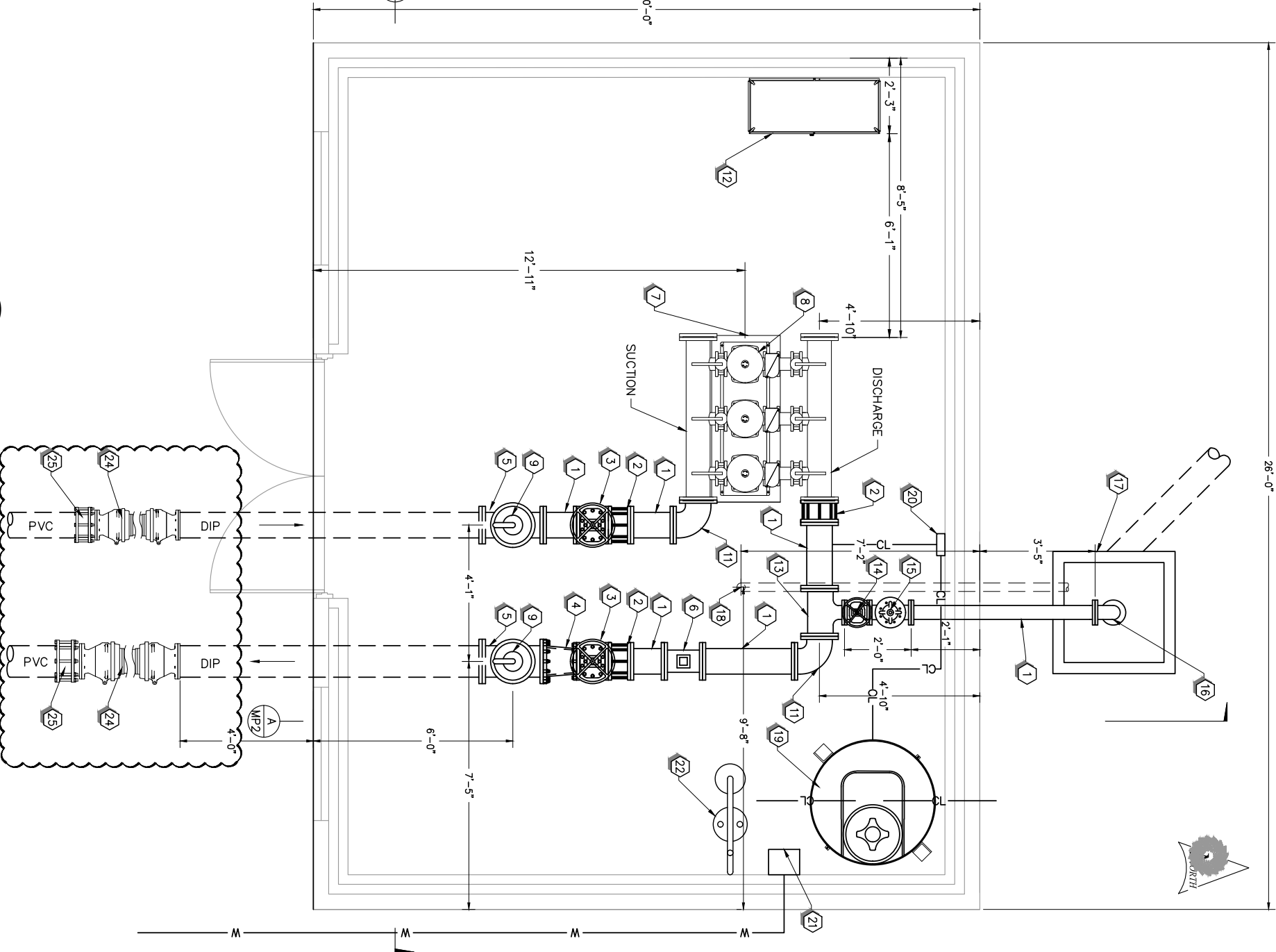
2036 LINCOLN AVENUE, SUITE 104
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BOOSTER STATION AND TRANSMISSION LINE
BOOSTER PUMP BUILDING

KANSVILLE CITY

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	A5
07062	SH	TR	SH	22 of 44	

PIPING LAYOUT SCHEDULE			
NO.	DESCRIPTION	SIZE	REMARKS
1	SPOOL	4" & 8" & 10"	VARIOUS LENGTHS
2	DISMANTLING JOINT	8"	
3	GATE VALVE	8"	
4	REDUCER	10" x 8"	
5	TEE WITH B.F.	8" & 10"	
6	MAG METER	8"	MAGFLOW 5100CW W/5000 TRANSMITTER ABB MAG MASTER, OR EQUIVALENT
7	EQUIPMENT PAD	5'-0" x 2'-0" x 1'-8" THICK	
8	BOOSTER PAQ SKID MOUNTED CENTRIFUGAL PUMPS	50 HP, EACH	MODEL: HYDRO MPC E 3CR95-2
9	AIR VAC VALVE ASSEMBLY	2"	(D MP4) ROUTE PIPING TO DRAIN
10	90° ELBOW	10"	
11	90° ELBOW	8"	
12	CONTROL PANEL		
13	TEE	8"x4"	
14	GATE VALVE	4"	
15	PRESSURE RELIEF VALVE	4"	
16	90° ELBOW	4"	WITH #14 MESH SCREW & FLANGE
17	PRECAST CATCH BASIN	3'-0" x 3'-0" x 3'-0"	GRATE ELEVATION = 4862.96
18	FLOOR DRAIN	4"	(F MP4)
19	VERTICAL STORAGE TANK	200 GALLON	SNYDER INDUSTRIES VERTICAL TANK, (A MP5) OR EQUIVALENT
20	CHLORINE DOSING METER & PUMP		GRUNDOS DDA DOSING PUMP, OR EQUIVALENT
21	CHLORINE RESIDUAL ANALYZER		WALLACE & TIERNAN DEPOLOX 3 PLUS RESIDUAL ANALYZER, OR EQUIVALENT
22	EYE WASH/ SHOWER STATION	7'-0" TALL	(E MP5)
23	PIPE SUPPORT		(E MP4)
24	ROMAC FLEXJOINT FLEXIBLE BALLJOINT FITTING WITH FLANGED ENDS (OR EQUAL)	8" & 10"	
25	RESTRAINED FLANGE COUPLING ADAPTER	8" & 10"	



A
DETAIL - BOOSTER PUMP PIPING

- NOTES:
- MANIFOLDS 8" ANSI CLASS 150 AISI 316SS SCHEDULE 10S ASTM A312 OR Ø219.1mm x 3mm
 - BASE/FRAME AISI 304SS
 - SYSTEM LAYOUT : PANEL LOCATED ON ADJACENT WALL
 - 4" LUG STYLE ANSI 150# CLASS GATE VALVE
 - NEMA 3R RATED ELECTRICAL PANEL (PANEL SIZE ~~12" X 12" X 12"~~)
 - PIPE AND FITTING MATERIAL TO BE DUCTILE IRON.

2	ADDENDUM #2	02-10-2020
1	ADDENDUM #1	02-04-2020
REV NO.	COMMENT	DATE

PROFESSIONAL ENGINEER

2-10-2020

CLIFTON G. LINDORF

No. 631187

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2036 LINCOLN AVENUE, SUITE 104

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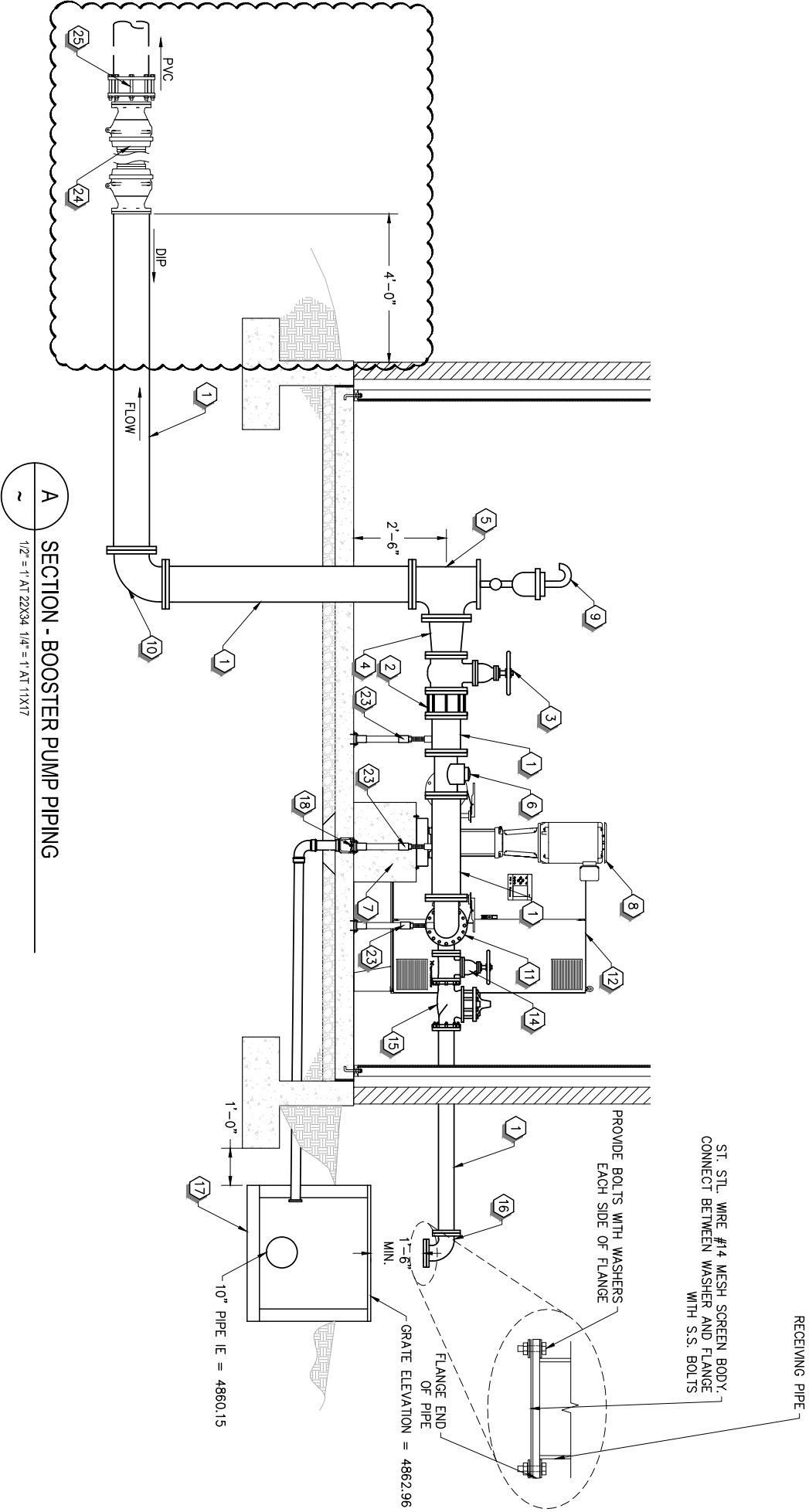
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KANSVILLE CITY			
BOOSTER STATION AND TRANSMISSION LINE BOOSTER PUMP MECHANICAL PIPING DETAILS			
SHEET NO.	DESIGNED	DRAWN	CHECKED
07062	CL	TR	SH
SHEET NO.			23 of 44
			MP1

PIPING LAYOUT SCHEDULE			
NO.	DESCRIPTION	SIZE	REMARKS
1	SPOOL	4" & 8" & 10"	VARIOUS LENGTHS
2	FLANGE COUPLING ADAPTER	8"	
3	GATE VALVE	8"	
4	REDUCER	10" x 8"	
5	TEE WITH B.F.	10"	
6	MAG METER	8"	MAGFLOW 5100W W/5000 TRANSMITTER ABB MAG MASTER, OR EQUIVALENT
7	EQUIPMENT PAD	5'-0" x 2'-0" x 1'-8" THICK	
8	BOOSTER PAQ SKID MOUNTED CENTRIFUGAL PUMPS	50 HP. EACH	MODEL: HYDRO MPC E 3CR95-2
9	AIR VAC VALVE ASSEMBLY	2"	(D MP4) ROUTE PIPING TO DRAIN
10	90° ELBOW	10"	
11	90° ELBOW	8"	
12	CONTROL PANEL		
13	TEE	8"-4"	
14	GATE VALVE	4"	
15	PRESSURE RELIEF VALVE	4"	
16	90° ELBOW	4"	WITH #14 MESH SCREW & FLANGE
17	PRECAST CATCH BASIN	3'-0" x 3'-0" x 3'-0"	GRATE ELEVATION = 4862.96
18	FLOOR DRAIN	4"	(F MP4) SNYDER INDUSTRIES VERTICAL TANK, OR EQUIVALENT
19	VERTICAL STORAGE TANK	200 GALLON	(A MP5) GRUNDOS DDA DOSING PUMP, OR EQUIVALENT
20	CHLORINE DOSING METER & PUMP		WALLACE & TIERNAN DEPOLOX 3 PLUS RESIDUAL ANALYZER, OR EQUIVALENT
21	CHLORINE RESIDUAL ANALYZER		
22	EYE WASH/ SHOWER STATION	7'-0" TALL	(E MP5)
23	PIPE SUPPORT		(E MP4)
24	ROMAC FLEXJOINT FLEXIBLE BALLJOINT FITTING WITH FLANGED ENDS (OR EQUAL)	8" & 10"	
25	RESTRAINED FLANGE COUPLING ADAPTER	8" & 10"	

NOTES:

1. MANIFOLDS 8" ANSI CLASS 150 AISI 316SS
SCHEDULE 10s ASTM A312 OR #219.1mm x 3mm
2. BASE /FRAME AISI 304SS
3. SYSTEM LAYOUT : PANEL LOCATED ON ADJACENT
WALL
4. 4" LUG STYLE ANSI 150# CLASS GATE VALVE
5. NEMA 3R RATED ELECTRICAL PANEL (PANEL SIZE
WILL VARY WITH OPTIONS)
6. ALL PIPING AND FITTINGS TO BE DUCTILE IRON.



2

ADDENDUM #2

02-10-2020

1

ADDENDUM #1

02-04-2020

REF NO.

COMMENT

DATE

PROFESSIONAL ENGINEER

2-10-2020

CLIFTON G. LINFORD

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KANSVILLE CITY

BOOSTER STATION AND TRANSMISSION LINE

BOOSTER PUMP MECHANICAL PIPING

DETAILS

SET NO.

DESIGNED

CL

DRAWN

TR

CHECKED

SH

SHEET NO.

24 of 44

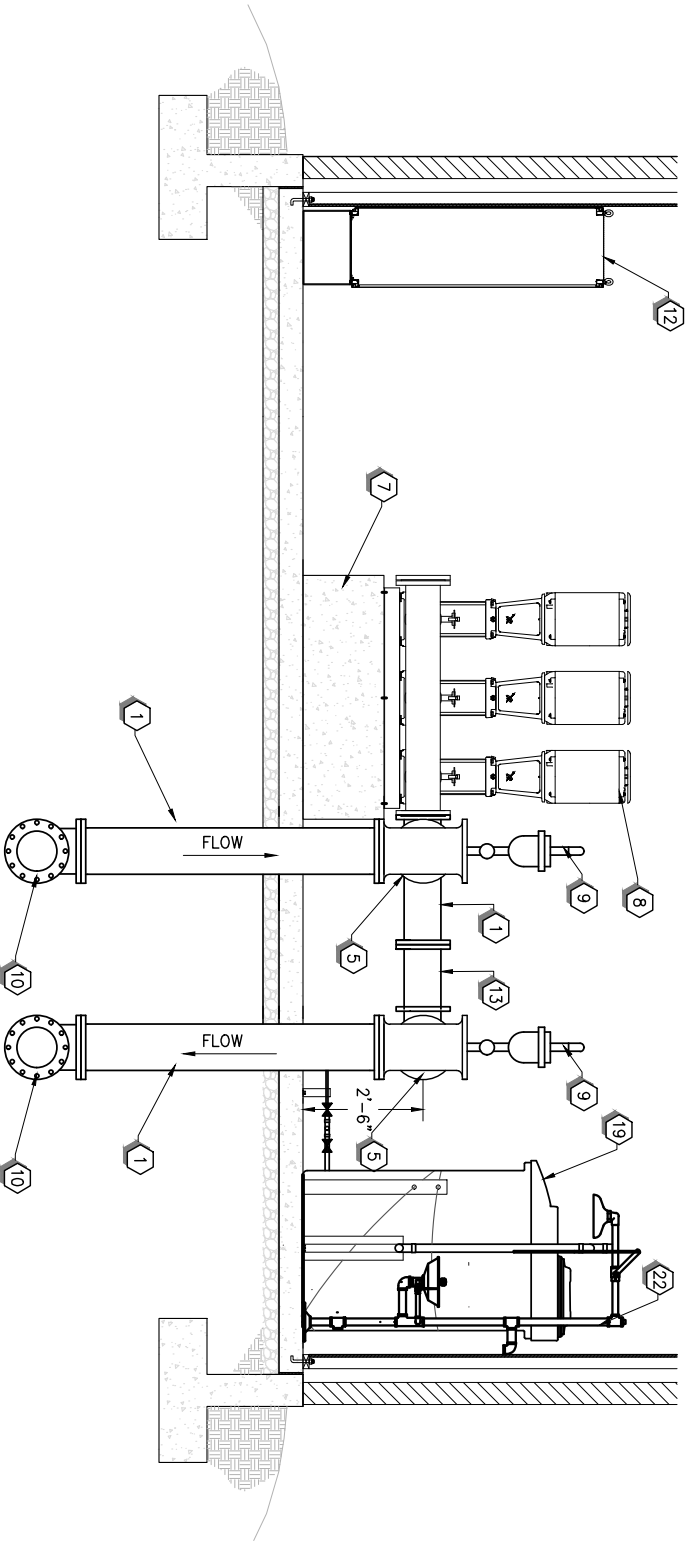
MP2

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PIPING LAYOUT SCHEDULE			
NO.	DESCRIPTION	SIZE	REMARKS
1	SPOOL	4" & 8" & 10"	VARIOUS LENGTHS
2	FLANGE COUPLING ADAPTER	8"	
3	GATE VALVE	8"	
4	REDUCER	10" x 8"	
5	TEE WITH B.F.	8" & 10"	
6	MAG METER	8"	MAGFLOW 5100W W/5000 TRANSMITTER ABB MAG MASTER, OR EQUIVALENT
7	EQUIPMENT PAD	5'-0" x 2'-0" x 1'-8" THICK	
8	BOOSTER PAQ SKID MOUNTED CENTRIFUGAL PUMPS	50 HP. EACH	MODEL: HYDRO MPC E 3CR95-2
9	AIR VAC VALVE ASSEMBLY	2"	
10	90° ELBOW	10"	
11	90° ELBOW	8"	
12	CONTROL PANEL		
13	TEE	8"-4"	
14	GATE VALVE	4"	
15	PRESSURE RELIEF VALVE	4"	
16	90° ELBOW	4"	
17	PRECAST CATCH BASIN	2'-0" x 2'-0" x 3'-0"	GRATE ELEVATION = 4862.96
18	REDUCER	10" x 8"	
19	VERTICAL STORAGE TANK	200 GALLON	SNYDER INDUSTRIES VERTICAL TANK, (A) OR EQUIVALENT (MP5)
20	CHLORINE DOSING METER & PUMP		GRUNDFOS DDA DOSING PUMP, OR EQUIVALENT
21	CHLORINE RESIDUAL ANALYZER		WALLACE & TIERNAN DEPOLOX 3 PLUS RESIDUAL ANALYZER, OR EQUIVALENT
22	EYE WASH / SHOWER STATION	7'-0" TALL	(E) (MP5)

NOTES:

1. MANIFOLDS 8" ANSI CLASS 150 AISI 316SS
SCHEDULE 10s ASTM A312 OR #219.1mm x 3mm
2. BASE /FRAME AISI 304SS
3. SYSTEM LAYOUT : PANEL LOCATED ON ADJACENT
WALL
4. 4" LUG STYLE ANSI 150# CLASS GATE VALVE
5. NEMA 3R RATED ELECTRICAL PANEL (PANEL SIZE
WILL VARY WITH OPTIONS)
6. ALL PIPING AND FITTINGS TO BE DUCTILE IRON.



A SECTION - BOOSTER PUMP PIPING
1/2" = 1' AT 22X34, 1/4" = 1' AT 11X17

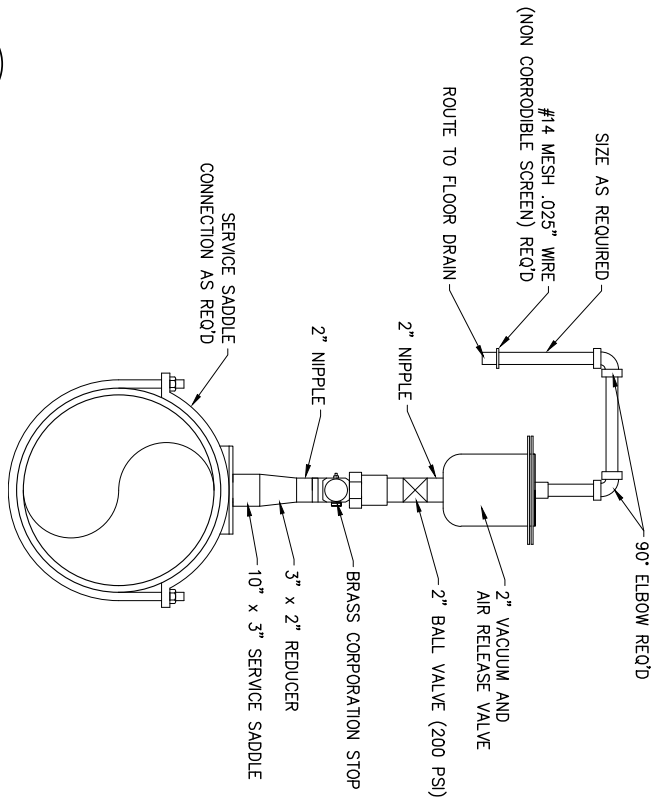
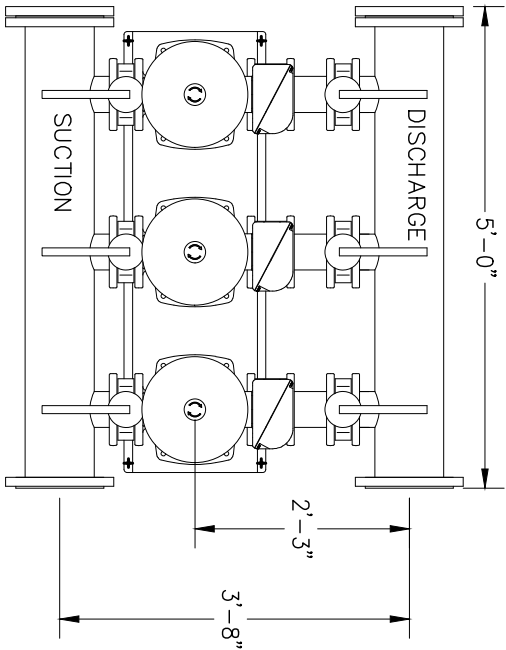
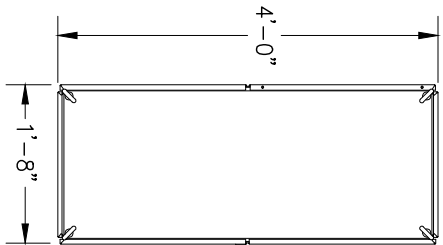
2	ADDENDUM #2	02-10-2020
1	ADDENDUM #1	02-04-2020
REV. NO.	COMMENT	DATE

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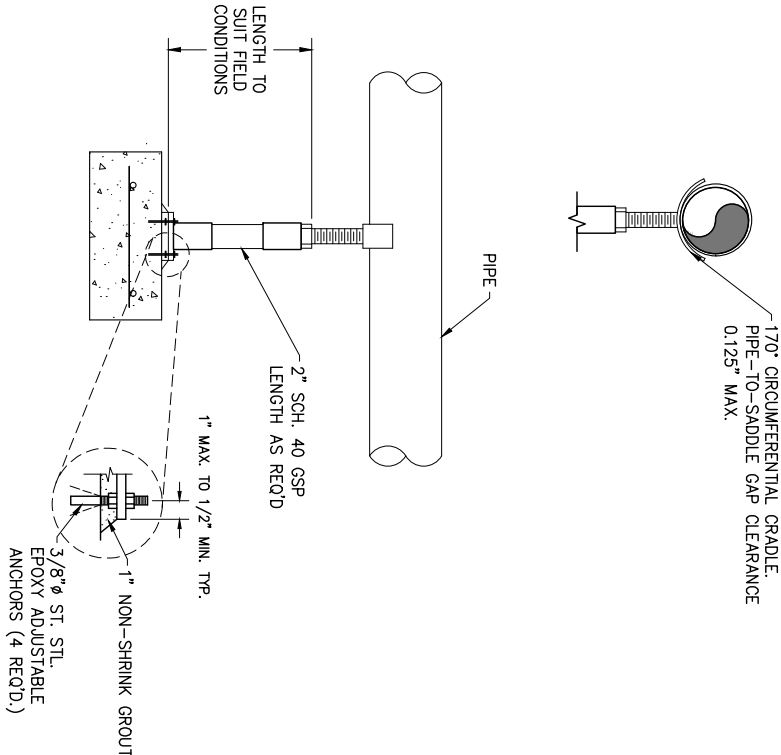
BOOSTER STATION AND TRANSMISSION LINE
BOOSTER PUMP MECHANICAL PIPING
DETAILS

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	CL	TR	SH	25 of 44
MP3				



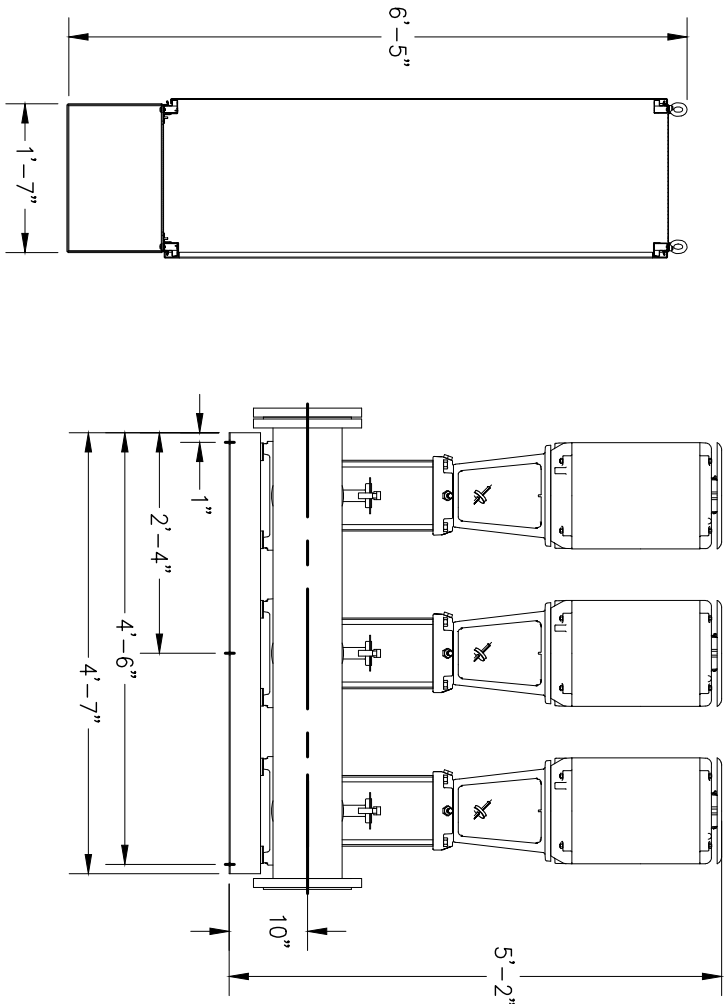
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DETAIL - 2" AIR VAC VALVE ASSEMBLY

E
DETAIL - PIPE SUPPORT

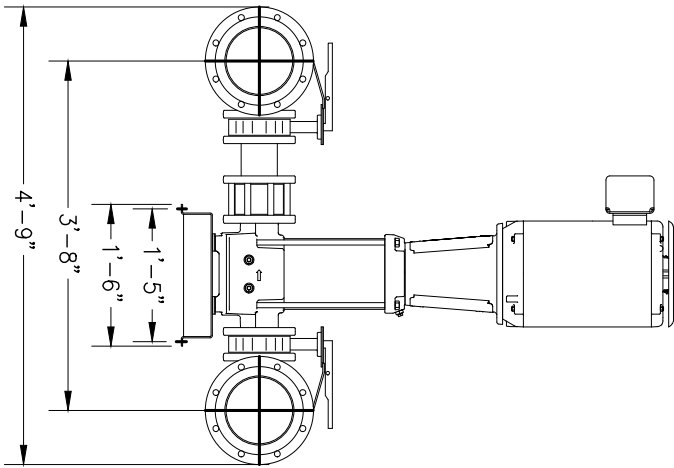


A
DETAIL - BOOSTER PUMP - TOP VIEW

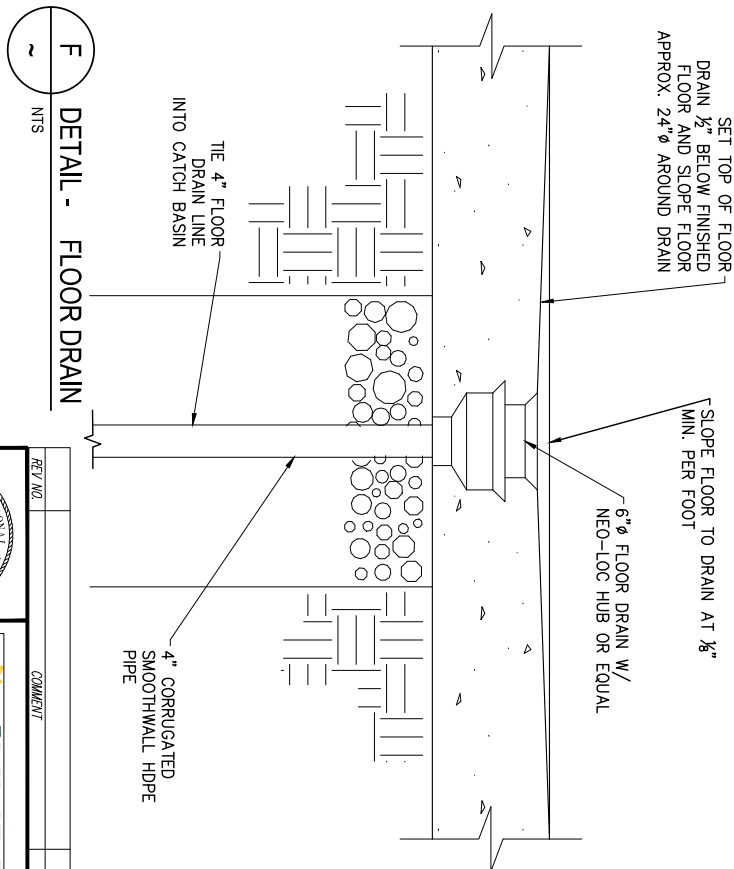
NOTES
1. GRUNDFOS HYDRO MPC E 3CR95-2 PUMP OR
EQUAL EQUIVALENT



B
DETAIL - BOOSTER PUMP - FRONT VIEW



C
DETAIL - BOOSTER PUMP - END VIEW



F
DETAIL - FLOOR DRAIN

PROFESSIONAL ENGINEER

1-2-2020

CLIFTON G. LINFORD

No. 6311187

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ENGINEERING

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KAYSVILLE CITY

BOOSTER STATION AND TRANSMISSION LINE

BOOSTER PUMP MECHANICAL PIPING

BOOSTER PUMP DETAILS

SET NO. 07062

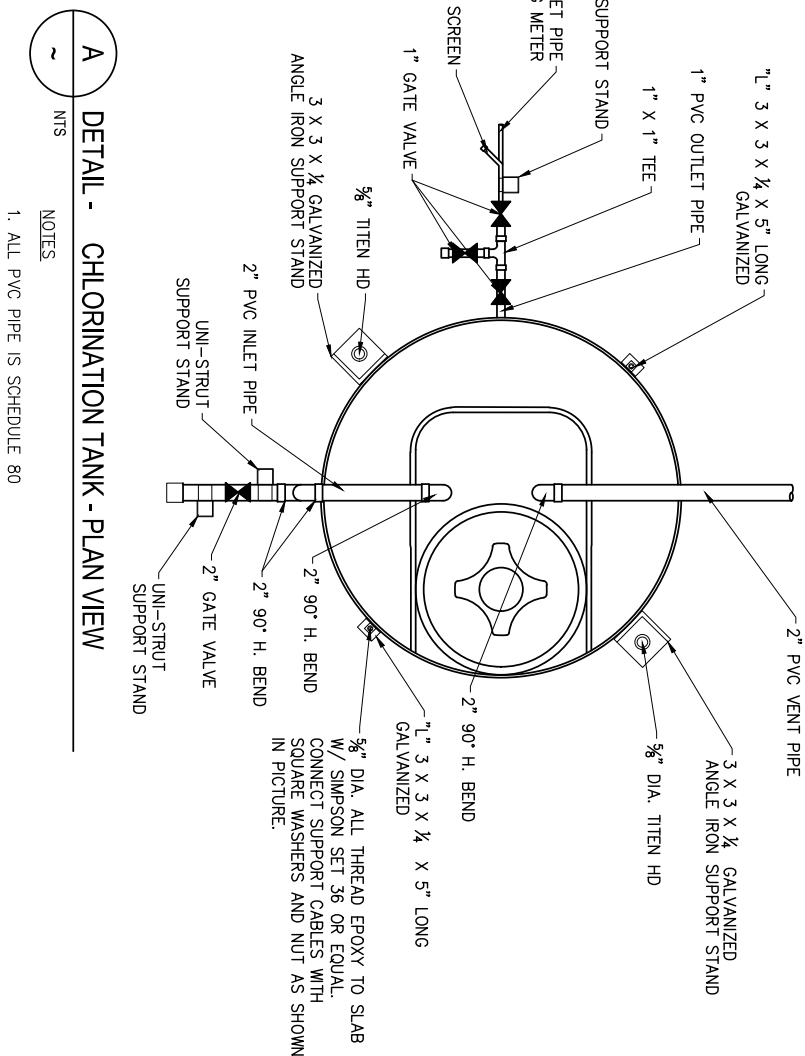
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SHEET NO. 26 of 44

MP4

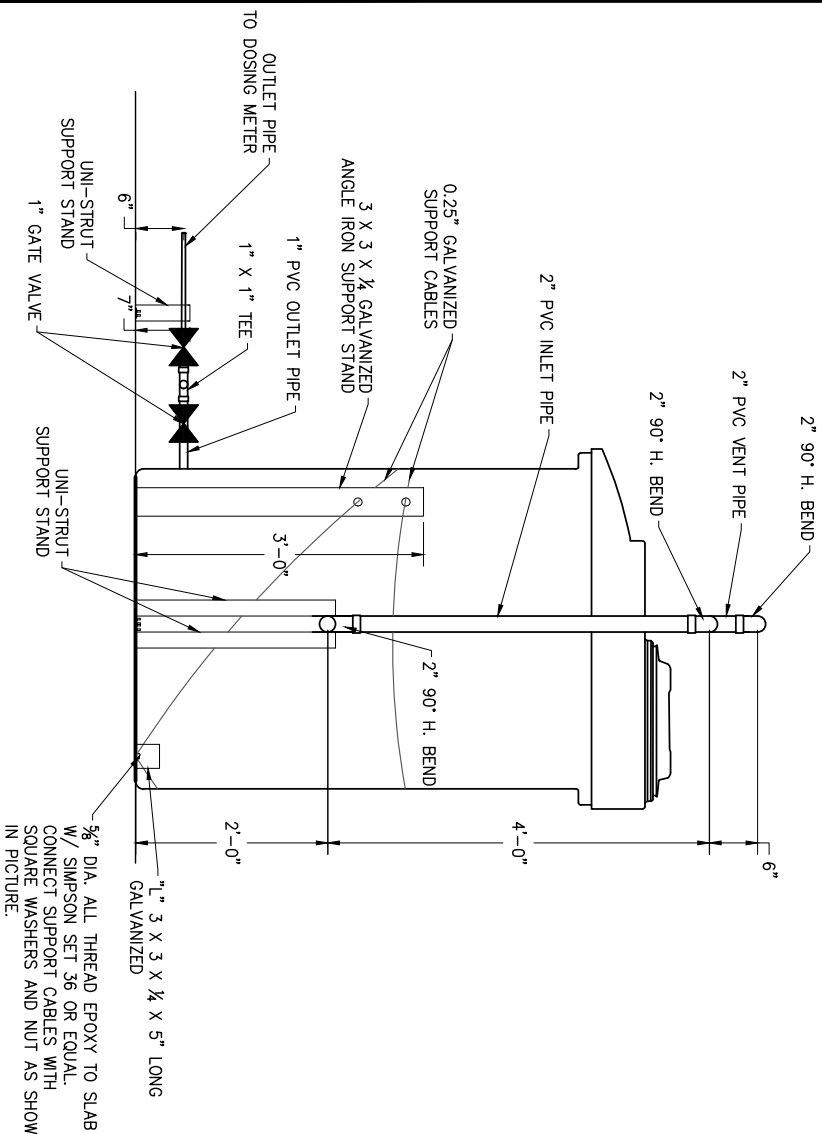


DETAIL - CHLORINATION TANK - PLAN VIEW

TS

NOTES

1. ALL PVC PIPE IS SCHEDULE 80



B) DETAIL - CHLORINATION TANK - PROFILE VIEW

NTS



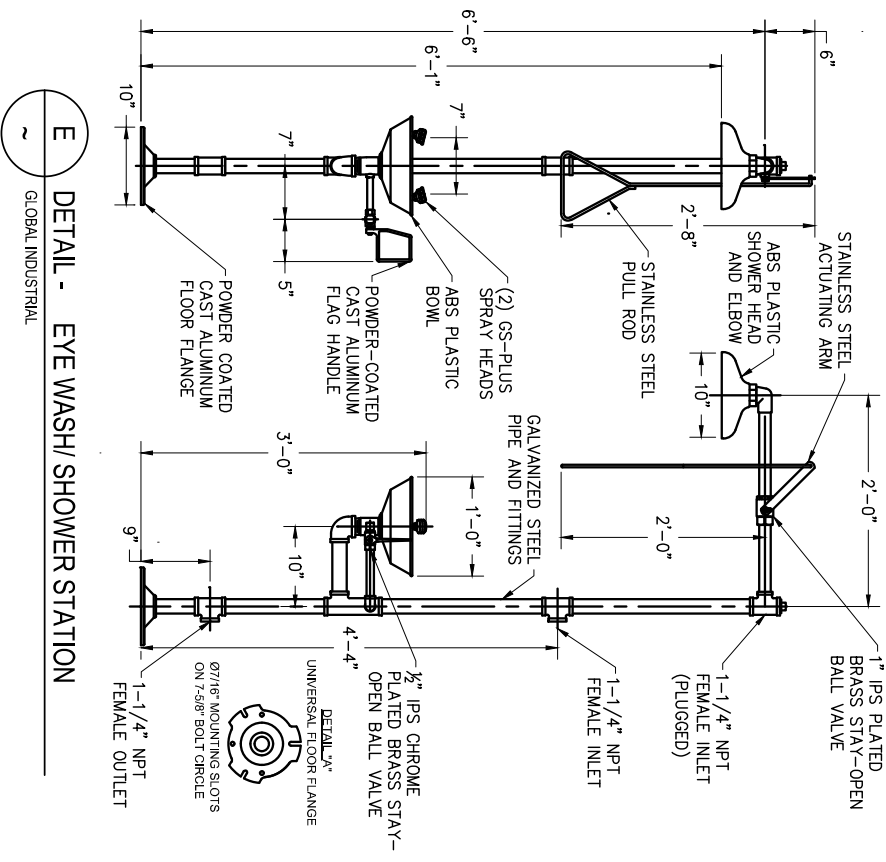
DETAIL - CHLORINATION TANK

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DETAIL - CHLORINATION TANK - OUTLET PIPE

NTS



--- EYE WASH/ SHOWER STATION

GLOBAL INDUSTRIAL

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	MP5
07062	CL.	TR	SH	ZI of 44	
BOOSTER STATION AND TRANSMISSION LINE BOOSTER PUMP MECHANICAL PING CHLORINATION SYSTEM DETAILS					
KAYSVILLE CITY					
 2036 LINCOLN AVENUE, SUITE 104 CLEVELAND, OHIO 44102 TEL. 801.892.5515 • FAX 801.892.7167 www.sunrise-eng.com  SUNRISE ENGINEERING					
REF. NO.		COMMENT		DATE	

GENERAL STRUCTURAL NOTES									
A. DESIGN CRITERIA:									
1. BUILDING CODES:									
2015 INTERNATIONAL BUILDING CODE									
ACI 318-14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY"									
ASCE 7-10 "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES"									
2015 NATIONAL DESIGN SPECIFICATION for WOOD CONSTRUCTION WITH COMMENTARY									
2. RISK CATEGORY III PER IBC TABLE 1604.5									
3. DESIGN DEAD LOADS:									
ROOF DL = 15.0 PSF									
WOOD WALL DL = 15 PSF									
4. LIVE LOAD:									
ROOF LIVE LOAD = 20 PSF									
5. SNOW LOAD: PER ASCE 7-10 AND UTAH AMENDMENT 15A-3-107(6)									
GROUND SNOW LOAD = 49 PSF, IMPORTANCE FACTOR Is = 1.10									
SLOPED ROOF SNOW LOAD USED FOR DESIGN = 40 PSF									
6. WIND LOADING: PER ASCE 7-10									
BASIC WIND SPEED V = 105 MPH, IMPORTANCE FACTOR Iw = 1.0									
KD = 0.85									
EXPOSURE CATEGORY = C									
TOPOGRAPHIC FACTOR Kzt = 1.0									
GUST EFFECT FACTOR G = 0.85									
BUILDING = ENCLOSED									
FOR WIND PRESSURES USED IN DESIGN, SEE CALCULATIONS									
7. SEISMIC LOADING:									
SITE CLASS D, SEISMIC IMPORTANCE FACTOR Ie = 1.25									
SS = 1.246g									
SI = 0.4849g									
SDS = 0.997g									
SD1 = 0.490g									
SEISMIC DESIGN CATEGORY D PER ASCE 7-10 TABLE 11.6-2									
LATERAL FORCE RESISTING SYSTEM IS LIGHT FRAMED WOOD WALLS SHEATHED WITH WOOD STRUCTURAL PANELS RATED FOR SHEAR RESISTANCE									
B. GENERAL REQUIREMENTS:									
1. DIMENSIONS: DIMENSIONS SHOWN ON THE PLANS ARE APPROXIMATIONS BASED OFF OF FIELD MEASUREMENTS. CONTRACTOR TO VERIFY ALL DIMENSIONS AND FIELD FIT TO THE EXISTING STRUCTURE									
2. THE CONTRACTOR MUST SUBMIT IN WRITING ANY REQUESTS FOR MODIFICATIONS TO THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW DO NOT CONSTITUTE "IN WRITING" UNLESS IT IS CLEARLY NOTED THAT SPECIFIC CHANGES ARE BEING REQUESTED.									
3. LOADS FROM CONSTRUCTION MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED FLOORS OR ROOFS. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT LISTED IN THE DESIGN CRITERIA. CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND OR BRACING WHERE STRUCTURE HAS NOT ATTAINED DESIGN STRENGTH.									
4. THESE DOCUMENTS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS AS REQUIRED FOR THIS OR SIMILAR LOCALITIES. THEY ASSUME THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKMEN WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND (OR INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.									
5. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, LAGGING, SHORING, BRACING, FORM-WORK, ETC. AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION.									
C. FOUNDATION REQUIREMENTS:									
1. FOUNDATIONS FOR THE STRUCTURES SHOWN IN THE PLANS WERE DESIGNED BASED ON THE GEOTECHNICAL INVESTIGATION FROST PROPERTY 1402 NORTH HIGHWAY 89, KAYSVILLE, UT BY CHRISTENSEN GEOTECHNICAL DATED JUNE 22, 2018. LOAD-BEARING VALUES OF THE SOILS ARE PROVIDED IN THE REPORT. CONTINUOUS AND SPREAD FOOTINGS DESIGNED FOR ALLOWABLE BEARING PRESSURE OF 2,500 PSF PER THE SOILS REPORT. IF SOIL CONDITIONS ARE FOUND TO BE DIFFERENT THAN THE TYPES LISTED ABOVE OR OF UNUSUAL MAKE-UP, OR SUB-STANDARD, PLEASE CONTACT THE ENGINEER OF RECORD.									
D. CONCRETE REQUIREMENTS:									
1. ALL CONCRETE CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ACI 318 AND ACI 301, EXCEPT AS MODIFIED BY THE CONSTRUCTION DOCUMENTS.									
2. CONCRETE SHALL HAVE THE FOLLOWING COMPRESSIVE STRENGTHS:									
CONCRETE									
MIN. f'_c (28 DAYS)									
SLUMP									
W/C RATIO									
CLASS									
FOUNDATIONS									
4500 PSI									
3" TO 5"									
0.45									
F2									
INT. SLAB-ON-GRADE									
4000 PSI									
3" TO 5"									
0.45									
F2									
CONCRETE NOT NOTED									
4500 PSI									
3" TO 5"									
0.45									
F2									
SLUMP: CONCRETE w/ ADMIXTURES SHALL HAVE A MAXIMUM SLUMP OF 5".									
STRUCTURAL DESIGN OF FOOTINGS ASSUMED f'_c = 2500 PSI.									
ADMIXTURES:									
3.1. AIR ENTRAINMENT ASTM C-260									
3.2. CALCIUM CHLORIDE NOT PERMITTED									
3.3. ALUMINUM PRODUCTS NOT PERMITTED									
D. CONCRETE REQUIREMENTS CONTINUED...									
4. CONCRETE MIXES SHALL BE DESIGNED BY A CERTIFIED LABORATORY, STAMPED BY AN APPROPRIATELY LICENSED SPECIALTY ENGINEER, AND APPROVED BY THE ENGINEER OF RECORD. MIX DESIGNS SHALL INCLUDE THE PROJECT NAME AND INDICATE THEIR USE WITHIN THE STRUCTURE. MIX DESIGNS SHALL BE PROPORTIONED TO MINIMIZE SHRINKAGE AND HAVE PROVEN SHRINKAGE CHARACTERISTICS OF 0.05% OR LESS BASED ON TESTING PER ASTM C157.									
5. IF USED, EARLY STRENGTH CONCRETE SHALL BE PROPORTIONED TO DEVELOP THE 28 DAY COMPRESSIVE STRENGTH AT THE AGE REQUIRED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT TEST DATA FOR REVIEW BY THE STRUCTURAL ENGINEER TO SUBSTANTIATE THE CONCRETE STRENGTH AT THE REQUIRED AGE.									
6. ALL CONCRETE SHALL BE NORMAL WEIGHT OF 145 POUNDS PER CUBIC FOOT USING HARD ROCK AGGREGATES CONFORMING TO ASTM C33 U.N.O. WHERE LIGHTWEIGHT CONCRETE IS SPECIFIED, CONCRETE SHALL BE 110 POUNDS PER CUBIC FOOT USING AGGREGATES CONFORMING TO ASTM C330. LARGEST NOMINAL AGGREGATE SIZE SHALL BE 1-1/2" OR GREATER FOR SLABS ON GRADE AND 3/4" OR GREATER FOR ALL OTHER CONCRETE U.N.O.									
7. PORTLAND CEMENT SHALL CONFORM TO ASTM C150. TYPE V CEMENT SHALL BE USED FOR CONCRETE IN CONTACT WITH EARTH. TYPE II CEMENT MAY BE USED ELSEWHERE. CEMENT SHALL BE TYPE V WITH POZZOLAN WHERE CONCRETE IS IN CONTACT WITH SOIL CONTAINING VERY SEVERE SULFATE EXPOSURE.									
8. FLY ASH MAY BE USED IN CONCRETE, SUBJECT TO APPROVAL BY THE ARCHITECT AND ENGINEER, PROVIDED THE FOLLOWING CONDITIONS ARE MET:									
8.1. FLY ASH SHALL COMPLY WITH ASTM C618.									
8.2. CEMENT CONTENT SHALL BE REDUCED A MINIMUM OF 15 PERCENT UP TO A MAXIMUM OF 25 PERCENT WHEN COMPARED TO AN EQUIVALENT CONCRETE MIX DESIGN WITHOUT FLY ASH. FLY ASH CONTENT SHALL NOT COMPRISE MORE THAN 35 PERCENT OF THE TOTAL CEMENTITIOUS CONTENT. THE WATER-CEMENT RATIO SHALL BE CALCULATED BASED ON THE TOTAL CEMENTITIOUS MATERIAL IN THE MIX.									
8.3. CLASS F FLY ASH SHALL BE USED IN SULFATE RESISTANT CONCRETE WITH f'_c EQUAL TO OR GREATER THAN 4000 PSI. CLASS C FLY ASH MAY BE USED ELSEWHERE.									
9. WATER SOLUBLE CHLORIDE ION CONCENTRATIONS IN CONCRETE SHALL BE LIMITED PER ACI 318, SECTION 4.4.									
10. ALL CONCRETE EXPOSED TO FREEZE/THAW CYCLES OR DEICING CHEMICALS SHALL CONFORM TO ACI 318, SECTION 4.2.									
11. TIME BETWEEN CONCRETE BATCHING AND PLACEMENT SHALL BE IN ACCORDANCE WITH ASTM C94.									
12. CONCRETE MIXING, PLACEMENT AND QUALITY SHALL BE PER IBC SECTION 1905. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED. SLABS ON GRADE NEED BE VIBRATED ONLY AROUND AND UNDER FLOOR DUCTS OR SIMILAR ELEMENTS. REMOVE ALL DEBRIS FROM FORMS BEFORE PLACING CONCRETE. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL SO AS TO CAUSE SEGREGATION OF AGGREGATES. UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED 5 FEET.									
13. PROTECT CONCRETE FROM DAMAGE OR REDUCED STRENGTH DUE TO COLD OR HOT WEATHER IN ACCORDANCE WITH ACI 305 AND 306. CONTRACTOR SHALL TAKE SPECIAL CURING PRECAUTIONS TO MINIMIZE SHRINKAGE CRACKING OF CONCRETE SLABS.									
14. ALL REINFORCING STEEL SHALL BE SET AND TIED IN PLACE PRIOR TO POURING OF CONCRETE. EXCEPT THAT VERTICAL DOMELS FOR MASONRY WALL REINFORCING MAY BE "TIED" IN PLACE. DO NOT FIELD BEND BARS PARTIALLY EMBEDDED IN HARDENED CONCRETE UNLESS SPECIFICALLY INDICATED OR APPROVED BY THE ENGINEER OF RECORD.									
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PLACEMENT AND LOCATION OF ANY AND ALL EMBEDDED ITEMS INCLUDING PLATES, BOLTS, AND OTHER INSERTS SPECIFIED IN THE DRAWINGS. REINFORCING STEEL FOR PRECAST CONCRETE PANELS SHOWN ON THE DRAWINGS ARE FOR THE GRAVITY, SEISMIC AND WIND LOADS ONLY. LIFTING PROCEDURES ON ALL PRECAST PANELS SHALL BE THE CONTRACTOR'S RESPONSIBILITY. THE CONTRACTOR SHALL SUBMIT A COPY OF THE DESIGN CALCULATIONS AND SHOP DRAWINGS TO THE ENGINEER OF RECORD FOR ALL PRECAST CONCRETE REINFORCEMENT AND LIFTING HARDWARE ASSOCIATED WITH HIS CHOSEN INSTALLATION PROCEDURE.									
16. ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCEMENT, DOMELS, BOLTS, ANCHORS, STEELS, ETC., SHALL BE SECURELY POSITIONED IN THE FORMS.									
17. MECH., ELECT., AND PUMPING PENETRATIONS / EMBEDDED CONDUITS SHALL COMPLY WITH THE FOLLOWING:									
17.1. ELECTRICAL CONDUITS MAY BE EMBEDDED IN STRUCTURAL CONCRETE ONLY AS NOTED IN TYPICAL DETAILS FOR WALLS AND CAST-IN-PLACE ELEVATED SLABS (EMBEDDED CONDUITS IN CONCRETE OVER STEEL DECK ARE NOT PERMITTED) OR WHERE SPECIFICALLY APPROVED IN WRITING BY THE ENGINEER. PIPING SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE U.N.O. EMBEDDED ITEMS SHALL NOT IMPAIR THE STRENGTH OF THE MEMBER.									
17.2. REFER TO TYPICAL DETAILS FOR ACCEPTABLE CONDUIT, PIPING, AND DUCT PENETRATIONS THRU SLABS AND WALLS. DO NOT CUT ANY REIN. THAT MAY INTERFERE WITH PERMITTED PENETRATIONS. OPENINGS SHALL NOT BE CORED WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER THRU THE ARCHITECT. PENETRATIONS THRU BEAMS AND COLUMNS ARE PERMITTED ONLY WHERE SPECIFICALLY DETAILD.									
17.3. CONTRACTOR SHALL SUBMIT SHOP DRAWING SHOWING SIZES AND DIMENSIONS LOCATIONS OF ALL PENETRATIONS AND EMBEDDED CONDUITS IN WALLS AND ELEVATED SLABS. SHOP DRAWING MUST BE APPROVED BY ENGINEER PRIOR TO CONCRETE PLACEMENT. PENETRATIONS AND EMBEDDED CONDUITS NOT SHOWN ON APPROVED SHOP DRAWING WILL NOT BE PERMITTED UNLESS SPECIFICALLY APPROVED IN WRITING BY THE ENGINEER.									
18. FORMWORK, SHORING, AND RESHORING SHALL BE DESIGNED PER ACI 347 RECOMMENDATIONS BY AN APPROPRIATELY LICENSED SPECIALTY ENGINEER EXPERIENCED IN THIS TYPE OF WORK AND SHALL BE SUBMITTED TO ENGINEER OF RECORD FOR REVIEW. FOR MULTISTORY CONSTRUCTION, SHORING/RESHORING DESIGN SHALL DEMONSTRATE THAT SHORES/RESHORES WILL BE PROVIDED FOR A SUFFICIENT NUMBER OF FLOORS TO DISTRIBUTE IMPROSED CONSTRUCTION LOADS TO SEVERAL SLAB LEVELS WITHOUT CAUSING EXCESSIVE STRESSES AND SLAB DEFLECTIONS. FOR PURPOSES OF SHORING/RESHORING CALCULATIONS, MAGNITUDES OF REDUCED LIVE LOADS SHALL BE TAKEN TO BE 60% OF VALUES INDICATED IN BASIS FOR DESIGN U.N.O.									
D. CONCRETE REQUIREMENTS CONTINUED...									
19. CONSTRUCTION JOINT SURFACES SHALL BE CLEANED AND LATANCE REMOVED. HORIZONTAL JOINT SURFACES SHALL BE ROUGHENED TO 1/4" AMPLITUDE. THOROUGHLY WET ALL JOINT SURFACES AND REMOVE STANDING WATER IMMEDIATELY PRIOR TO NEW CONCRETE PLACEMENT.									
20. CONCRETE SHALL BE CURED IN ACCORDANCE WITH ACI 318, SECTIONS 5.11.1 OR 5.11.2, WHICHEVER IS APPLICABLE. UNLESS ALTERNATE METHODS HAVE BEEN APPROVED BY THE ARCHITECT AND ENGINEER, WHERE CURING COMPOUNDS HAVE BEEN APPROVED FOR SLAB CURING, CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPATIBILITY OF COMPOUNDS WITH ANTICIPATED FLOOR FINISH (e.g., RESILIENT TILE) PRIOR TO CURING COMPOUND APPLICATION.									
E. REINFORCING STEEL REQUIREMENTS									
1. REINFORCING STEEL SHALL BE DETAILED AND PLACED IN ACCORDANCE WITH ACI 318 AND CRSI'S MANUAL OF STANDARD PRACTICE.									
2. REINFORCING STEEL SHALL CONFORM TO ASTM A615 OR ASTM A706 (A706 REQUIRED FOR ALL REINFORCING TO BE WELDED) AND SHALL BE GRADE 60 (f_y = 60 KSI) DEFORMED BARS U.N.O. REINFORCING IN SLABS ON GRADE MAY BE GRADE 40 (f_y = 40 KSI) DEFORMED BARS FOR ALL BARS #4 AND SMALLER U.N.O. ON PLANS OR DETAILS.									
3. ALL DIMENSIONS SHOWING THE LOCATION OF REINFORCING STEEL NOT NOTED AS "CLEAR" OR "CLR." ARE TO CENTER OF STEEL. CLEAR COVER FOR NON-PRESSRESSED CONCRETE REINFORCING SHALL BE AS NOTED BELOW. U.N.O. ON PLANS OR DETAILS. CLEAR COVER FOR PRESTRESSED CONCRETE AND FOR PRECAST CONCRETE MANUFACTURED UNDER PLANT CONTROL CONDITIONS SHALL BE PER ACI 318, SECTIONS 7.7.2 AND 7.7.3, RESPECTIVELY.									
4. EXPOSURE CONDITION:									
COVER:									
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH									
3"									
EXPOSED TO WEATHER (INCLUDES SLABS ON GRADE)									
NO. 5 AND SMALLER									
1 1/2"									
NO. 6 AND LARGER									
2"									
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND STRUCTURAL SLABS, WALLS, JOISTS									
NO. 11 AND SMALLER									
3/4"									
NO. 14 AND LARGER									
1 1/2"									
BEAMS, COLUMNS (PRIMARY REINFORCEMENT, TIES, STIRRUPS, SPIRALS)									
1 1/2"									
5. LAP SPICES OF REINFORCING STEEL SHALL CONFORM TO TYPICAL REBAR LAP SCHEDULE U.N.O. NO TACK WELDING OF REINFORCING BARS ALLOWED. LATEST ACI CODE AND DETAILING MANUAL APPLY. AT WALLS AND FOOTINGS, PROVIDE BENT CORNER BARS TO MATCH LAP WITH HORIZ. BARS AT ALL CORNERS AND INTERSECTIONS U.N.O. VERT. WALL BARS SHALL BE SPLICED AT OR NEAR FLOOR LINES. SPUCE TOP BARS AT CENTER LINE OF SPAN AND BOTTOM BARS AT THE SUPPORT IN SPANDRELS, BEAMS, GRADE BEAMS, ETC., U.N.O. ON PLANS OR DETAILS.									
6. MECHANICAL SPUCE COUPLERS SHALL HAVE CURRENT ICC APPROVAL AND SHALL BE CAPABLE OF DEVELOPING 125% OF THE SPLICED BARS' YIELD STRENGTH.									
7. ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UN-BENT AND RE-BENT. FIELD BENDING OF REBAR SHALL NOT BE ALLOWED UNLESS SPECIFICALLY NOTED.									
8. WELDING OF REINFORCING BARS, METAL INSERTS, AND CONNECTIONS SHALL BE MADE ONLY AT LOCATIONS SHOWN ON PLANS OR DETAILS. SEE WELDING SECTION OF G.S.N. FOR ADDITIONAL REQUIREMENTS.									
9. REINFORCING BAR SPACINGS SHOWN ON PLANS ARE MAX. ON CENTER DIMENSIONS. DOWEL ALL VERT. REINFORCING TO FOUNDATION. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE. MIN. CLEAR SPACING BETWEEN PARALLEL REINFORCEMENT SHALL BE THE LARGER OF 1-1/2 TIMES NOMINAL BAR DIA. OR 1-1/3 TIMES MAX. AGGREGATE SIZE OR 1-1/2". CLEAR SPACING LIMITATION APPLIES ALSO TO CLEAR DISTANCE BETWEEN A CONTACT LAP SPUCE AND ADJACENT SPLICERS OR BARS.									
10. MIN. REINFORCING AT EDGES OF CONCRETE WALL OPENINGS SHALL BE (2) #5 BARS. EXTEND THE GREATER OF THE DEVELOPMENT LENGTH OF THE BAR PER TYPICAL REBAR LAP SCHEDULE OR 24" MIN. PAST EDGES OF OPENING U.N.O. HOOK ENDS AT INTERFERENCE WITH EXTENSION.									
F. WOOD FRAMING REQUIREMENTS									
1. ALL SIL. PLATES AND OTHER WOOD MEMBERS IN CONTACT WITH CONCRETE OR CMU SHALL BE PRESSURE TREATED LUMBER PER THE APPLICABLE AMPA STANDARD U1 AND W4 FOR THE SPECIES, PRODUCT, PRESERVATIVE AND END USE OR REDWOOD. PRESERVATIVES SHALL BE LISTED IN SECTION 4 OF AMPA U1.									
2. FASTENERS FOR PRESSURE PRESERVATIVE AND FIRE-RETARDANT-TREATED WOOD SHALL BE OF HOT-DIPPED GALVANIZED STEEL, STAINLESS STEEL, SILICON BRONZE OR COPPER OR ONE-HALF-INCH DIAMETER OR GREATER STEEL BOLTS.									
3. ALL SOLID SAWM LUMBER SHALL BE DOUGLAS FIR NO. 2 GRADE OR HIGHER. SIL. PLATES SHALL HAVE A WIDTH AT LEAST EQUAL TO THE WIDTH OF THE WALL STUDS. ALL STUDS IN STUD WALLS SHALL BE CUT SO THAT STUDS HAVE FULL END BEARING. IS FLUSH AGAINST SIL. PLATE.									
4. GULAM BEAMS SHALL BE DOUGLAS FIR COMBINATION 24F-18 U.N.O. FABRICATION AND HANDLING SHALL CONFORM WITH THE LATEST AISC AND ASTM STANDARDS. BEAMS SHALL BEAR AN APPROPRIATE GRADE STAMP CLEARLY NOTING ITS DESIGN PROPERTIES. BEAMS SHALL BE MANUFACTURED WITH 3500 FT. RADII OF CURVATURE UNLESS ALTERNATE CAMBER IS SPECIFICALLY NOTED ON THE DRAWINGS.									
5. ALL SHEATHING PANELS SHOULD BE IDENTIFIED WITH THE APPROPRIATE TRADEMARK OF APA, AND SHALL MEET THE LATEST REQUIREMENTS OF THE LATEST EDITION OF VOLUNTARY PRODUCT STANDARD PSI, VOLUNTARY PRODUCT STANDARD PS2, OR APA PRP-108 PERFORMANCE STANDARDS.									
F. WOOD FRAMING REQUIREMENTS CONTINUED...									
6. ROOF AND FLOOR SHEATHING SHALL BE APA RATED SHEATHING EXP 1 OR EXT AND SHALL HAVE A SPAN RATING OF 24/16 MINIMUM. ALL PANELS WHICH HAVE ANY EDGE OR SURFACE EXPOSED LONG TERM TO THE WEATHER SHALL BE CLASSIFIED AS EXT. OSB OF EQUIVALENT GRADE AND SPAN RATING MAY BE USED IN LIEU OF PLTWOOD PROVIDED THE THICKNESS IS EQUAL OR GREATER THAN THE REQUIRED PLTWOOD THICKNESS. SHEATHING THICKNESS SHALL BE AS SPECIFIED ON THE PLANS. EDGE NAILING AND FIELD NAILING SHALL BE AS SPECIFIED ON THE PLANS. ROOF SHEATHING SHALL BE ORIENTED SO THAT THE LONG AXIS IS PERPENDICULAR TO THE TRUSS SPAN DIRECTION. THE SHORT EDGES OF THE PLTWOOD SHOULD BE STAGGERED (CASE 1 IBC TABLE 2306.3.1). ALL PANEL EDGES SHOULD BE BLOCKED.									
7. LAMINATED VENEER LUMBER (LVL) SHALL BE LEVEL MICROLAM LVL (ICC ESR-1387), OR BOISE CASCADE VERSA-LAM (ICC ESR-1040). GRADE SHALL BE 1.9E OR HIGHER.									
8. NAILS SHALL CONFORM TO REQUIREMENTS OF ASTM F 1667. NAILS USED FOR FRAMING AND SHEATHING CONNECTIONS SHALL HAVE MINIMUM AVERAGE BENDING YIELD STRENGTHS AS FOLLOWS:									
80 KIPS PER SQUARE INCH									
0.177" < SHANK DIA. < 0.254"									
90 KIPS PER SQUARE INCH									
0.142" < SHANK DIA. < 0.177"									
100 KIPS PER SQUARE INCH									
0.099" < SHANK DIA. < 0.142"									
G. PREFABRICATED WOOD TRUSS REQUIREMENTS									
1. PREFABRICATED WOOD TRUSSES SHALL BE DESIGNED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE TRUSS PLATE INSTITUTE "NATIONAL DESIGN STANDARD FOR METAL PLATE CONNECTED WOOD TRUSS CONSTRUCTION" AND SHALL BE PROVIDED BY AND APPROVED FABRICATOR.									
2. ALL MEMBERS RECEIVING FASTENERS PER STRUCTURAL DRAWINGS SHALL HAVE A SPECIFIC GRAVITY OF 0.42 OR HIGHER, U.N.O.									
3. MAX. DEFLECTION LIMITS FOR TRUSSES SHALL BE AS FOLLOWS:									
LOCATION:									
LIVE LOAD:									
SPAN/240									
SPAN/360									
FLOOR									
SPAN/480									
SPAN/360									
TRUSS SUPPORTING									
SPAN/600									
STONE VENEER									
SPAN/600									
4. TRUSSES SHALL BE DESIGNED TO SUPPORT THEIR SELF WEIGHT, PLUS LIVE LOAD, SUPERIMPOSED DEAD LOAD (INCLUDING BUT NOT LIMITED TO ALL MECHANICAL AND OTHER EQUIPMENT) AND ATTIC LOADS AS REQUIRED PER IBC TABLE 1607.1 AND SHALL BE DESIGNED TO RESIST ALL DRAG FORCES, SHEAR WALL UPLIFT AND DOWNWARD LOADS, AND OTHER SPECIAL LOADS NOTED ON THE DRAWINGS.									
5. ALL TRUSS TO TRUSS CONNECTIONS SHALL BE SPECIFIED BY THE TRUSS DESIGNER AND INCLUDED IN THE TRUSS DIAGRAMS. ALL CONNECTIONS SHALL HAVE CURRENT ICC APPROVAL.									
6. TRUSS DIAGRAMS AND KEYED LAYOUT SHALL BE AVAILABLE TO FIELD INSPECTOR AT THE JOB-SITE AT THE TIME OF ROOF NAILING AND FRAMING INSPECTION.									
7. SHOP DRAWINGS, ERECTION DRAWINGS, AND DESIGN CALCULATIONS SEALED BY AN APPROPRIATELY REGISTERED ENGINEER SHALL BE SUBMITTED FOR REVIEW. SHOP DRAWINGS SHALL SHOW ANY SPECIAL DETAILS REQUIRED AT BEARING POINTS.									
8. BRACING SIZE AND SPACING SHALL BE AS DESIGNATED BY THE TRUSS MANUFACTURER.									
H. EARTHWORK									
1. CONSULT THE PROJECT SPECIFICATIONS AND THE GEOTECHNICAL REPORT FOR EARTHWORK REQUIREMENTS.									
2. ALL SOFT SPOTS SHALL BE REMOVED AND REPLACED WITH COMPACTED STRUCTURAL FILL.									
3. STRUCTURAL FILL SHALL BE AS DEFINED IN THE GEOTECHNICAL REPORT. THE CONTRACTOR SHALL HAVE ALL FILL TESTED.									
4. ALL INTERIOR CONCRETE SLABS-ON-GRADE SHALL BE UNDERLAIN WITH FREE DRAINING GRANULAR FILL PER THE GEOTECHNICAL REPORT.									
5. ALL STRUCTURES SHALL HAVE STRUCTURAL FILL PLACED BENEATH FOOTING/SLAB PER GEOTECHNICAL REPORT.									
6. TRENCHES AND EXCAVATIONS UNDER OR ADJACENT TO FOUNDATIONS SHALL BE PROPERLY BACKFILLED AND COMPACTED.									
7. REFER TO GEOTECHNICAL REPORT FOR ON-SITE SOIL CORROSION POTENTIAL ON METAL CONSTRUCTION MATERIALS. CONSULT A QUALIFIED CORROSION ENGINEER FOR RECOMMENDATIONS FOR MITIGATING CORROSIVE EFFECTS, IF NECESSARY.									
8. WATER PROOFING AS MAY BE REQUIRED AT SOIL FACE OF WALLS BELOW GRADE SHALL BE BY OTHERS.									
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DESIGNED SH									
DRAWN SH									
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SHEET NO. 28 of 44									
S0.1									
BOOSTER STATION AND TRANSMISSION LINE BOOSTER PUMP BUILDING									
KAYSVILLE CITY									
3036 LINCOLN AVENUE, SUITE 104 COPPER, UTAH 84401 TEL 801.852.5515 • FAX 801.892.7167 WWW.SUNRISE-ENGINEERING.COM									
SUNRISE ENGINEERING									
PROFESSIONAL SEAL NO. 54919-2020 DATE 01/07/2024 KAYSVILLE, UTAH									
REF. NO. COMMENT DATE									

GENERAL STRUCTURAL NOTES CONTINUED...

J. EPOXY DOWELS

1. USE SAMPSON SET-AP EPOXY ANCHORING SYSTEMS (OR APPROVED EQUAL) FOR ANY EPOXY ANCHORING INTO CONCRETE, UN.O ON PLANS OR IN DETAILS. USE SAMPSON SET EPOXY ANCHOR SYSTEM FOR ANY EPOXY ANCHORING INTO MASONRY.
2. HOLES SHALL BE DRILLED TO THE REQUIRED DEPTHS LISTED IN THE EPOXY ANCHOR SCHEDULE USING ROTARY HAMMER DRILLS AND CARBIDE-TIPPED DRILL BITS, COMPLYING W/ ANSI B212.15-1994. THE BIT DIAMETERS MUST COMPLY WITH THOSE LISTED ON SHEET S301.
3. USE MINIMUM GRADE A307 GRADED THREADED ANCHORS UN.O, AND ALL ROD THREADS MUST COMPLY W/ ANSI B1.1-74. THE MINIMUM BASE MATERIAL INSTALLATION TEMPERATURE FOR THESE SYSTEMS IS 40° F(MINIMUM).
4. AFTER DRILLING, ALL HOLES MUST BE CLEANED FROM THE BOTTOM W/ FORCED AIR. A WIRE BRUSH SHALL THEN BE USED TO CLEAN DUST AND SLURRY FROM THE HOLE. FOLLOW THIS BY ANOTHER CLEANING W/ FORCED AIR, ENSURING THAT THERE ARE NO LOOSE DEBRIS NOR MATERIALS IN THE HOLE.
5. ADHESIVE SHALL THEN BE PUMPED INTO THE HOLE AND ANCHORS OR BARS INSTALLED. PER MANUFACTURER'S SPECIFICATIONS. ANCHORS OR BARS SHALL BE INSERTED BY ROTATING A MINIMUM OF TWO TURNS TO EVENLY DISTRIBUTE EPOXY.
6. CURE TIMES SHALL BE DETERMINED PER MANUFACTURER'S RECOMMENDATIONS. REFER TO RESPECTIVE ICC EVALUATION REPORTS.
7. PER ICBO REQUIREMENTS, CONTINUOUS SPECIAL INSPECTION IS REQUIRED FOR ALL ADHESIVE ANCHOR INSTALLATIONS. THE SPECIAL INSPECTOR SHALL RECORD AND SUBMIT COMPLIANCE OF THE FOLLOWING:
 - A. DRILL BIT TYPE AND SIZE, PER ANSI B212.15-1994
 - B. HOLE DEPTH AND CLEANLINESS
 - C. PRODUCT DESCRIPTION, INCLUDING PRODUCT NAME, ROD DIAMETER, AND LENGTH
 - D. ADHESIVE EXPIRATION DATE
 - F. VERIFICATION OF ANCHOR INSTALLATION PER THE MANUFACTURER'S PUBLISHED INSTRUCTIONS.
8. MINIMUM EDGE, END, AND SPACING DISTANCES PER MANUFACTURER'S RECOMMENDATIONS, AND SER'S DETAILS.

K. QUALITY CONTROL AND INSPECTION REQUIREMENTS

1. QUALITY CONTROL AND INSPECTIONS SHALL BE PERFORMED AS REQUIRED IN IBC 2015 CHAPTER 17. AS STATED IN IBC 2015 1704.2, "THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS OF SECTION 1704 TO THE SATISFACTION OF THE BUILDING OFFICIAL.

L. SPECIAL INSPECTION

SPECIAL INSPECTION AND QUALITY ASSURANCE, AS REQUIRED BY SECTION 1704 OF THE IBC, SHALL BE PROVIDED BY AN INDEPENDENT AGENCY EMPLOYED BY THE OWNER UNLESS WAIVED BY THE BUILDING OFFICIAL. THE CONTRACTOR SHALL COORDINATE AND COOPERATE WITH THE REQUIRED INSPECTIONS. ALL TESTING AND INSPECTION REPORTS SHALL BE SENT TO THE ENGINEER OF RECORD FOR REVIEW. ITEMS REQUIRING SPECIAL INSPECTION AND QUALITY ASSURANCE ARE:

1. SOILS PER IBC SECTION 1704.7
 - 1.1. SPECIAL INSPECTION SHALL BE PROVIDED PRIOR TO POURING CONCRETE FOOTINGS.
 - 1.2. SPECIAL INSPECTION SHALL BE PROVIDED PRIOR TO PLACEMENT OF FILL AND DURING PLACEMENT OF FILL.
2. CONCRETE PLACEMENTS PER IBC SECTION 1704.4
 - 2.1. CONTINUOUS SPECIAL INSPECTION SHALL BE PROVIDED
 - 2.2. CYLINDERS, SLUMP AND AIR-ENTRAGEMENT TEST SHALL BE PERFORMED FOR EVERY 50 CUBIC YARDS OR EACH DAY'S PRODUCTION IF LESS THAN 50 CUBIC YARDS. TEST SHALL BE PERFORMED IN ACCORDANCE WITH ASTM C31 AND C39.
3. A-BOLTS INSTALLED IN CONCRETE SECTION 1704.4
 - 3.1. ALL A-BOLTS SHALL BE INSPECTED PRIOR TO AND DURING CONCRETE PLACEMENT.
4. CONCRETE REINFORCING STEEL PLACEMENT IBC SECTION 1704.4
 - 4.1. REINFORCING SHALL BE INSPECTED PRIOR TO CONCRETE PLACEMENT.
5. EPOXY ANCHORS IBC SECTION 1701.3.13
 - 5.1. SPECIAL INSPECTIONS SHALL VERIFY ALL DRILLED HOLES SIZE AND DEPTH PRIOR TO INSTALLATION OF EPOXY AND ANCHOR ROD.
6. PREFABRICATED METAL PLATE WOOD TRUSSES PER IBC SECTION 1704.6 AND 1704.2.
7. STRUCTURAL WOOD SHEAR WALLS & DIAPHRAGMS IBC SECTION 1704.6, 1707.3 & 1706.10.

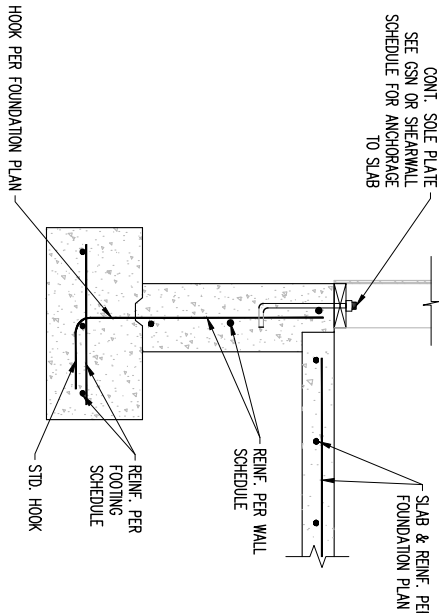
M. SUBMITTALS

1. SHOP DRAWINGS OR REPORTS FOR THE FOLLOWING ITEMS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER OF RECORD PRIOR TO FABRICATION OR CONSTRUCTION (AS APPLICABLE) UN.O.
 - CONCRETE CYLINDER TESTS
 - REINFORCING STEEL
 - CONCRETE MIX DESIGN
 - ADJUXTURE SPECIFICATIONS
 - CURING AGENT SPECIFICATIONS
 - STRUCTURAL STEEL
2. CONTRACTOR SHALL REVIEW AND STAMP SHOP DRAWINGS PRIOR TO SUBMITTING. CONTRACTOR'S REVIEW SHALL CHECK FOR COMPLETENESS/COMPLIANCE WITH CONTRACT DOCUMENTS.
3. SHOP DRAWINGS ARE REVIEWED BY ENGINEER ONLY FOR GENERAL COMPLIANCE WITH THE STRUCTURAL DRAWINGS. RESPONSIBILITY FOR CORRECTNESS SHALL REST WITH THE CONTRACTOR. SHOP DRAWINGS DO NOT SUPERSEDE OR REPLACE THE CONTRACT DRAWINGS OR SPECIFICATIONS. CHANGES, SUBSTITUTIONS, OR DEVIATIONS FROM CONTRACT DRAWINGS AND/OR SPECIFICATIONS WILL NOT BE ACCEPTED VIA SHOP DRAWING REVIEW. ALL SUCH MODIFICATIONS SHALL BE SUBMITTED SEPARATELY FOR ENGINEER'S REVIEW.
4. PREFABRICATED COMPONENTS, SPECIALTY ITEMS, OR DESIGN-BUILD ELEMENTS NOTED ON THE STRUCTURAL DRAWINGS, BUT WHICH REQUIRE THE MFR. OR SUPPLIER TO PROVIDE THE DESIGN, SHALL BE SUBMITTED BY THE CONTRACTOR TO THE ARCHITECT AND/OR ENGINEER FOR REVIEW AS A DEFERRED SUBMITTAL. DEFERRED SUBMITTALS RECD. BY THE STRUCTURAL ENGINEER OF RECORD SHALL INCLUDE, BUT NOT BE LIMITED TO, THE FOLLOWING:
 - PREFABRICATED WOOD TRUSSES
5. DEFERRED SUBMITTALS SHALL INCLUDE CALCULATIONS AND DRAWINGS PREPARED AND STAMPED BY AN APPROPRIATELY LICENSED ENGINEER (SPECIALTY ENGINEER) SHOWING LOCATION AND MAGNITUDE OF LOADS, CONFIGURATION AND SIZE OF MEMBERS, AND COMPATIBILITY OF SUBMITTAL ITEM WITH THE PRIMARY STRUCTURAL SYSTEM.
6. THE PURPOSE OF THE STRUCTURAL ENGINEER'S REVIEW OF DEFERRED SUBMITTALS SHALL BE LIMITED TO DETERMINING THAT THE DRAWINGS AND CALCULATIONS HAVE BEEN PROPERLY SEALED, THAT THE LOAD CRITERIA IS IN GENERAL CONFORMANCE WITH THE CONTRACT DOCUMENTS AND WITH THE REFERENCED BUILDING CODE, THAT CONNECTIONS TO THE PRIMARY STRUCTURE ARE COMPATIBLE WITH THE PRIMARY DESIGN, AND THAT THE PRIMARY STRUCTURE IS CAPABLE OF SUPPORTING THE IMPOSED LOADS.
7. THE STRUCTURAL ENGINEER WILL RELY UPON THE SPECIALTY ENGINEER'S SEAL AS CERTIFICATION THAT THE ITEMS DESIGNED BY THE SPECIALTY ENGINEER COMPLY WITH THE CRITERIA SET FORTH IN THE CONTRACT DOCUMENTS AND APPLICABLE CODES AND STANDARDS. THE STRUCTURAL ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ADEQUACY OF DESIGNS PROVIDED BY OTHERS.
8. FOR ALL SUBMITTALS, ANY CORRECTIONS NOTED WILL BE MARKED ON ONE (1) COPY SET ONLY AND RETURNED. ADDITIONAL COPIES OF ANY SUBMITTAL WILL BE RETURNED UNMARKED. CONTRACTOR SHALL BE RESPONSIBLE FOR REPRODUCING ENGINEER'S CORRECTIONS ON ADDITIONAL COPIES RECD. ONE COPY SET MAY BE RETAINED FOR THE ENGINEER'S RECORDS. ALLOW FIVE (5) TO TEN (10) WORKING DAYS FOR THE ENGINEER'S REVIEW.
9. REFER TO APPLICABLE C.S.M. SECTIONS FOR FURTHER REQUIREMENTS SPECIFIC TO INDIVIDUAL SUBMITTALS.

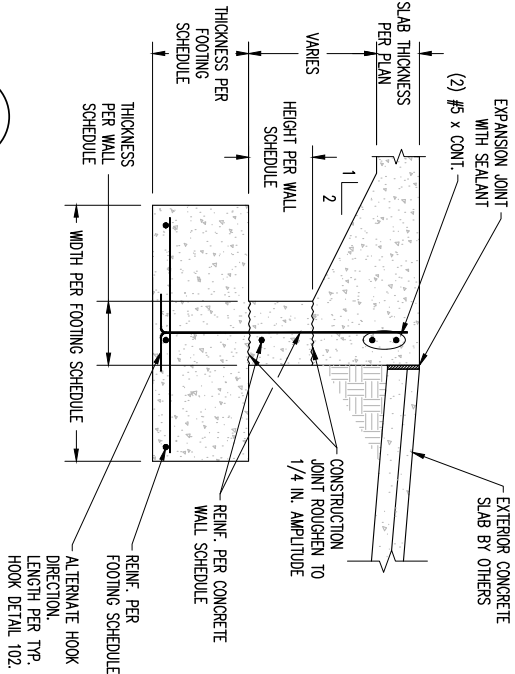
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 SUNRISE ENGINEERING 2036 LINCOLN AVENUE, SUITE 104 CODENV, UTAH 84401 TEL 801.692.6515 • FAX 801.692.7167 WWW.SUNRISE-ENG.COM KAYSVILLE CITY BOOSTER STATION AND TRANSMISSION LINE BOOSTER PUMP BUILDING					
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FOUNDATION REQUIREMENTS

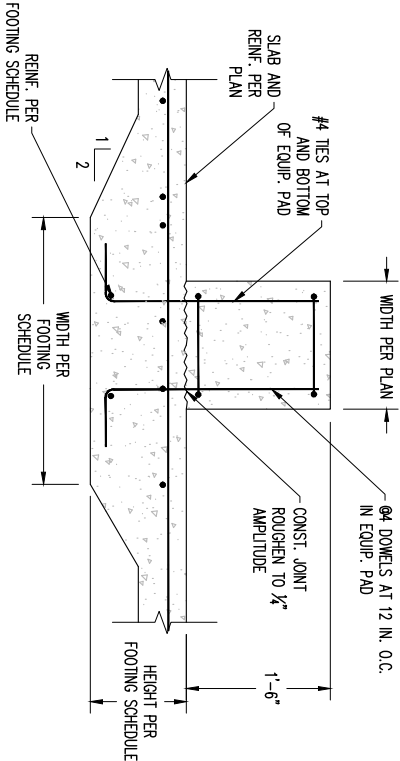
- F1. VERIFY LOCATION AND SIZE OF ALL INSERTS AND OPENINGS IN SLAB, WALLS, AND FLOORS WITH ARCH'L, MECH, PLUMBING, AND ELECT. PRIOR TO CONSTRUCTION.
- F2. ALL FOOTINGS AND SLABS SHALL BE PLACED ON STRUCTURAL FILL AS DEFINED IN THE GEOTECHNICAL REPORT. THE MOISTURE CONTENT OF STRUCTURAL FILL SHOULD BE CONDITIONED TO NEAR OPTIMUM WATER CONTENT, PLACED IN UNIFORM LIFTS NOT EXCEEDING 8 INCHES IN LOOSE THICKNESS, AND COMPACTED PER REQUIREMENTS OF THE GEOTECHNICAL REPORT.
- F3. ALL STANDARD WALL FOOTINGS SHALL EXTEND TO AT LEAST 24 INCHES BELOW FINISHED GRADE FOR FROST PROTECTION.
- F4. F1, F2, F3, ... DENOTES FOOTING PER FOOTING SCHEDULE ON THIS SHEET.
- F5. CM1, CM2, CM3 ... DENOTES CONCRETE WALL PER CONCRETE WALL SCHEDULE ON THIS SHEET.
- F6. CONCRETE CONTROL JOINTS SHOULD BE AS SHOWN ON THESE PLANS AND PER THE REFERENCED DETAILS.
- F7. PLACE SLABS ON GRADE OVER VAPOR BARRIER (AS REQ'D) PER THE GEOTECHNICAL REPORT.
- F8. INTERIOR CONCRETE SLAB SHALL BE 6 INCHES THICK WITH REINFORCEMENT AS SHOWN ON THE PLANS, UNLESS NOTED OTHERWISE.
- F9. FOR SMALL PIPES/CONDUITS, THROUGH FOUNDATION WALLS/FOOTINGS, SEE DETAIL 112 ON SHEET S1.3
- F10. ALL EXTERIOR WOOD WALLS SHALL BE CONNECTED TO THE FOUNDATION WITH 5/8" DIA. ANCHOR BOLTS AT 32" o.c. EMBEDDED 7" MIN., UNLESS NOTED OTHERWISE ON FOUNDATION PLAN. PROVIDE 3"x3"x1/4" PLATE WASHERS AT ALL BOLTS.
- F11. CONCRETE LAP SPLICE REQUIREMENTS PER DETAIL 113 SHEET S1.3



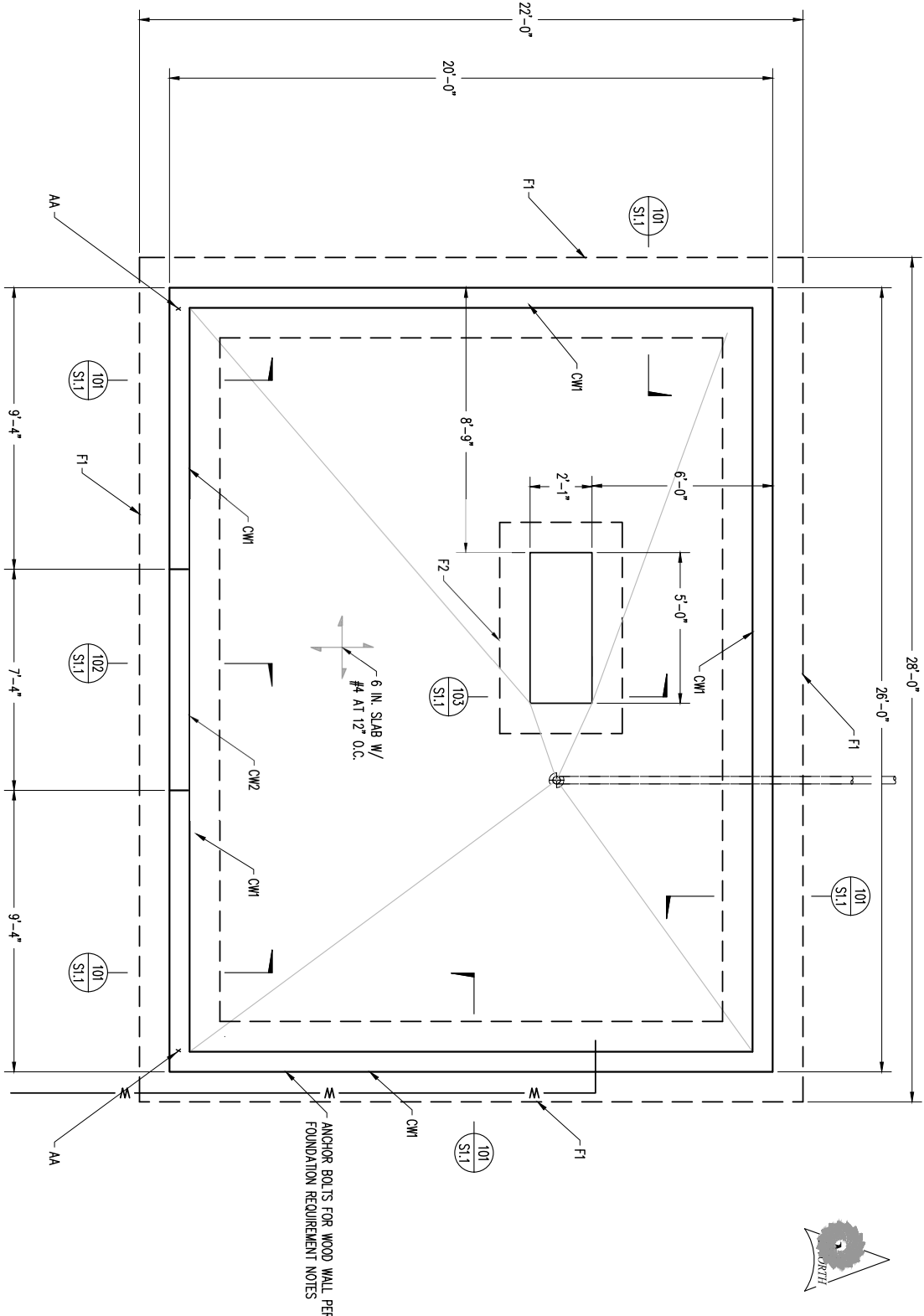
101 TYPICAL WALL FOOTING



102 FOOTING AT OPENING



103 FOOTING AT CONC. EQUIPMENT PAD



CONCRETE WALL SCHEDULE

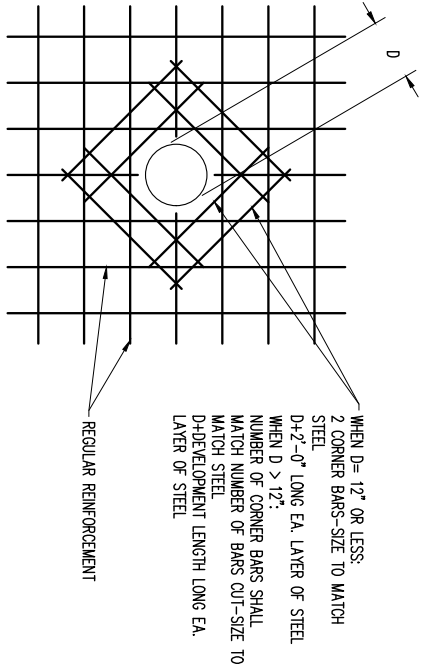
MARK	THICKNESS	HEIGHT	VERTICAL REINFORCING	HORIZONTAL REINFORCING	TOP OF WALL EL.
CM1	8"	2'-6"	#5 AT 16" O.C. CENTERED	(3) #5 CONT.	4862.50
CM2	8"	1'-6"	#5 AT 12" O.C. CENTERED	(2) #5 CONT.	4861.50

FOOTING SCHEDULE

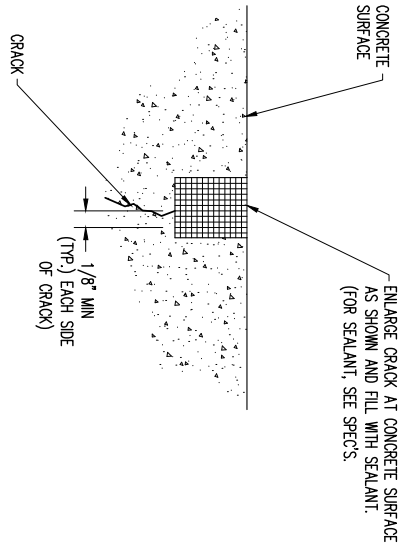
MARK	WIDTH	LENGTH	THICKNESS	REINFORCEMENT	BOT. OF FOOTING ELEV.
F1	2'-8"	CONT.	10"	#5 AT 18" o.c. TRANSVERSE BOT. (3) #5 CONT. LONGITUDINAL BOT.	4859.17
F2	4'-1"	7'-0"	12"	#5 AT 16" O.C. B.W. IN BOT.	4861.50

HOLDOWN SCHEDULE

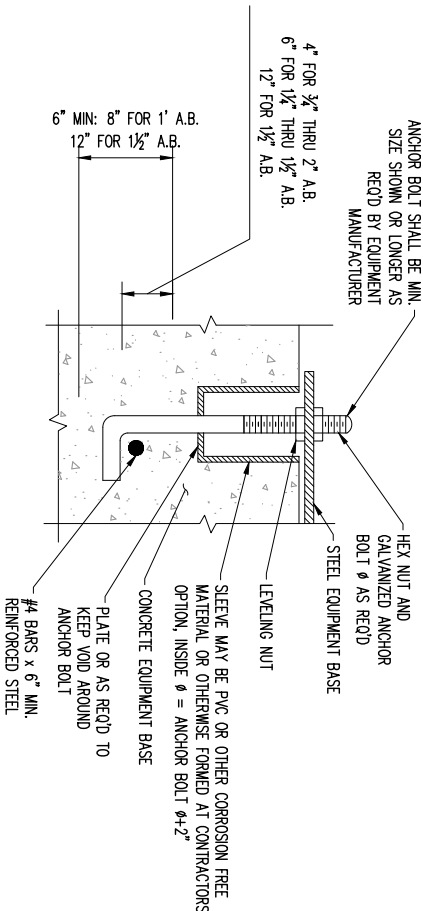
MARK	TYPE	SOS SCREWS	ANCHOR BOLT	MIN BOLT EMBED. (IN.)
AA	H0U2-S0S2.5	6-S0S 1/4" x 2-1/2"	SB 5/8" x 24"	18"



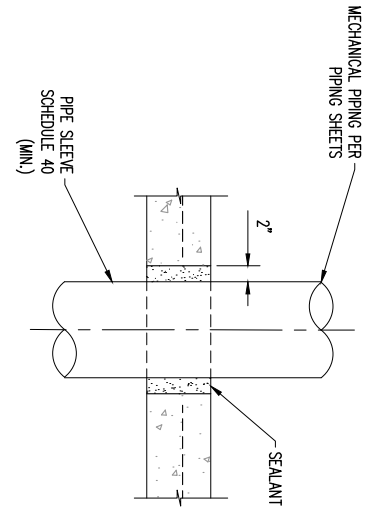
106 EXTRA REINF. AT PIPE PENETRATIONS
NTS



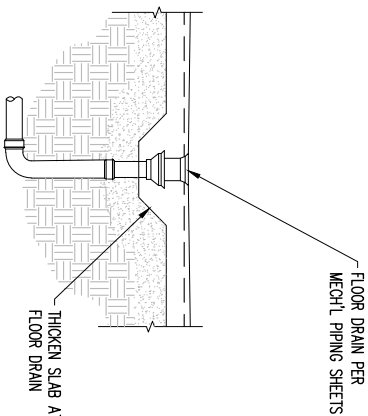
105 CONCRETE CRACK REPAIR
NTS



104 BOLT AT EQUIPMENT PAD
NTS



107 PIPE PENETRATION AT SLAB
NTS

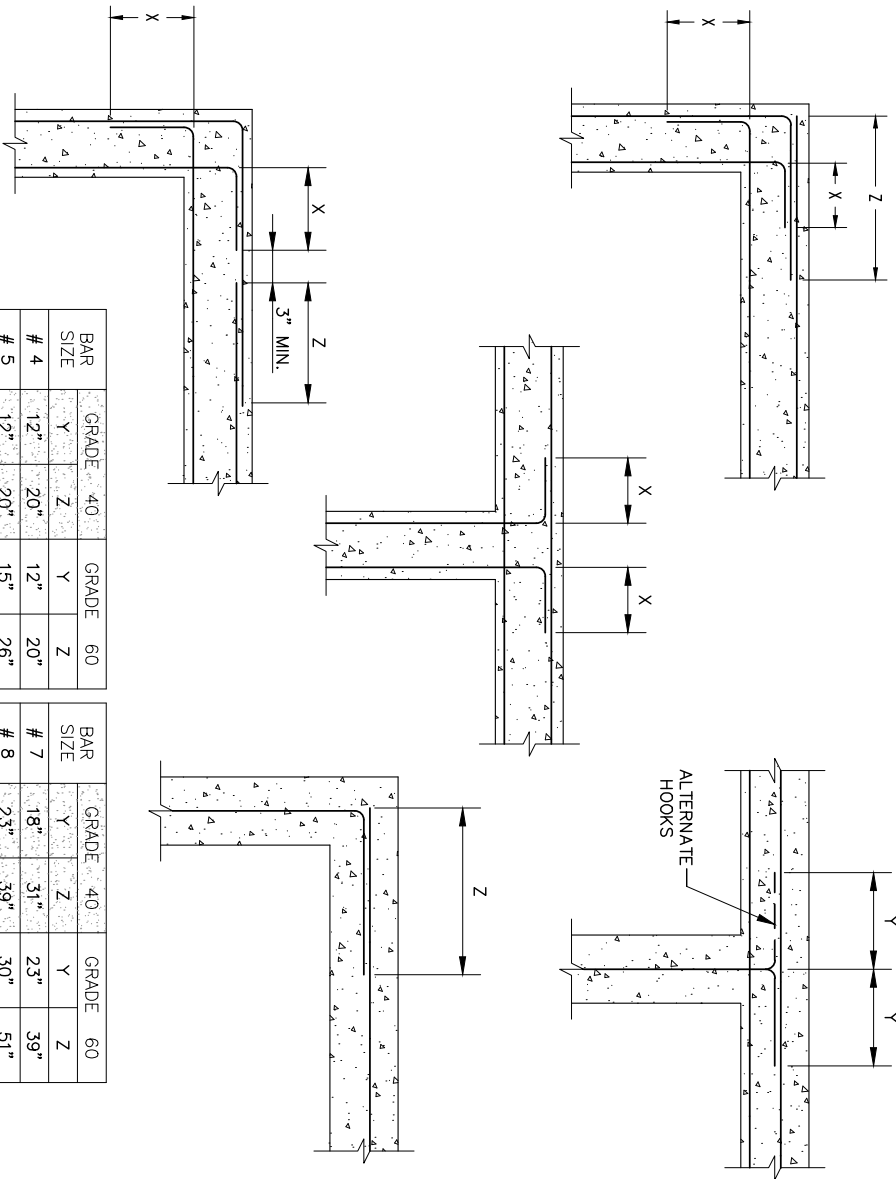


108 FLOOR DRAIN AT SLAB
NTS

TYPE	BAR SIZE	MIN. INSIDE BEND DIA. (IN)	STRAIGHT EXTENSION ⁽¹⁾ L _{dev} (IN)	TYPE OF STANDARD HOOK
90 DEG. HOOK	NO. 3 TO NO. 8	6d _b	12d _b	
	NO. 9 TO NO. 11	8d _b		
	NO. 14 & NO. 18	10d _b		
180 DEG. HOOK	NO. 3 TO NO. 8	6d _b	GREATER OF 4d _b AND 2.5 IN.	
	NO. 9 TO NO. 11	8d _b		
	NO. 14 & NO. 18	10d _b		

(1) A STANDARD HOOK FOR BENT BARS IN TENSION INCLUDES THE SPECIFIC INSIDE BEND DIAMETER AND STRAIGHT EXTENSION LENGTH. IT SHALL BE FORMED WITH A MINIMUM STRAIGHT EXTENSION AT THE END OF A HOOK. A LARGER EXTENSION SHALL NOT BE CONSIDERED TO INCREASE THE ANCHORAGE CAPACITY OF THE HOOK.

110 STD. HOOK GEOMETRY
DEFORMED BARS IN TENSION IN CONCRETE



BAR SIZE	GRADE	40	GRADE	60	BAR SIZE	GRADE	40	GRADE	60
# 4	12"	20"	12"	20"	# 7	18"	31"	23"	39"
# 5	12"	20"	15"	26"	# 8	23"	39"	30"	51"
# 6	13"	22"	18"	31"	# 9	29"	49"	38"	65"

109 HORIZ. REINF. AT WALL INTERSECTIONS
NTS

* THIS DETAIL TO BE USED ONLY WHEN NO OTHER DETAIL IS INDICATED ON THE DRAWINGS.

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HANS J. HANSEN
No. 54819
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Expires 01/07/2024

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REF. NO.

COMMENT

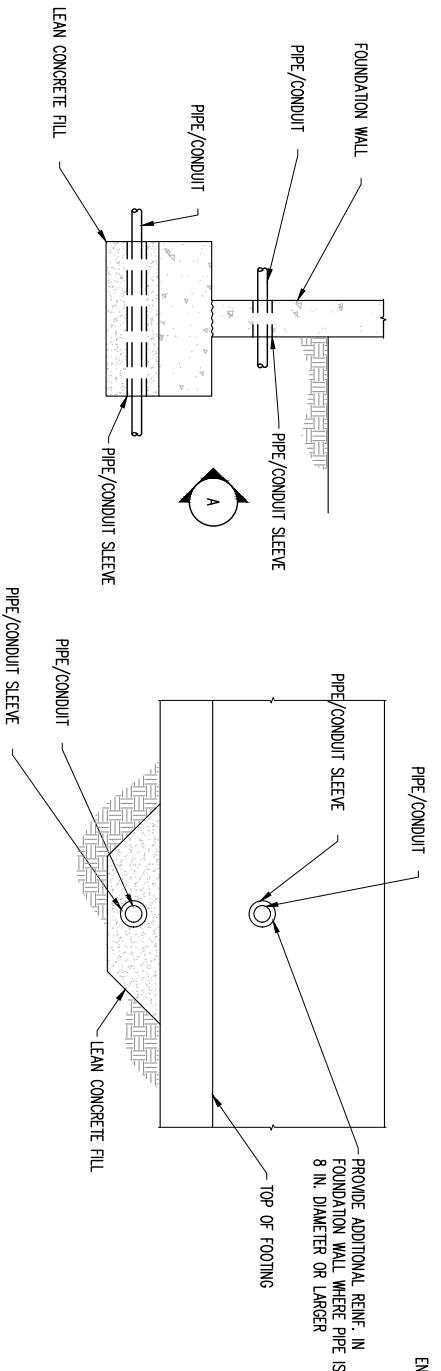
DATE

BOOSTER STATION AND TRANSMISSION LINE
BOOSTER PUMP BUILDING

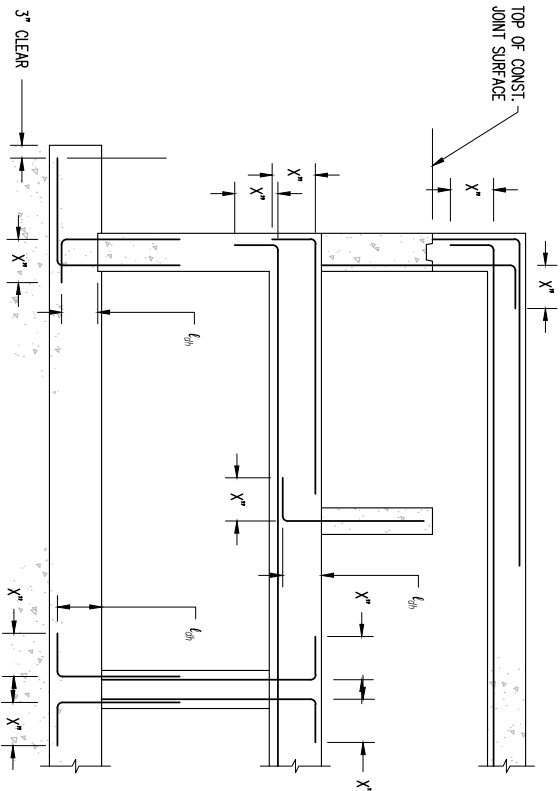
KAYSVILLE CITY

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07062	SH	SH	SH	31 of 44

S1.2



112 PIPE/CONDUIT PENETRATIONS
NTS

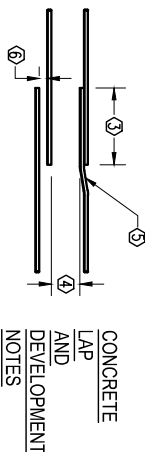


111 STANDARD FOR 90° BAR HOOKS
NTS

BAR SIZE	90° HOOKS	BAR SIZE	90° HOOKS
# 3	6"	# 8	12"
# 4	6"	# 9	14"
# 5	8"	# 10	16"
# 6	9"	# 11	17"
# 7	11"		

NOTE:
UNLESS OTHERWISE NOTED ON THE DRAWINGS ALL LENGTHS OF BAR HOOKS IN FOOTINGS, COLUMNS, WALLS AND SLABS SHALL BE AS GIVEN IN THE TABLE HEREIN. THE HOOK LENGTH "X" IS THE STANDARD 90° BAR HOOK LENGTH FOR GRADE 40 OR GRADE 60 REINFORCEMENT STEEL.

F'c = 4000 PSI				
BAR SIZE #	TENSION			
	LIE TOP	LIE OTHER	LTS TOP	LTS OTHER
#3	15	12	20	15
#4	20	16	26	20
#5	25	19	32	25
#6	30	23	39	30
#7	54	42	71	54
#8	62	48	81	62



- 1 TOP BARS ARE HORIZ. BARS PLACED SUCH THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN MEMBER BELOW SPLICE
- 2 WHERE BARS OF UNEQUAL SIZE LAP ONE ANOTHER, USE TABULATED LAP LENGTH FOR SMALLER BAR U.N.O.
- 3 LAP SPLICE LENGTH PER SCHEDULE
- 4 CLEAR DISTANCE BETWEEN ADJACENT BARS OR SPLICES TO BE USED IN DETERMINING APPLICABLE LAP LENGTH FROM SCHEDULE
- 5 OPTIONAL OFFSET. SEE STANDARD REBAR BEND DETAILS FOR OFFSET REQUIREMENTS
- 6 FOR NON-CONTACT LAP SPLICES, MIN. CLEAR DISTANCE BETWEEN SPLICED BARS SHALL BE PER GENERAL STRUCTURAL NOTES. MAX. CLEAR DISTANCE SHALL BE 1/5 THE TABULATED LAP LENGTH OR (6" - DB"), WHICHEVER IS LESS, WHERE DB = BAR DIA.

- A. ALL TABULATED VALUES ARE IN UNITS OF INCHES U.N.O.
- B. AT CONTRACTOR'S OPTION, MECHANICAL SPLICE COUPLERS PER G.S.N. MAY BE USED IN LIEU OF LAP SPLICES
- C. SEE G.S.N. FOR ACTUAL CONCRETE SPECIFICATIONS AND MIN. CLR. COVER / CLR. SPACING REQUIREMENTS
- D. SCHEDULED VALUES ARE BASED ON CLASS "B" TENSION LAP SPLICES U.N.O., NORMAL WT., CONCRETE, AND UNCOATED GRADE 60 REIN. FOR OTHER CONDITIONS NOTED BELOW, MODIFY TABULATED VALUES AS INDICATED:
- E. E1. FOR DEVELOPMENT LENGTH AND CLASS "A" LAP SPLICES, WHERE SPECIFICALLY NOTED ON PLANS OR DETAILS, DIVIDE TABULATED VALUES BY 1.3. CLASS "A" SPLICES SHALL BE LOCATED SUCH THAT NO MORE THAN 1/2 OF THE TOTAL REIN. IS LAPPED WITHIN THE REQUIRED LAP LENGTH
- E2. FOR LIGHTWEIGHT CONCRETE, MULTIPLY TABULATED VALUES BY 1.3
- E3. FOR EPOXY COATED REBAR, MULTIPLY TABULATED VALUES BY 1.5
- E4. FOR GRADE 75 REIN., MULTIPLY TABULATED VALUES BY 1.25
- F. LCE = COMPRESSION EMBEDMENT LENGTH
- LCS = COMPRESSION LAP SPLICE LENGTH
- LIE = TENSION EMBEDMENT LENGTH
- LTS = TENSION LAP SPLICE LENGTH
- G. TOP BARS ARE HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12 IN. OF FRESH CONCRETE IS CAST BELOW BAR. ALL BARS THAT ARE NOT TOP BARS ARE OTHER BARS UNLESS NOTED OTHERWISE. ALL HOOKS SHALL EXTEND TO THE FACE (LESS 2" COVER)

113 CONCRETE LAP/DEVELOPMENT SCHEDULE
NTS

REV. NO.	COMMENT			DATE
07062	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	SH	SH	32 of 44
S1.3				

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PROFESSIONAL SEAL
DATE: 01/07/2020
NO. 5481902308
HANSEN
STATE OF UTAH

KANSVILLE CITY

BOOSTER STATION AND TRANSMISSION LINE
BOOSTER PUMP BUILDING

WALL FRAMING REQUIREMENTS

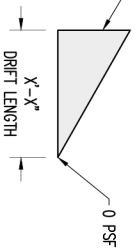
- W1. ALL SOLID SAWN LUMBER SHALL BE DOUGLAS FIR NO. 2 GRADE OR HIGHER
- W2. ALL EXTERIOR DOOR OPENINGS SHALL HAVE A MIN. OF (1) TRIMMER STUD (TS) AND (2) KING STUDS (KS), UNO
- W3. EXTERIOR STUD WALLS SHALL BE 2X6 AT 16 INCHES O.C. 2X6 STUDS MAY BE REPLACED BY MANUFACTURED STUD OF EQUAL OR GREATER DIMENSIONS. BOTTOM PLATE SHALL BE 2X6 TREATED LUMBER CONNECTED TO FOUNDATION WITH 5/8" DIA. ANCHOR BOLTS AT 32" O.C.

ROOF SHEATHING REQUIREMENTS:

- 1- 15/32" O.S.B PLYWOOD OR O.S.B. PER GENERAL STRUCTURAL NOTES
- 2- 8D AT 6" O.C. BOUNDARY FASTENERS (DIAPHRAGM BOUNDARIES, SHEAR PANEL BLOCKING, SOLID BLOCKING, AND DRAG MEMBERS AS NOTED ON FRAMING DETAILS)
- 3- 8D AT 6" O.C. EDGE FASTENERS (AT SUPPORTED PANEL EDGES)
- 4- 8D AT 12" O.C. FIELD FASTENERS (ALONG INTERMEDIATE FRAMING MEMBERS)
- 5- ALT. FASTENERS #8 X 2" MIN. ZINC COATED, FLAT/BOULE HEAD SCREWS W/ SPACING NOTED ABOVE. SCREWS SHALL BE QUICK DRIVE WENTIL WOOD SCREWS, GRABBER PLYWOOD SCREWS, OR GRABBER COARSE THREAD SCREWS.

ROOF AND FLOOR FRAMING REQUIREMENTS

- R1. NOTIFY ENGINEER OF RECORD FOR PENETRATIONS THROUGH BEAMS, JOISTS, COLUMNS AND OTHER STRUCTURAL MEMBERS. PENETRATIONS SHALL COMPLY WITH THE REQUIREMENTS OF THE ENGINEER AND MANUFACTURER OF THE STRUCTURAL ELEMENT.
- R2. ALL BEAMS, HEADERS, JOISTS, AND TRUSSES SHALL HAVE SUFFICIENT BEARING AREA PER REQUIREMENTS OF THE AMERICAN WOOD COUNCIL NATIONAL DESIGN SPECIFICATION (NDS) 2015. ALL BEARING POINTS SHALL HAVE A CONTINUOUS LOAD PATH TO FOUNDATIONS. FRAMING SHALL BE PER DETAIL 303 ON SHEET S6.1
- R3. ALL FINISHES SHALL BE PER THE ARCHITECT, CONTRACTOR, AND OWNER. ENGINEER OF RECORD IS NOT RESPONSIBLE FOR WATER PROOFING AND CORROSION PROTECTION OF STRUCTURAL ELEMENTS. THIS RESPONSIBILITY FALLS SOLELY UPON THE CONTRACTOR AND ARCHITECT.
- R4. DOUBLE 2X BEAMS SHOULD BE SITCHED TOGETHER PER WFR RECOMMENDATIONS.
- R5. # SHOWN ON THE PLAN DENOTES TYPE OF BEAM, HEADER OR JOIST AS SHOWN IN THE SCHEDULE. SM# DENOTES TYPE OF SHEAR WALL PER SCHEDULE.
- R6. ALL HARDWARE SHOWN ON THE PLANS SHALL BE SIMPSON STRONG TIE OR APPROVED EQUAL. SEE G.S.N. FOR REQUIREMENTS.
- R7. DIMENSIONS SHOWN ON THE PLANS ARE APPROXIMATIONS BASED OFF OF FIELD MEASUREMENTS. CONTRACTOR TO VERIFY ALL DIMENSIONS AND FIELD FIT TO THE EXISTING STRUCTURE. BEAM AND HEADER LENGTHS ARE ALLOWED TO BE 6 INCHES LONGER THAN SHOWN ON THE PLAN. IF IT IS NECESSARY TO INCREASE LENGTH OF THE BEAMS OR HEADERS BY MORE THAN 6 INCHES, APPROVAL MUST BE OBTAINED FROM THE ENGINEER OF RECORD.
- R8. KS = KING STUD, TS = TRIMMER STUD, TP = TRIMMER POST, ES = END STUD, EP = END POST. MINIMUM (1) KS AND (1)TS REQUIRED AT ALL OPENINGS. PROVIDE CONTINUOUS BEARING TO FOUNDATION FOR (2) TS OR GREATER.
- R9. WHERE NOT DESIGNATED AS A SHEAR WALL, EXTERIOR WALLS SHALL BE SHEATHED AS REQ'D BY ARCHITECT AND LOCAL BUILDING CODES.
- R10. FOR SMALL PIPES/CONDUITS, THROUGH FOUNDATION WALLS/FOOTINGS, SEE DETAIL 711 ON SHEET S7.1.
- R11. DRAFT LOADS SHALL BE AS INDICATED ON THE PLANS USING SYMBOLS AND NOTATION AS FOLLOWS:



NAILING SCHEDULE	
CONNECTION	MINIMUM NAILING, ONE ON PLANS OR DETAILS
JOINT OR TRUSS TO TOP PLATE SILL, ETC.	(3) 16d or (3) x 0.131" TOENAIL
BRODING TO JOIST	(2) 8d COMMON OR (2) 3" x 0.131" TOENAIL EA. END
BOTTOM PLATE TO JOIST OR BLOCKING (AT SHEAR WALLS, SEE SHEAR WALL SCHEDULE).	16d AT 16" o.c. OR 3" x 0.131" AT 8" o.c. FACE NAIL
TOP AND BOTTOM PLATE TO POST	(2) 16d COMMON, (3) 3" x 0.131", END NAIL
TOP PLATE TO STUD	(2) 16d COMMON, (3) 3"x 0.131", END NAIL
STUD TO BOTTOM PLATE	TOENAILS: (4) 8d COMMON OR (4) 3" x0.131", (4) 16d AT 3x AND LARGER. END NAILS: (2) 16d COMMON OR (3) 3" x 0.131", (2) 20d AT 3x
DOUBLE OR MULTIPLE BUILT-UP STUDS (POSTS)	(2) 16d COMMON AT 16" o.c., OR (3) 3" x 0.131" AT 8" o.c., FACE NAIL
DOUBLE OR MULTIPLE TOP PLATES	(2) 16d COMMON AT 16" o.c., OR (3) 3" x 0.131", AT 12" o.c. FACE NAIL
BLOCKING BTWN. JOIST OR RAFTERS TO TOP PLATE	(3) 16d COMMON, (3) 3" x 0.131", TOENAIL
RNM JOISTS TO TOP PLATE	16d AT 6" o.c. OR 3" x 0.131" AT 6" o.c., TOENAIL
TOP PLATES, LAPS & INTERSECTIONS	(2) 16d COMMON OR (3) 3" x 0.131", FACE NAIL
CONT. HEADER, TWO OR MORE LAMINATIONS	16d COMMON AT 16" o.c. ALONG EACH EDGE
CEILING JOIST TO PLATE	(3) 16d OR (5) 3" x 0.131", FACE NAIL
CONT. HEADER TO INTERMEDIATE SUPPORT(S)	(4) 8d COMMON TOENAIL/CEILING JOISTS,
LAPS OVER PARTITIONS	(3) 16d OR (4) 3" x 0.131", FACE NAIL
CEILING JOISTS TO PARALLEL RAFTERS	(3) 16d OR (4) 3" x 0.131", FACE NAIL
RAFTER OR TRUSS TO PLATE	(2) 16d COMMON, (3) 3" x 0.131", TOENAIL
CORNER GI/RAFTER TO PLATE	(4) 16d, TOENAIL/BUILT-UP CORNER STUDS16d AT 16" o.c. OR 3" x 0.131" AT 16" o.c.

A: SEE PLAN OR GSN FOR TOP PLATE SPJCE CONNECTION
B: WISC. NAILING SHALL BE PER IRC TABLE 2304.5.1

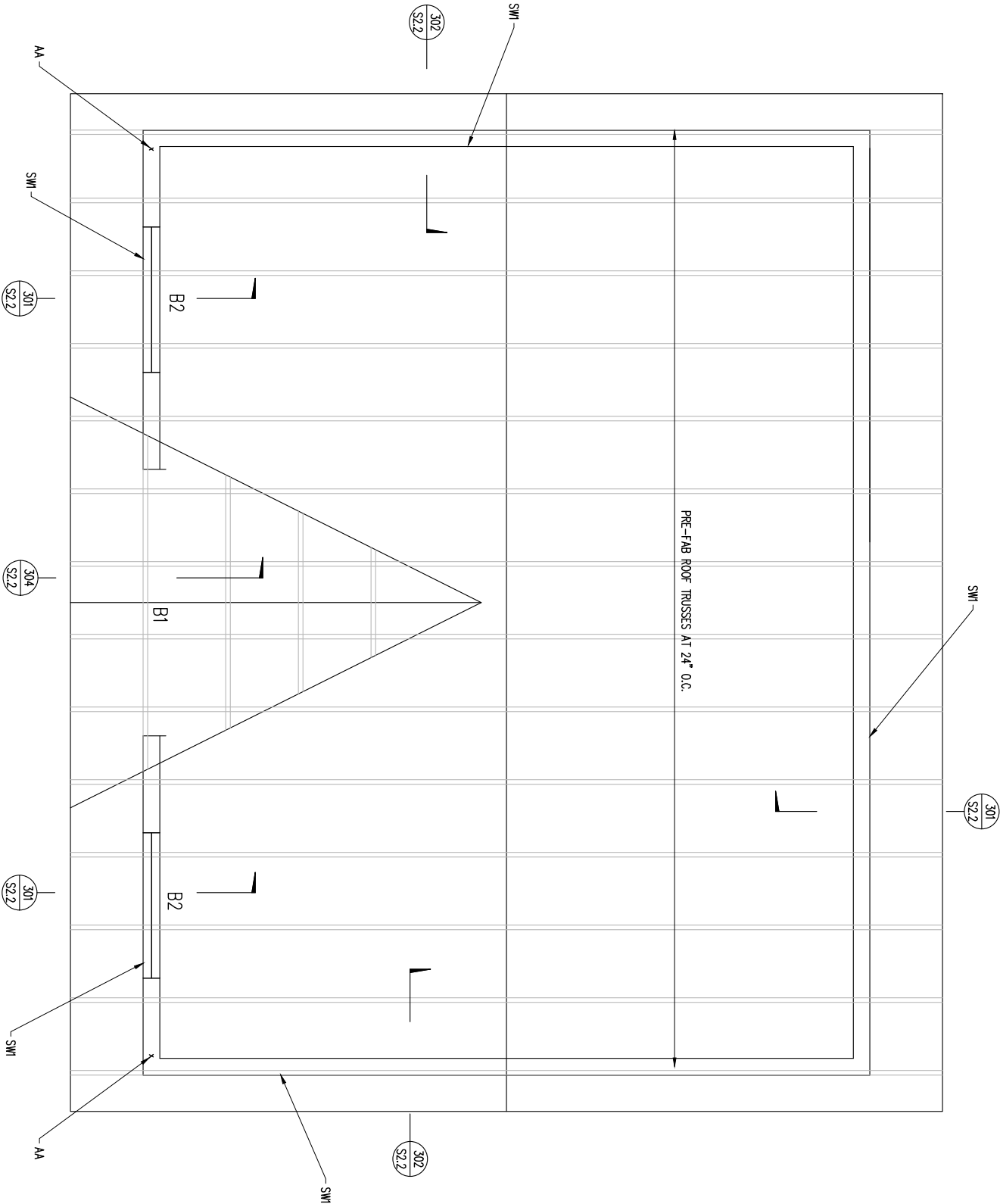
BEAM / HEADER TABLE

MARK	TYPE	SIZE	TRIMMER STUDS/POST	KING STUDS/POST
B1	DOUGLAS FIR NO. 2	(3) 2X10 BUILT-UP	(2) 2 x 6	(2) 2x6
B2	DOUGLAS FIR NO. 2	(3) 2X6 BUILT-UP	(1) 2 x 6	(1) 2x6

SHEAR WALL SCHEDULE

MARK	WALL	PLY/OSB THK. (N).	FIELD	EDGE	BOTTOM PLATE FRAMING AT ADJ. PANEL EDGES	ANCHOR BOLT SPACING	END FRAMING
SW#	2x6	15/32"	8d AT 12" o.c.	8d AT 6" o.c.	2x6	5/8" BOLT AT 32" o.c.	(2) 2X6 STUDS

A PLAN- ROOF FRAMING
ST4 SCALE: 3/8" =1'-0" (22X34)



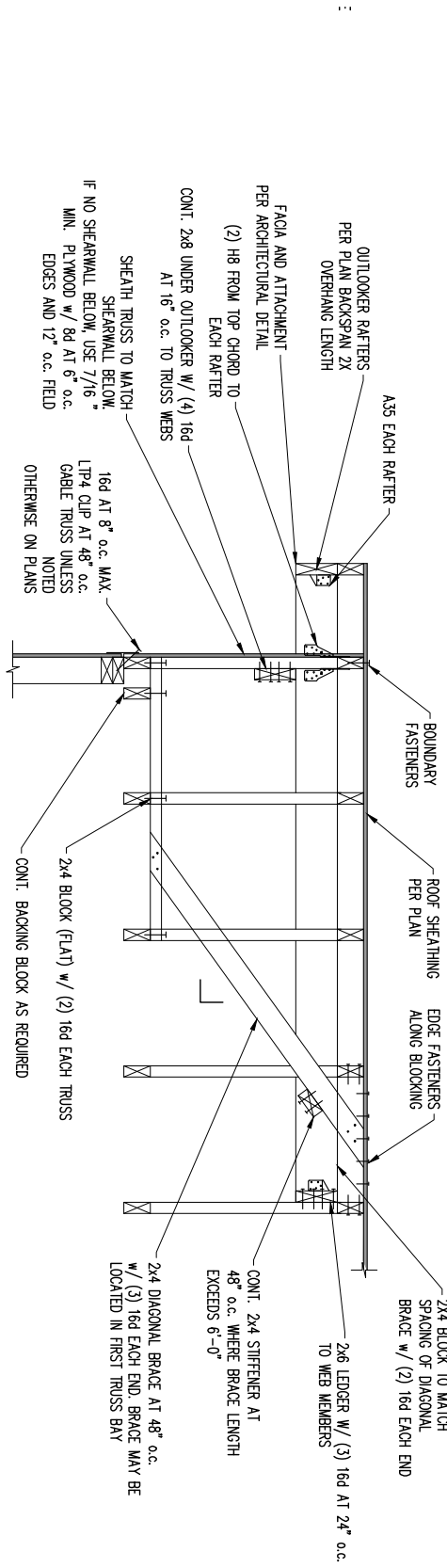
HOLDOWN SCHEDULE

MARK	TYPE	SDS SCREWS	ANCHOR BOLT	MIN BOLT EMBED (IN.)
AA	H012-SDS2.5	6-SDS 1/4" x 2-1/2"	SB 5/8" x 24"	18"

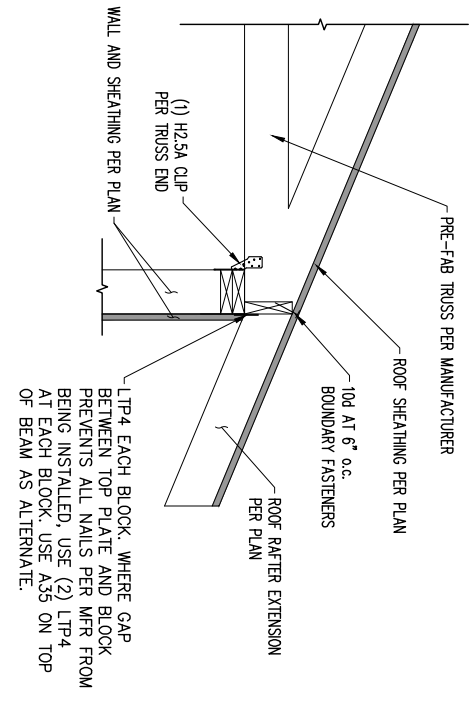
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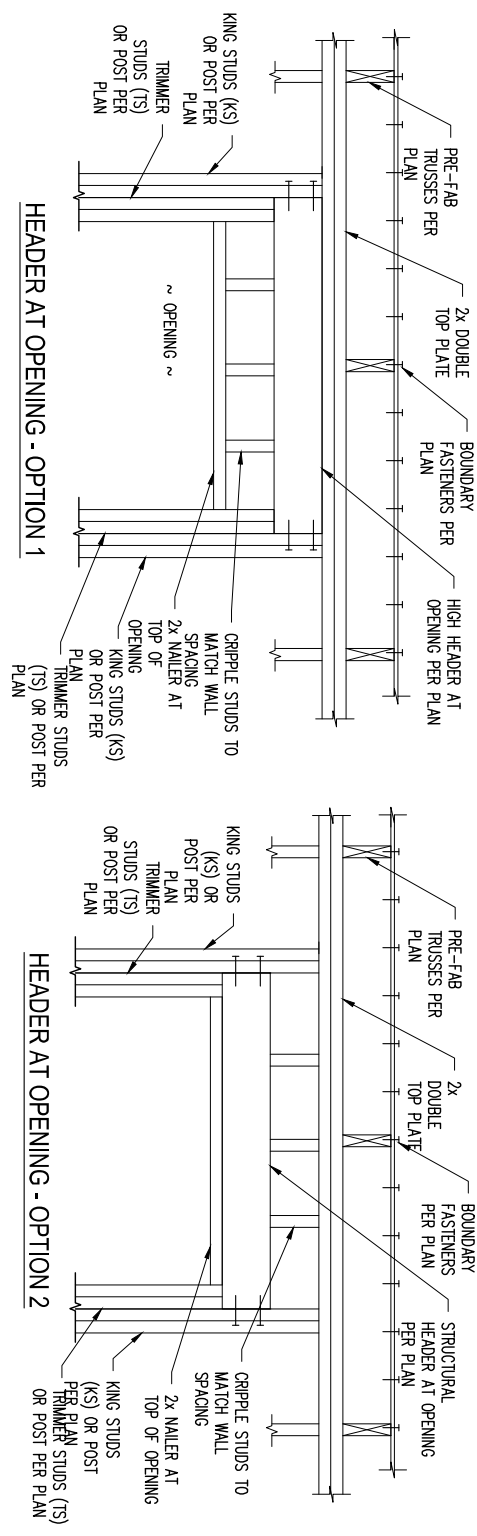
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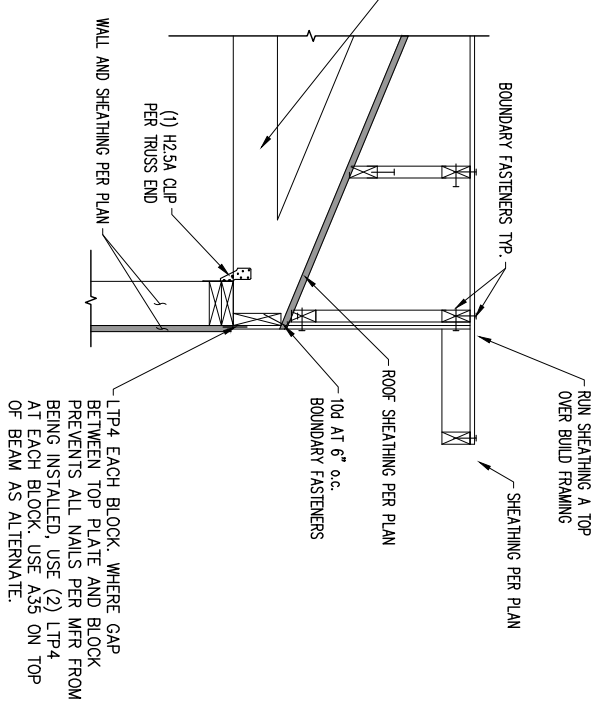
302 END WALL TRUSS
NTS



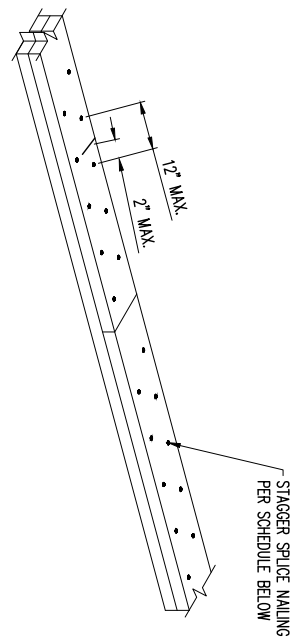
301 TRUSS TO WALL CONN.
NTS



302 FRAMING AT STRUCT. HEADER
NTS
NOTE: (1) TRIMMER STUD AND (1) KING STUD REQUIRED WHERE NOT NOTED ON PLAN



304 OVERBUILD FRAMING
NTS



TOP PLATE	# OF NAILS EA. SIDE OF SPLICE
2x4	32
2x6	44
2x8	54

OF NAILS REPRESENTS NAILS REQ'D TO EQUAL STRENGTH OF TOP PLATE

305 TOP PLATE SPLICE TYP.
NTS

REV. NO.

DATE

COMMENT

PROFESSIONAL SEAL

01/07/2020

NO. 548190230

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07062	SH	SH	SH	34 of 44	

ELECTRICAL STANDARDS LEGEND
(ALL SYMBOLS MAY NOT BE USED IN DRAWINGS)

	DIRECT BURIED OR CONCRETE EMBEDDED CONDUIT		240 V RECEPTACLE
	CONDUIT RUN EXPOSED		CIRCUIT BREAKER
	PROCESS FLOW		20A 3P CIRCUIT BREAKER - UPPER NUMBER INDICATES AMP TRIP RATING - LOWER NUMBER INDICATES POLES
	PNEUMATIC SIGNAL		MOTOR OVERLOAD
	ELECTRICAL SIGNAL		EQUIPMENT GROUND
	PANEL OR ENCLOSURE		LIGHT SWITCH, SINGLE POLE, MOUNT 4'-6" ABOVE FLOOR ON BUILDING WALL
	STAND-BY GENERATOR		GENERATOR MAIN BREAKER
	GENERATOR MAIN BREAKER		LIGHT SWITCH, SINGLE POINT MOUNT 4'-6" ABOVE FLOOR ON BUILDING WALL, WEATHER PROOF
	WALL PACK FIXTURE, MOUNTING HEIGHT AS INDICATED IN DRAWINGS		RELAY
	FLOOD LIGHT		TIMING RELAY
	EMERGENCY EXIT SIGN		TIMING DELAY RELAY
	EMERGENCY LIGHTING PACK		CONTROL RELAY COIL
	HIGH/LOW BAY LED FIXTURE AS INDICATED IN DRAWINGS AND EQUIPMENT SCHEDULE		MAGNETIC RELAY
	1' X 4' LED FIXTURE AS INDICATED IN DRAWINGS AND EQUIPMENT SCHEDULE		MOMENTARY PUSH-BUTTON SWITCH
	INDICATOR LAMP - LETTER INDICATES COLOR		HAND-OFF-AUTO SELECTOR SWITCH
	FLASHING BEACON - LETTER INDICATES COLOR		NORMALLY CLOSED PUSHBUTTON
	MOTION SENSOR		NORMALLY OPEN PUSHBUTTON
	EXHAUST FAN		RUNNING TIME METER
	OTHER LIGHT FIXTURE AS INDICATED IN DRAWINGS.		MOTOR STARTER - NUMBER INDICATES SIZE
	AUDIBLE ALARM OR HORN		NORMALLY CLOSED CONTACTS
	UNDERGROUND JUNCTION/PULLBOX - SIZE 5 UNLESS OTHERWISE INDICATED		NORMALLY OPEN CONTACTS
	STEEL JUNCTION/PULLBOX		CONTACTOR OR STARTER, NUMBER DENOTES NEMA SIZE
	ELECTRIC MANHOLE		MOTOR - NUMBER INDICATES HORSEPOWER RATING
	FUSE: XX - DENOTES AMPERAGE		CONDUIT IDENTIFICATION, REFER TO CONDUIT AND CONDUCTOR SCHEDULE FOR QUANTITY AND FILL:
	120 V GROUND FAULT INTERRUPTER DUPLEX RECEPTACLE		CONDUCTOR SCHEDULE FOR QUANTITY AND FILL: YYY = ID
	120 V DUPLEX RECEPTACLE, WP (WEATHERPROOF)		OTHER SYMBOLS AS SHOWN ON DRAWINGS

GENERAL ELECTRICAL ABBREVIATIONS

MCP	MOTOR CIRCUIT PROTECTOR	CB	CIRCUIT BREAKER	EMH	ELECTRICAL MANHOLE	RTU	REMOTE TERMINAL UNIT
NC	NORMALLY CLOSED	CNTL	CONTROL	MTU	MASTER TERMINAL UNIT	SPD	SURGE PROTECTIVE DEVICE
NO	NORMALLY OPEN	IC	INSTRUMENTATION CONDUIT	TSP	TWISTED SHIELDED PAIRS	PP	POWER PANEL
SPC	SPARE CONDUIT	INST	INSTRUMENT	VFD	VARIABLE FREQUENCY DRIVE	PCP	PUMP CONTROL PANEL
PLC	PROGRAMMABLE LOGIC CONTROLLER	HMI	HUMAN MACHINE INTERFACE	SPIC	SPARE INSTRUMENT CONDUIT		
ATS	AUTOMATIC TRANSFER SWITCH	SSSS	SOLID STATE SOFT START	WP	WEATHERPROOF		
LCP	LOCAL CONTROL PANEL	ACB	AIR CIRCUIT BREAKER	OL	MOTOR OVERLOAD		
C	CONDUIT	AFG	ABOVE FINISHED GRADE	LP	LIGHTING PANEL		

LIGHTNING PROTECTION

1. PROVIDE A COMPLETE LIGHTNING PROTECTION SYSTEM BY VFC OR APPROVED COMPLING WITH NFPA 780. SYSTEM TO INCLUDE: CABLING NETWORK, AIR TERMINALS, CONNECTIONS, SPLICES, BONDING, GROUND RING, GROUND RODS, AND ANY OTHER REQUIRED EQUIPMENT. ALL ROOF MOUNTED EQUIPMENT SHALL BE BONDED AND PROTECTED BY THE LIGHTNING PROTECTION SYSTEM. INSTALLER SHALL PROVIDE A UL MASTER LABEL FOR THE LIGHTNING PROTECTION SYSTEM UPON COMPLETION OF THE PROJECT.
2. REFER TO SPECIFICATION 16065 SP FOR ADDITIONAL DETAILS.

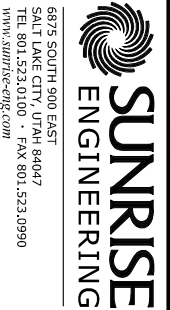
GENERAL ELECTRICAL REQUIREMENTS

1. THE COMPLETED INSTALLATION SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE AND LOCAL CODE ORDINANCES AND REGULATIONS. CONTRACTOR SHALL OBTAIN NECESSARY PERMITS AND INSPECTIONS REQUIRED BY THE GOVERNING AUTHORITIES. ALL WORK SHALL BE DONE IN A NEAT, PROFESSIONAL, FINISHED AND SAFE MANNER, UNDER COMPETENT SUPERVISION. INSTALL GROUNDING AND ALL ELECTRICAL WORK AS REQUIRED BY THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AS WELL AS ANY OTHER APPLICABLE CODES.
2. MATERIAL, EQUIPMENT AND INSTALLATION SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS WHICH ARE PART OF THE CONTRACT DOCUMENTS FOR THIS PROJECT.
3. VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND ALL OTHER FACTORS WHICH MAY AFFECT THE EXECUTION OF THIS WORK. INCLUDE ALL RELATED COSTS IN THE INITIAL BID PROPOSAL.
4. ALL MATERIALS SHALL BE NEW AND OF THE BEST QUALITY, MANUFACTURED IN ACCORDANCE WITH NEMA, ANSI, U.L. OR OTHER APPLICABLE STANDARDS. THE USE OF MANUFACTURER'S NAMES, MODELS AND NUMBERS IS INTENDED TO ESTABLISH STYLE, QUALITY, APPEARANCE, USEFULNESS AND BID PRICE. PROPOSED SUBSTITUTIONS SHALL BE SUBMITTED IN WRITING AND APPROVED BY THE ENGINEER BEFORE ORDERING.
5. PROTECT ALL ELECTRICAL MATERIAL AND EQUIPMENT INSTALLED UNDER THIS PROJECT AGAINST DAMAGE BY OTHER TRADES, WEATHER CONDITION OR ANY OTHER CAUSES. EQUIPMENT FOUND DAMAGED OR IN OTHER THAN NEW CONDITION WILL BE REJECTED AS DEFECTIVE.
6. LEAVE THE SITE CLEAN, REMOVE ALL DEBRIS, EMPTY CARTONS, TOOLS, CONDUIT, WIRE SCRAPS AND ALL MISCELLANEOUS SPARE EQUIPMENT AND MATERIALS USED IN THE WORK DURING CONSTRUCTION. ALL COMPONENTS SHALL BE FREE OF DUST, GRIT AND FOREIGN MATERIALS, LEFT AS NEW BEFORE FINAL ACCEPTANCE OF WORK.
7. ALL CONDUCTORS SHALL BE THHN/THWN COPPER, STRANDED RATED AT 600 VOLTS UNLESS OTHERWISE NOTED. ALUMINUM WIRE WILL NOT BE ALLOWED.
8. ALL CONDUCTORS SHALL BE INSTALLED IN A CONDUIT SYSTEM EXCEPT WHERE NOTED IN DRAWINGS. REFER TO CONDUIT AND CONDUCTOR SCHEDULE FOR CONDUIT TYPE AND SIZE. WHERE CONDUIT SIZE IS NOT CALLED OUT, CONDUIT SHALL BE INSTALLED PER SPECIFICATION 16010 AND SIZED PER LATEST ADOPTED EDITION OF THE NEC.
9. ALL UNDERGROUND CONDUIT TO BE SCHEDULE 40 PVC, MINIMUM DEPTH 30". MINIMUM SIZE 3/4" EXCEPT AS NOTED IN DRAWINGS AND SPECIFICATIONS. ALL UNDERGROUND ELBOWS SHALL BE RIGID LONG SWEEP WRAPPED WITH 3M--50 10 MIL PIPE WRAP OR APPROVED EQUAL EXCEPT FOR COMMUNICATIONS. CABLE AND CONDUIT WHEN SPECIFIED DIFFERENTLY ON THE DETAILED ELECTRICAL DRAWINGS.
9. ALL EXPOSED CONDUIT BELOW 4' SHALL BE IMC OR RIGID STEEL CONDUIT, WITH A MINIMUM SIZE OF 1" EXCEPT AS NOTED IN DRAWINGS AND SPECIFICATIONS. EMT WILL BE PERMITTED ONLY IN WALLS OR ABOVE 4' AFF. EXPOSED PVC CONDUIT SHALL NOT BE PERMITTED UNLESS NOTED OTHERWISE IN DRAWINGS.
10. ALL SAFETY SWITCHES AND OTHER DISTRIBUTION AND CONTROL ELECTRICAL EQUIPMENT SHALL BE RATED FOR HEAVY DUTY SERVICE.
11. ALL WIRING DEVICES SHALL BE SPECIFICATION GRADE GROUNDED BODY TYPE DEVICES.
12. THE CONTRACTOR SHALL INSTALL ALL INSTRUMENTS AND CONTROLS, INCLUDING HVAC AND CONTROL PANELS. THE CONTRACTOR SHALL OBTAIN AND REVIEW ALL INSTRUMENT, CONTROL AND HVAC DRAWINGS FOR TOTAL SCOPE OF WORK.
13. ALL PANELS, DISCONNECTS AND SWITCHGEAR ON THE OUTSIDE OF THE BUILDING SHALL BE NEMA 3R TYPE ENCLOSURES UNLESS OTHERWISE SPECIFIED. CT CABINET AND METER BASE SHALL BE OUTSIDE THE BUILDING.
14. SURGE PROTECTIVE DEVICES (SPD) SHALL BE SIZED FOR 160KA UNLESS OTHERWISE NOTED.
15. ALL CONDUIT FOR ALL EQUIPMENT, INCLUDING EQUIPMENT FURNISHED BY OTHERS, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
16. ALL CONDUIT, WHERE LEAVING ELECTRICAL EQUIPMENT TO GO UNDERGROUND, MUST BE ANCHORED TO THE FOUNDATION WITH STAND-OFF BRACKETS TO ALLOW FOR SUFFICIENT CLEARANCE FOR FOOTINGS AND WALL STUDS ON THE WALLS IN THE BUILDING. ALL RGS CONDUIT AND ELBOWS USED UNDERGROUND WILL BE WRAPPED WITH AN APPROVED PIPE WRAP. (TYP. FOR ALL BUILDINGS)
17. ALL WIRING IN CLASS I HAZARDOUS LOCATIONS SHALL COMPLY WITH NEC 501. WET WELL SHALL BE CONSIDERED CLASS I DIV 1, GROUPS C&D.

REV NO.

COMMENT

DATE



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ELECTRICAL NOTES AND SYMBOLS

BOOSTER STATION

SET NO.

DESIGNED

CHECKED

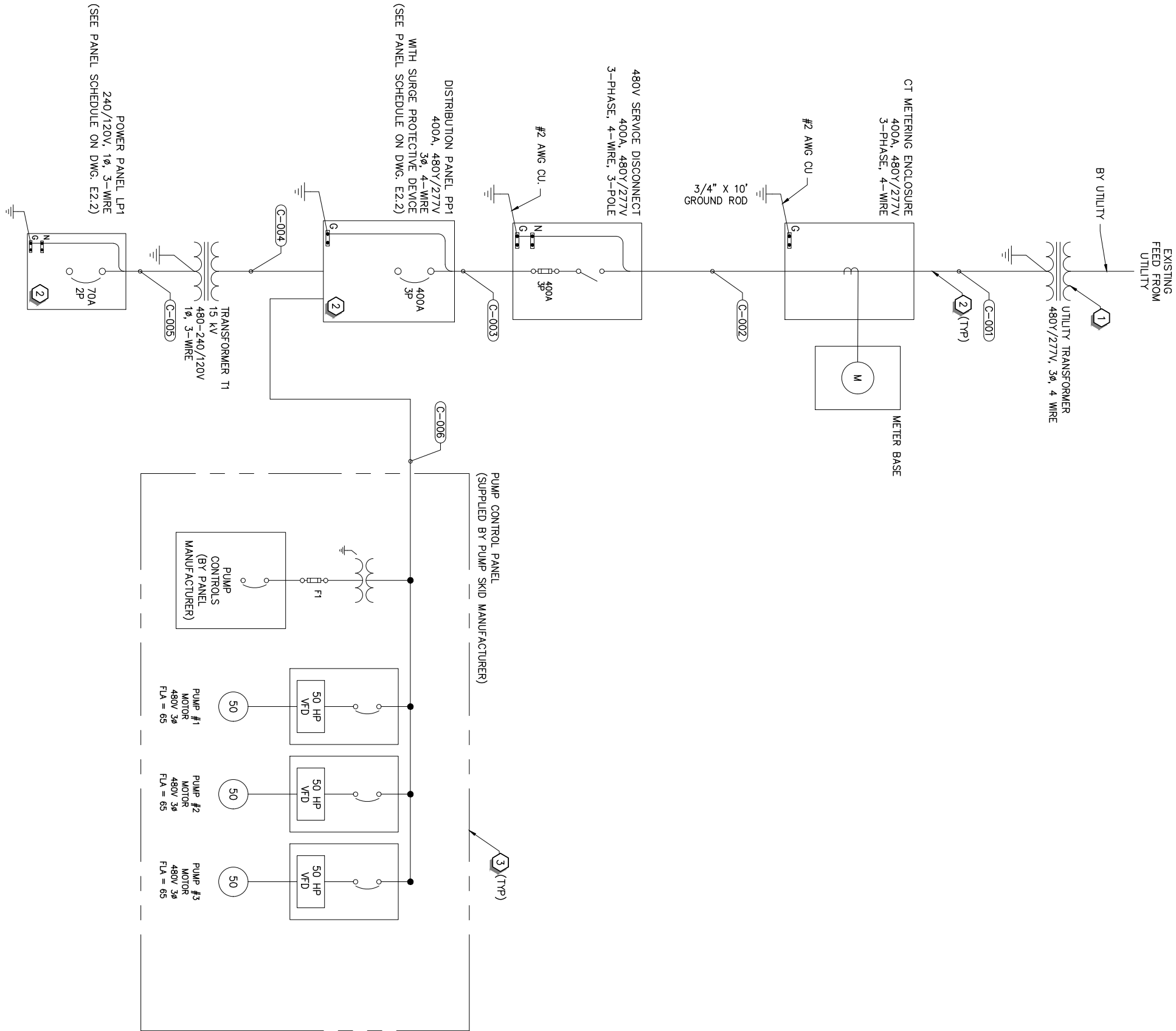
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DATE

SHEET NO.

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E1



SHEET NOTES:

- ONE-LINE DIAGRAM SHOWS PROPOSED CONFIGURATION. CONTRACTOR SHALL CONFIRM ACTUAL CONFIGURATION WITH UTILITY PRIOR TO CONSTRUCTION AND PROVIDE ALL NECESSARY EQUIPMENT PADS, PULL BOXES OR OTHER ITEMS REQUIRED BY UTILITY.
- THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OWNER PRIOR TO CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL TRENCHING, BACKFILL, COMPACTION, AND THE INSTALLATION OF CONDUIT SHOWN AS NEW OR TO BE EXTENDED TO NEW EQUIPMENT LOCATION.
- PROVIDE BONDING AND GREEN INSULATED GROUND FOR ALL ELECTRICAL ENCLOSURES PER LATEST EDITION OF NEC.
- SOME CONDUITS SHOWN AS COMBINED FOR CLARITY. REFER TO CONDUIT SCHEDULE FOR CONDUIT QUANTITY, SIZE AND FILL. LIGHTING AND RECEPTACLE CIRCUITS GENERALLY NOT SHOWN IN CONDUIT AND CONDUCTOR SCHEDULE.
- REFER TO DRAWING E2.2 FOR CONDUIT AND CONDUCTOR SCHEDULE.
- REFER TO DRAWING E4.5 FOR EQUIPMENT SCHEDULE.

KEY NOTES

- COORDINATE ALL SERVICE ENTRANCE WORK WITH UTILITY PRIOR TO CONSTRUCTION TO CONFIRM EXACT LOCATION, CONDUIT SIZE AND OTHER REQUIREMENTS AND UTILITY STANDARDS.
- REFER TO DRAWING E2.2 FOR PANEL SCHEDULES AND CONDUIT/CONDUCTOR SCHEDULE
- PUMP MANUFACTURER TO PROVIDE VFD CABINET AND PUMP SKID. CABINET/SKID COMBINATION ARE DESIGNED TO BE FULLY INTEGRATED AS A UNIT. CONTRACTOR TO SUPPLY CONDUIT AND CONDUCTORS TO CABINET FROM RTU FOR SCADA COMMUNICATION. PUMP CONTROLS SHALL BE PROVIDED WITH THE FOLLOWING I/O:
 - * NORMALLY OPEN DISCREET OUTPUT FOR CHLORINE PUMP START.
 - * 4-20mA ANALOG OUTPUT FOR PRESSURE.

REV NO.		COMMENT		DATE	
SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
S06652	JRK	JRH	JRK	36 of 42	E2.1
ELECTRICAL ONE-LINE DIAGRAM					
BOOSTER STATION					
KAYSVILLE CITY					
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PANEL PP1 KAYSVILLE CITY PUMP STATION															500A CU Bus			
VOLTAGE		PH		WIRE												35 KA SC Rating (RMS)		
480/277		3		4 - WIRE												42 CIRCUIT PANEL		
						PANEL SCHEDULE CIRCUIT										400 AMP MAIN CB		
CKT NO.	AMPS	POLE	DESCRIPTION	LOAD (VA)			AMPS			LOAD (VA)			DESCRIPTION	POLE	AMPS	CKT NO.		
			LIGHT	RECEP	OTHER	A	B	C	OTHER	RECEP	LIGHT							
1	300	3	PUMP CONTROL PANEL	0	0	173500	211.2	23.9		11450	0	0	TRANSFORMER T1	2	40	2		
3	-	-	..	0	0	0		211.2	23.9		0	0	..	-	-	4		
5	-	-	..	0	0	0			211.2	0.0	0	0		-		6		
7	-	-		0	0	0	0.0	0.0		0	0	0		-		8		
9	-	-		0	0	0		0.0	0.0	0	0	0		-		10		
11	-	-		0	0	0			0.0	0.0	0	0		-		12		
				0	0	173500	235		235	211	11450	0	0	Total AMPS				
				Subtotal Watts		173500								11450	Total AMPS			
				Total Watts		186950								Average Amps		PP1		
NEC DIVERSIFIED LOAD CALCULATIONS															PANEL NAME: PP1			
LIGHTING AND CONTINUOUS LOADS: (100% CONNECTED LOAD PLUS 25%)										0.0 KVA		Lighting Total Calculated KVA:					0.0	
RECEPTACLES: (FIRST 10KVA @ 100% REMAINDER @50%)										0.0 KVA		Receptacles Total Calculated KVA:					0.0	
ALL OTHER LOADS @ 100%: MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED AT 125% PER NEC										187.0 KVA		Other Loads Total Calculated KVA:					187.0	
										DIVERSIFIED TOTAL KVA							187.0	
										AVERAGE AMPS PER PHASE							225.0	

CONDUIT AND CONDUCTOR SCHEDULE									
CONDUIT TAG	DESCRIPTION	FROM	ROUTING	TO	MIN. CONDUIT	SIZE	C	GND	VOLTAGE
					(QTY)	SIZE			
C-000	UTILITY SERVICE			UTILITY TRANSFORMER					
C-001	UTILITY SERVICE			UTILITY TRANSFORMER	1	4"			480
C-002	METERING SERVICE			CT ENCLOSURE	1	3/4"			480
C-003	FEEDER TO BUILDING DISCONNECT			CT ENCLOSURE	2	2"	(4)	#3/0	480
C-004	FEEDER TO PANEL PP1			DISCONNECT	2	2"	(4)	#3/0	480
C-005	FEEDER TO TRANSFORMER T1			PANEL PP1 - 2,4	1	3/4"	(2)	#8	480
C-006	FEEDER TO PANEL LP1			TRANSFORMER T1	1	1"	(3)	#3	240
C-007	POWER TO RTU			PANEL LP1-2	1	3/4"	(3)	#12	120
C-008	POWER TO PUMP CONTROL PANEL			PANEL PP1-1,3,5	1	2"	(3)	#1/0	480
C-009	CONTROL TO PUMP CONTROL PANEL			RTU	1	1"			
C-010	POWER TO PUMP #1			PUMP CONTROL PANEL	1	3/4"	(2)	#4	480
C-011	POWER TO PUMP #2			PUMP CONTROL PANEL	1	3/4"	(2)	#4	480
C-012	POWER TO PUMP #3			PUMP CONTROL PANEL	1	3/4"	(2)	#4	480
C-013	TANK COMMUNICATIONS			RTU	1	1"	(3)	#8	480
C-014	MAG METER POWER			PANEL LP1-5	1	3/4"	(2)	#12	120
C-015	MAG METER CONTROL			RTU	1	3/4"	(1) #16 TSP (2) #14	#14	CTRL
C-016	DOOR INTRUSION SENSOR			RTU	1	3/4"	(2) #14	#14	CTRL
C-017	FEEDER TO ELECTRIC UNIT HEATER			PANEL LP1-8,10	1	3/4"	(2) #12	#12	240
C-018	FEEDER TO AIR HANDLER / CONDENSER UNIT			PANEL LP1-4,6	1	3/4"	(2) #10	#10	240
C-019	FEEDER TO AIR HANDLER / CONDENSER UNIT			DISCONNECT SWITCH	1	3/4"	(2) #10	#10	240
C-020	FEEDER TO AIR HANDLER			CU-1	1	3/4"	(2) #10	#10	240
C-021	CHLORINE PUMP FEEDER			PANEL LP1-5	1	3/4"	(2) #12	#12	120
C-022	CHLORINE PUMP CONTROL			PUMP CONTROL PANEL	1	3/4"	(2) #14	#14	CTRL
C-023	CHLORINE ANALYZER FEEDER			PANEL LP1-7	1	3/4"	(2) #12	#12	120
C-024	CHLORINE ANALYZER SIGNAL			RTU	1	3/4"	(1) #16 TSP		CTRL
C-025	CHLORINE PACING SIGNAL			RTU	1	3/4"	(1) #16 TSP		CTRL
C-026	PUMP CONTROLS			PUMP CONTROL PANEL	1	1"			CTRL

PANEL LP1 KAYSVILLE CITY PUMP STATION															CU Bus								
VOLTAGE		PH	WIRE											70 AMP MAIN CB									
240/120		1	3 - WIRE	PANEL SCHEDULE CIRCUIT																			
CKT NO.	AMPS	POLE	DESCRIPTION	LOAD (VA)			AMPS			LOAD (VA)			DESCRIPTION	POLE	AMPS	CKT NO.							
				LIGHT	RECEP	OTHER	A	B	OTHER	RECEP	LIGHT												
1	20	1	BUILDING LIGHTS	350	0	0	2.9	10.0			1200	0	0	RTU	1	20	2						
3	20	1	BUILDING OUTLETS	0	720	0			6.0	24.0	5760	0	0	CU-1 / AH-1	2	30	4						
5	20	1	CHLORINE PUMP	0	0	50	0.4	24.0			0	0	0	..	-	-	6						
7		-		0	0	0			0.0	12.5	3000	0	0	UNIT HEATER EUH-1	2	20	8						
9		-		0	0	0	0.0	12.5			0	0	0	..	-	-	10						
11		-		0	0	0			0.0	0.0	0	0	0		-		12						
13		-		0	0	0	0.0	0.0			0	0	0		-		14						
15		-		0	0	0			0.0	0.0	0	0	0		-		16						
17		-		0	0	0	0.0	0.0			0	0	0		-		18						
				350	720	50	50			43			9960			0	0	Total AMPS					
				Subtotal Watts									9960			Subtotal Watts							
				Total Watts												Average Amps							
NEC DIVERSIFIED LOAD CALCULATIONS															PANEL NAME: A								
LIGHTING AND CONTINUOUS LOADS: (100% CONNECTED LOAD PLUS 25%)															0.4 kVA			Lighting Total Calculated kVA:			0.4		
RECEPTACLES: (FIRST 10kVA @ 100%, REMAINDER @50%)															0.7 kVA			Receptacles Total Calculated kVA:			0.7		
ALL OTHER LOADS @ 100% MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED AT 125% PER NEC															10.0 kVA			Other Loads Total Calculated kVA:			11.5		
															DIVERSIFIED TOTAL kVA			12.6					
															AVERAGE AMPS PER PHASE			52.5					

REV NO.

COMMENT

DATE



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KAYSVILLE CITY
BOOSTER STATION

ELECTRICAL SCHEDULES

SET NO.
S06652

DESIGNED
JRK

DRAWN
JEH

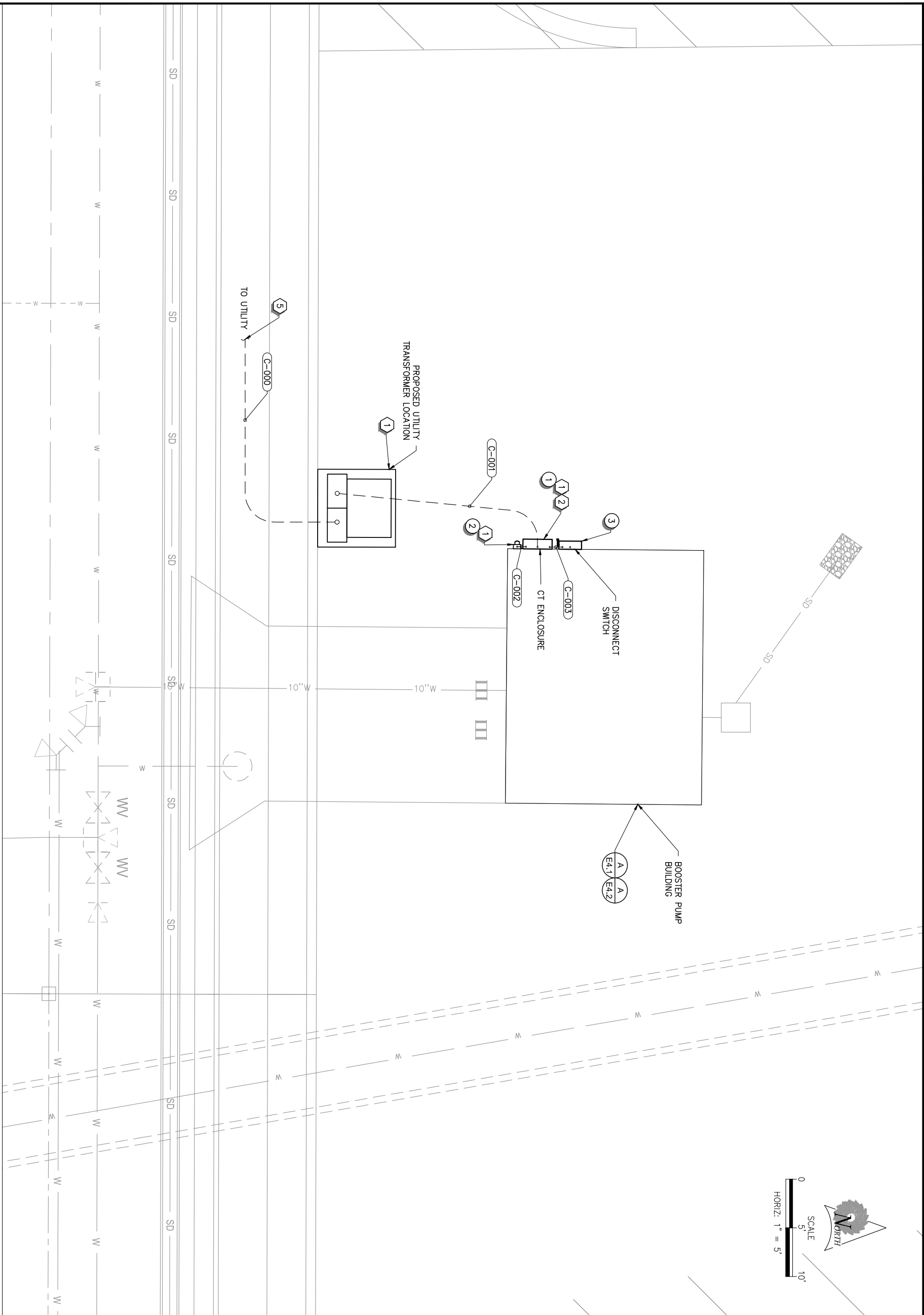
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JRK

SHEET NO.
37 of 42

E2.2

P:\kaysville\00000 booster station\electrical\dwg\Electrical One-line Diagram & Schedules.dwg Jan 06, 2020 12:57pm rknapp

EXHIBIT B



- SHEET NOTES:**
1. THE CONTRACTOR WILL BE RESPONSIBLE TO LOCATE ALL EXISTING UNDERGROUND UTILITIES BEFORE ANY EXCAVATION IS PERFORMED. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED TO NEW CONDITION OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
 2. NOT ALL CONDUITS ARE SHOWN. REFER TO CONDUIT AND CONDUCTOR SCHEDULE FOR INDIVIDUAL CONDUIT FILL REQUIREMENTS. CONDUIT LAYOUT SHOWN IS DIAGRAMMATIC ONLY. CONTRACTOR SHALL FIELD ROUTE AS NECESSARY TO ACCOMMODATE FIELD CONDITIONS AND AVOID OTHER STRUCTURES AS REQUIRED.
 3. REFER TO DRAWING E2.2 FOR CONDUIT IDENTIFICATION.
 4. REFER TO DRAWING E4.3 FOR EQUIPMENT SCHEDULE.

KEY NOTES

- 1 CONTRACTOR SHALL COORDINATE WITH UTILITY FOR ALL SERVICE ENTRANCE WORK. CONTRACTOR SHALL PROVIDE AND INSTALL CONDUIT, FITTINGS AND TRENCHING BETWEEN TRANSFORMER AND BUILDING SERVICE ENTRANCE. ALL 90 DEGREE ELBOWS SHALL BE LONG-SWEEP WITH MIN. 36" RADIUS. CONDUIT SHALL BE BURIED PER UTILITY REQUIREMENTS.
- 2 CONTRACTOR SHALL PROVIDE AND INSTALL CT ENCLOSURE, METERBASE, CONDUIT, FITTINGS, MOUNTING HARDWARE, AND ALL ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION OF SERVICE ENTRANCE EQUIPMENT.
- 3 ALL BURIED RIGID CONDUIT SHALL BE TAPE WRAPPED TO 4" ABOVE GRADE WITH 3M-50 10 MIL PIPE WRAP OR APPROVED EQUAL.
- 4 TRANSFORMER BY UTILITY, PAD BY CONTRACTOR. CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS AND LOCATION WITH UTILITY PRIOR TO CONSTRUCTION.
- 5 DEVELOPER TO PROVIDE AND INSTALL CONDUIT FROM UTILITY TRANSFORMER TO NEAREST UTILITY ACCESS POINT. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH UTILITY PRIOR TO CONSTRUCTION. ROUTE SHOWN IS CONCEPTUAL ONLY AND IS TO BE CONFIRMED BY UTILITY.

REV NO.	COMMENT	DATE
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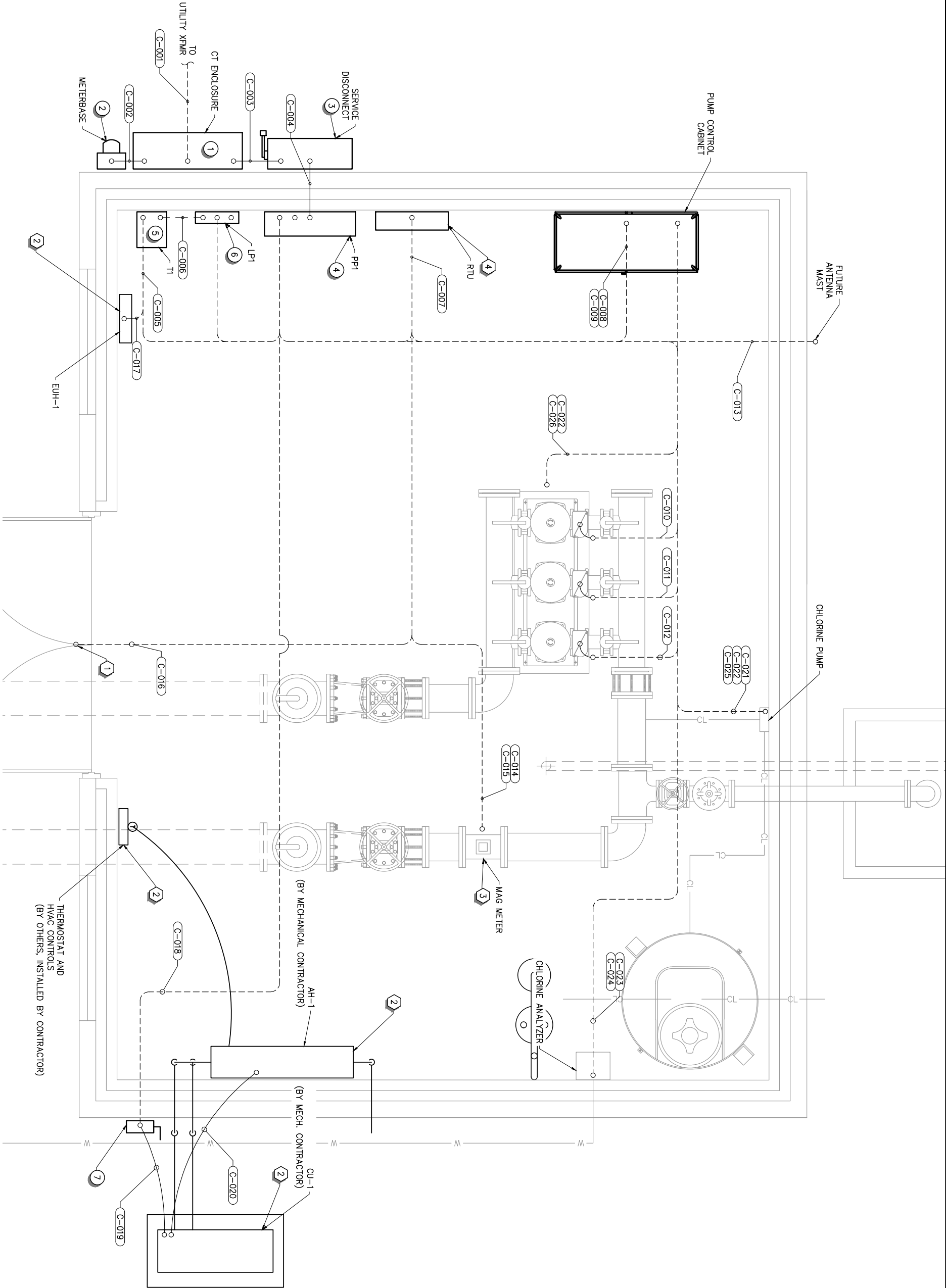


KAYSVILLE CITY

BOOSTER STATION

BOOSTER STATION ELECTRICAL ELECTRICAL SITE PLAN

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	E3
S06652	JRK	JEH	JRK	38 of 42	



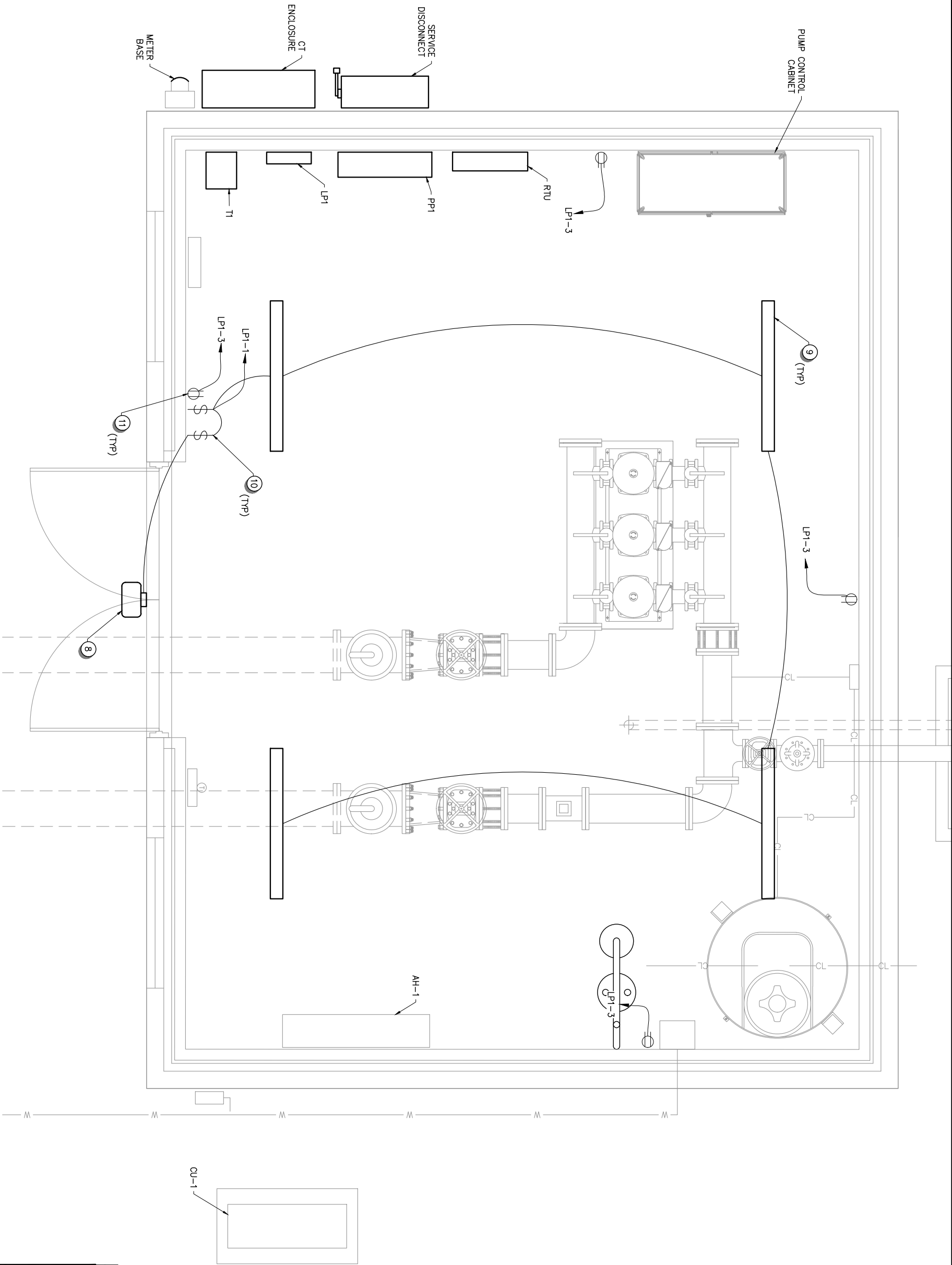
GENERAL NOTES:

1. CONTRACTOR TO COMPLY WITH GENERAL ELECTRICAL REQUIREMENTS ON DRAWING E-1.
2. CONDUITS SHOWN ARE SCHEMATIC ONLY. CONTRACTOR SHALL FIELD ROUTE CONDUIT AS NECESSARY TO AVOID OBSTACLES AND OTHER EQUIPMENT.
3. NOT ALL CONDUITS ARE SHOWN FOR CLARITY. REFER TO CONDUIT AND CONDUCTOR SCHEDULE FOR ADDITIONAL CIRCUITING INFORMATION.
4. SEE DRAWING E2.3 FOR CONDUIT AND CONDUCTOR SCHEDULE.
5. SEE DRAWING E4.5 FOR EQUIPMENT SCHEDULE AND DETAILS.
6. REFER TO MECHANICAL DRAWINGS FOR MECHANICAL EQUIPMENT DETAILS.

KEY NOTES

- 1 CONTRACTOR TO INSTALL CONDUIT TO STUB DIRECTLY INTO TOP OF DOOR FRAME. CONDUIT TO BE CONCEALED IN WALLS AND CEILINGS FOR ZERO VISIBILITY. CONTRACTOR TO COORDINATE STUB LOCATIONS WITH SCADA SYSTEM INTEGRATOR AND ACCESS CONTROL PROVIDER. REFER TO MECHANICAL SHEETS FOR ADDITIONAL CONNECTION INFORMATION AND DETAILS.
- 2 CONTRACTOR SHALL PROVIDE SIGNAL SPLITTER FOR 4-20mA FLOW RATE SIGNAL. SPLITTER SHALL BE LOCATED IN RTU. COORDINATE INSTALLATION OF SIGNAL SPLITTER WITH OWNER'S SYSTEM INTEGRATOR.
- 3 RTU PROVIDED BY OTHERS AND INSTALLED BY CONTRACTOR. CONTRACTOR SHALL COORDINATE INSTALLATION WITH OWNER'S SYSTEM INTEGRATOR.

REV NO.	COMMENT			DATE
05-Jan-2019	J. RANDALL			
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KAYSVILLE CITY				
BOOSTER STATION				
POWER & CONTROL PLAN				
SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
S06652	JRK	JRH	JRK	39 of 42
				E4.1



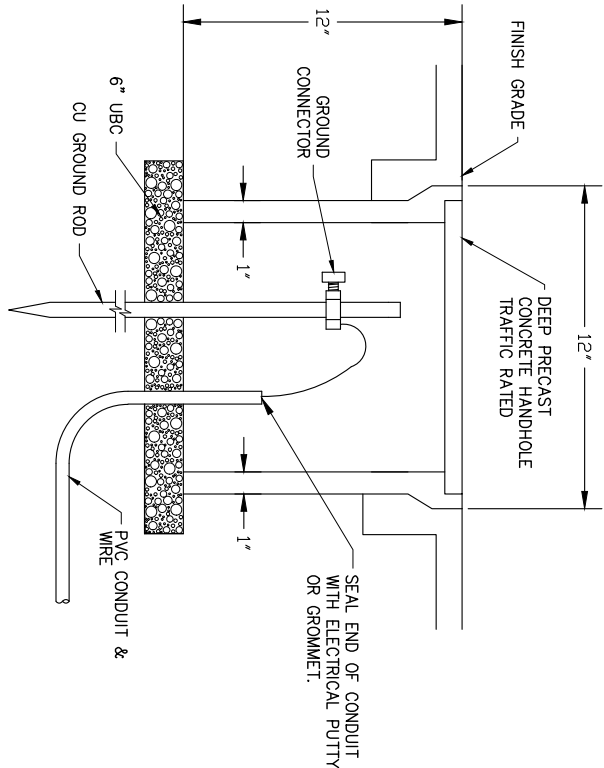
- GENERAL NOTES:
1. CONTRACTOR TO COMPLY WITH GENERAL ELECTRICAL REQUIREMENTS ON DRAWING E-1.
 2. CONDUITS SHOWN ARE SCHEMATIC ONLY. CONTRACTOR SHALL FIELD ROUTE CONDUIT AS NECESSARY TO AVOID OBSTACLES AND OTHER EQUIPMENT.
 3. NOT ALL CONDUITS ARE SHOWN FOR CLARITY. REFER TO CONDUIT AND CONDUCTOR SCHEDULE FOR ADDITIONAL CIRCUITING INFORMATION.
 4. SEE DRAWING E2.3 FOR CONDUIT AND CONDUCTOR SCHEDULE.
 5. SEE DRAWING E4.5 FOR EQUIPMENT SCHEDULE AND DETAILS.
 6. REFER TO MECHANICAL DRAWINGS FOR MECHANICAL EQUIPMENT DETAILS.

A ~ 1" = 1' DETAIL - LIGHTING AND RECEPTACLE PLAN

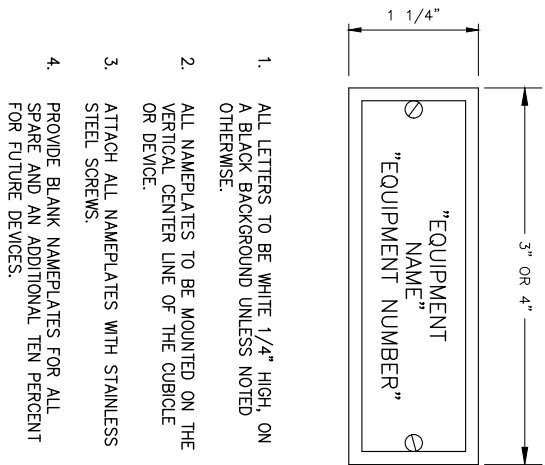
REV NO.	COMMENT			DATE
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SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
S06652	JRK	JRH	JRK	40 of 42
				E4.2

ELECTRICAL EQUIPMENT SCHEDULE					
ITEM #	DESCRIPTION	QUANTITY	MODEL / SPECIFICATION	MANUFACTURER	COMMENTS
①	400A CT ENCLOSURE WITH MOUNTING BRACKETS	1	PER UTILITY REQUIREMENTS	PER UTILITY REQUIREMENTS	COORDINATE SERVICE WORK WITH UTILITY
②	METERBASE	1	PER UTILITY REQUIREMENTS	PER UTILITY REQUIREMENTS	COORDINATE SERVICE WORK WITH UTILITY
③	DISCONNECT SWITCH, 480V, 3-POLE, 400A, HEAVY DUTY, NEMA 3R	1	16400	SQUARE D OR APPROVED	
④	PANEL PP1, 480V/277V, 3ø, 4-WIRE, 400A MAIN CB CU BUS 22 KAIC	1	16400	SQUARE D OR APPROVED	
⑤	TRANSFORMER T1 15KVA, 480-240/120V, DRY TYPE, CU WINDINGS	1	16400	EATON OR APPROVED	
⑥	PANEL LP1, 240/120V, 1ø, 3-WIRE, 70A MAIN CB CU BUS 22 KAIC, 20 CIRCUIT	1	16400	SQUARE D OR APPROVED	
⑦	DISCONNECT SWITCH, 240V, 2-POLE, 30A, HEAVY DUTY, NEMA 3R	1	16010	SQUARE D OR APPROVED	
⑧	GENERAL PURPOSE OUTDOOR WALLPACK LIGHTING FIXTURE	1	OLW14	LITHONIA LIGHTING OR APPROVED EQUAL	
⑨	4' SURFACE MOUNT, VAPOR-TITE, LED STRIP LIGHT	4	XVWL L48 5000LM MVOLT 40K 80CRI	LITHONIA LIGHTING OR APPROVED EQUAL	
⑩	20A HEAVY-DUTY SWITCH	AS SHOWN	CSL120GY	HUBBELL OR APPROVED	
⑪	20A GFCI RECEPTACLE	AS SHOWN	GFI53625GCGY	HUBBELL OR APPROVED	PROVIDE GFCI RECEPTACLES AS INDICATED IN DRAWINGS AND WHERE REQUIRED BY NEC OR LOCAL CODES.

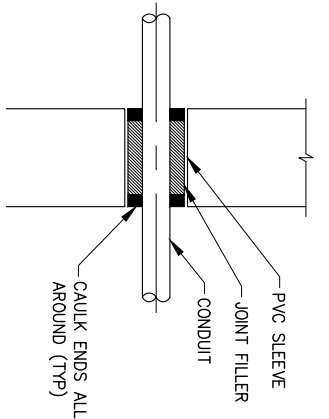
REV NO.		COMMENT		DATE	
  6875 SOUTH 900 EAST SALT LAKE CITY, UTAH 84047 TEL 801.523.0100 • FAX 801.523.0990 WWW.SUNRISE-ENG.COM KAYSVILLE CITY BOOSTER STATION LTG. FIXTURE & EQUIPMENT SCHEDULES SET NO. DESIGNED S06652 JRK DRAWN JEH CHECKED JRK SHEET NO. 41 of 42 E4.3					



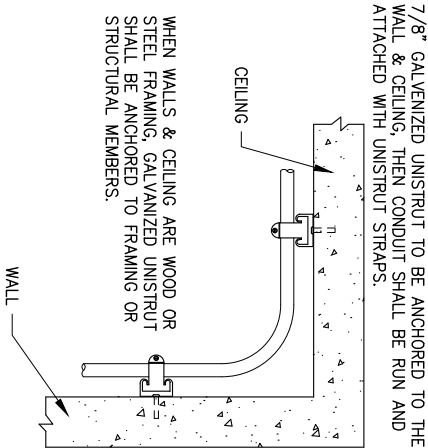
A DETAIL - GROUND WELL
N.T.S.



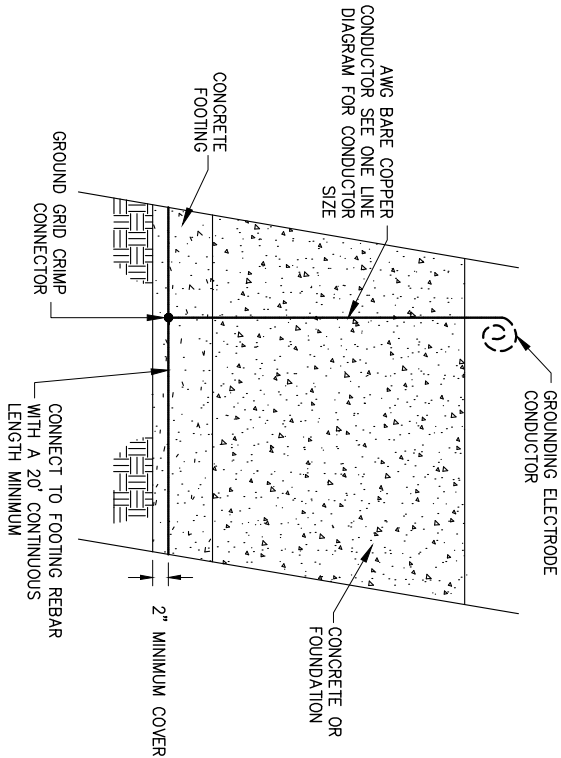
B DETAIL - NAMEPLATE
N.T.S.



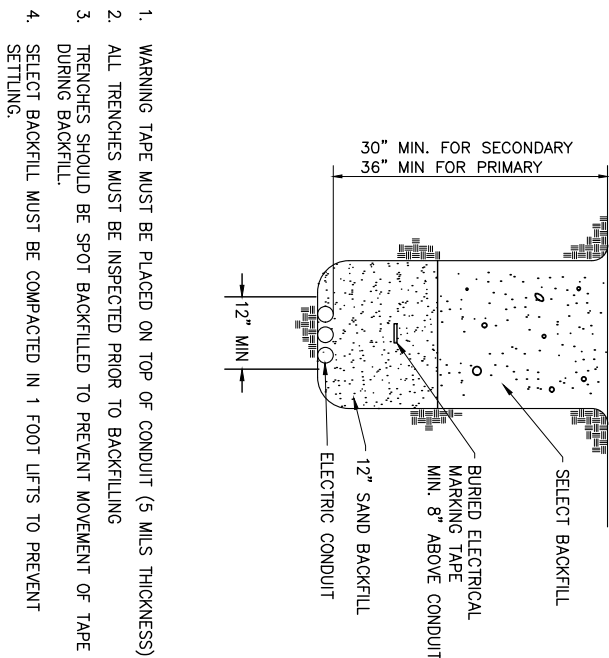
C CONDUIT PENETRATION
N.T.S.



D DETAIL - CONDUIT MOUNT
N.T.S.



E DETAIL - UFER CONCRETE ENCASED
N.T.S.



F DETAIL - UNDERGROUND CONDUIT POWER CABLE TRENCH
N.T.S.

REV NO.	COMMENT	DATE



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KAYSVILLE CITY

BOOSTER STATION

ELECTRICAL DETAILS

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
S06652	JRK	JEH	JRK	42 of 42

E5

GENERAL NOTES

1. WHERE A SPECIFIC MODEL/MANUFACTURER IS LISTED ON THIS SHEET, AN APPROVED EQUAL ITEM MAY BE SUBSTITUTED.

LEGEND OF MECHANICAL SYMBOLS AND ABBREVIATIONS

MECHANICAL

① THERMOSTAT

	RISE OR DROP
	REFRIGERANT LIQUID
	REFRIGERANT SUCTION

CODE INFORMATION

- A. 2015 IBC, 2015 IRC, 2015 IECC & THE STATE OF UTAH AMENDMENTS. ALL SYSTEMS SHALL BEIN COMPLIANCE WITH THE ABOVE CODES AS ADOPTED BY THE STATE OF UTAH.
- B. OUTDOOR AIR VENTILATION PROVIDED AND BASED ON CHAPTER 4, SECTION 402 NATURAL VENTILATION OF THE 2015 IMC.
- C. EQUIPMENT AND APPLIANCES SHALL BE INSTALLED AS REQUIRED BY THE TERMS OF THEIR APPROVAL. IN ACCORDANCE WITH THE CONDITIONS OF THE LISTING, THE MANUFACTURERS INSTALLATION INSTRUCTIONS AND THIS CODE. MANUFACTURERS INSTALLATION INSTRUCTIONS SHALL BE AVAILABLE ON THE JOB SITE AT THE TIME OF INSPECTION PER SECTION 504.1.

SYMBOLS

	DETAIL TAG - TOP FIGURE IS DETAIL NO. BOTTOM FIGURE IS SHEET NO.
	EQUIPMENT IDENTIFICATION
	KEYED NOTE IDENTIFICATION

2015 IECC COMPLIANCE NOTES

1. PROVIDE AUTOMATIC CHANGED/ER 7-DAY PROGRAMMABLE THERMOSTATS FOR EACH ZONE WITH A 2-HOUR OCCUPANT OVERRIDE, INTELLIGENT RECOVERY, AND 16-HOUR MINIMUM BATTERY BACKUP. PROGRAM SETBACK TEMPERATURES TO 80°F COOL AND 65°F HEAT. THERMOSTATS USED TO CONTROL BOTH HEATING AND COOLING SHALL PROVIDE A SETPOINT OVERLAP RESTRICTION(S) SUCH AS A DEADBAND OF AT LEAST 1°F. ALDUE A TEMPERATURE CONTROLS ARE TO BE TESTED, ADJUSTED, AND CALIBRATED FOR PROPER OPERATION. MOUNT ALL THERMOSTATS AND TEMPERATURE SENSORS AS INDICATED ON THE DRAWINGS. COORDINATE EXACT LOCATION WITH THE ARCHITECT. PROVIDE LOCKING COVER AS REQUIRED BY THE ARCHITECT OR THE OWNER. MOUNT BETWEEN 48"-54" AFF.
2. PROVIDE OWNER WITH COMPLETE OPERATION AND MAINTENANCE MANUALS FOR ALL EQUIPMENT AND CONTROLS INSTALLED. DOCUMENTATION MUST INCLUDE EQUIPMENT CAPACITY (INPUT & OUTPUT), REQUIRED MAINTENANCE ACTIONS, CONTROLS AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, CONTROL SEQUENCE DESCRIPTIONS, DESIRED OR HELP-DETERMINED SETPOINTS, AND A COMPLETE NARRATIVE OF HOW EACH SYSTEM IS INTENDED TO OPERATE.

ELECTRIC UNIT HEATER SCHEDULE

ID	MANUFACTURER AND MODEL NUMBER	LOCATION	TYPE	SURFACE	ELECTRICAL			PHYSICAL		NOTES		
					AIRFLOW RATE (CFM)	HEATING CAPACITY (MBH)	HEATING CAPACITY (KW)	AMPS	VOLTPH/Hz		CABINET DIMENSIONS LxWxH (IN)	WEIGHT (LBS)
EUH-1	MARLEY AWH4407F	SEE PLANS			100	10	3	12.5	240/160	4/16/2/20	30	(1)(2)(3)

- (1) DISCONNECT BY ELECTRICAL.
- (2) UNIT HEATER TO BE SERFACE MOUNTED. FIELD VERIFY CONDITIONS.
- (3) UNIT COMPLETE WITH INTERNAL THERMOSTAT. SET TEMPERATURE TO 90 DEGREES F.

AIR HANDLER SCHEDULE

ID	MANUFACTURER AND MODEL NUMBER	LOCATION	AIR		ELECTRICAL		PHYSICAL		NOTES	
			SUPPLY AIRFLOW (CFM)	COOLING LOAD (BTU/H)	HEATING LOAD (BTU/H)	SINGLE POINT VOLT/PH/Hz	CABINET LENGTH/ WIDTH/HEIGHT (IN)	WEIGHT (LB)		
AH-1	LG LS363HLV	PUMP HOUSE	706	33000	35000	230/160	SEE CU-1	47/10.5/14	40	(1)(2)(3)(4)

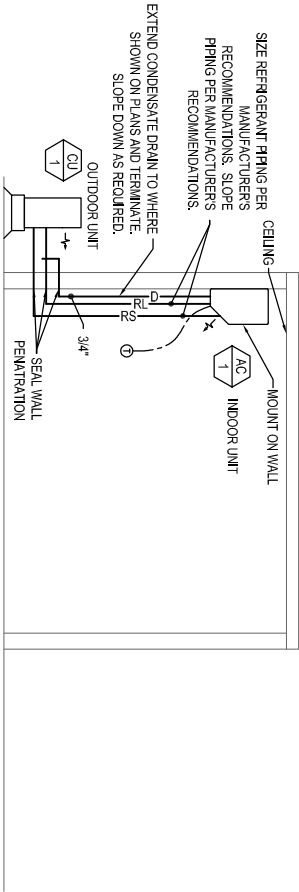
- (1) ELEVATION 4350 FT.
- (2) UNIT COMPLETE WITH 7-DAY PROGRAMMABLE THERMOSTAT CAPABLE OF CONTROLLING ALL UNITS.
- (3) INDOOR UNIT SHALL BE POWERED BY THE OUTDOOR UNIT.
- (4) COOLING CONDITIONS: INDOOR 80/67 DBWB, OUTDOOR 95/75 DBWB, HEATING CONDITIONS: INDOOR 70/59 DBWB, OUTDOOR 47/43 DBWB.

CONDENSING UNIT SCHEDULE

ID	MANUFACTURER AND MODEL NUMBER	LOCATION	USAGE	AIR		DX		ELECTRICAL		PHYSICAL		NOTES
				AIRFLOW RATE (CFM)	HEATING/ COOLING NOMINAL LOAD (BTU/H)	MEDIUM	SINGLE POINT VOLT/PH/Hz	MOP AMPS	CABINET LENGTH/ WIDTH/HEIGHT (IN)	WEIGHT (LB)		
CU-1	LG LSU363HLV	OUTSIDE	HEAT PUMP	2119	33000/35000	R410A	230/160	30	38/14/32	125	(1)(2)(3)	

- (1) ELEVATION 4350 FT.
- (2) DISCONNECT BY DIV. 26. INDOOR UNIT SHALL BE POWERED BY OUTDOOR UNIT.
- (3) COOLING CONDITIONS: INDOOR 80/67 DBWB, OUTDOOR 95/75 DBWB, HEATING CONDITIONS: INDOOR 70/59 DBWB, OUTDOOR 47/43 DBWB.
- (4) UNIT COMPLETE WITH LOW AMBIENT HT TO ALLOW FOR OPERATION DOWN TO -4 DEGREES F.

SPLIT SYSTEM CONDITIONING UNIT DETAIL



REV. NO.	COMMENT	DATE
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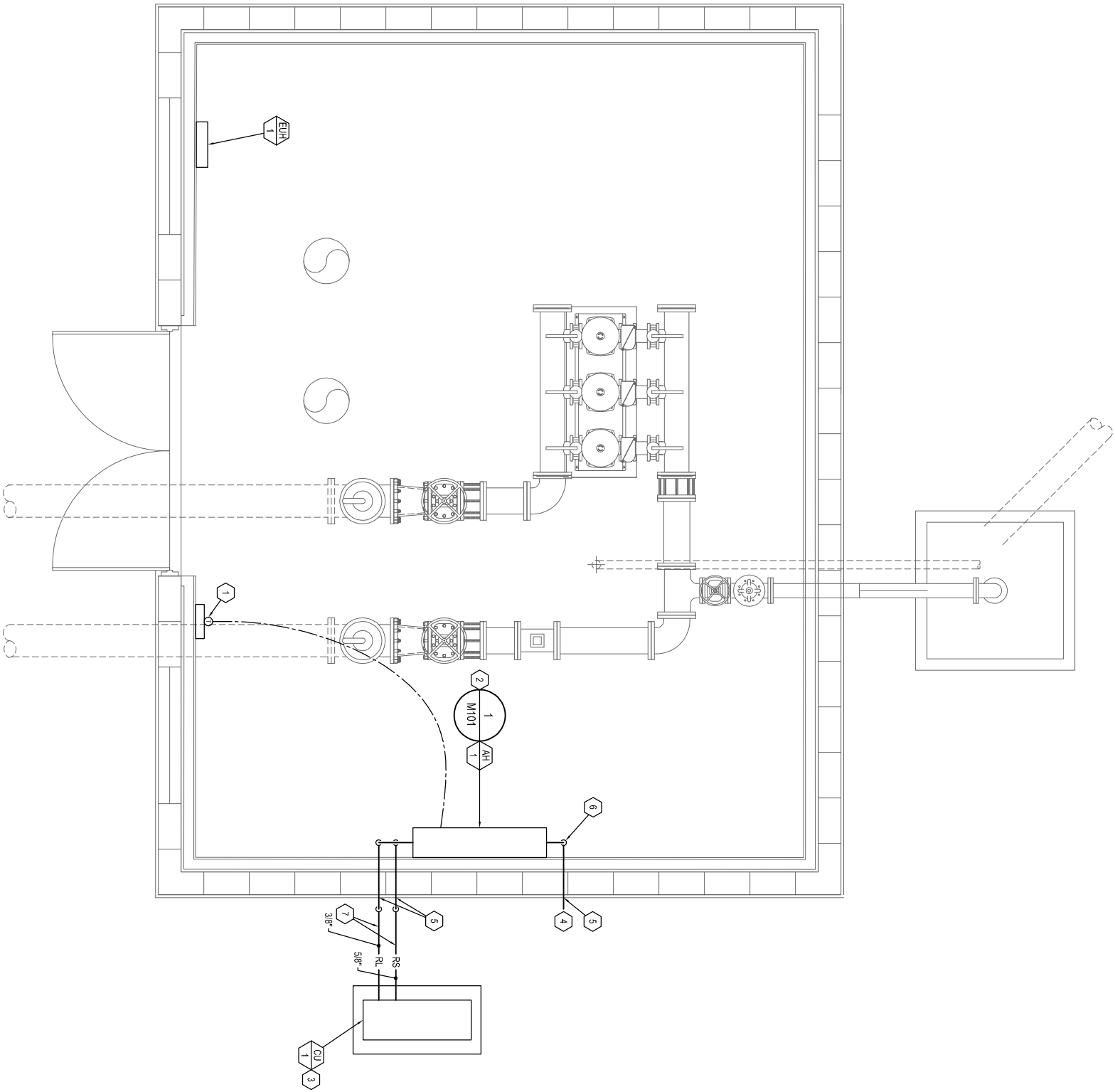


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BOOSTER STATION
MECHANICAL SYMBOLS LEGEND

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
4.1	DBB	ROY	1 of 2	M101



KEYED NOTES

- 1. COORDINATE EXACT MOUNTING LOCATIONS OF THERMOSTAT WITH LATEST REVISIONS OF ALL ARCHITECTURAL AND ELECTRICAL ELEVATIONS. MOUNT THERMOSTAT ON 2" FOAM INSULATION BLOCK.
- 2. MOUNT ON WALL 6 FEET ABOVE FINISHED FLOOR.
- 3. PROVIDE 6" MINIMUM CONCRETE PAD FOR HVAC UNITS. MAINTAIN MANUFACTURERS REQUIRED CLEARANCES.
- 4. CONDENSATE DRAIN PIPING TO TERMINATE ABOVE LANDSCAPE. PROVIDE PEA GRAVEL IN THE LANDSCAPE AREA.
- 5. SEAL WALL PENETRATION WEATHER TIGHT.
- 6. SLOPE 1" PIPING OUT OF BUILDING AT 2%.
- 7. ALL EXTERIOR REFRIGERANT PIPING TO BE PROVIDED WITH A WATER TIGHT ALUMINUM JACKET.

GENERAL NOTES

- 1. CONTRACTOR SHALL OFFSET, TRANSITION AND PROVIDE CHANGES AS REQUIRED FOR COORDINATION WITH OTHER TRADES, TYPICAL.
- 2. MECHANICAL CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT IS PROVIDED AND INSTALLED WITH CLEARANCES PER MANUFACTURER RECOMMENDATIONS. THE CONTRACTOR SHALL MAINTAIN PROPER SERVICE SPACE FOR COIL PULLS, GAS DEVICES, MAINTENANCE ACCESS, ETC.

REV. NO.	COMMENT	DATE
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KAYSVILLE CITY
BOOSTER STATION
MECHANICAL PLAN

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
	ALJ	DBB	ROY	2 of 2	M102



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KAYSVILLE CITY

1.0 MG WATER TANK

2020

KAYSVILLE

JOSH BELNAP, P.E. PUBLIC WORKS DIRECTOR



ENGINEERING CONSULTANTS (SEI)

STEVE HANSEN, P.E. PROJECT MANAGER

CLIFF LINFORD, P.E. PROJECT ENGINEER

RANDY KNAPP, P.E. ELECTRICAL ENGINEER

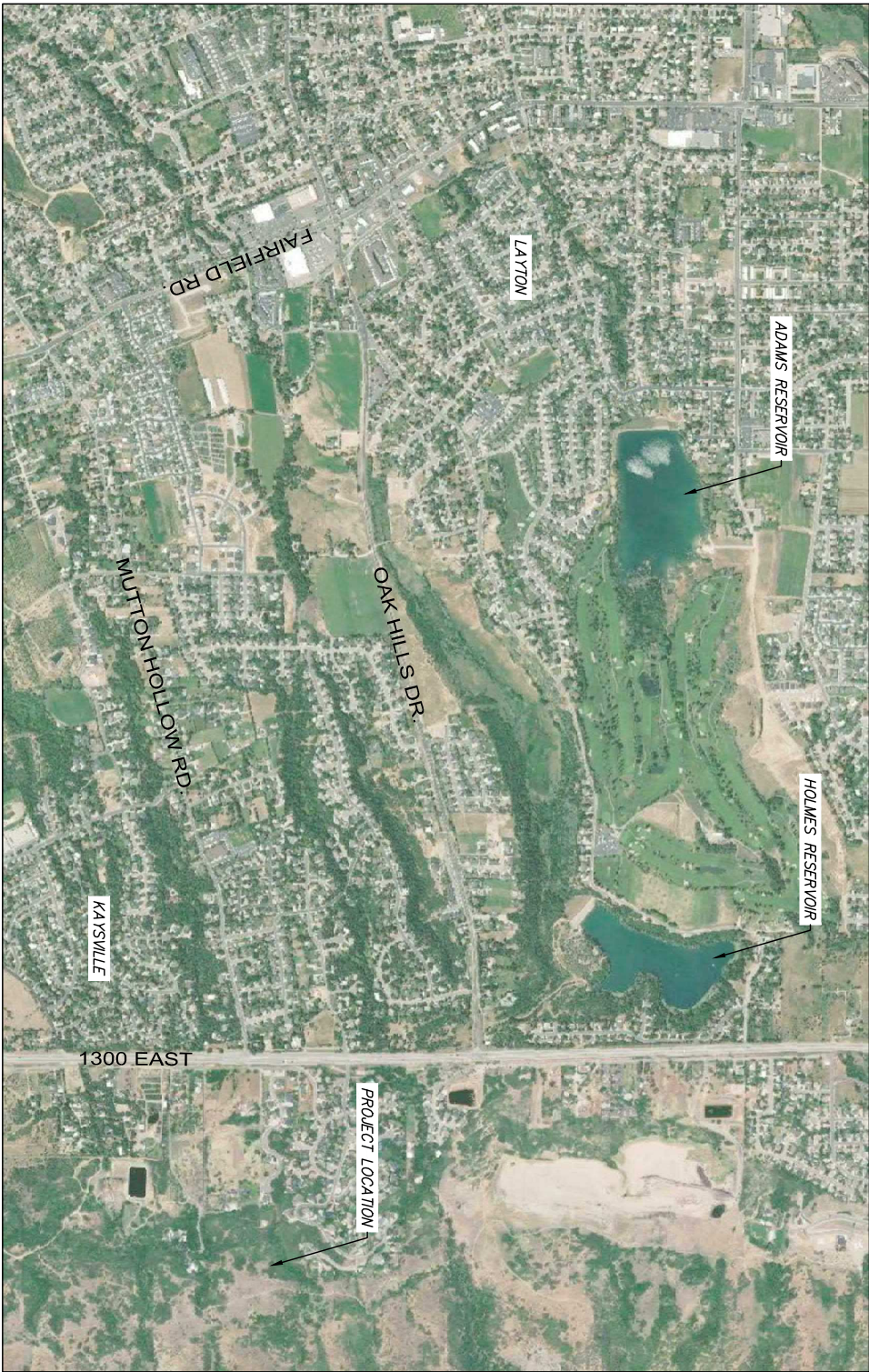


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AREA MAP



NOT TO SCALE



LOCATION MAP



NOT TO SCALE



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STRUCTURAL NOTES	
ABBREVIATIONS AND LEGEND	

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GRADING PLAN - EXCAVATION	
GRADING PLAN - FILL	
GRADING PLAN - ACCESS ROAD	
ACCESS ROAD SECTION VIEW	
PLAN & PROFILE - RETAINING WALLS	
PLAN & PROFILE - PIPE NETWORK	
CIVIL DETAILS	
TANK LAYOUT	
TANK APPURTENANCE DETAILS	
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3 - ELECTRICAL:

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DWG. NO.

SHEET NO.

DWG. NO.

SHEET NO.

DWG. NO.

SHEET NO.

E100
E201
E301
E401
E501-E502

34
35
36
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38-39

PROFESSIONAL SEAL
STATE OF UTAH
No. 546819-2-208
DATE 01/07/2020
HANSEN

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KAYSVILLE CITY

1.0 MG WATER TANK

DESIGNED	TR	CHECKED	SHEET NO.	DATE
07062			2 of 39	G2

GENERAL CONSTRUCTION NOTES

1. ALL WATER LINES SHALL BE INSTALLED AT LOCATIONS AND DEPTHS REQUIRED ON THE PLANS OR AS OTHERWISE DIRECTED BY THE ENGINEER.
2. ALL CONSTRUCTION WORK SHALL BE PERFORMED WITHIN EXISTING RIGHTS-OF-WAY OR EASEMENTS OBTAINED BY KANSVILLE CITY FOR CONSTRUCTION PURPOSES.
3. ALL NEW PIPE SHALL BE DIP CLASS 350, PVC C-900 (DR-25) OR CORRUGATED SMOOTHWALL HDPE UNLESS OTHERWISE SPECIFIED ON THE PLANS. ALL DI FITTINGS SHALL BE MEGA-LUG RESTRAINED, CLASS 250, AWWA C110. THE INSTALLATION OF VARIABLE SIZED OPENINGS IN TEES, ELBOWS, CROSSSES, ETC. WHERE APPLICABLE IS AN ACCEPTABLE ALTERNATIVE TO THE USE OF A CROSS.
4. THE APPROXIMATE LOCATION OF EXISTING UTILITIES ARE SHOWN ON THE PLANS BASED ON THE RECORD DRAWINGS FROM KANSVILLE CITY & RESPECTIVE UTILITIES. BLUE STAKES SHALL BE NOTIFIED BY CONTRACTOR FOR STAKING OF ALL UTILITIES. CONTRACTOR SHALL CONFIRM LOCATION OF ANY EXISTING UTILITIES DISTURBED DURING CONSTRUCTION AND SHALL BE REPLACED OR REPAIRED AT NO ADDITIONAL COST TO THE OWNER.
5. THE EXISTING SYSTEM AND THE PROPOSED IMPROVEMENTS ARE SHOWN AS ACCURATELY AS POSSIBLE. ALL PIPE LOCATIONS AND SIZES ARE SHOWN ACCORDING TO THE INFORMATION AVAILABLE TO THE ENGINEER. HOWEVER, THE ACTUAL FIELD CONDITIONS MAY VARY. APPROVAL BY THE ENGINEER. MAY BE REQUIRED AND LIKEWISE PROPOSED WORK MAY BE ELIMINATED BASED ON ACTUAL FIELD CONDITIONS. SUCH WORK SHALL REQUIRE
6. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL ROAD CONSTRUCTION BARRICADES, CHANNELING DEVICES, AND CONSTRUCTION SIGNS AS REQUIRED BY THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND AS REQUIRED BY THE OWNER AND ENGINEER.
7. TRAFFIC ACCESS SHALL BE MAINTAINED FOR LOCAL RESIDENTS TO THEIR RESPECTIVE PROPERTIES DURING CONSTRUCTION, UNLESS APPROVED OTHERWISE BY THE ENGINEER.
8. ALL DEBRIS RESULTING FROM WORK ON THE PROJECT SHALL BE DISPOSED OF BY THE CONTRACTOR. THE CONTRACTOR SHALL MAKE APPROPRIATE ARRANGEMENTS FOR DISPOSAL SITES AT WHICH DEBRIS MAY BE LAWFULLY DISPOSED.
9. DISTRIBUTION PRELINES SHALL HAVE A MINIMUM OF 4'-0" OF COVER. TRANSMISSION LINES SHALL HAVE A MINIMUM OF 5'-0" OF COVER, UNLESS NOTED DEEPER ON PLANS.
10. THE CONTRACTOR SHALL PROVIDE MEANS OF MANAGING ANY STORM WATER, GROUNDWATER, OR NUISANCE WATER FROM INTERFERING WITH THE CONSTRUCTION OPERATION. COST OF CONTROLLING ALL WATER SHALL BE INCLUDED IN THE CONTRACT PRICE FOR RELATED BID ITEMS.
11. THE WORK IS LOCATED WITHIN KANSVILLE CITY LIMITS AND MUST COMPLY WITH KANSVILLE CITY STANDARDS AND AWWA 2012 STANDARDS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS. THESE INCLUDE, BUT MAY NOT BE LIMITED TO: KANSVILLE CITY BUILDING PERMIT, & SHIPP.
12. THE CONTRACTOR SHALL NOTIFY ALL RESIDENTS AFFECTED BY ANY SERVICE SHUTOFF OR MAINLINE SHUT OFF. 48 HOURS PREVIOUS TO TURNING OFF THE SERVICE. IF THE RESIDENT CANNOT BE CONTACTED THE CONTRACTOR WILL PLACE A FLYER IN VISIBLE SIGHT NOTIFYING THE RESIDENT OF THE WATER SERVICE SHUTOFF.
13. THE CONTRACTOR SHALL NOTIFY KANSVILLE CITY 48 HOURS PRIOR TO ANY MAINLINE SHUT OFF AND COORDINATE WITH CITY PERSONNEL TO SHUT OFF A MAIN.
14. ALL MAIN LINE DISINFECTION AND FLUSHING WILL BE SUPERVISED BY KANSVILLE CITY AND THE RESIDENT INSPECTOR. KANSVILLE CITY WILL BE NOTIFIED FOR TIME, TESTING AND DURATION OF ANY FLUSHING AND TESTING AND WILL ASSIST IN TAKING SAMPLES.
15. ALL EXISTING LINES AND SERVICES ARE TO REMAIN IN SERVICE UNTIL PROPOSED LINES ARE COMPLETED, FINISHED, TESTED AND APPROVED BY KANSVILLE CITY PERSONAL.
16. ALL INSTALLED PIPE SHALL BE INSPECTED, PHOTOGRAPHED AND APPROVED FOR BURIAL BY THE RESIDENT INSPECTOR PRIOR TO PIPE BURIAL. GP'S LOCATION OF ALL FITTINGS, VALVES, ETC. IN PIPES SHALL BE OBTAINED BY CITY PERSONNEL PRIOR TO BURIAL.
17. ALL CONNECTIONS TO EXISTING PIPE SHALL BE POT HOLED PRIOR TO ORDERING FITTINGS. CONTRACTOR, CITY AND ENGINEER SHALL AGREE UPON ALL FITTINGS NECESSARY TO COMPLETE CONNECTIONS.
18. ALL FITTINGS THAT ARE ABOVE GROUND OR IN VAULTS SHALL BE FLANGE FITTINGS WITH STAINLESS STEEL BOLTS.
19. ALL DISTURBED LANDSCAPING, IRRIGATION LINES, AND SOD SHALL BE REPLACED.
20. THE TANK LEVEL CONTROLS SHOULD BE INTEGRATED INTO THE KANSVILLE CITY CONTROL OR SCADA SYSTEM. CONTRACTOR TO COORDINATE WITH KANSVILLE CITY FOR ALL SCADA.
21. ALL TANK INTERIOR METAL COMPONENTS ARE TO BE PROTECTED FROM CORROSION BY USING STAINLESS STEEL PER CONTRACT PLANS & DETAILS. WHERE MATERIAL IS NOT SPECIFIED ON DETAILS OR PLANS, METAL COMPONENTS SHALL BE STAINLESS STEEL.

GENERAL DESIGN CRITERIA

ALL DESIGN DRAWINGS AND CONSTRUCTION MATERIALS HEREIN PROPOSED MEET OR EXCEED THE REQUIREMENTS OF THE UTAH DIVISION OF DRINKING WATER DEPARTMENT OF ENVIRONMENTAL QUALITY.

TANK SIZING

TANK SIZED PER KANSVILLE CITY STORAGE & DISTRIBUTION NEEDS.

TANK HYDRAULICS

TANK INLET

PIPE SIZE	10	IN
ANTICIPATED FLOW RATE	1,000	GPM

TANK TO BE FED BY FUTURE BOOSTER STATION
(NOT INCLUDED IN THIS PROJECT)

TANK OVERFLOW PIPE

OVERFLOW PIPE SIZE	10	IN
OVERFLOW FUNNEL DIAMETER	24	IN
TOTAL MAX. FLOW TO TANK	1,000	GPM
TOTAL MAX. TO OVERFLOW	1,000	GPM
CAPACITY OF OVERFLOW PIPE	5,246	GPM
Ave. SLOPE OF OVERFLOW PIPE	11.7	%
LENGTH OF OVERFLOW PIPE	196	LF

TANK OUTLET

PIPE SIZE TO SYSTEM	10	IN
PIPE PRESSURIZED BY HEAD IN TANK		

TANK DRAIN PIPE (PRESSURIZED)

PIPE SIZE	8	IN
AVG. TIME TO DRAIN TANK	6.6	HRS
AVG. DRAIN FLOW RATE	3,787	GPM
MAX. DRAIN FLOW RATE	4,929	GPM
AVG. SLOPE OF DRAIN PIPE	0.60	%
LENGTH OF DRAIN PIPE	26	LF

REV NO.	COMMENT	DATE
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KANSVILLE CITY

1.0 MG WATER TANK

GENERAL CONSTRUCTION NOTES & DESIGN CRITERIA

DESIGNED

DRAWN

CHECKED

SHEET NO.

07062

SH

TR

CL

3 of 39

G3

Vault Structural Notes

DESIGN CRITERIA:

1. BUILDING CODES:
AC 318-14 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY" ASCE 7-10
"MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES"

2. RISK CATEGORY III PER IBC TABLE 1604.5

3. DESIGN DEAD LOADS:
WEIGHT OF CONCRETE = 150 lb./ CU. FT.

4. LIVE LOAD:
ROOF LIVE LOAD = 40 PSF

5. SNOW LOAD PER ASCE 7-10 AND UTAH AMENDMENT 15A-3-107(6)
GROUND SNOW LOAD = 60 PSF

6. WIND LOADING:
NOT APPLICABLE
BURIED VAULT

7. SEISMIC LOADING:
SITE CLASS "STIFF SOIL"
S₁ = 1.25 g
S₁ = 0.485 g
SD₁ = 0.832 g
SD₀ = 0.488 g
SEISMIC DESIGN CATEGORY D PER ASCE 7.10 TABLE 11.6-2
LATERAL FORCE RESISTING SYSTEM IS SPECIAL REINFORCED CONCRETE SHEAR WALLS

GENERAL REQUIREMENTS:

1. DIMENSIONS: DIMENSIONS SHOWN ON THE PLANS ARE APPROXIMATIONS BASED OFF OF FIELD MEASUREMENTS. CONTRACTOR TO VERIFY ALL DIMENSIONS AND FIELD FIT TO THE EXISTING STRUCTURE

2. THE CONTRACTOR MUST SUBMIT IN WRITING ANY REQUESTS FOR MODIFICATIONS TO THE PLANS AND SPECIFICATIONS. SHOP DRAWINGS SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW DO NOT CONSTITUTE "IN WRITING" UNLESS IT IS CLEARLY NOTED THAT SPECIFIC CHANGES ARE BEING REQUESTED.

3. LOADS FROM CONSTRUCTION MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED FLOORS OR ROOFS. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT LISTED IN THE DESIGN CRITERIA. CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND OR BRACING WHERE STRUCTURE HAS NOT ATTAINED DESIGN STRENGTH.

4. THESE DOCUMENTS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS AS REQUIRED FOR THIS OR SIMILAR LOCALITIES. THEY ASSUME THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKMEN WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS FOR CAN BE EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.

5. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, LAGGING, SHORING, BRACING, FORM-WORK, ETC. AS REQUIRED FOR THE PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION.
8. FOUNDATION REQUIREMENTS
1. FOUNDATIONS FOR THE STRUCTURES SHOWN IN THE PLANS WERE DESIGNED BASED ON THE GEOTECHNICAL INVESTIGATION FOR THE 5MG WATER TANK DATED JUNE 5, 2014. IF SOIL CONDITIONS ARE FOUND TO BE DIFFERENT THAN THE TYPES LISTED ABOVE OR OF UNUSUAL MAKE-UP, OR SUB-STANDARD, PLEASE CONTACT THE ENGINEER OF RECORD.

CONCRETE REQUIREMENTS

1. ALL CONCRETE CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH AC 318 AND ACI 301, EXCEPT AS MODIFIED BY THE CONSTRUCTION DOCUMENTS.

2. CONCRETE SHALL HAVE THE FOLLOWING COMPRESSIVE STRENGTHS:
CONCRETE MIN. FC (28 DAYS) SLUMP W/C RATIO CLASS
FOUNDATIONS 4500 PSI 3" TO 5" 0.45 F2
CONCRETE NOT NOTED 4500 PSI 3" TO 5" 0.45 F2
SLUMP: CONCRETE w/ ADMIXTURES SHALL HAVE A MAXIMUM SLUMP OF 5".
STRUCTURAL DESIGN OF FOOTINGS ASSUMED MIN BEARING 2500 PSF.

3. ADMIXTURES:
3.1. AIR ENTRAINMENT ASTM C-260 (provide per ACI 318 SECTION 4.2)
3.2. CALCIUM CHLORIDE NOT PERMITTED.
3.3. ~~CONCRETE SHALL BE DESIGNED BY A CERTIFIED LABORATORY, STAMPED BY AN APPROPRIATELY LICENSED SPECIALTY ENGINEER, AND APPROVED BY THE ENGINEER OF RECORD. MIX DESIGNS SHALL INCLUDE THE PROJECT NAME AND INDICATE THEIR USE WITHIN THE STRUCTURE. MIX DESIGNS SHALL BE PROPORTIONED TO MINIMIZE SHRINKAGE AND HAVE PROVEN SHRINKAGE CHARACTERISTICS OF 0.05% OR LESS BASED ON TESTING PER ASTM C157.~~
3.4. XYPEX ADMIXTURE REQUIRED IN TANK ROOF. REFER TO TANK PRE-STRESSING PLANS FROM SUPPLIER FOR XYPEX REQUIREMENTS IN OTHER ELEMENTS.

4. CONCRETE MIXES SHALL BE DESIGNED BY A CERTIFIED LABORATORY, STAMPED BY AN APPROPRIATELY LICENSED SPECIALTY ENGINEER, AND APPROVED BY THE ENGINEER OF RECORD. MIX DESIGNS SHALL INCLUDE THE PROJECT NAME AND INDICATE THEIR USE WITHIN THE STRUCTURE. MIX DESIGNS SHALL BE PROPORTIONED TO MINIMIZE SHRINKAGE AND HAVE PROVEN SHRINKAGE CHARACTERISTICS OF 0.05% OR LESS BASED ON TESTING PER ASTM C157.

5. IF USED, EARLY STRENGTH CONCRETE SHALL BE PROPORTIONED TO DEVELOP THE 28 DAY COMPRESSIVE STRENGTH AT THE AGE REQUIRED BY THE CONTRACTOR. CONTRACTOR SHALL SUBMIT TEST DATA FOR REVIEW BY THE STRUCTURAL ENGINEER TO SUBSTANTIATE THE CONCRETE STRENGTH AT THE REQUIRED AGE.

6. ALL CONCRETE SHALL BE NORMAL WEIGHT OF 145 POUNDS PER CUBIC FOOT USING HARD ROCK AGGREGATES CONFORMING TO ASTM C33 U.N.O. WHERE LIGHTWEIGHT CONCRETE IS SPECIFIED, CONCRETE SHALL BE 110 POUNDS PER CUBIC FOOT USING AGGREGATES CONFORMING TO ASTM C330. LARGEST NOMINAL AGGREGATE SIZE SHALL BE 1-1/2" OR GREATER FOR SLABS ON GRADE AND 3/4" OR GREATER FOR ALL OTHER CONCRETE U.N.O.

7. PORTLAND CEMENT SHALL CONFORM TO ASTM C150. TYPE V CEMENT SHALL BE USED FOR CONCRETE IN CONTACT WITH EARTH. TYPE II CEMENT MAY BE USED ELSEWHERE. CEMENT SHALL BE TYPE V WITH POZZOLAN WHERE CONCRETE IS IN CONTACT WITH SOIL CONTAINING HIGH SEVERE SULFATE EXPOSURE.

8. FLY ASH MAY BE USED IN CONCRETE, SUBJECT TO APPROVAL BY THE ARCHITECT AND ENGINEER, PROVIDED THE FOLLOWING CONDITIONS ARE MET:
8.1. FLY ASH SHALL COMPLY WITH ASTM C618.
8.2. CEMENT CONTENT SHALL BE REDUCED A MINIMUM OF 15 PERCENT UP TO A MAXIMUM OF 25 PERCENT WHEN COMPARED TO AN EQUIVALENT CONCRETE MIX DESIGN WITHOUT FLY ASH. FLY ASH CONTENT SHALL NOT COMPRISE MORE THAN 35 PERCENT OF THE TOTAL CEMENTITIOUS CONTENT. THE WATER-CEMENT RATIO SHALL BE CALCULATED BASED ON THE TOTAL CEMENTITIOUS MATERIAL IN THE MIX.

9. 8.3. CLASS F FLY ASH SHALL BE USED IN SULFATE RESISTANT CONCRETE WITH FC EQUAL TO OR GREATER THAN 4000 PSI. CLASS C FLY ASH MAY BE USED ELSEWHERE.
4.4. WATER SOLUBLE CHLORIDE ION CONCENTRATIONS IN CONCRETE SHALL BE LIMITED PER ACI 318, SECTION 4.2.

10. ALL CONCRETE EXPOSED TO FREEZE/THAW CYCLES OR DEICING CHEMICALS SHALL CONFORM TO ACI 318, SECTION 4.2.

11. TIME BETWEEN CONCRETE BATCHING AND PLACEMENT SHALL BE IN ACCORDANCE WITH ASTM C94.

12. CONCRETE MIXING, PLACEMENT AND QUALITY SHALL BE PER IBC SECTION 1905. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED. SLABS ON GRADE NEED BE VIBRATED ONLY AROUND AND UNDER FLOOR DUCTS OR SIMILAR ELEMENTS. REMOVE ALL DEBRIS FROM FORMS BEFORE PLACING CONCRETE. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL SO AS TO CAUSE SEGREGATION OF AGGREGATES. UNCONFINED FALL OF CONCRETE SHALL NOT EXCEED 5 FEET.

13. PROTECT CONCRETE FROM DAMAGE OR REDUCED STRENGTH DUE TO COLD OR HOT WEATHER IN ACCORDANCE WITH ACI 305 AND 306. CONTRACTOR SHALL TAKE SPECIAL CURING PRECAUTIONS TO MINIMIZE SHRINKAGE CRACKING OF CONCRETE SLABS.

14. ALL REINFORCING STEEL SHALL BE SET AND TIED IN PLACE PRIOR TO POURING OF CONCRETE, EXCEPT THAT VERTICAL DOWELS FOR MASONRY WALL REINFORCING MAY BE "FLOATED" IN PLACE. DO NOT FIELD BEND BARS PARTIALLY EMBEDDED IN HARDENED CONCRETE UNLESS SPECIFICALLY INDICATED OR APPROVED BY THE ENGINEER OF RECORD.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PLACEMENT AND LOCATION OF ANY AND ALL EMBEDDED ITEMS INCLUDING PLATES, BOLTS, AND OTHER INSERTS SPECIFIED IN THE DRAWINGS. REINFORCING STEEL FOR PRECAST CONCRETE PANELS SHOWN ON THE DRAWINGS ARE FOR THE GRAVITY, SEISMIC AND WIND LOADS ONLY. LIFTING PROCEDURES OF ALL PRECAST PANELS SHALL BE THE CONTRACTOR'S RESPONSIBILITY. THE CONTRACTOR SHALL SUBMIT A COPY OF THE DESIGN CALCULATIONS AND SHOP DRAWINGS TO THE ENGINEER OF RECORD FOR ALL PRECAST CONCRETE REINFORCEMENT AND LIFTING HARDWARE ASSOCIATED WITH HIS CHOSEN INSTALLATION PROCEDURE.

CONCRETE REQUIREMENTS CONTINUED...

16. ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCEMENT, DOWELS, BOLTS, ANCHORS, SLEEVES, ETC., SHALL BE SECURELY POSITIONED IN THE FORMS.

17. MECH., ELECT., AND PLUMBING PENETRATIONS / EMBEDDED CONDUITS SHALL COMPLY WITH THE FOLLOWING:
17.1. ELECTRICAL CONDUITS MAY BE EMBEDDED IN STRUCTURAL CONCRETE ONLY AS NOTED IN TYPICAL DETAILS FOR WALLS AND CAST-IN-PLACE ELEVATED SLABS (EMBEDDED CONDUITS IN CONCRETE OVER STEEL DECK ARE NOT PERMITTED OR WHERE SPECIFICALLY APPROVED IN WRITING BY THE ENGINEER. PIPING SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE U.N.O. EMBEDDED ITEMS SHALL NOT IMPAIR THE STRENGTH OF THE MEMBER.
17.2. REFER TO TYPICAL DETAILS FOR ACCEPTABLE CONDUIT, PIPING, AND DUCT PENETRATIONS THRU SLABS AND WALLS. DO NOT CUT ANY REIN. THAT MAY INTERFERE WITH PERMITTED PENETRATIONS. OPENINGS SHALL NOT BE CORED WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER THRU THE ARCHITECT. PENETRATIONS THRU BEAMS AND COLUMNS ARE PERMITTED ONLY WHERE SPECIFICALLY DETAILED.

17.3. CONTRACTOR SHALL SUBMIT SHOP DRAWING SHOWING SIZES AND DIMENSIONED LOCATIONS OF ALL PENETRATIONS AND EMBEDDED CONDUITS IN WALLS AND ELEVATED SLABS. SHOP DRAWING MUST BE APPROVED BY ENGINEER PRIOR TO CONCRETE PLACEMENT. PENETRATIONS AND EMBEDDED CONDUITS NOT SHOWN ON APPROVED SHOP DRAWING WILL NOT BE PERMITTED UNLESS SPECIFICALLY APPROVED IN WRITING BY THE ENGINEER.

18. FORMWORK, SHORING, AND RESHORING SHALL BE DESIGNED PER ACI 347 RECOMMENDATIONS BY AN APPROPRIATELY LICENSED SPECIALTY ENGINEER EXPERIENCED IN THIS TYPE OF WORK AND SHALL BE SUBMITTED TO ENGINEER OF RECORD FOR REVIEW. FOR MULTI-STORY CONSTRUCTION, SHORING/RESHORING DESIGN SHALL DEMONSTRATE THAT SHORES/RESHORES WILL BE PROVIDED FOR A SUFFICIENT NUMBER OF FLOORS TO DISTRIBUTE IMPOSED CONSTRUCTION LOADS TO SEVERAL SLAB LEVELS WITHOUT CAUSING EXCESSIVE STRESSES AND SLAB DEFLECTIONS. FOR PURPOSES OF SHORING/RESHORING CALCULATIONS, MAINTENANCE OF REDUCED LIVE LOADS SHALL BE TAKEN TO BE 60% OF VALUES INDICATED IN BASIS FOR DESIGN U.N.O.

19. CONSTRUCTION JOINTS OR POUR JOINTS IN STRUCTURAL ELEMENTS (BEAMS, COLUMNS, ELEVATED SLABS, ETC.) NOT SPECIFICALLY SHOWN OR NOTED ON THE DRAWINGS REQUIRE PRIOR APPROVAL OF THE ENGINEER. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS SHOWING PROPOSED JOINTS TO ENGINEER FOR APPROVAL.

20. CONSTRUCTION JOINT SURFACES SHALL BE CLEANED AND LANTANCE REMOVED. HORIZONTAL JOINT SURFACES SHALL BE ROUGHENED TO 1/4" AMPLITUDE. THOROUGHLY WET ALL JOINT SURFACES AND REMOVE STANDING WATER IMMEDIATELY PRIOR TO NEW CONCRETE PLACEMENT.

21. CONCRETE SHALL BE CURED IN ACCORDANCE WITH ACI 318, SECTIONS 5.11.1, OR 5.11.2, WHICHEVER IS APPLICABLE. UNLESS ALTERNATE METHODS HAVE BEEN APPROVED BY THE ARCHITECT AND ENGINEER, WHERE CURING COMPOUNDS HAVE BEEN APPROVED FOR SLAB CURING, CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING COMPATIBILITY OF COMPOUNDS WITH ANTICIPATED FLOOR FINISH (e.g., RESILIENT TILE) PRIOR TO CURING COMPOUND APPLICATION.
- D. REINFORCING STEEL REQUIREMENTS

1. REINFORCING STEEL SHALL BE DETAILED AND PLACED IN ACCORDANCE WITH ACI 318 AND CRS'S MANUAL OF STANDARD PRACTICE.

2. REINFORCING STEEL SHALL CONFORM TO ASTM A615 OR ASTM A706 (A706 REQUIRED FOR ALL REINFORCING TO BE WELDED) AND SHALL BE GRADE 60 (fy = 60 KSI) DEFORMED BARS U.N.O. REINFORCING IN SLABS ON GRADE MAY BE GRADE 40 (fy = 40 KSI) DEFORMED BARS FOR ALL BARS #4 AND SMALLER U.N.O. ON PLANS OR DETAILS.

3. ALL DIMENSIONS SHOWING THE LOCATION OF REINFORCING STEEL NOT NOTED AS "CLEAR" OR "CLR." ARE TO CENTER OF STEEL. CLEAR COVER FOR NON-PRESTRESSED CONCRETE REINFORCING SHALL BE AS NOTED BELOW. U.N.O. ON PLANS OR DETAILS. CLEAR COVER FOR PRESTRESSED CONCRETE AND FOR PRECAST MANUFACTURED UNDER PLANT CONTROL CONDITIONS SHALL BE PER ACI 318, SECTIONS 7.7.2 AND 7.7.3, RESPECTIVELY.
EXPOSURE CONDITION: COVER:
CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 3"
EXPOSED TO EARTH OR WEATHER (INCLUDES SLABS ON GRADE) 1.1/2"
NO. 5 AND SMALLER 2"
NO. 6 AND LARGER 3/4"
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND STRUCTURAL SLABS, WALLS, JOISTS 1.1/2"
NO. 11 AND LARGER 3/4"
BEAMS, COLUMNS (PRIMARY REINFORCEMENT, TIES, STIRRUPS, SPIRALS) 1.1/2"

4. LAP SPACES OF REINFORCING STEEL SHALL CONFORM TO TYPICAL REBAR LAP SCHEDULE U.N.O. NO TACK WELDING OF REINFORCING BARS ALLOWED. LATEST ACI CODE AND DETAILING MANUAL APPLY. AT WALLS AND FOOTINGS, PROVIDE BENT CORNER BARS TO MATCH LAP WITH HORIZ. BARS AT ALL CORNERS AND INTERSECTIONS U.N.O. VERT. WALL BARS SHALL BE SPICED AT OR NEAR FLOOR LINES. SPACE TOP BARS AT CENTER LINE OF SPAN AND BOTTOM BARS AT THE SUPPORT IN SPANDRELS, BEAMS, GRADE BEAMS, ETC. U.N.O. ON PLANS OR DETAILS.

5. MECHANICAL SPICE COUPLERS SHALL HAVE CURRENT ICC APPROVAL AND SHALL BE CAPABLE OF DEVELOPING 125% OF THE SPICED BARS YIELD STRENGTH.

REINFORCING STEEL REQUIREMENTS CONTINUED...

6. ALL REINFORCING SHALL BE BENT COLD. BARS SHALL NOT BE UNBENT AND RE-BENT. FIELD BENDING OF REBAR SHALL NOT BE ALLOWED UNLESS SPECIFICALLY NOTED.

7. WELDING OF REINFORCING BARS, METAL INSERTS, AND CONNECTIONS SHALL BE MADE ONLY AT LOCATIONS SHOWN ON PLANS OR DETAILS. SEE WELDING SECTION OF G.S.N. FOR ADDITIONAL REQUIREMENTS.

8. REINFORCING BAR SPACINGS SHOWN ON PLANS ARE MAX. ON CENTER DIMENSIONS. DOWEL, ALL VERT. REINFORCING TO FOUNDATION, SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE. MIN. CLEAR SPACING BETWEEN PARALLEL REINFORCEMENT SHALL BE THE LARGER OF 1-1/2 TIMES NOMINAL BAR DIA. OR 1.3 TIMES MAX. AGGREGATE SIZE OR 1-1/2". CLEAR SPACING LIMITATION APPLIES ALSO TO CLEAR DISTANCE BETWEEN A CONTACT LAP SPICE AND ADJACENT SPICES OR BARS.

9. MIN. REINFORCING AT EDGES OF CONCRETE WALL OPENINGS SHALL BE (2) #5 BARS, EXTEND THE GREATER OF THE DEVELOPMENT LENGTH OF THE BAR PER TYPICAL REBAR LAP SCHEDULE OR 24" MIN. PAST EDGES OF OPENING U.N.O. HOOK ENDS AT INTERFERENCE WITH EXTENSION.

SPECIAL INSPECTION

- SPECIAL INSPECTION AND QUALITY ASSURANCE, AS REQUIRED BY SECTION 1704 OF THE IBC, SHALL BE PROVIDED BY AN INDEPENDENT AGENCY EMPLOYED BY THE OWNER UNLESS NAMED BY THE BUILDING OFFICIAL. THE CONTRACTOR SHALL COORDINATE AND COOPERATE WITH THE REQUIRED INSPECTIONS, ALL TESTING AND INSPECTION REPORTS SHALL BE SENT TO THE ENGINEER OF RECORD FOR REVIEW. ITEMS REQUIRING SPECIAL INSPECTION AND QUALITY ASSURANCE ARE:
1. SOILS PER IBC SECTION 1704.7

1.1. SPECIAL INSPECTION SHALL BE PROVIDED PRIOR TO POURING CONCRETE FOOTINGS.

1.2. SPECIAL INSPECTION SHALL BE PROVIDED PRIOR TO PLACEMENT OF FILL AND DURING PLACEMENT OF FILL.

2. CONCRETE PLACEMENTS PER IBC SECTION 1704.4

2.1. CONTINUOUS SPECIAL INSPECTION SHALL BE PROVIDED

2.2. COLUMNS, SLUMP AND AIR-ENTRAINMENT TEST SHALL BE PERFORMED FOR EVERY 50 CUBIC YARDS OR EACH DAY'S PRODUCTION IF LESS THAN 50 CUBIC YARDS. TEST SHALL BE PERFORMED IN ACCORDANCE WITH ASTM C31 AND C39.

3. CONCRETE REINFORCING STEEL PLACEMENT IBC SECTION 1704.4

3.1. REINFORCING SHALL BE INSPECTED PRIOR TO CONCRETE PLACEMENT.

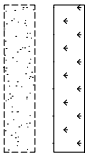
A STRUCTURAL OBSERVATION SHALL BE PERFORMED AND A WRITTEN REPORT SHALL BE SUBMITTED IN ACCORDANCE WITH IBC SECTION 1709.1 & 1709.2. THE SPECIAL INSPECTIONS ARE REQUIRED BY THE IBC CODE SECTION 1704.

1	ADDENDUM #2	COMMENT	02-10-2020	DATE
REV. NO.				
PROFESSIONAL SEAL 02/10/2020 NO. 5261902-200 HANSEN STATE OF UTAH 2036 LINCOLN AVENUE, SUITE 104 CODY, UTAH 84401 TEL 801.692.5515 • FAX 801.692.7167 WWW.SUNRISE-ENG.COM SUNRISE ENGINEERING				
KAYSVILLE CITY				
1.0 MG WATER TANK				
STRUCTURAL DETAIL SHEET				
SHEET NO. 07062	DESIGNED SH	DRAWN SH	CHECKED SH	SHEET NO. 4 of 39
				G4

ABBREVIATIONS

AB	ANCHOR BOLT	HB	HOSE BIB
ALUM.	ALUMINUM	IN. OR "	INCH
∟	ANGLE	ID	INSIDE DIAMETER
APPROX.	APPROXIMATELY	INSUL.	INSULATION
ASSY.	ASSEMBLY	INV.	INVERT
⊙	AT	IPS	IRON PIPE SIZE
AV	ALTITUDE VALVE	IRR	IRRIGATION
B.M.	BENCH MARK	K	CURVE COEFFICIENT
BF	BUTTERFLY VALVE	L	LENGTH
B.W.	BOTH WAYS	LC	LENGTH OF CHORD ON HORIZONTAL CURVE
BTM.	BOTTOM	LF	LINEAR FEET
BLDG.	BUILDING	LVC	LENGTH OF VERTICAL CURVE
BVCS	BEGINNING VERTICAL CURVE STATION	MH	MANHOLE
BVCE	BEGINNING VERTICAL CURVE ELEVATION	MFR.	MANUFACTURER
CB	CHORD BEARING	MAX.	MAXIMUM
CI	CAST IRON	MECH.	MECHANICAL
CL	CENTER LINE	MGD.	MILLION GALLONS PER DAY
Q	CLEAR	MIN.	MINIMUM
CLR.	CLEAR	MID.	MIDDLE POINT OF HORIZONTAL CURVE
CONC.	CONCRETE	NO. OR #	NUMBER
CFM	CUBIC FEET per MINUTE	O.C.	ON CENTER
CFS	CUBIC FEET per SECOND	OD	OUTSIDE DIAMETER
CV	CONTROL VALVE	OF	OVERFLOW
CW	CONCRETE WALL	PC	POINT OF CURVATURE
CY	CUBIC YARD	PT (ROAD)	POINT OF TANGENT
DEG. OR °	DEGREE	PL	PLATE
DIA. OR ø	DIAMETER	PE	POLYETHYLENE
DL	DRAIN LINE	PT	POINT
DWG.	DRAWING	PVI	POINT OF VERTICAL INTERSECTION
DI	DUCTILE IRON	PRV	PRESSURE REDUCING VALVE
EA.	EACH	PVC	POLYVINYL-CHLORIDE
E.F.	EACH FACE	LB. OR #	POUND
ELL.	ELBOW	PSF	POUNDS per SQUARE FOOT
ELEV.	ELEVATION	PSI	POUNDS per SQUARE INCH
ETC.	ETCETERA	R	PROPERTY LINE
ENCE	END OF VERTICAL CURVE ELEVATION	R	RADIUS OF HORIZONTAL CURVE
EVCS	END OF VERTICAL CURVE STATION	RAD	RADIUS
EX.	EXISTING	RD	RING DRAIN
EXST.	EXISTING	RCP	REINFORCED CONCRETE PIPE
EXP.	EXPANSION	REINF.	REINFORCEMENT
E.G.	EXISTING GROUND	REQD.	REQUIRED
F	FOOTING OR FOUNDATION SLAB	REV.	REVISION
F.F.	FINISH FLOOR	R/W	RIGHT-OF-WAY
FT OR '	FEET	SCH.	SCHEDULE
F.G.	FINISH GRADE	SPEC.	SPECIFICATION
FTG.	FITTING	SQ.	SQUARE
FLG	FLANGE	SF	SQUARE FEET
GAL.	GALLON	SI	SQUARE INCHES
GALV.	GALVANIZED	ST. STL.	STAINLESS STEEL
GB	GRADE BREAK	STD.	STANDARD
GSP OR GS	GALVANIZED STEEL PIPE	STA	STATION
GI	GALVANIZED IRON PIPE	T	TANGENT OF HORIZONTAL CURVE
GA.	GAUGE	△	ANGLE BETWEEN TANGENTS HOR. CURVE
GPM	GALLONS per MINUTE	TRP.	TYPICAL
GSN	GENERAL STRUCTURAL NOTES	UBC	UNTREATED BASE COURSE
GV	GATE VALVE	U.N.O.	UNLESS OTHERWISE NOTED
HORIZ.	HORIZONTAL	VERT.	VERTICAL
		W/	WITH

EXISTING

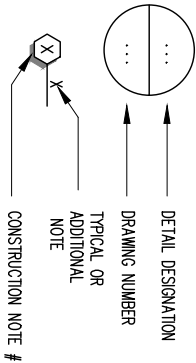
WATERLINE	-----w-----w-----
GAS	-----g-----g-----
FIBER OPTIC	-----fo-----fo-----
TELENSION	-----utv-----t-----
TELEPHONE	-----t-----t-----
POWER LINE	-----uge-----s-----
SEWER LINE	-----s-----s-----
STORM DRAIN	-----sd-----sd-----
FENCE	-----x-----x-----x-----
CENTERLINE	-----
EDGE OF PAVEMENT	-----
PROPERTY LINE	-----
CURB & GUTTER	=====
LANDSCAPED AREA	=====
DIRTROAD	
EXISTING GATE VALVE	
STORM DRAIN MANHOLE	
WATER MANHOLE	
FIRE HYDRANT	
IRRIGATION BOX	
CATCH BASIN	
WATER METER	
SEWER MANHOLE	
POWERSPOLE	
STREET LIGHT	
ELECTRIC BOX	

LEGEND

8" WATER LINE	-----8"W-----
10" OVERFLOW LINE	-----10"OF-----
10" DRAIN LINE	-----10"DL-----
24" STORM DRAIN LINE	-----24"SD-----
6" RING DRAIN LINE	-----6"RD-----
CURB & GUTTER	=====
LANDSCAPED AREA	
DIRT ROAD	
BUTTERFLY VALVE	
GATE VALVE	
11.25" ELBOW	
22.5" ELBOW	
45" ELBOW	
90° ELBOW	
TEE (SIZED BY WATER LINE)	
CROSS (SIZE AS REQD ON PLAN)	
FIRE HYDRANT	
AIR VAC	
BLOW OFF	
REDUCER (SIZE AS REQD ON PLAN)	
CHAIN LINK FENCE	-----o-----
METAL GUARDRAIL	-----x-----
RCP CULVERT	-----Y-----Y-----

12" WATER LINE	-----12"W-----
16" WATER LINE	-----16"W-----
24" WATER LINE	-----24"W-----
CENTERLINE	-----
CURB & GUTTER	=====

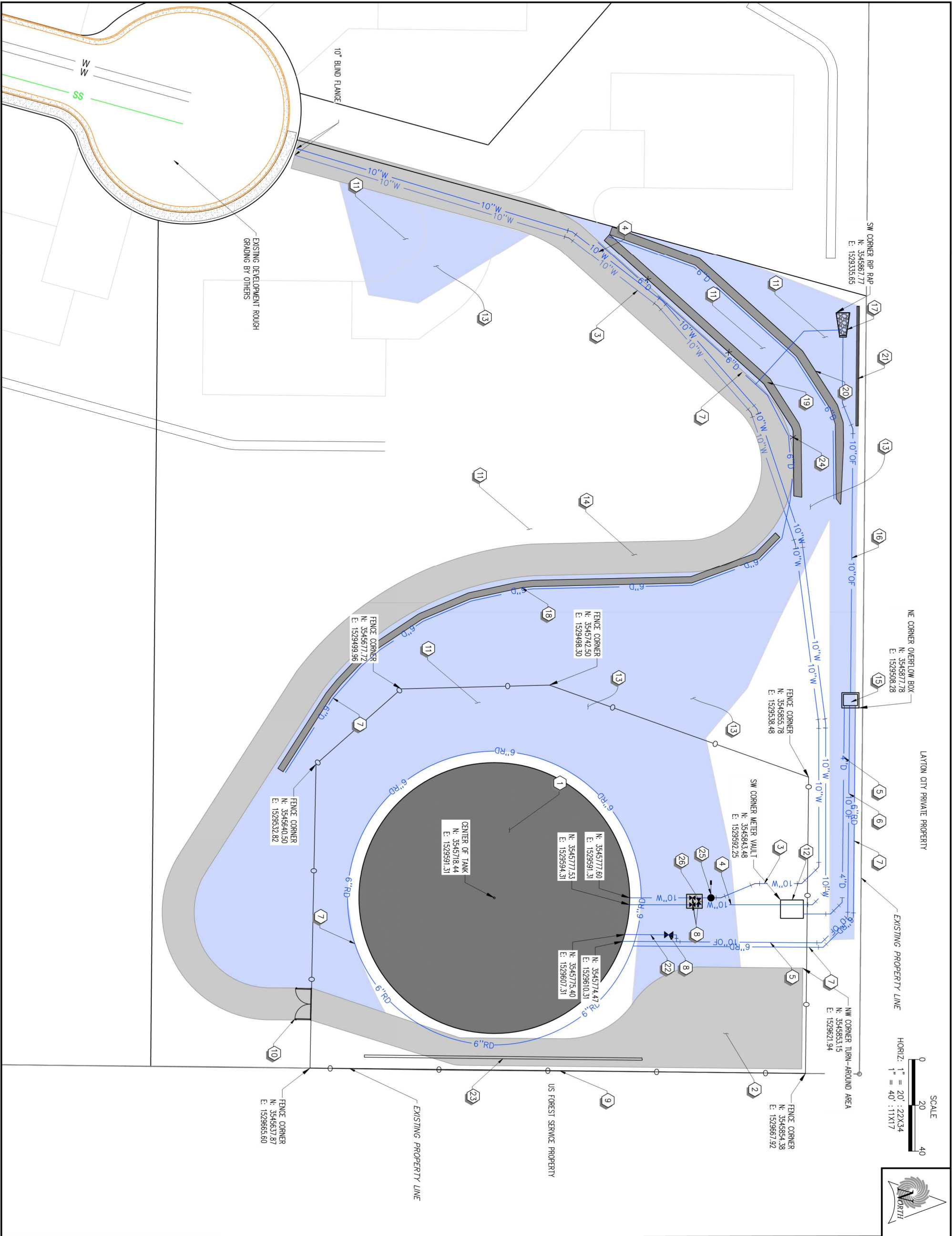
FUTURE/OTHERS



R.O.W. MARKER	
PROPERTY CORNER	
ALUM CAP U.E.L.S	

EXHIBIT B

REV. NO.		COMMENT			DATE	
  2036 LINCOLN AVENUE, SUITE 104 DOVER, UTAH 84401 TEL 801.692.6515 • FAX 801.692.7167 WWW.SUNRISE-ENG.COM KANSVILLE CITY 1.0 MG WATER TANK ABBREVIATIONS AND LEGEND						
SHEET NO. 07062	DESIGNED SH	DRAWN TR	CHECKED CL	SHEET NO. 5 of 39	G5	



CONSTRUCTION NOTES

- 1.0 MG BURIED CONCRETE TANK (SEE SHEET TL)
- ROADBASE TURN-AROUND AREA
8" THICK ROAD BASE
- INLET-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP1-PP2) (A)
CD1
- OUTLET-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP3-PP4) (A)
CD1
- OVERFLOW-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP5) (A)
CD1
- VAULT DRAIN-4" CONTECH A-2000 OR APPROVED EQUAL (A)
CD1
- DRAIN-6" CONTECH A-2000 OR APPROVED EQUAL (D)
GP1
- 10" GATE VALVE (CLASS 150) (B)
CD1
- 8'-0" HEIGHT CHAIN-LINK FENCE (A)
CD2
- 16'-0" WIDE CHAIN-LINK GATE (B)
CD2
- PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS, AND HYDROSEED W/ NATIVE VEGETATION, HYDROSEED MIX TO BE APPROVED BY CITY AND ENGINEER OF RECORD
- ISOLATION VALVE/METER VAULT (A)
V1
- PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED SLOPES, TANK FILL AND ROAD CUT
- ACCESS ROAD (C)
GP4
- OVERFLOW DISCHARGE BOX (A)
CD3
- OVERFLOW OUTLET PIPE-10" ADS
- PIPE OUTLET RIP RAP (C)
CD3
- ROCKERY RETAINING WALL A (C)
GP5
- ROCKERY RETAINING WALL B (C)
GP6
- ROCKERY RETAINING WALL C (C)
GP7
- ROCKERY RETAINING WALL D (C)
GP8
- DRAIN - 8" PVC C-900 (DR-25) (SEE PIPING PLAN SHEET PP5)
- TEMP. EXCAVATION SHORING (SEE EXCAVATION PLAN SHEET GP1)
- BOULDER GAULD RAIL
- BELOW GRADE COMBO AIR/ VAC ASSEMBLY (C)
CD2
- 6" CONCRETE PAD ENCLOSING (3) VALVE BOXES

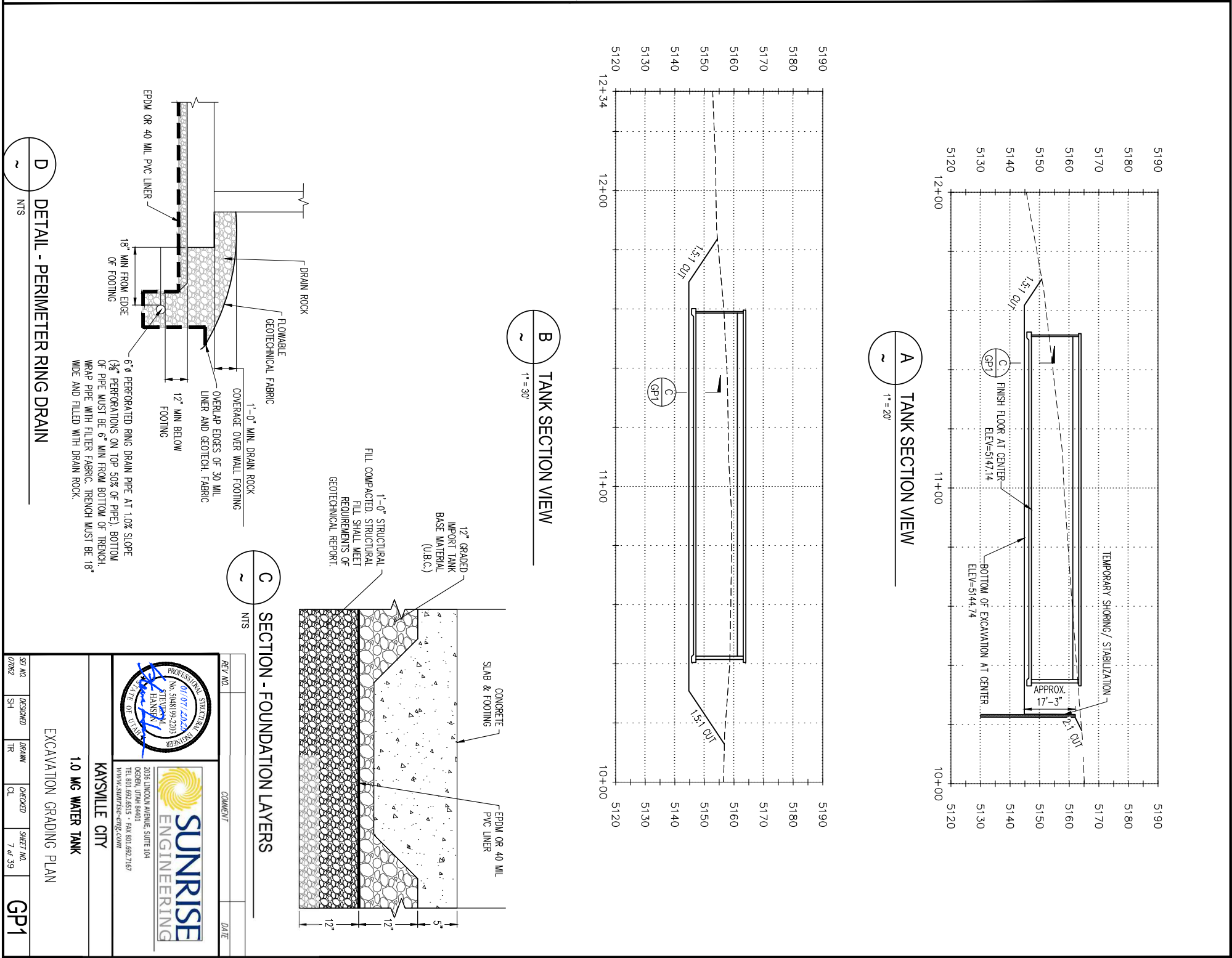
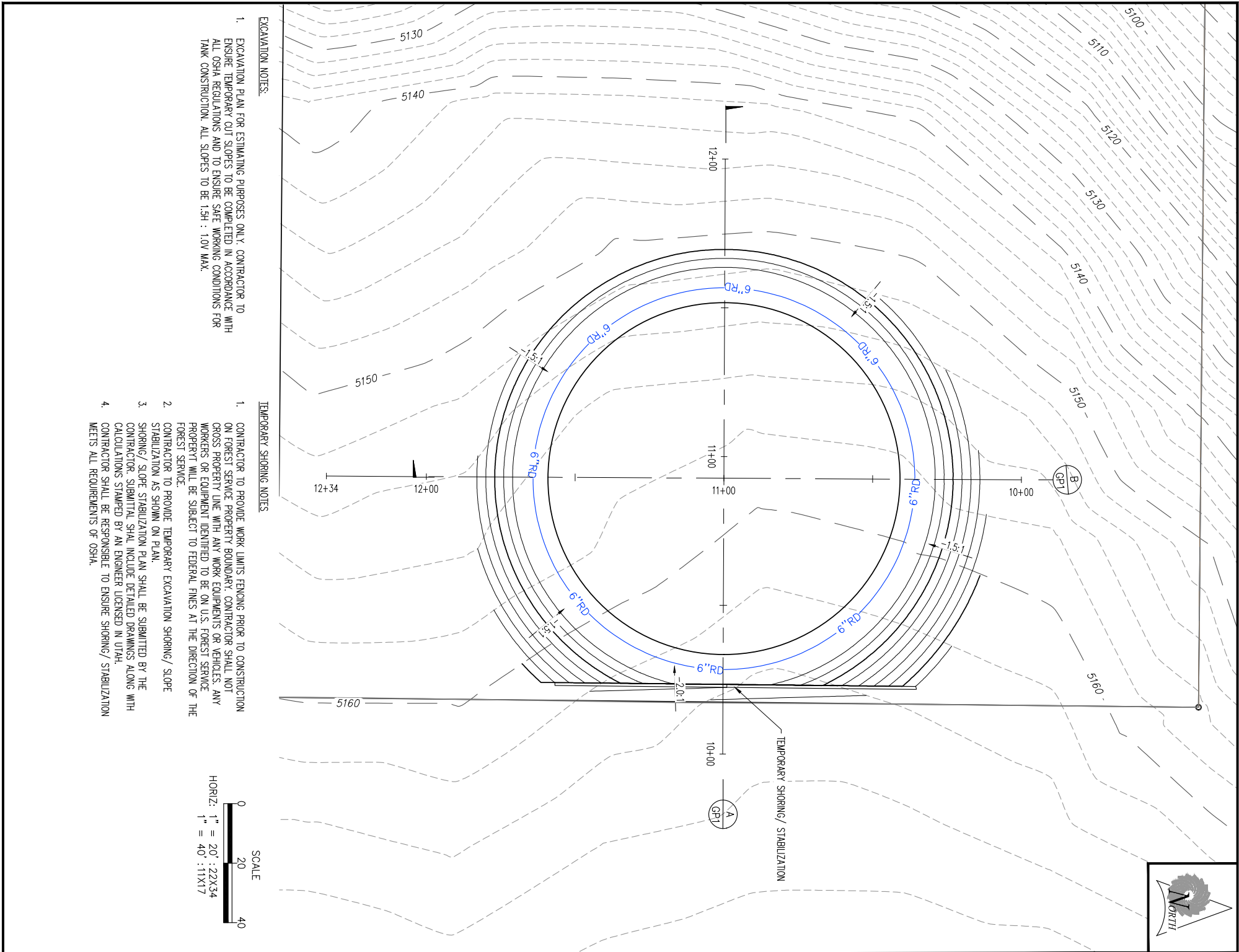
REF. NO.	COMMENT	DATE

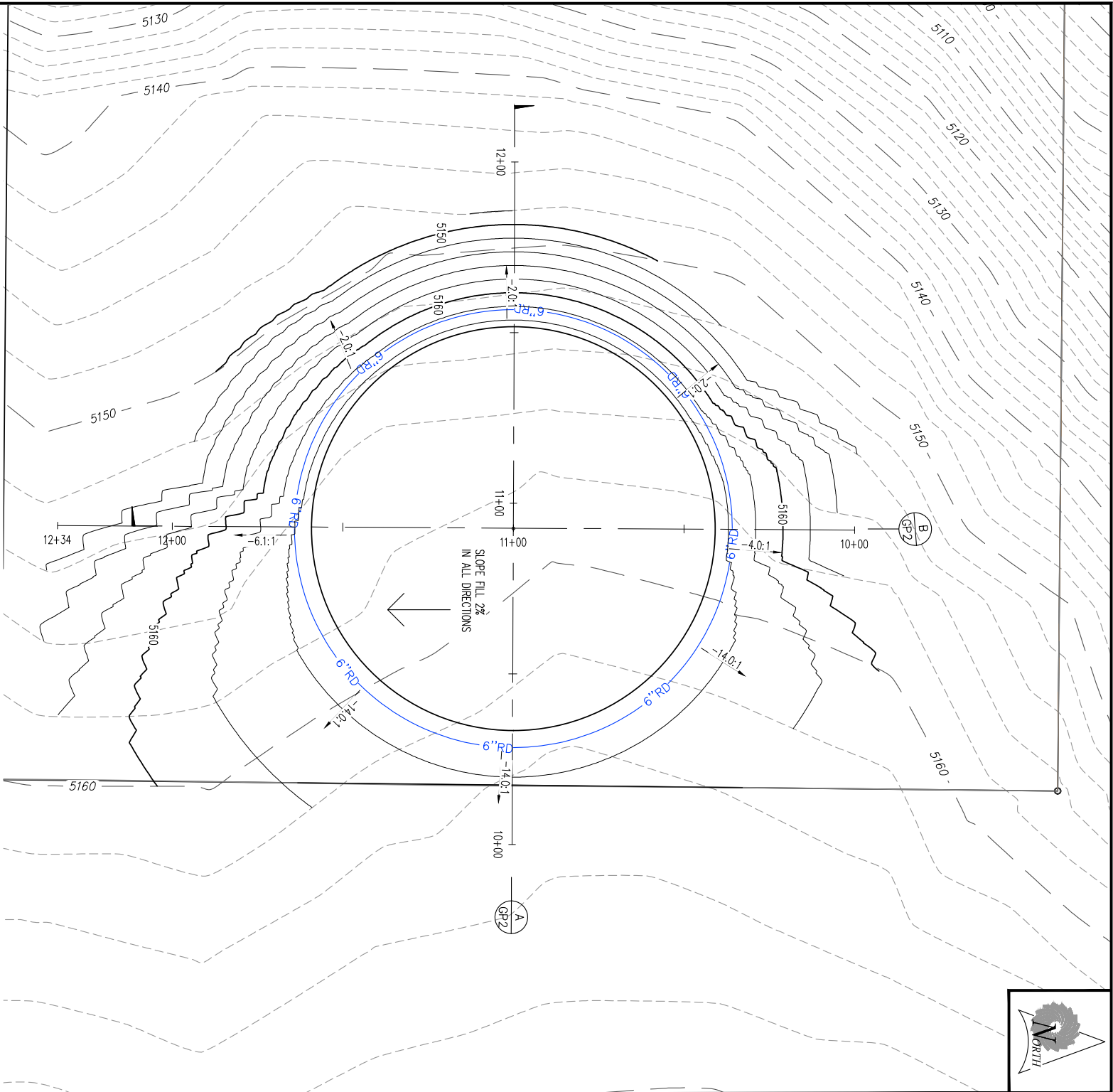
PROFESSIONAL ENGINEER
STEVEN M. HANSEN
No. 5048199-2018
Expiration 07/07/2024
STATE OF UTAH

SUNRISE
ENGINEERING

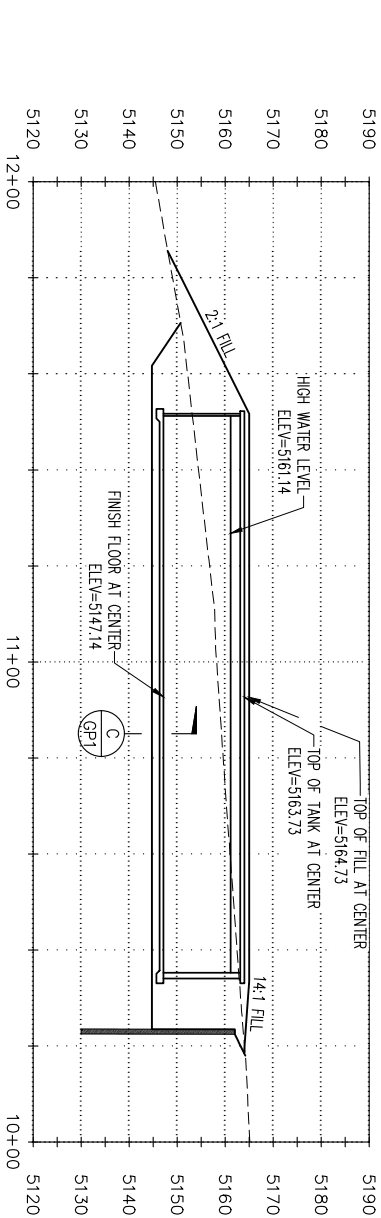
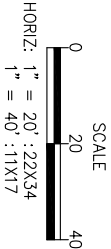
2036 LINCOLN AVENUE, SUITE 104
OGDEN, UTAH 84401
TEL: 801.892.8515 • FAX: 801.892.7187
WWW.SUNRISE-ENG.COM

KAYSVILLE CITY					
1.0 MG WATER TANK					
SITE PLAN					
SHEET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
07062	SH	TR	CL	6 of 39	SP1

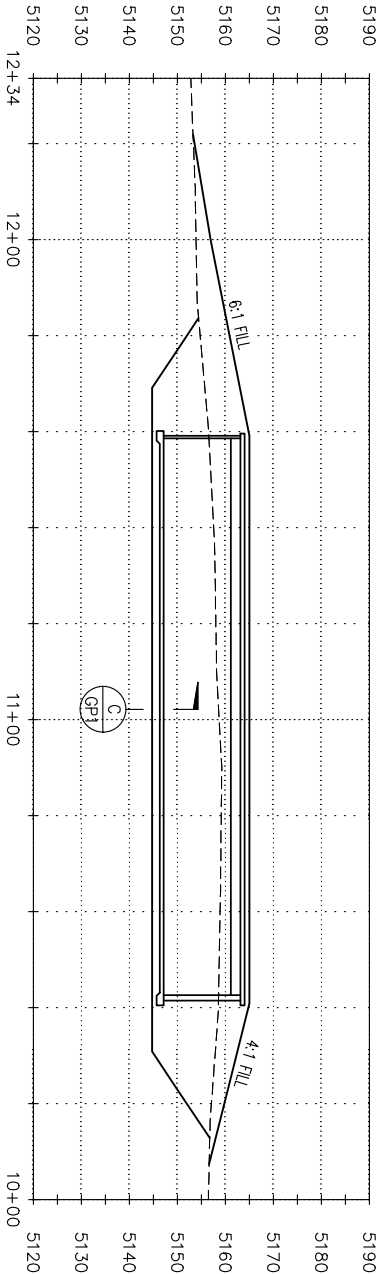




- NOTES:
1. ALL PERMANENT FINISHED GRADE SLOPES SHALL NOT BE STEEPER THAN 2H : 1V AS REQUIRED IN THE SOILS REPORT.
 2. ALL EXCESS MATERIAL TO BE HAULED OFF-SITE FOR DISPOSAL.



A TANK SECTION VIEW



B TANK SECTION VIEW

EARTHWORK VOLUMES		
DESCRIPTION	UNIT	VOLUME
EXCAVATED MATERIAL-TANK	CY	9010
FILL MATERIAL-TANK	CY	6740
EXCAVATED MATERIAL-ACCESS ROAD	CY	4900
FILL MATERIAL-ACCESS ROAD	CY	2840
MATERIAL EXCESS	CY	4330

*VOLUMES SHOWN ARE FOR ESTIMATING PURPOSES ONLY AND DO NOT ACCOUNT FOR SHRINK OR SWELL OF DIRT.

RET. NO.

COMMENT

DATE

PROFESSIONAL ENGINEER
No. 504819-2018
01/07/2023
JENNIFER HANSEN
STATE OF ILLINOIS

SUNRISE
ENGINEERING

2036 LINCOLN AVENUE, SUITE 104
OAKEN, ILLINOIS 60440
TEL: 815.692.8515 FAX: 815.692.7187
WWW.SUNRISE-ENG.COM

KANSVILLE CITY

1.0 MG WATER TANK

FILL GRADING PLAN

SET NO.
07062

DESIGNED
SH

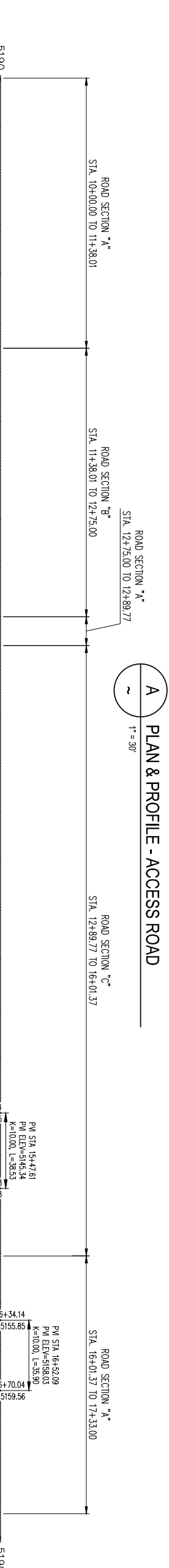
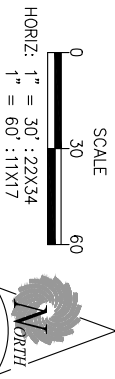
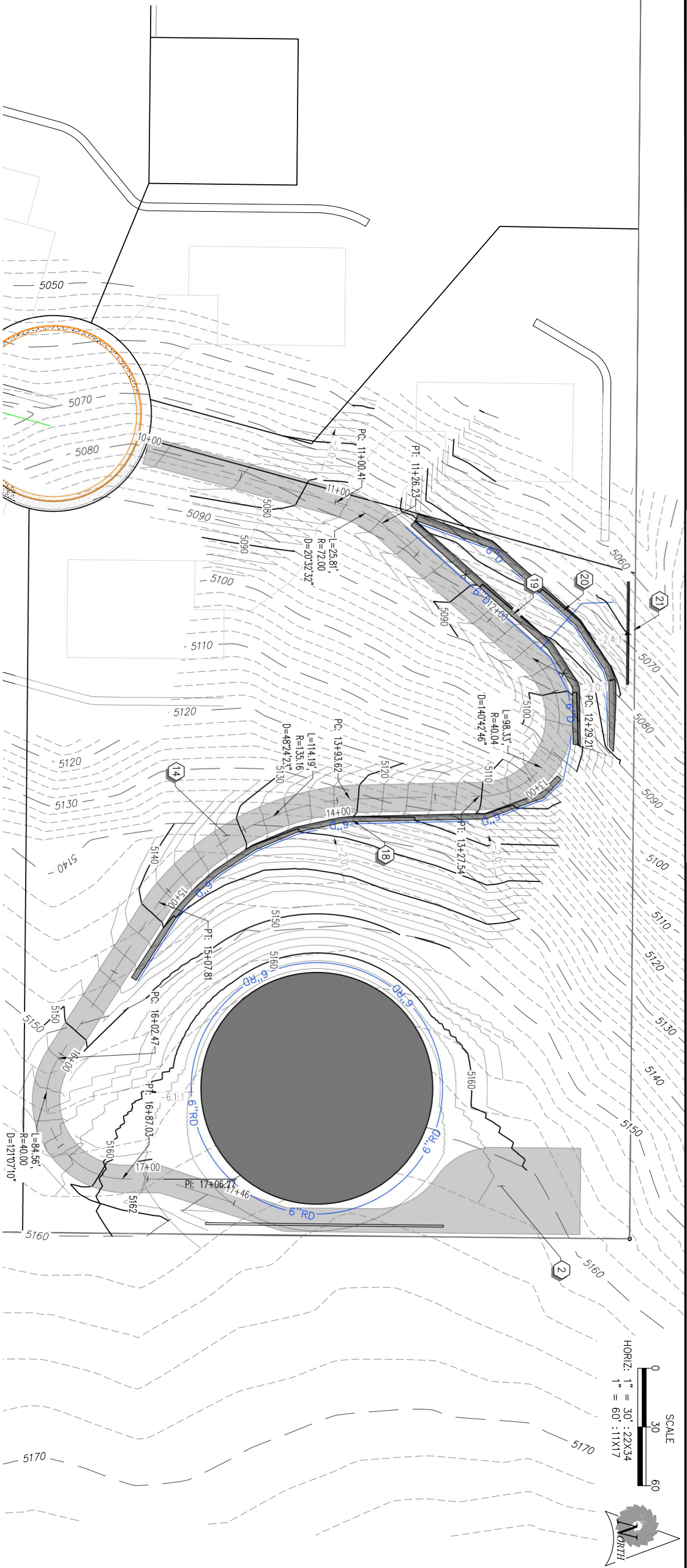
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SHEET NO.
8 of 39

GP2

P:\Kaysville\1.0 MG Tank\Design3D\Civil3D\Sheets\KC11-SITE REV 3.dwg Jan 07, 2020 3:08pm troberts



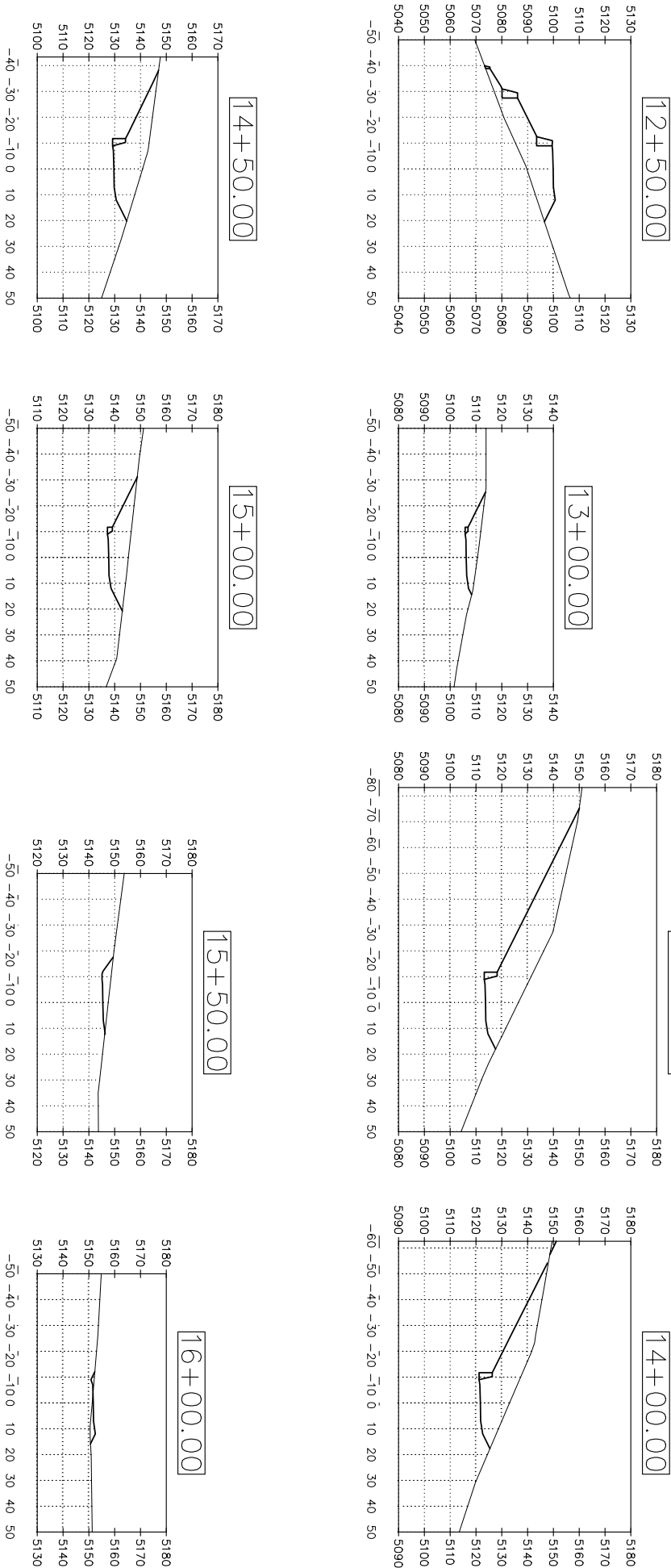
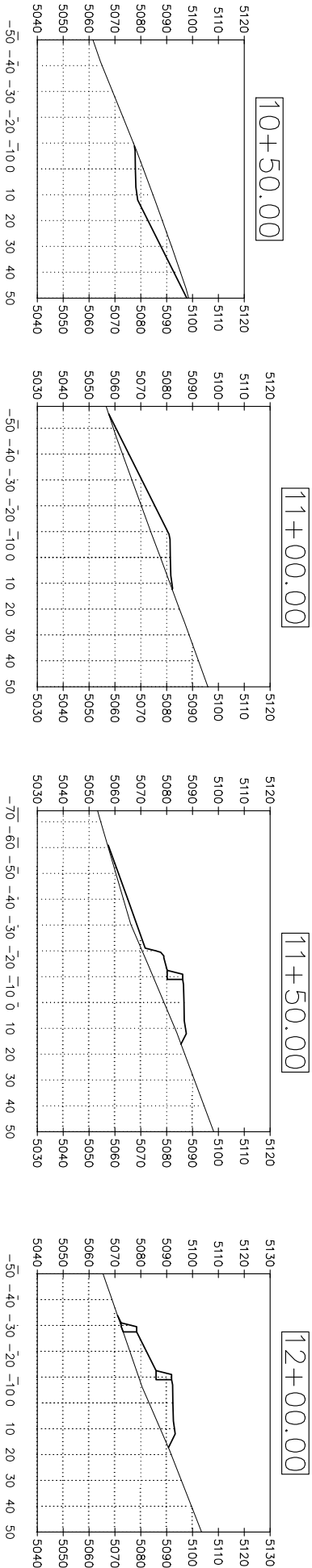
A PLAN & PROFILE - ACCESS ROAD
1" = 30'

CONSTRUCTION NOTES

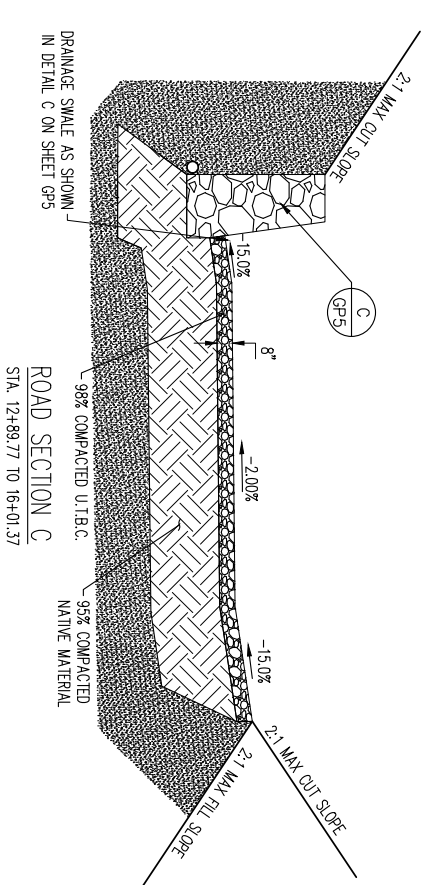
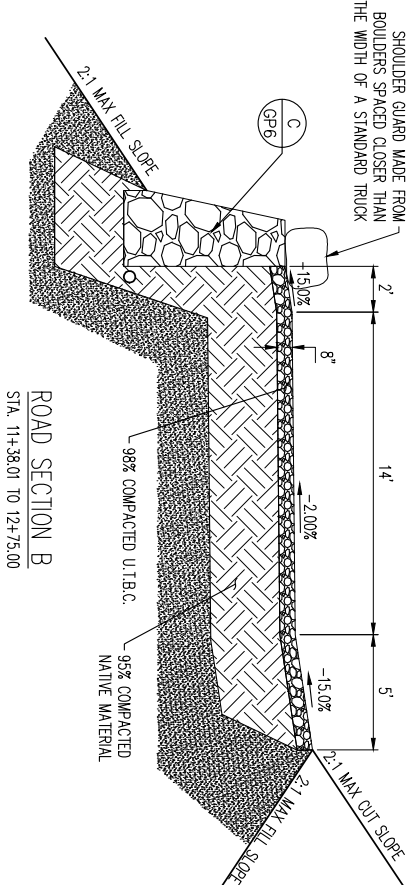
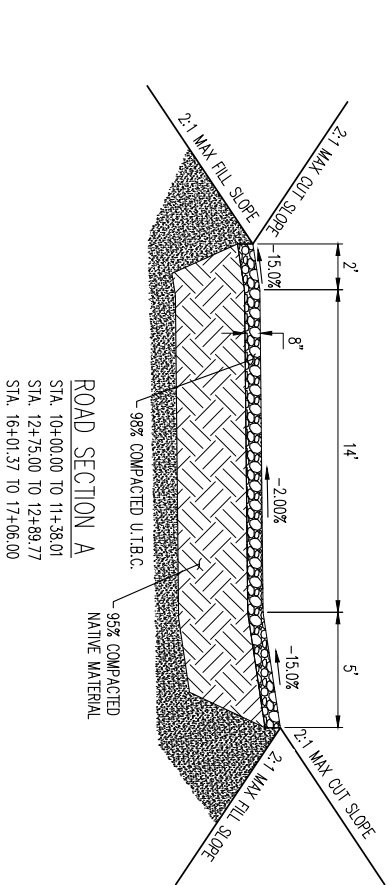
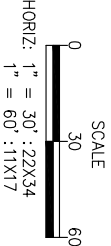
- 1.0 MG BURIED CONCRETE TANK
(SEE SHEET TL)
- ROADBASE TURN-AROUND AREA
8" THICK ROAD BASE
- INLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP1-PP2)
- OUTLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP3-PP4)
- OVERFLOW-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP5)
- VAULT DRAIN-4" CONTECH A-2000
OR APPROVED EQUAL
- DRAIN-6" CONTECH A-2000
OR APPROVED EQUAL
- 10" GATE VALVE (CLASS 150)
- 8'-0" HEIGHT CHAIN-LINK FENCE
- 16'-0" WIDE CHAIN-LINK GATE
- PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS,
AND HYDROSEED W/ NATIVE VEGETATION. HYDROSEED MIX TO
BE APPROVED BY CITY AND ENGINEER OF RECORD
- ISOLATION VALVE/METER VAULT
- PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED
SLOPES, TANK FILL AND ROAD CUT
- ACCESS ROAD
- OVERFLOW DISCHARGE BOX
- OVERFLOW OUTLET PIPE-10" ADS
- PIPE OUTLET RIP RAP
- ROCKERY RETAINING WALL A
- ROCKERY RETAINING WALL B
- ROCKERY RETAINING WALL C
- ROCKERY RETAINING WALL D
- DRAIN - 8" PVC C-900 (DR-25)
(SEE PIPING PLAN SHEET PP5)
- TEMP. EXCAVATION SHORING
(SEE EXCAVATION PLAN SHEET GP1)
- BOULDER GUARD RAIL
- BURIED COMBO AIR/ VAC ASSEMBLY
- 6" CONCRETE PAD ENCASING (3) VALVE BOXES

RET. NO.	COMMENT	DATE
01/07/2020	PROFESSIONAL ENGINEER J. HANSEN No. 548199-2018 www.sunrise-eng.com	
2036 LINCOLN AVENUE, SUITE 104 OBERLIN, OHIO 44001 TEL: 801.852.8515 FAX: 801.852.7187 www.sunrise-eng.com		
KANSVILLE CITY		
1.0 MG WATER TANK		
ACCESS ROAD GRADING PLAN		

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	TR	CL	9 of 39
GP3				



A ACCESS ROAD SECTION VIEWS



B TYPICAL ROAD SECTIONS

PROFESSIONAL ENGINEER
01/07/2023
JENNIFER HANSEN
No. 5048199-2013
MAINE
2036 LINCOLN AVENUE, SUITE 104
ORFORD, UTAH 84401
TEL: 801.652.2515 • FAX: 801.652.7187
WWW.SUNRISE-ENG.COM

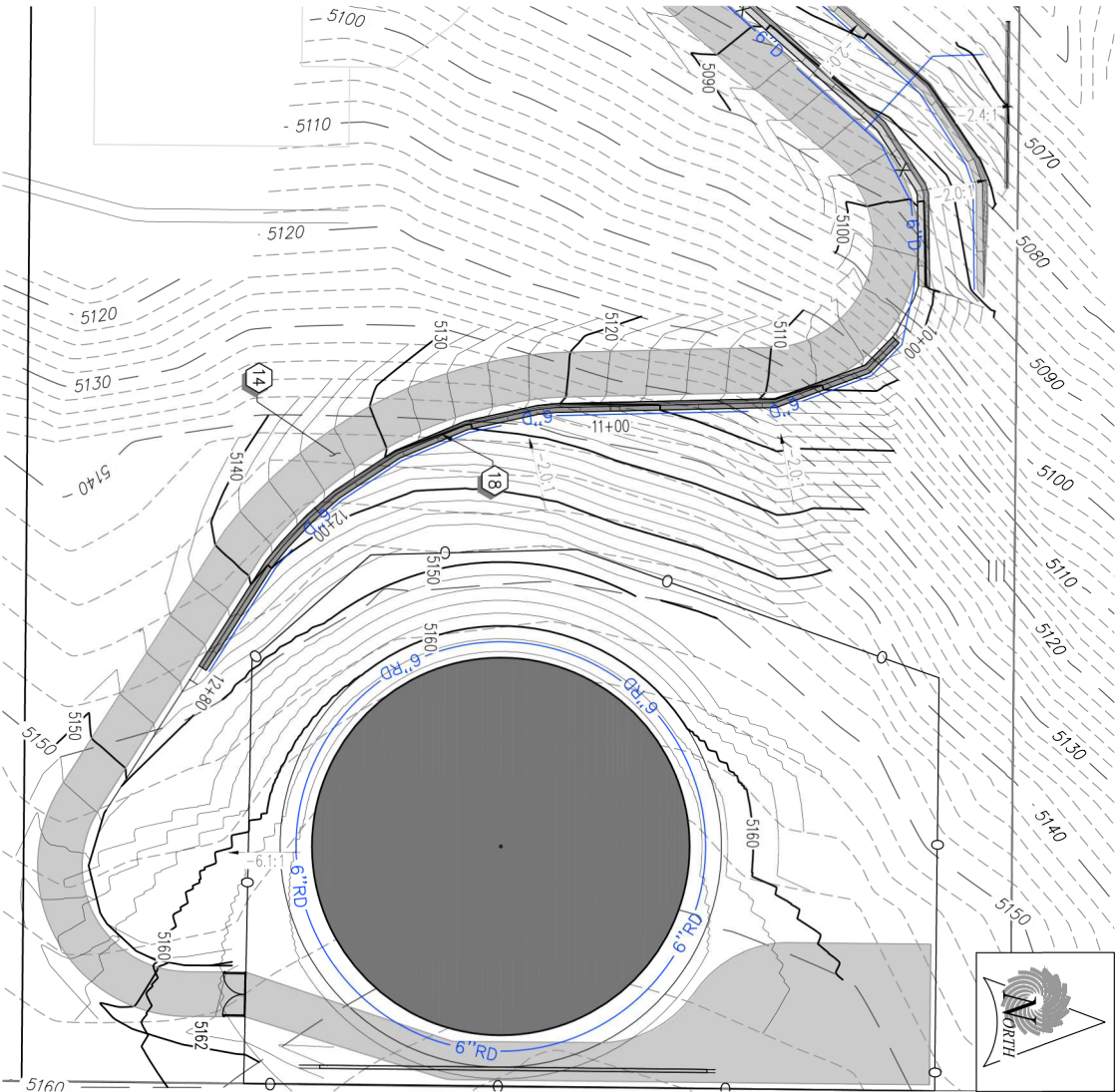
SUNRISE ENGINEERING

KAYSVILLE CITY

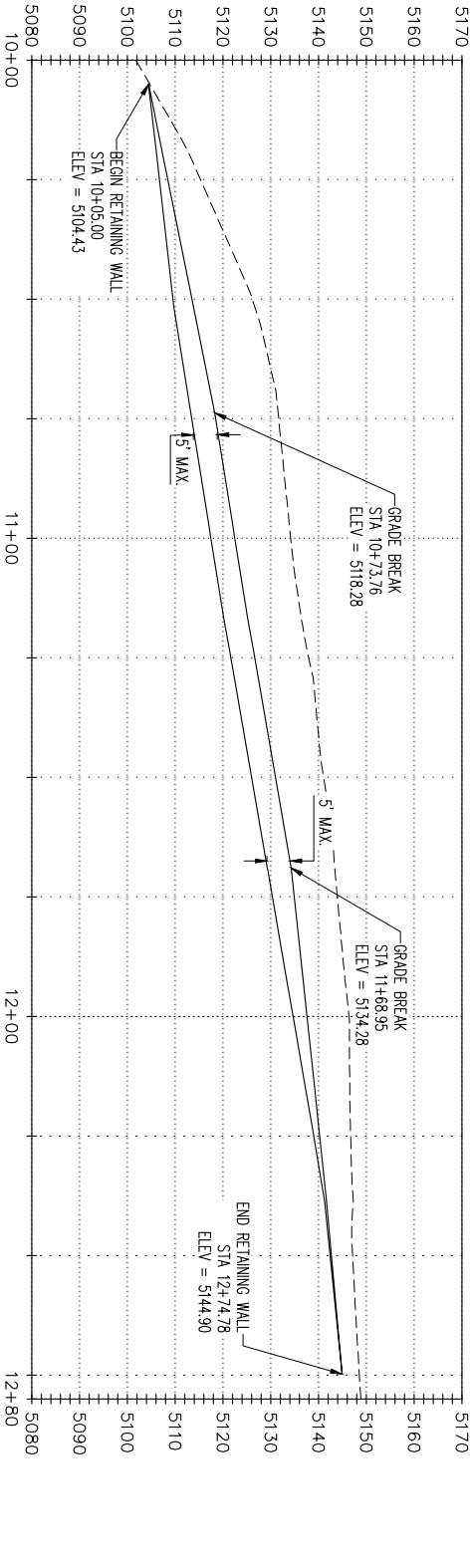
1.0 MG WATER TANK

ACCESS ROAD SECTION VIEW

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
07062	SH	TR	CL	10 of 39	GP4

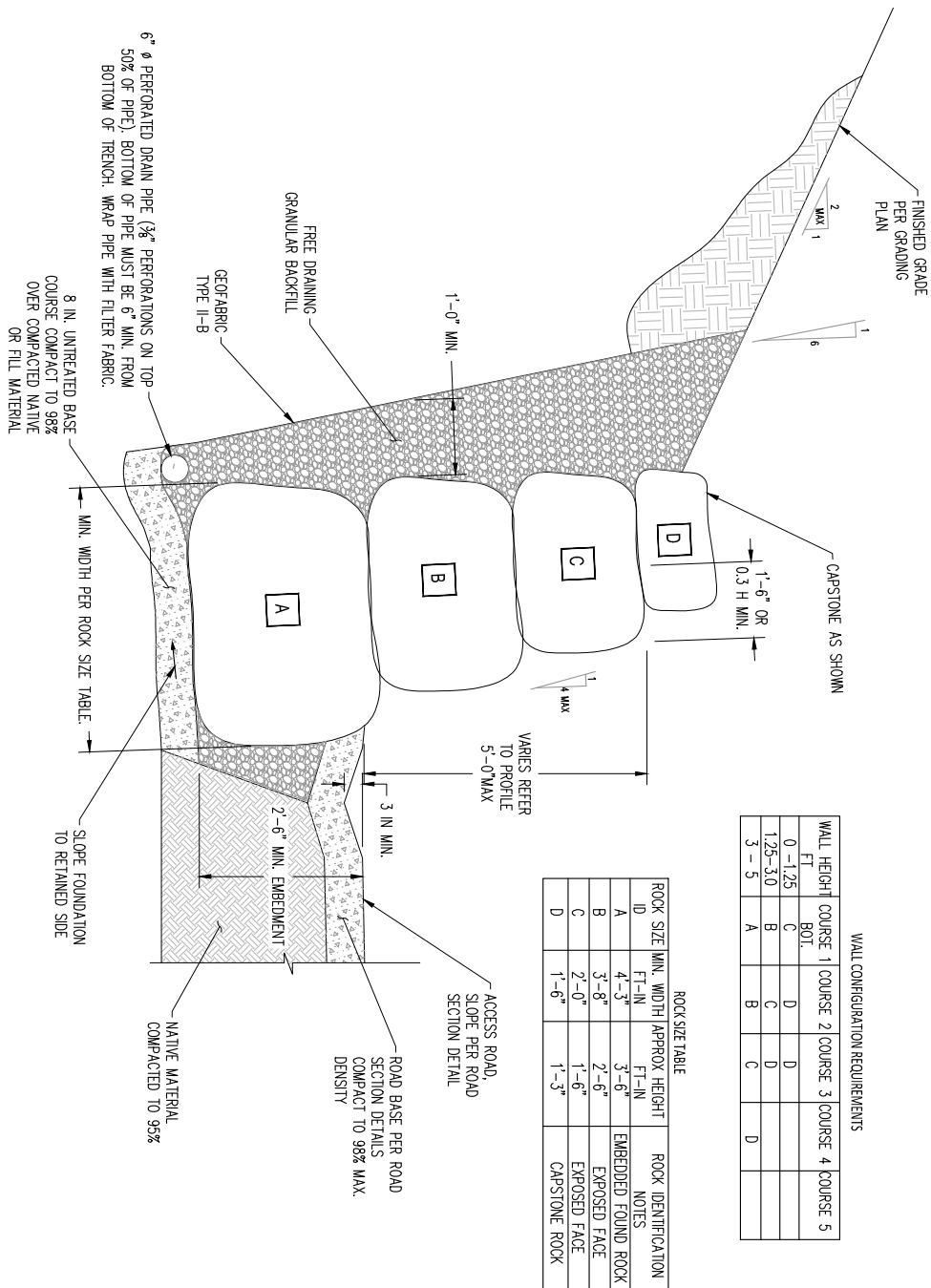


SCALE
0 30 60
HORIZ. 1" = 30' : 22X34
1" = 60' : 11X17
A PLAN - ROCKERY RETAINING WALL "A"



B PROFILE - ROCKERY RETAINING WALL "A"

SCALE
0 20 40
HORIZ: 1" = 20' : 22X34
1" = 40' : 11X17



C SECTION - ROCKERY RETAINING WALL "A"

CONSTRUCTION NOTES

- 1.0 MG BURIED CONCRETE TANK (SEE SHEET TL)
- ROADBASE TURN-AROUND AREA 8" THICK ROAD BASE
- INLET-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP1-PP2) **CD1**
- OUTLET-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP3-PP4) **CD1**
- OVERFLOW-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP5) **CD1**
- VAULT DRAIN-4" CONTECH A-2000 OR APPROVED EQUAL **CD1**
- DRAIN-6" CONTECH A-2000 OR APPROVED EQUAL **GP1**
- 10" GATE VALVE (CLASS 150) **CD1**
- 8'-0" HEIGHT CHAIN-LINK FENCE **CD2**
- 16'-0" WIDE CHAIN-LINK GATE **CD2**
- PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS, AND HYDROSEED W/ NATIVE VEGETATION. HYDROSEED MAX TO BE APPROVED BY CITY AND ENGINEER OF RECORD
- ISOLATION VALVE/METER VAULT **VI**
- PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED SLOPES, TANK FILL AND ROAD CUT
- ACCESS ROAD **GP4**
- OVERFLOW DISCHARGE BOX **CD3**
- OVERFLOW OUTLET PIPE-10" ADS
- PIPE OUTLET RIP RAP **CD3**
- ROCKERY RETAINING WALL A **GP5**
- ROCKERY RETAINING WALL B **GP6**
- ROCKERY RETAINING WALL C **GP7**
- ROCKERY RETAINING WALL D **GP8**
- DRAIN - 8" PVC C-900 (DR-25) (SEE PIPING PLAN SHEET PP5)
- TEMP. EXCAVATION SHORING (SEE EXCAVATION PLAN SHEET GP1)
- BOULDER GUARD RAIL
- BELOW GRADE COMBO AIR/ VAC ASSEMBLY **CD2**
- 6" CONCRETE PAD ENCLOSING (3) VALVE BOXES

RET NO.
COMMENT
DATE

KANSVILLE CITY

1.0 MG WATER TANK

PLAN & PROFILE - ROCKERY RETAINING WALL "A"

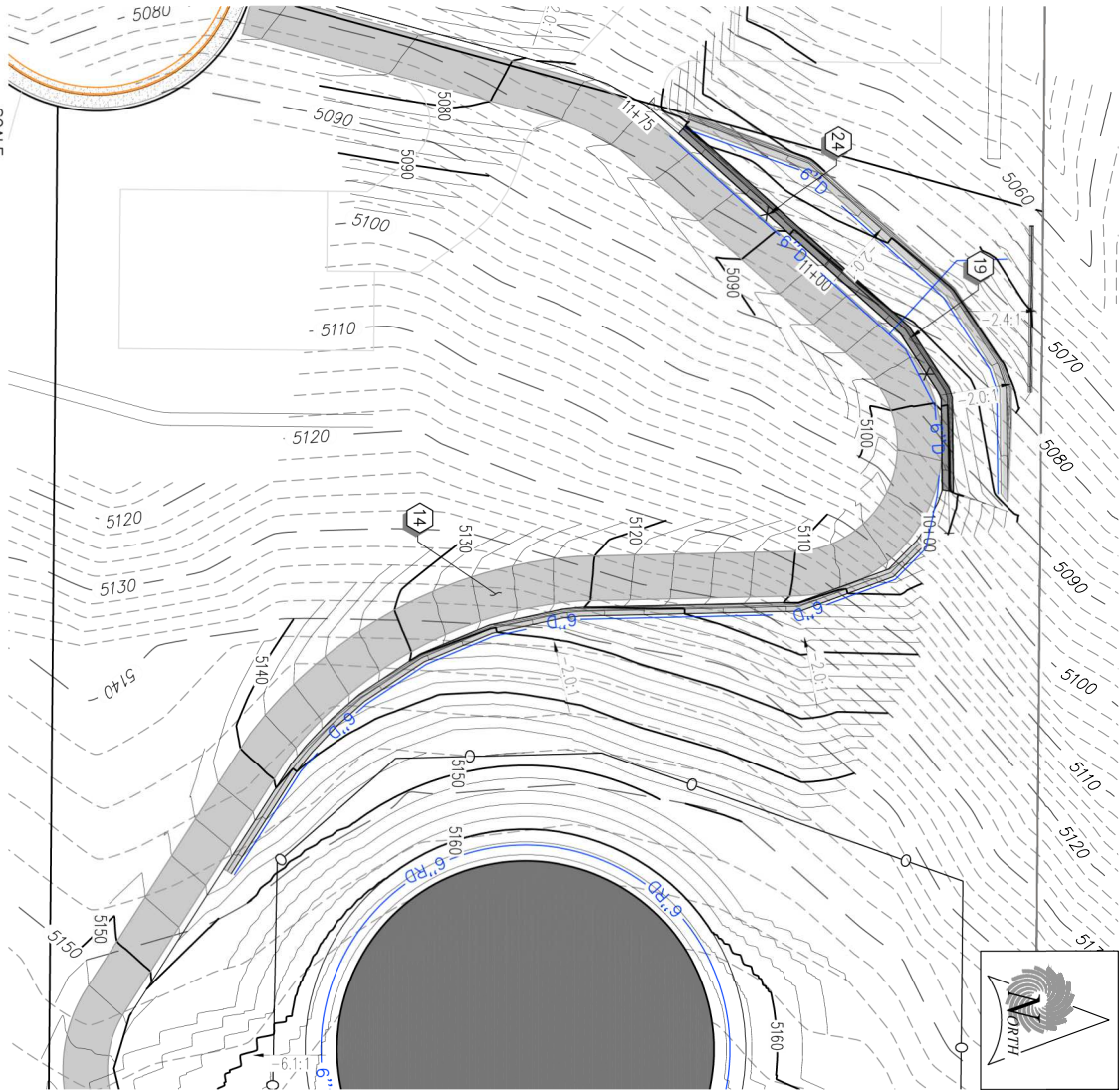
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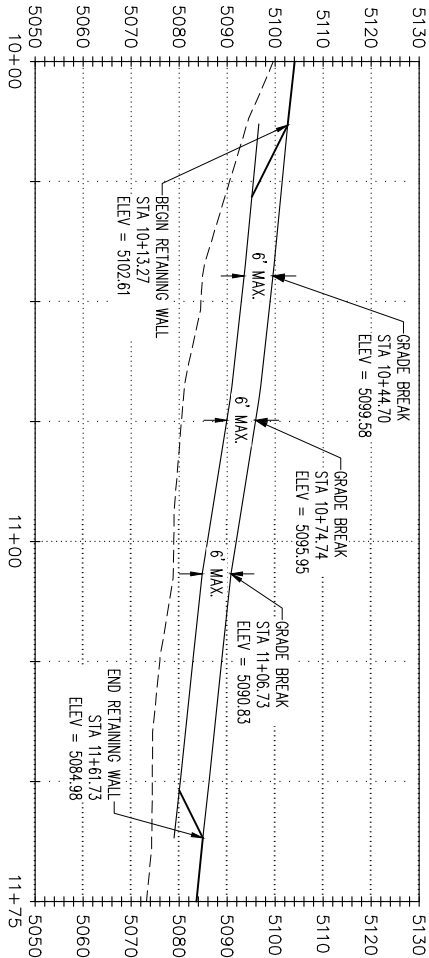
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CL

SHEET NO.
11 of 39

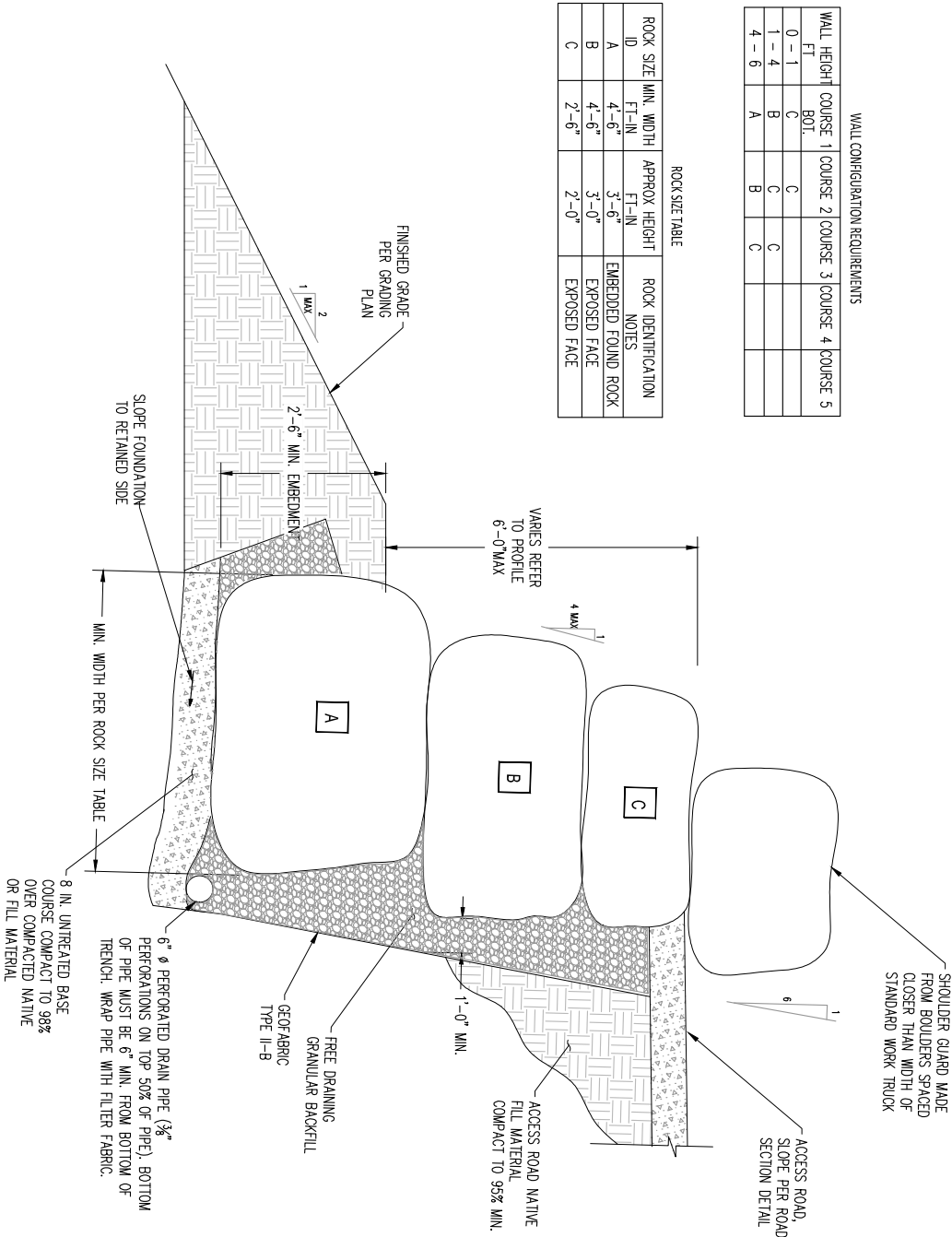
GP5



A PLAN - ROCKERY RETAINING WALL "B"



B PROFILE - ROCKERY RETAINING WALL "B"



C SECTION - ROCKERY RETAINING WALL "B"

WALL CONFIGURATION REQUIREMENTS				
WALL HEIGHT FT	COURSE 1 BOT.	COURSE 2	COURSE 3	COURSE 4 COURSE 5
0 - 1	C	C		
1 - 4	B	C	C	
4 - 6	A	B	C	

ROCK SIZE TABLE			ROCK IDENTIFICATION NOTES
ROCK SIZE ID	MIN. WIDTH FT-IN	APPROX. HEIGHT FT-IN	
A	4'-6"	3'-6"	EMBEDDED FOUND ROCK
B	4'-6"	3'-0"	EXPOSED FACE
C	2'-6"	2'-0"	

CONSTRUCTION NOTES

- 1.0 MG BURIED CONCRETE TANK
(SEE SHEET TL)
- ROADBASE TURN-AROUND AREA
8" THICK ROAD BASE
- INLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP1-PP2) (A)
CD1
- OUTLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP3-PP4) (A)
CD1
- OVERFLOW-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP5) (A)
CD1
- VAULT DRAIN-4" CONTECH A-2000
OR APPROVED EQUAL (A)
CD1
- DRAIN-6" CONTECH A-2000
OR APPROVED EQUAL (D)
GP1
- 10" GATE VALVE (CLASS 150) (B)
CD1
- 8'-0" HEIGHT CHAIN-LINK FENCE (A)
CD2
- 16'-0" WIDE CHAIN-LINK GATE (B)
CD2
- PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS,
AND HYDROSEED W/ NATIVE VEGETATION. HYDROSEED MAX TO
BE APPROVED BY CITY AND ENGINEER OF RECORD
- ISOLATION VALVE/METER VAULT (A)
VI
- PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED
SLOPES, TANK FILL AND ROAD CUT (B)
- ACCESS ROAD (C)
GP4
- OVERFLOW DISCHARGE BOX (A)
CD3
- OVERFLOW OUTLET PIPE-10" AUS
- PIPE OUTLET RIP RAP (C)
CD3
- ROCKERY RETAINING WALL A (C)
GP5
- ROCKERY RETAINING WALL B (C)
GP6
- ROCKERY RETAINING WALL C (C)
GP7
- ROCKERY RETAINING WALL D (C)
GP8
- DRAIN - 8" PVC C-900 (DR-25)
(SEE PIPING PLAN SHEET PP5)
- TEMP. EXCAVATION SHORING
(SEE EXCAVATION PLAN SHEET GP1)
- BOULDER GUARD RAIL
- BELOW GRADE COMBO AIR/ VAC ASSEMBLY (C)
CD2
- 6" CONCRETE PAD ENCASING (3) VALVE BOWES

RET NO.

COMMENT

DATE

KANSVILLE CITY

2036 LINCOLN AVENUE, SUITE 104
OGDEN, UTAH 84401
TEL 801.692.8515 • FAX 801.692.7187
WWW.SUNRISE-ENG.COM

1.0 MG WATER TANK

PLAN & PROFILE - ROCKERY RETAINING WALL "B"

SET NO.
07062

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12 of 39

GP6

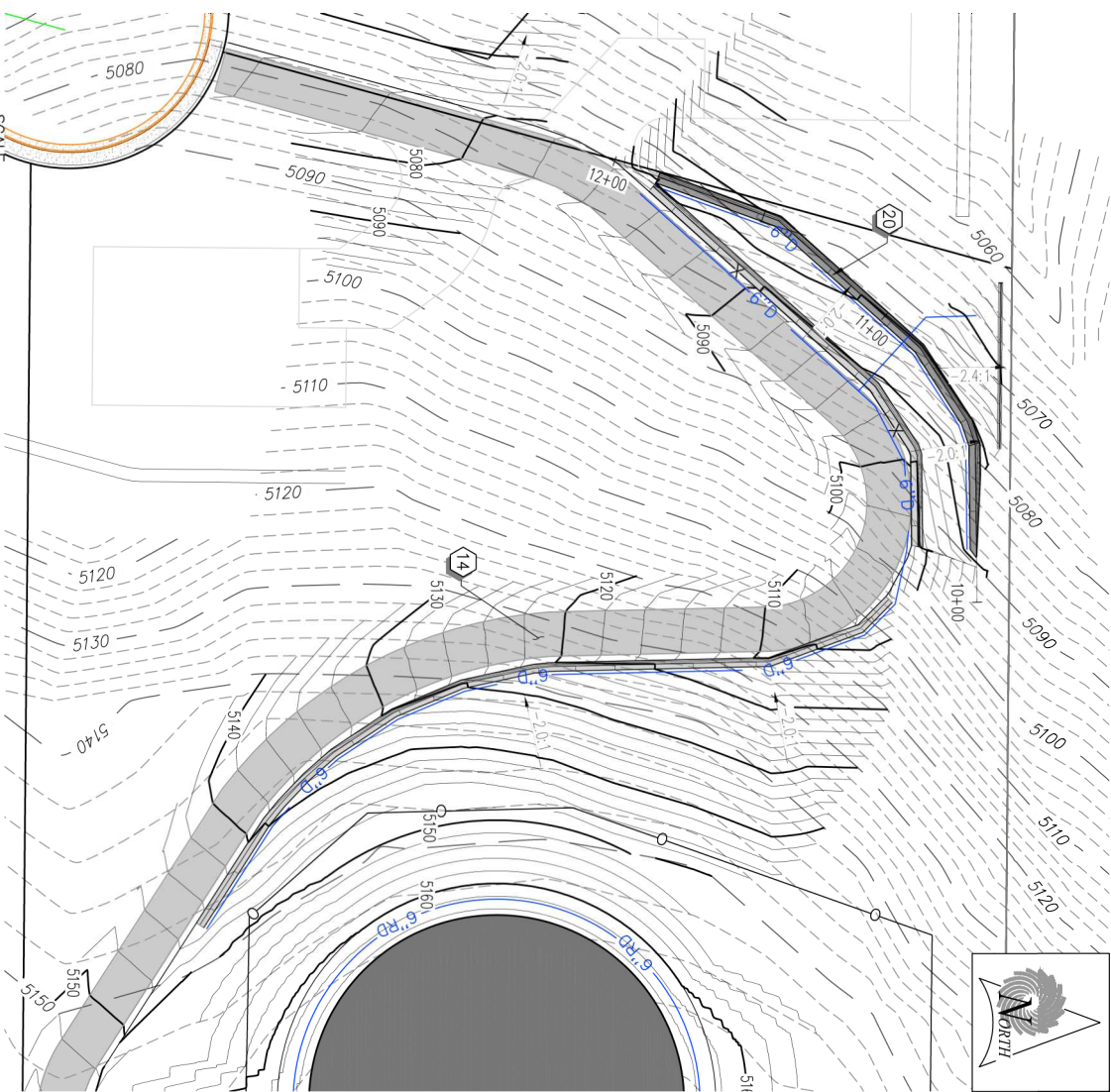
CONSTRUCTION NOTES

- 110 MG BURIED CONCRETE TANK
(SEE SHEET TL)
- ROADBASE TURN-AROUND AREA
8" THICK ROAD BASE
- INLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP1-PP2)
- OUTLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP3-PP4)
- OVERFLOW-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP5)
- VAULT DRAIN-4" CONTECH A-2000
OR APPROVED EQUAL
- DRAIN-6" CONTECH A-2000
OR APPROVED EQUAL
- 10" GATE VALVE (CLASS 150)
- 8'-0" HEIGHT CHAIN-LINK FENCE
- 16'-0" WIDE CHAIN-LINK GATE
- PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS,
AND HYDROSEED W/ NATIVE VEGETATION. HYDROSEED MAX TO
BE APPROVED BY CITY AND ENGINEER OF RECORD
- ISOLATION VALVE/METER VAULT
- PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED
SLOPES, TANK FILL AND ROAD CUT
- ACCESS ROAD
- OVERFLOW DISCHARGE BOX
- OVERFLOW OUTLET PIPE-10" ADS
- PIPE OUTLET RIP RAP
- ROCKERY RETAINING WALL A
- ROCKERY RETAINING WALL B
- ROCKERY RETAINING WALL C
- ROCKERY RETAINING WALL D
- DRAIN - 8" PVC C-900 (DR-25)
(SEE PIPING PLAN SHEET PP5)
- TEMP. EXCAVATION SHORING
(SEE EXCAVATION PLAN SHEET GP1)
- BOULDER GAUDED RAIL
- BELOW GRADE COMBO AIR/ VAC ASSEMBLY
- 6" CONCRETE PAD ENCASING (3) VALVE BOWES

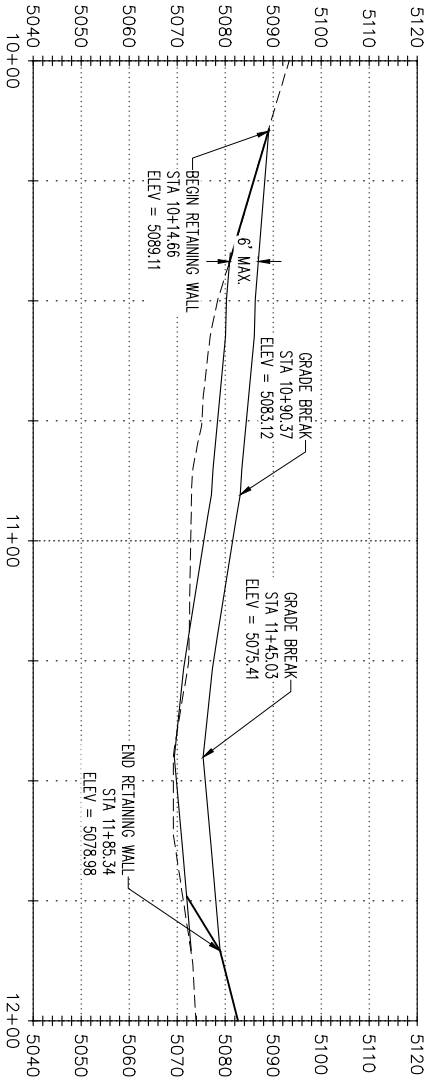
WALL CONFIGURATION REQUIREMENTS				
WALL HEIGHT FT	COURSE 1 BOT.	COURSE 2	COURSE 3	COURSE 4 COURSE 5
0 - 1	C	C		
1 - 3	B	C	D	
3 - 4	B	C	D	D
4 - 6	A	B	C	D

ROCK SIZE TABLE

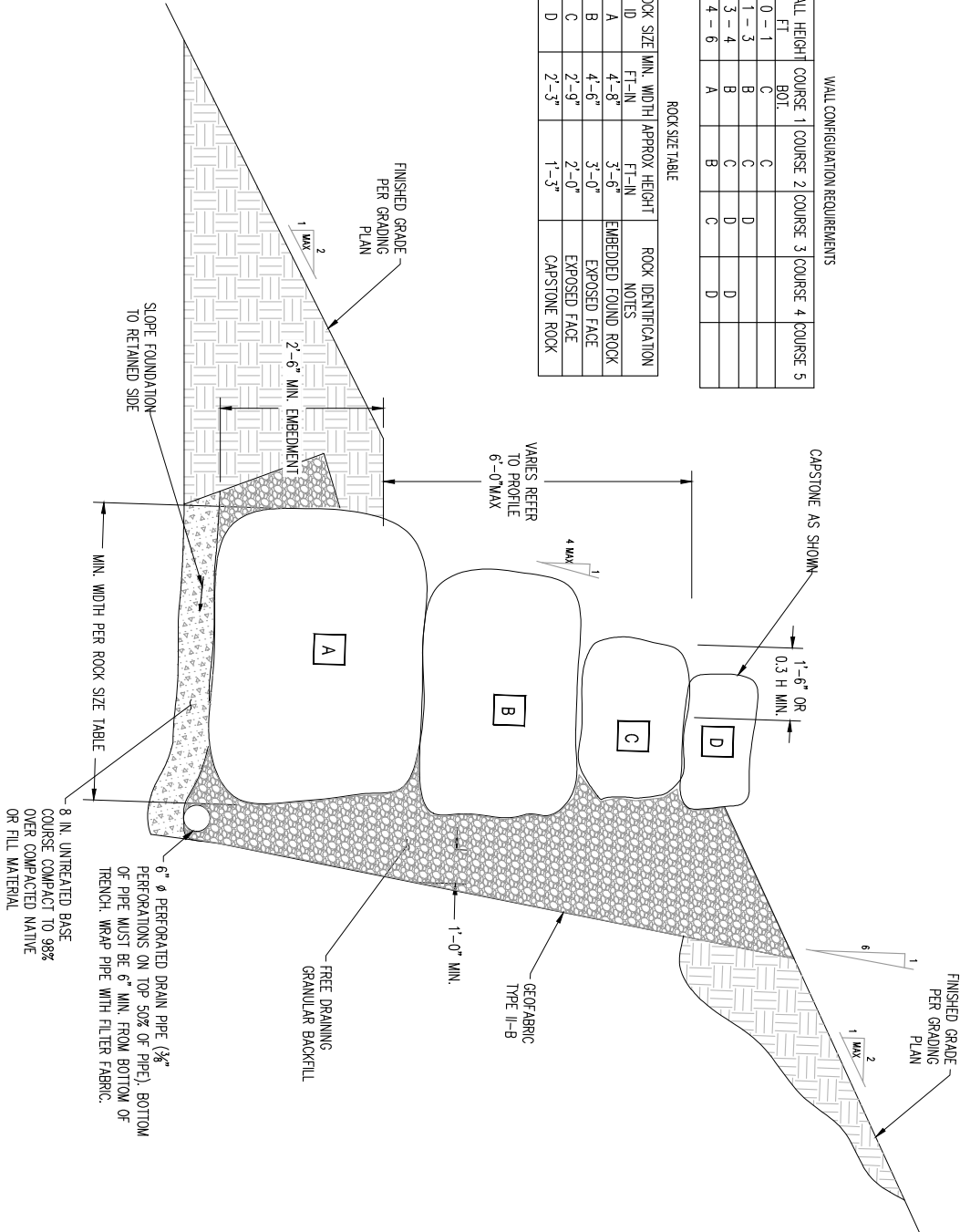
ROCK SIZE	MIN.	WIDTH	APPROX. HEIGHT	ROCK IDENTIFICATION
ID	FT.-IN	FT.-IN	FT.-IN	NOTES
A	4'-8"	3'-6"		EMBEDDED FOUND ROCK
B	4'-6"	3'-0"		EXPOSED FACE
C	2'-9"	2'-0"		EXPOSED FACE
D	2'-3"	1'-3"		CAPSTONE ROCK



A PLAN - ROCKERY RETAINING WALL "C"



B PROFILE - ROCKERY RETAINING WALL "C"



C SECTION - ROCKERY RETAINING WALL "C"

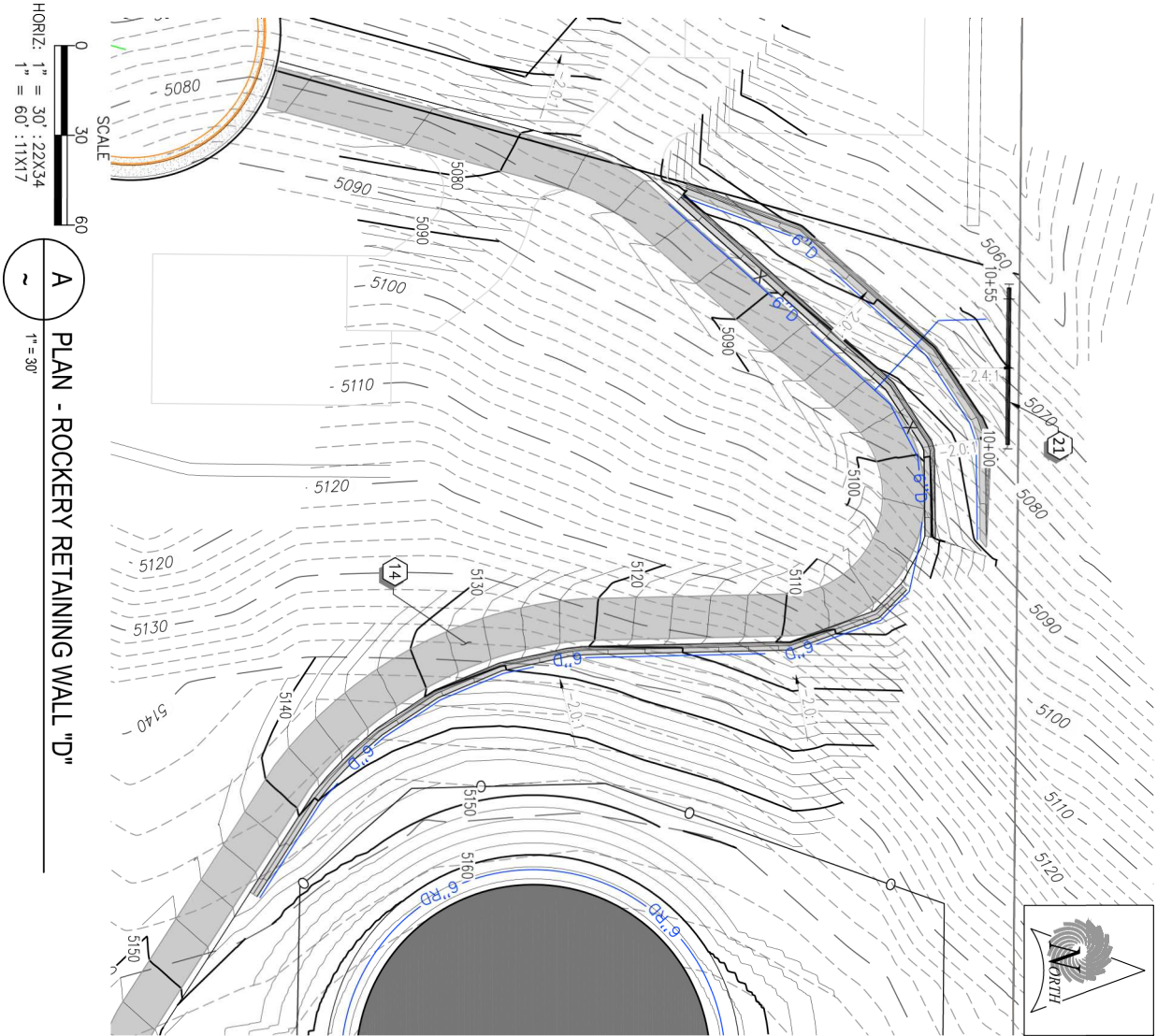
RET. NO. COMMENT DATE

KANSVILLE CITY

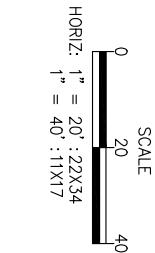
1.0 MG WATER TANK

PLAN & PROFILE - ROCKERY RETAINING WALL "C"

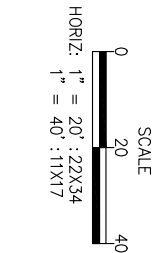
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A PLAN - ROCKERY RETAINING WALL "D"

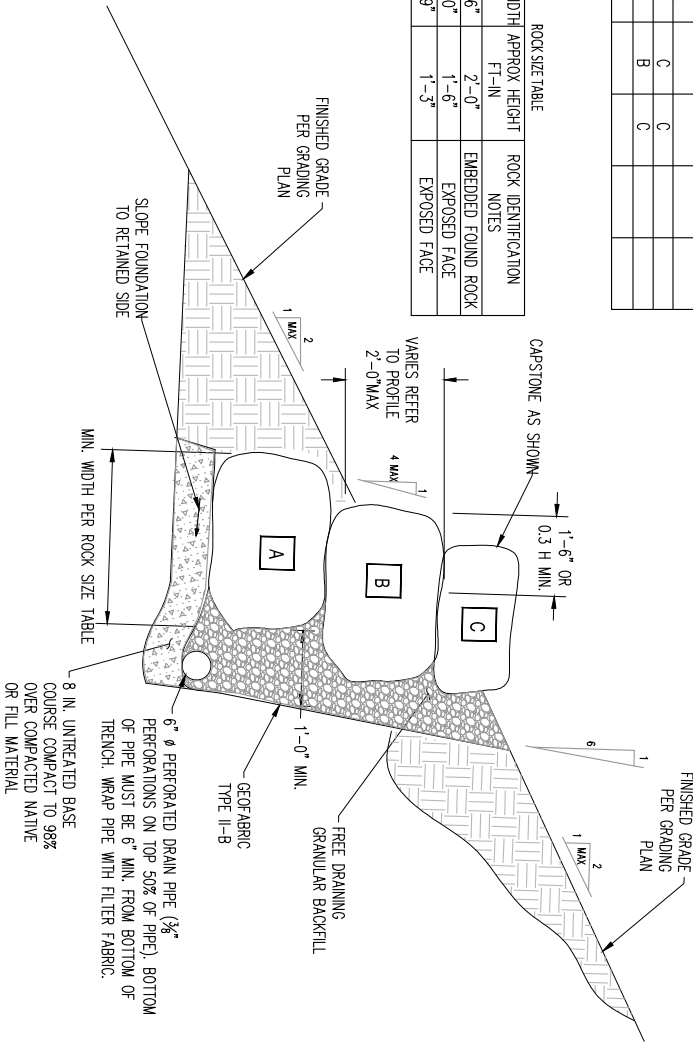


C SECTION - ROCKERY RETAINING WALL "D"



WALL CONFIGURATION REQUIREMENTS				
WALL HEIGHT	COURSE 1	COURSE 2	COURSE 3	COURSE 4
FT.	1	2	3	4
0 - 1	B	C	C	
1 - 2	A	B	C	

ROCK SIZE TABLE			
ROCK SIZE ID	MIN. WIDTH APPROX HEIGHT FT-IN	ROCK IDENTIFICATION	NOTES
A	2'-6"	2'-0"	EMBEDDED FOUND ROCK
B	2'-0"	1'-6"	EXPOSED FACE
C	1'-9"	1'-3"	EXPOSED FACE



- 1 1.0 MG BURIED CONCRETE TANK
(SEE SHEET TL)
- 2 ROADBASE TURN-AROUND AREA
8" THICK ROAD BASE
- 3 INLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP1-PP2) CD1
- 4 OUTLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP3-PP4) CD1
- 5 OVERFLOW-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP5) CD1
- 6 VAULT DRAIN-4" CONTECH A-2000
OR APPROVED EQUAL CD1
- 7 DRAIN-6" CONTECH A-2000
OR APPROVED EQUAL GP1
- 8 10" GATE VALVE (CLASS 150) CD1
- 9 8'-0" HEIGHT CHAIN-LINK FENCE CD2
- 10 16'-0" WIDE CHAIN-LINK GATE CD2
- 11 PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS,
AND HYDROSEED W/ NATIVE VEGETATION. HYDROSEED MAX TO
BE APPROVED BY CITY AND ENGINEER OF RECORD
- 12 ISOLATION VALVE/METER VAULT VI
- 13 PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED
SLOPES, TANK FILL AND ROAD CUT
- 14 ACCESS ROAD GP4
- 15 OVERFLOW DISCHARGE BOX CD3
- 16 OVERFLOW OUTLET PIPE-10" ADS
- 17 PIPE OUTLET RIP RAP CD3
- 18 ROCKERY RETAINING WALL A GP5
- 19 ROCKERY RETAINING WALL B GP6
- 20 ROCKERY RETAINING WALL C GP7
- 21 ROCKERY RETAINING WALL D GP8
- 22 DRAIN - 8" PVC C-900 (DR-25)
(SEE PIPING PLAN SHEET PP5)
- 23 TEMP. EXCAVATION SHORING
(SEE EXCAVATION PLAN SHEET GP1)
- 24 BOULDER GAUARD RAIL
- 25 BELOW GRADE COMBO AIR/ VAC ASSEMBLY CD2
- 26 6" CONCRETE PAD ENCASING (3) VALVE BOXES

CONSTRUCTION NOTES

RET. NO.

COMMENT

DATE

PROFESSIONAL ENGINEER
01/07/2023
JENNIFER HANSEN
STATE OF KANSAS

2036 LINCOLN AVENUE, SUITE 104
OBERLIN, UTAH 84001
TEL: 801.692.8515 • FAX: 801.692.7187
WWW.SUNRISE-ENG.COM

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KANSVILLE CITY

1.0 MG WATER TANK

PLAN & PROFILE - ROCKERY RETAINING WALL "D"

SET NO.
07062

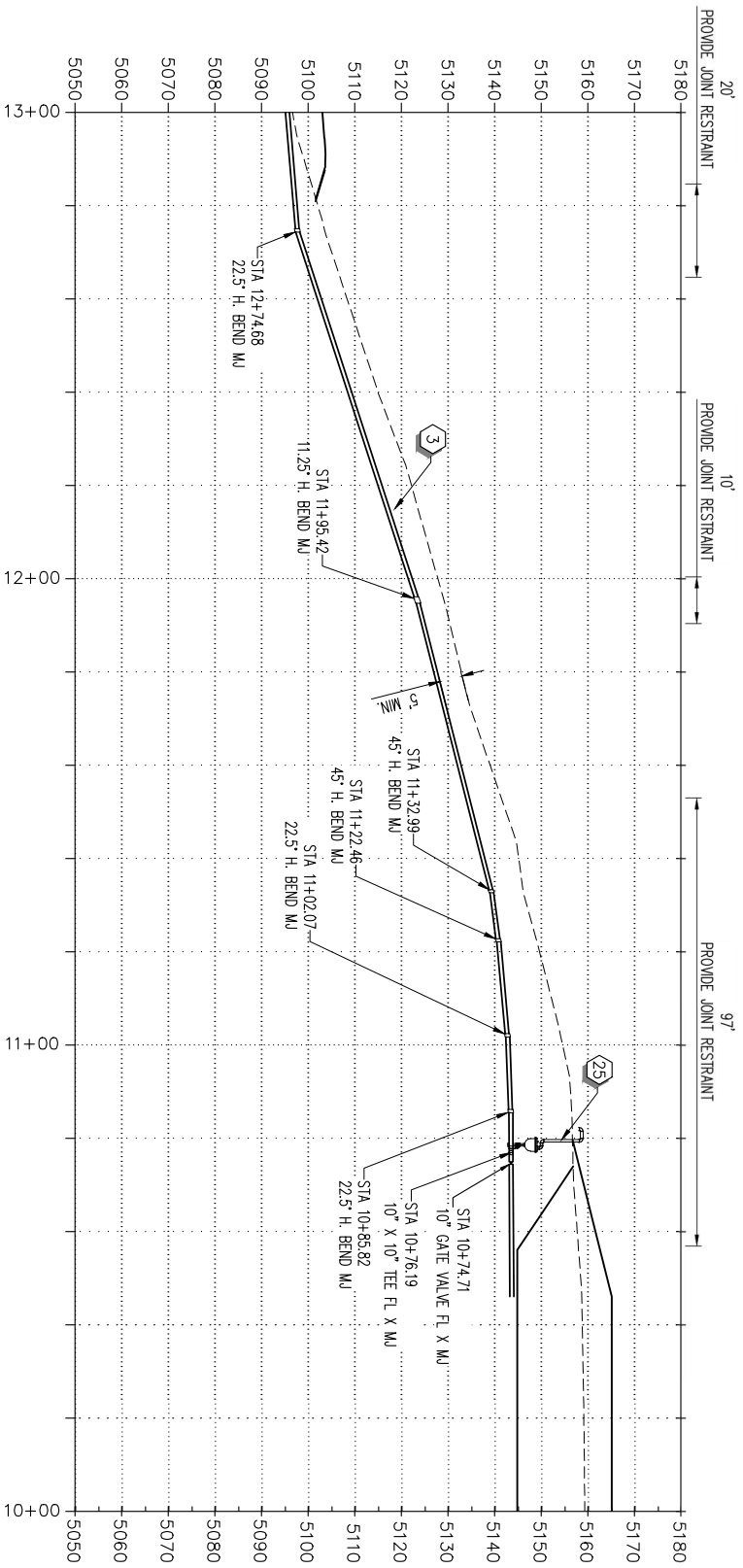
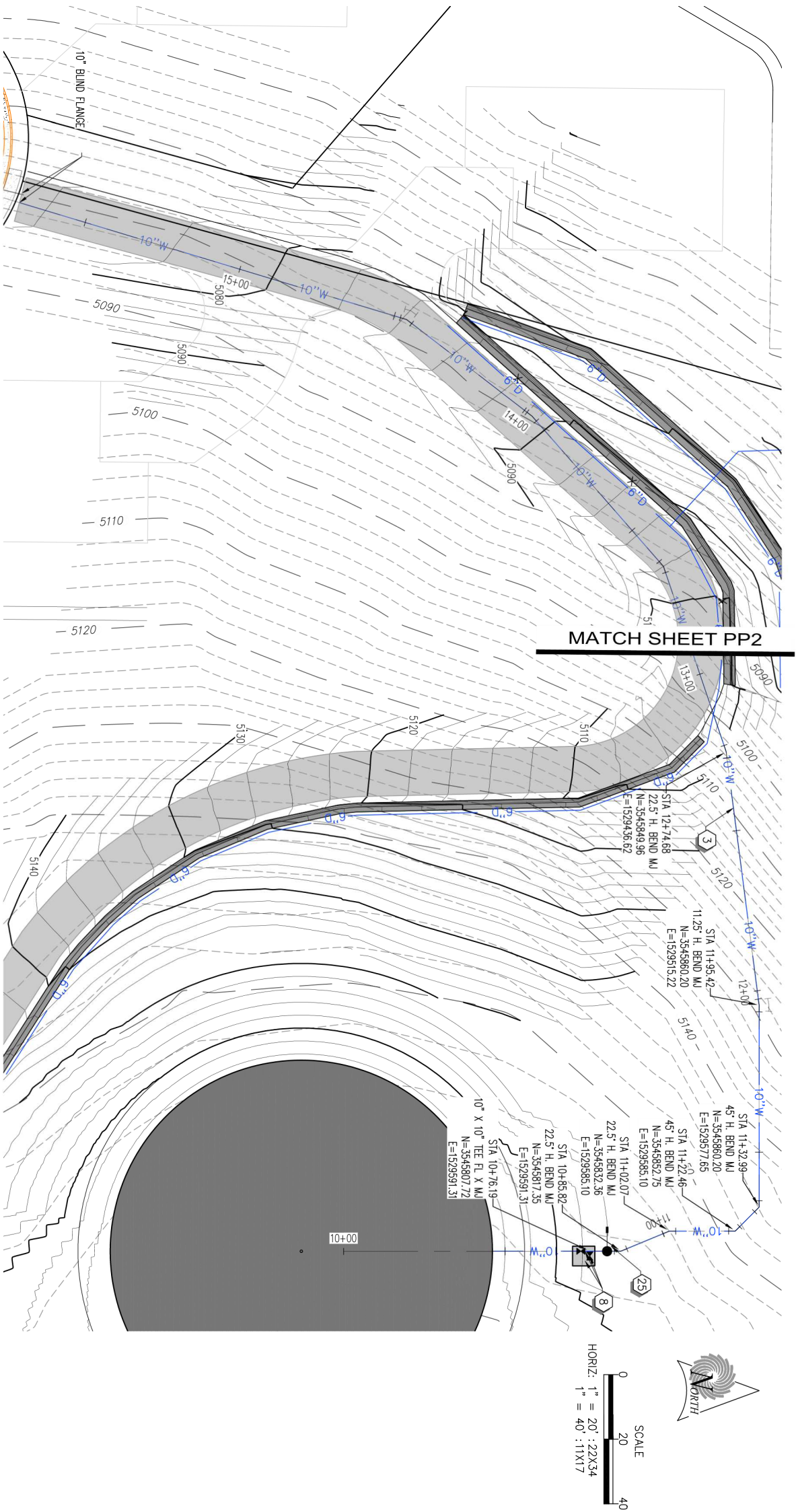
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SHEET NO.
14 of 39

GP8



CONSTRUCTION NOTES

- 1.0 MG BURIED CONCRETE TANK (SEE SHEET TL)
- ROADBASE TURN-AROUND AREA
8" THICK ROAD BASE
- INLET-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP1-PP2) CD1
- OUTLET-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP3-PP4) CD1
- OVERFLOW-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP5) CD1
- VAULT DRAIN-4" CONTECH A-2000 OR APPROVED EQUAL CD1
- DRAIN-6" CONTECH A-2000 OR APPROVED EQUAL GP1
- 10" GATE VALVE (CLASS 150) CD1
- 8'-0" HEIGHT CHAIN-LINK FENCE CD2
- 16'-0" WIDE CHAIN-LINK GATE CD2
- PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS, AND HYDROSEED W/ NATIVE VEGETATION. HYDROSEED MIX TO BE APPROVED BY CITY AND ENGINEER OF RECORD
- ISOLATION VALVE/METER VAULT V1
- PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED SLOPES, TANK FILL AND ROAD CUT
- ACCESS ROAD GP4
- OVERFLOW DISCHARGE BOX CD3
- OVERFLOW OUTLET PIPE-10" ADS
- PIPE OUTLET RIP RAP CD3
- ROCKERY RETAINING WALL A GP5
- ROCKERY RETAINING WALL B GP6
- ROCKERY RETAINING WALL C GP7
- ROCKERY RETAINING WALL D GP8
- DRAIN - 8" PVC C-900 (DR-25) (SEE PIPING PLAN SHEET PP5)
- TEMP. EXCAVATION SHORING (SEE EXCAVATION PLAN SHEET GP1)
- BOULDER GALVED RAIL
- BELOW GRADE COMBO AIR/ VAC ASSEMBLY CD2
- 6" CONCRETE PAD ENCLOSING (3) VALVE BOXES

REF. NO.	COMMENT	DATE
1	PROFESSIONAL SEAL	01/07/2023
2	DESIGNED	SH
3	DRAWN	TR
4	CHECKED	CL
5	SHEET NO.	15 of 39
6	PP1	

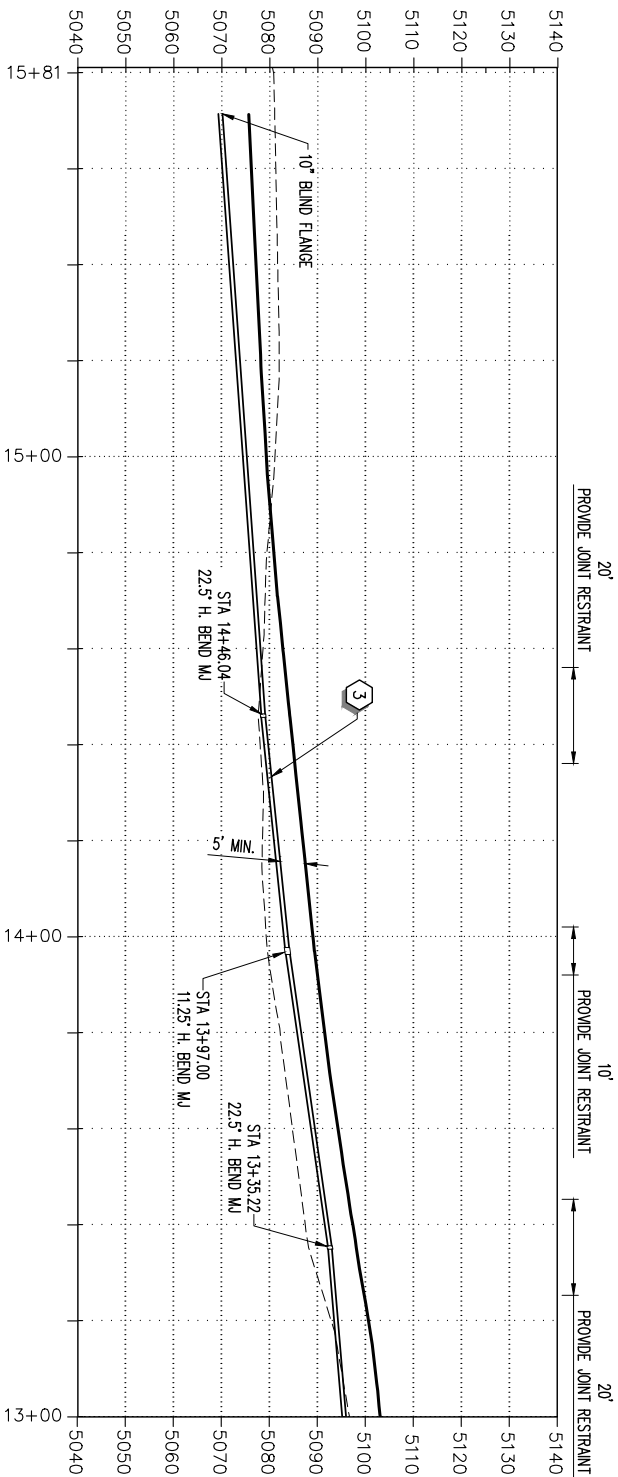
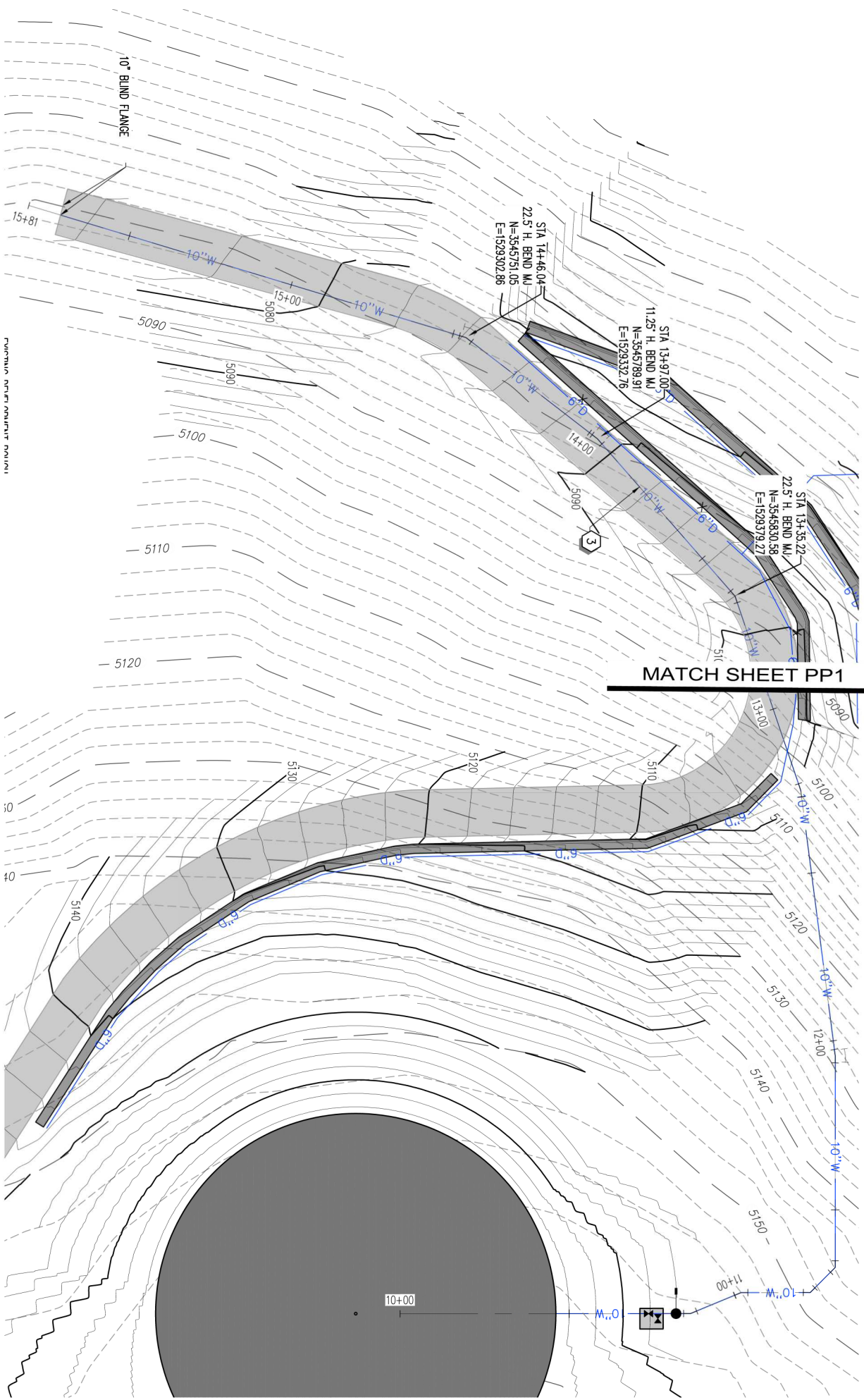
SUNRISE ENGINEERING

2036 LINCOLN AVENUE, SUITE 104
OGDEN, UTAH 84401
TEL: 801.692.8515 • FAX: 801.692.7187
WWW.SUNRISE-ENG.COM

KANSVILLE CITY

1.0 MG WATER TANK

PLAN & PROFILE - INLET WATERLINE



CONSTRUCTION NOTES

- 1 1.0 MG BURIED CONCRETE TANK
(SEE SHEET TL)
- 2 ROADBASE TURN-AROUND AREA
8" THICK ROAD BASE
- 3 INLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP1-PP2) (A)
CD1
- 4 OUTLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP3-PP4) (A)
CD1
- 5 OVERFLOW-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP5) (A)
CD1
- 6 VAULT DRAIN-4" CONTECH A-2000
OR APPROVED EQUAL (A)
CD1
- 7 DRAIN-6" CONTECH A-2000
OR APPROVED EQUAL (D)
GP1
- 8 10" GATE VALVE (CLASS 150) (B)
CD1
- 9 8'-0" HEIGHT CHAIN-LINK FENCE (A)
CD2
- 10 16'-0" WIDE CHAIN-LINK GATE (B)
CD2
- 11 PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS,
AND HYDROSEED W/ NATIVE VEGETATION. HYDROSEED MIX TO
BE APPROVED BY CITY AND ENGINEER OF RECORD
- 12 ISOLATION VALVE/METER VAULT (A)
V1
- 13 PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED
SLOPES, TANK FILL AND ROAD CUT
- 14 ACCESS ROAD (C)
GP4
- 15 OVERFLOW DISCHARGE BOX (A)
CD3
- 16 OVERFLOW OUTLET PIPE-10" ADS
- 17 PIPE OUTLET RIP RAP (C)
CD3
- 18 ROCKERY RETAINING WALL A (C)
GP5
- 19 ROCKERY RETAINING WALL B (C)
GP6
- 20 ROCKERY RETAINING WALL C (C)
GP7
- 21 ROCKERY RETAINING WALL D (C)
GP8
- 22 DRAIN - 8" PVC C-900 (DR-25)
(SEE PIPING PLAN SHEET PP5)
- 23 TEMP. EXCAVATION SHORING
(SEE EXCAVATION PLAN SHEET PP1)
- 24 BOULDER GALVED RAIL
- 25 BELOW GRADE COMBO AIR/ VAC ASSEMBLY (C)
CD2
- 26 6" CONCRETE PAD ENCASING (3) VALVE BOXES

REF. NO.	COMMENT			DATE
07062	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	TR	CL	16 of 39
PP2				

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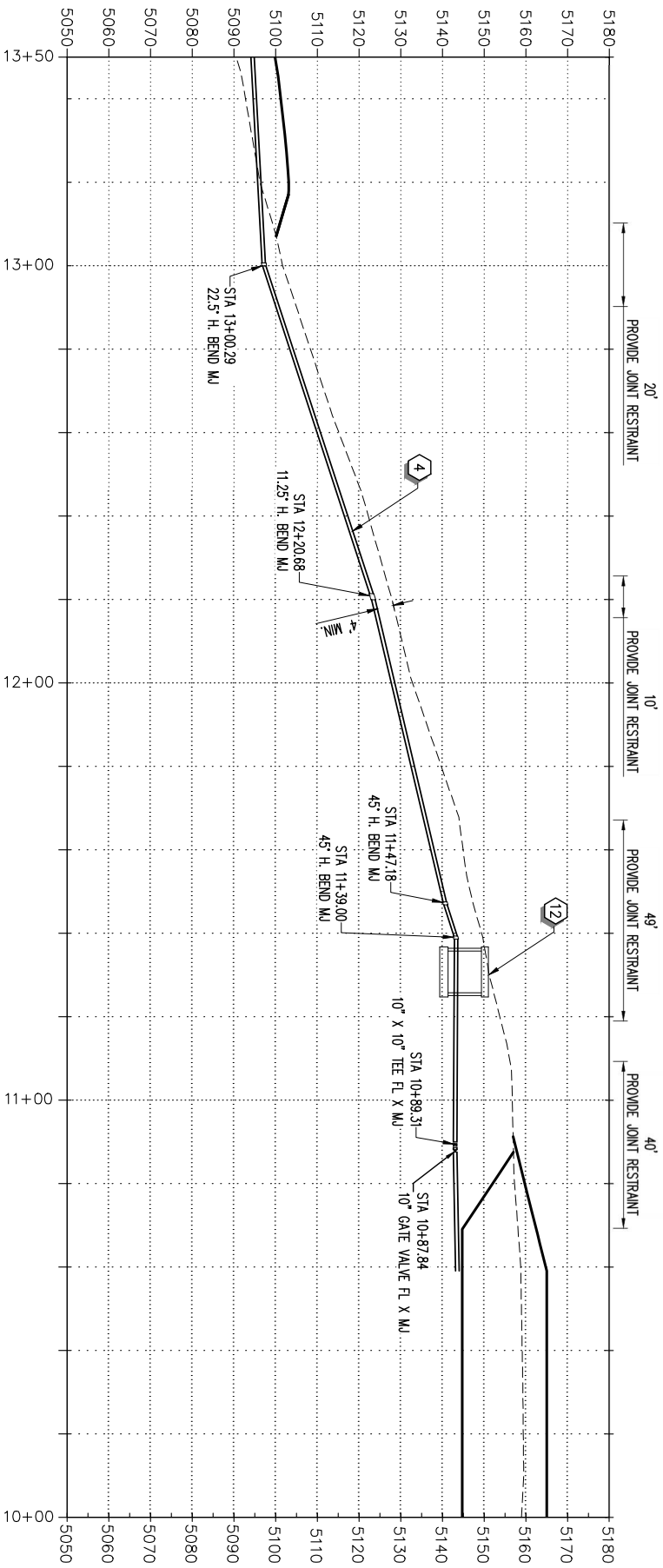
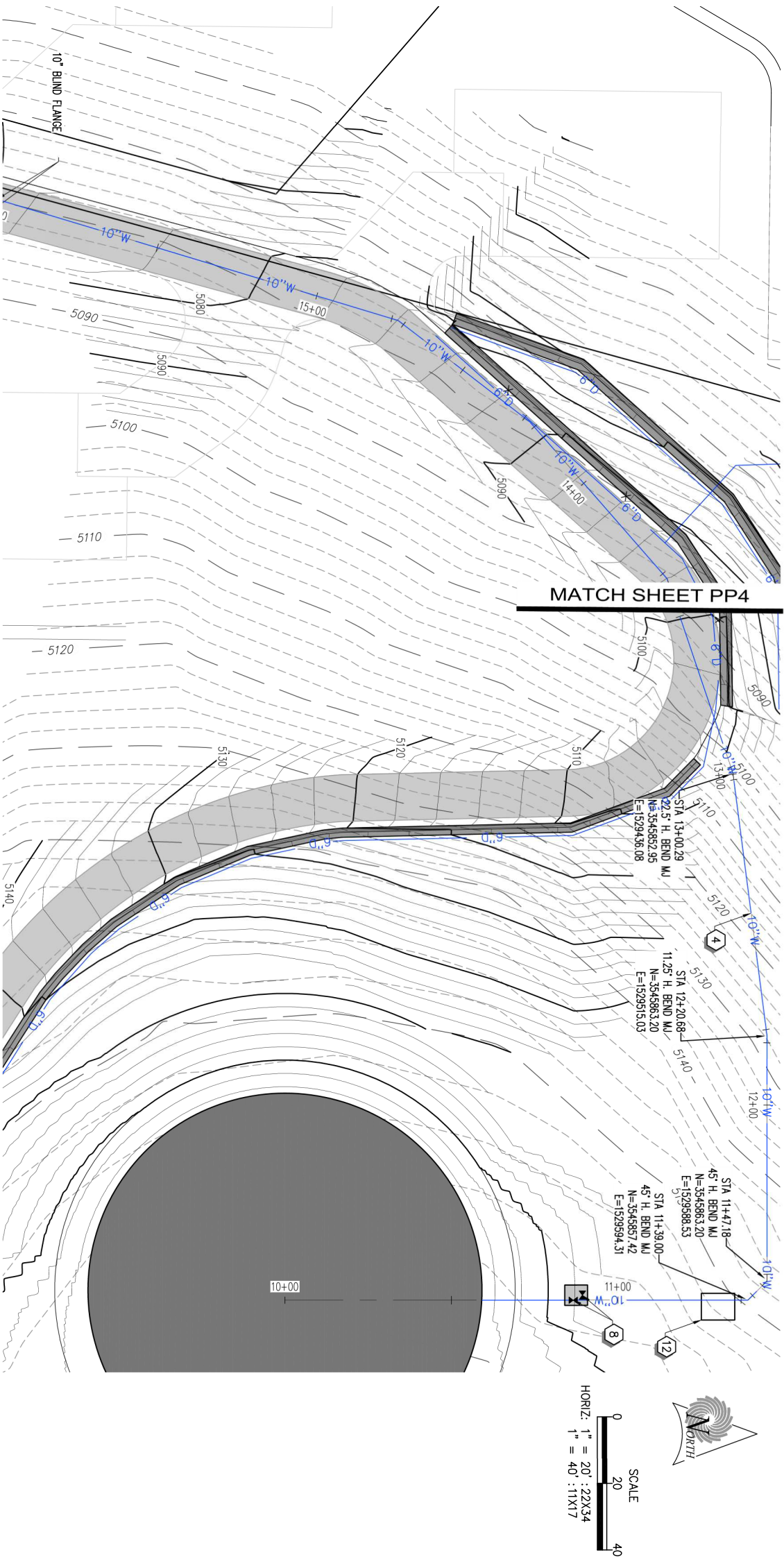
2036 LINCOLN AVENUE, SUITE 104
OAKDALE, UTAH 84041
TEL: 801.892.8515 • FAX: 801.892.7187
WWW.SUNRISE-ENG.COM

PROFESSIONAL ENGINEER
No. 5048196-2018
JENNIFER HANSEN
STATE OF UTAH

KANSVILLE CITY

1.0 MG WATER TANK

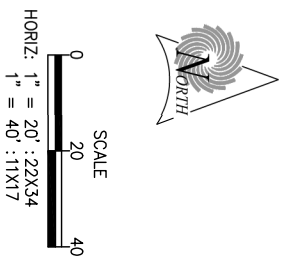
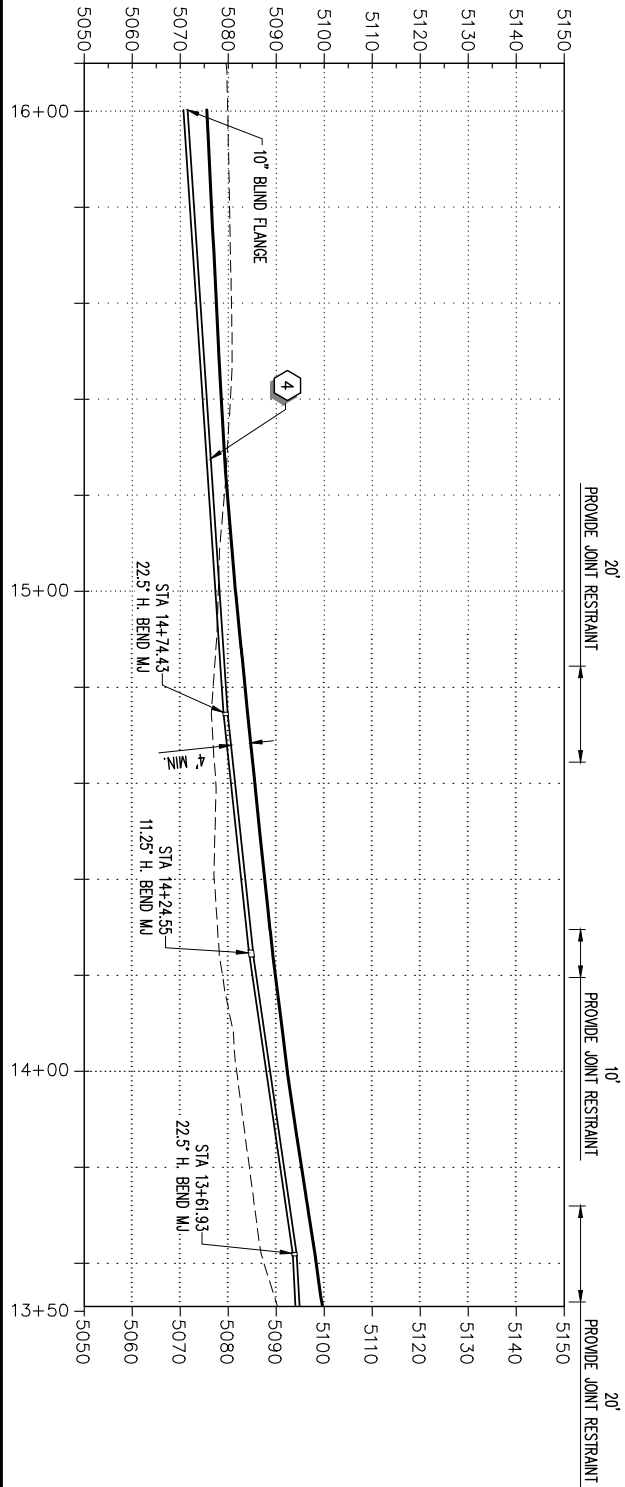
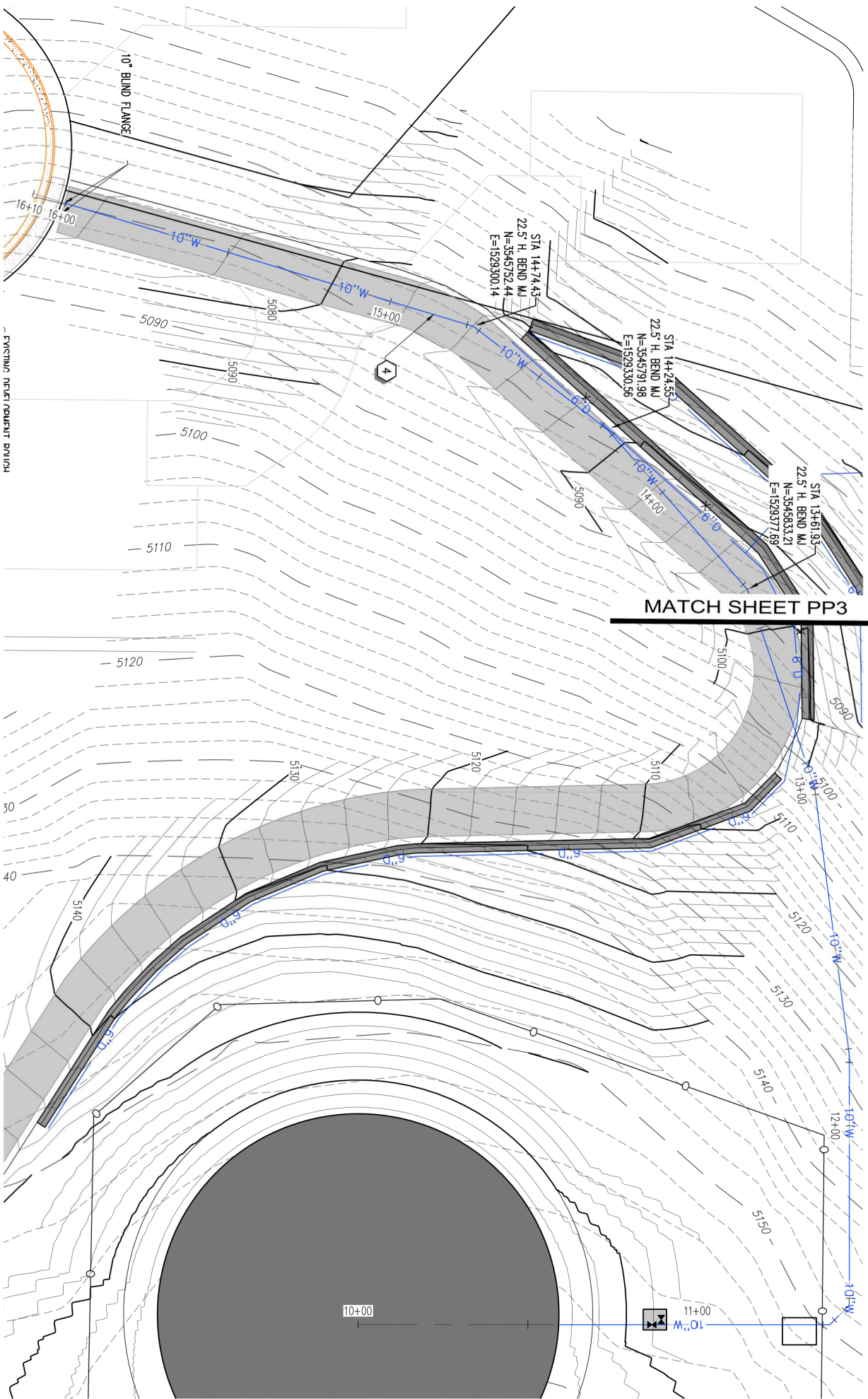
PLAN & PROFILE – INLET WATERLINE



CONSTRUCTION NOTES

- 1 1.0 MG BURIED CONCRETE TANK (SEE SHEET TL)
- 2 ROADBASE TURN-AROUND AREA 8" THICK ROAD BASE
- 3 INLET-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP1-PP2)
- 4 OUTLET-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP3-PP4)
- 5 OVERFLOW-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP5)
- 6 VAULT DRAIN-4" CONTECH A-2000 OR APPROVED EQUAL
- 7 DRAIN-6" CONTECH A-2000 OR APPROVED EQUAL
- 8 10" GATE VALVE (CLASS 150)
- 9 8'-0" HEIGHT CHAIN-LINK FENCE
- 10 16'-0" WIDE CHAIN-LINK GATE
- 11 PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS, AND HYDROSEED W/ NATIVE VEGETATION. HYDROSEED MIX TO BE APPROVED BY CITY AND ENGINEER OF RECORD
- 12 ISOLATION VALVE/METER VAULT
- 13 PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED SLOPES, TANK FILL AND ROAD CUT
- 14 ACCESS ROAD
- 15 OVERFLOW DISCHARGE BOX
- 16 OVERFLOW OUTLET PIPE-10" ADS
- 17 PIPE OUTLET RIP RAP
- 18 ROCKERY RETAINING WALL A
- 19 ROCKERY RETAINING WALL B
- 20 ROCKERY RETAINING WALL C
- 21 ROCKERY RETAINING WALL D
- 22 DRAIN - 8" PVC C-900 (DR-25) (SEE PIPING PLAN SHEET PP5)
- 23 TEMP. EXCAVATION SHORING (SEE EXCAVATION PLAN SHEET GP1)
- 24 BOULDER GAUDED RAIL
- 25 BELOW GRADE COMBO AIR/ VAC ASSEMBLY
- 26 6" CONCRETE PAD ENCASING (3) VALVE BOXES

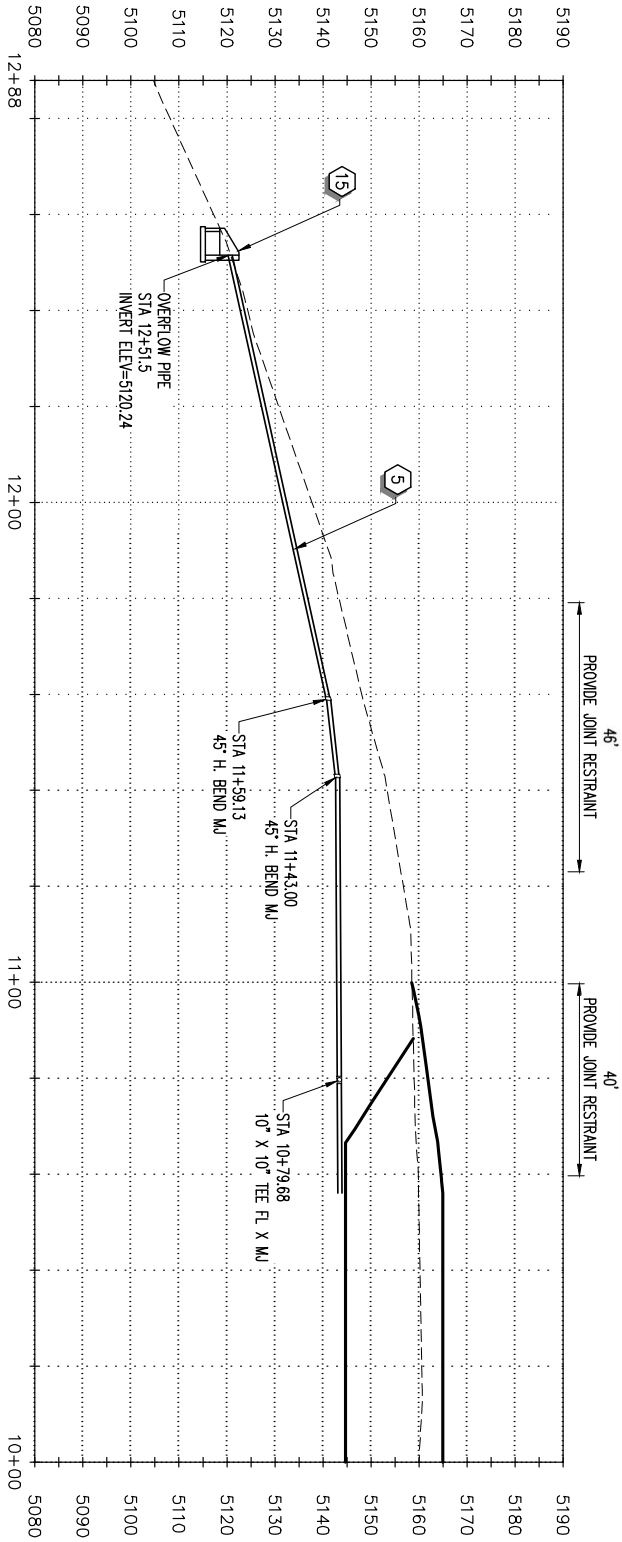
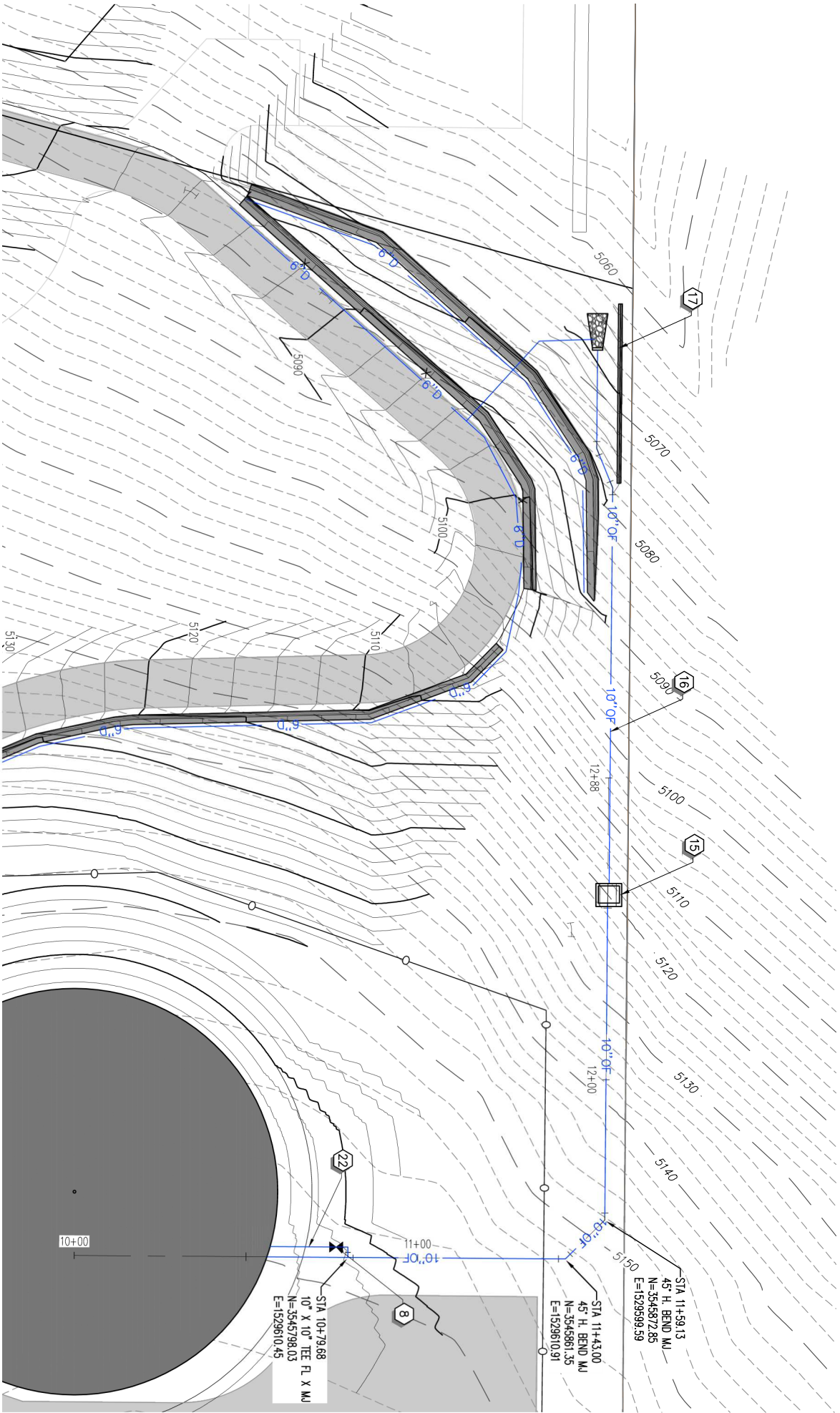
REF. NO.	COMMENT			DATE
KANSVILLE CITY				
1.0 MG WATER TANK				
PLAN & PROFILE - OUTLET WATERLINE				
SHEET NO. 07062	DESIGNED SH	DRAWN TR	CHECKED CL	SHEET NO. 17 of 39
				PP3



CONSTRUCTION NOTES

- 1.0 MG BURIED CONCRETE TANK (SEE SHEET TL)
- ROADBASE TURN-AROUND AREA 8" THICK ROAD BASE
- INLET-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP1-PP2)
- OUTLET-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP3-PP4)
- OVERFLOW-10" PVC C-900 (DR-25) (SEE PIPING PLAN-SHEET PP5)
- VAULT DRAIN-4" CONTECH A-2000 OR APPROVED EQUAL
- DRAIN-6" CONTECH A-2000 GP1 OR APPROVED EQUAL
- 10" GATE VALVE (CLASS 150) CD1
- 8'-0" HEIGHT CHAIN-LINK FENCE CD2
- 16'-0" WIDE CHAIN-LINK GATE CD2
- PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS, AND HYDROSEED W/ NATIVE VEGETATION. HYDROSEED MIX TO BE APPROVED BY CITY AND ENGINEER OF RECORD
- ISOLATION VALVE/METER VAULT VI
- PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED SLOPES, TANK FILL AND ROAD CUT
- ACCESS ROAD GP4
- OVERFLOW DISCHARGE BOX CD3
- OVERFLOW OUTLET PIPE-10" ADS
- PIPE OUTLET RIP RAP CD3
- ROCKERY RETAINING WALL A GP5
- ROCKERY RETAINING WALL B GP6
- ROCKERY RETAINING WALL C GP7
- ROCKERY RETAINING WALL D GP8
- DRAIN - 8" PVC C-900 (DR-25) (SEE PIPING PLAN SHEET PP5)
- TEMP. EXCAVATION SHORING (SEE EXCAVATION PLAN SHEET GP1)
- BOULDER GALIARD RAIL
- BELOW GRADE COMBO AIR/ VAC ASSEMBLY CD2
- 6" CONCRETE PAD ENCASING (3) VALVE BOXES

REF. NO.	COMMENT	DATE
	 2026 LINCOLN AVENUE, SUITE 104 OGDEN, UTAH 84401 TEL: 801.692.8515 • FAX 801.692.7187 WWW.SUNRISE-ENG.COM SUNRISE ENGINEERING	
	KANSVILLE CITY	
	1.0 MG WATER TANK	
	PLAN & PROFILE – OUTLET WATERLINE	
SHEET NO. 07062	DESIGNED SH	DRAWN TR
CHECKED CL	SHEET NO. 18 of 39	PP4



CONSTRUCTION NOTES

- 1.0 MG BURIED CONCRETE TANK
(SEE SHEET TL)
- ROADBASE TURN-AROUND AREA
8" THICK ROAD BASE
- INLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP1-PP2)
- OUTLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP3-PP4)
- OVERFLOW-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP5)
- VAULT DRAIN-4" CONTECH A-2000
OR APPROVED EQUAL
- DRAIN-6" CONTECH A-2000
OR APPROVED EQUAL
- 10" GATE VALVE (CLASS 150)
- 8'-0" HEIGHT CHAIN-LINK FENCE
- 16'-0" WIDE CHAIN-LINK GATE
- PROVIDE 10' OF NATIVE TOP SOIL AT ALL DISTURBED AREAS,
AND HYDROSEED W/ NATIVE VEGETATION, HYDROSEED MIX TO
BE APPROVED BY CITY AND ENGINEER OF RECORD
- ISOLATION VALVE/METER VAULT
- PROVIDE FIBER EROSION CONTROL AT ALL DISTURBED SLOPES,
TANK FILL AND ROAD CUT AT 20' INTERVALS
- ACCESS ROAD
- OVERFLOW DISCHARGE BOX
- OVERFLOW OUTLET PIPE-10" ADS
- PIPE OUTLET RIP RAMP
- ROCKERY RETAINING WALL A
- ROCKERY RETAINING WALL B
- ROCKERY RETAINING WALL C
- ROCKERY RETAINING WALL D
- DRAIN - 8" PVC C-900 (DR-25)
(SEE PIPING PLAN SHEET PP5)
- TEMP. EXCAVATION SHORING
(SEE EXCAVATION PLAN SHEET GP1)
- BOULDER GUARD RAIL
- BURIED COMBO AIR/ VAC ASSEMBLY
- 6" CONCRETE PAD ENCASING (3) VALVE BOXES

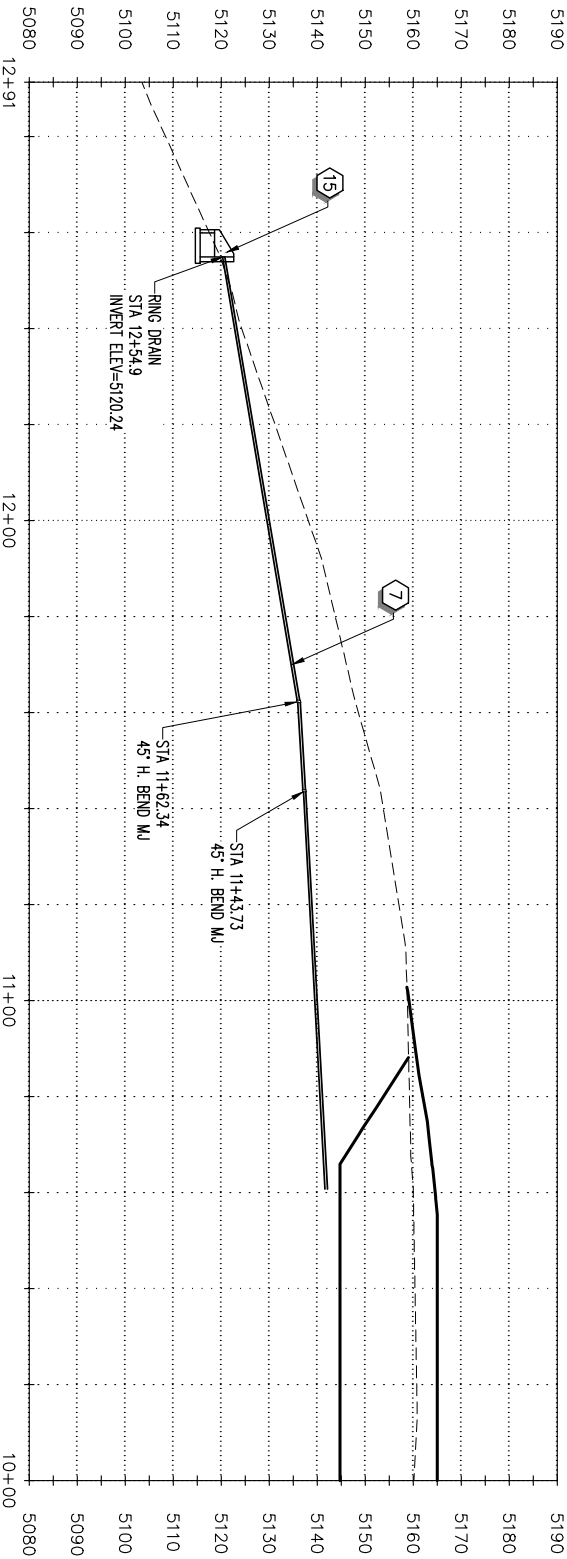
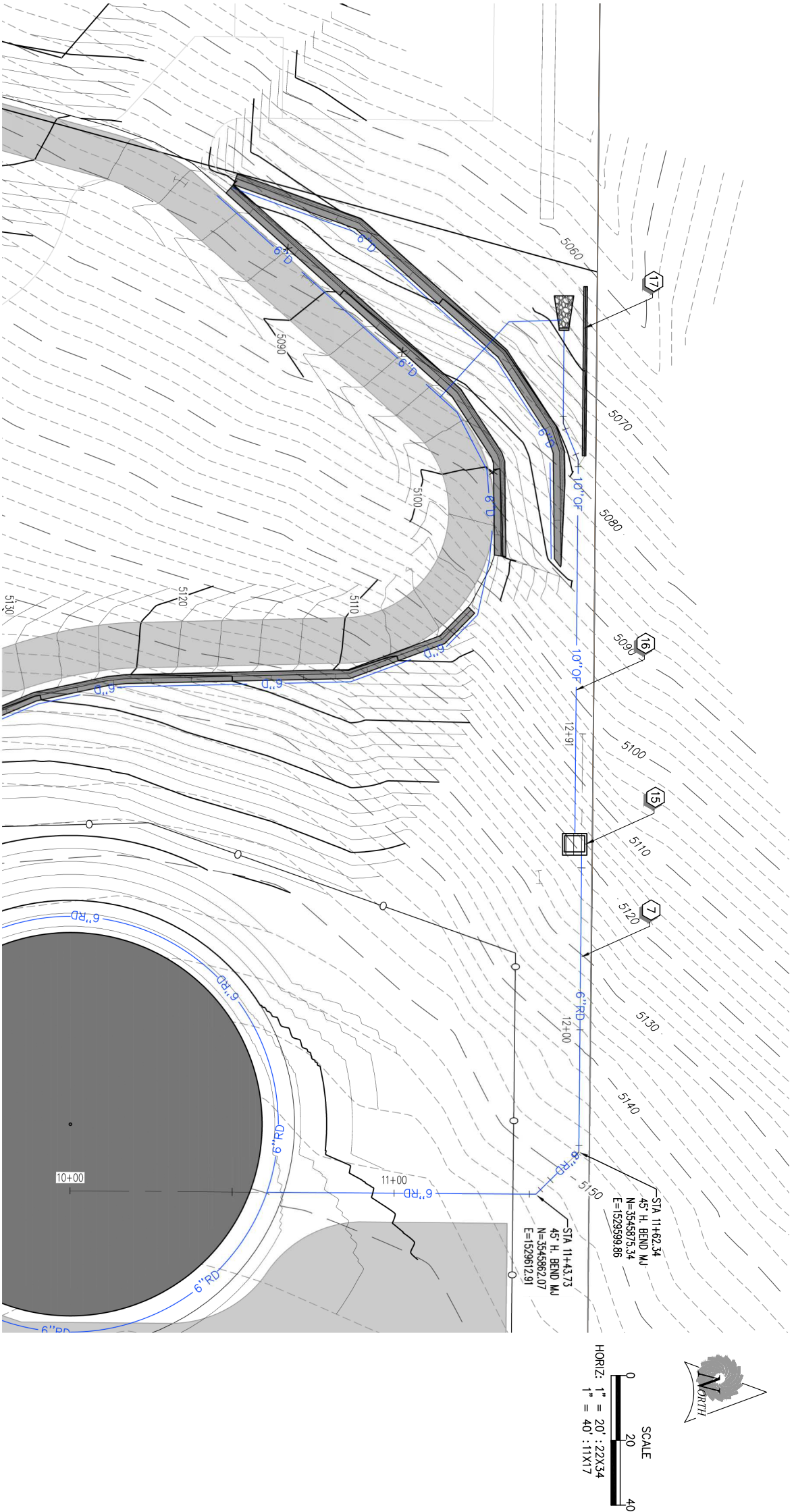
REF. NO.	COMMENT	DATE

PROFESSIONAL ENGINEER
HANEN HANEN
No. 5048194-2018
01/07/2023
STATE OF UTAH

SUNRISE
ENGINEERING

2036 LINCOLN AVENUE, SUITE 104
OGDEN, UTAH 84401
TEL: 801.892.8515 • FAX: 801.892.7167
WWW.SUNRISE-ENG.COM

KANSVILLE CITY				
1.0 MG WATER TANK				
PLAN & PROFILE - TANK OVERFLOW				
SET NO. 07062	DESIGNED SH	DRAWN TR	CHECKED CL	SHEET NO. 19 of 39
PP5				PP5



CONSTRUCTION NOTES

- 1.0 MG BURIED CONCRETE TANK
(SEE SHEET TL)
- ROADBASE TURN-AROUND AREA
8" THICK ROAD BASE
- INLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP1-PP2)
- OUTLET-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP3-PP4)
- OVERFLOW-10" PVC C-900 (DR-25)
(SEE PIPING PLAN-SHEET PP5)
- VAULT DRAIN-4" CONTECH A-2000
OR APPROVED EQUAL
- DRAIN-6" CONTECH A-2000
GP1
OR APPROVED EQUAL
- 10" GATE VALVE (CLASS 150)
CD1
- 8'-0" HEIGHT CHAIN-LINK FENCE
GD2
- 16'-0" WIDE CHAIN-LINK GATE
GD2
- PROVIDE 10" OF NATIVE TOP SOIL AT ALL DISTURBED AREAS,
AND HYDROSEED W/ NATIVE VEGETATION. HYDROSEED MIX TO
BE APPROVED BY CITY AND ENGINEER OF RECORD
- ISOLATION VALVE/METER VAULT
VI
- PROVIDE FIBER EROSION CONTROL BLANKETS AT ALL DISTURBED
SLOPES, TANK FILL AND ROAD CUT
- ACCESS ROAD
GP4
- OVERFLOW DISCHARGE BOX
CD3
- OVERFLOW OUTLET PIPE-10" ADS
- PIPE OUTLET RIP RAP
CD3
- ROCKERY RETAINING WALL A
GP5
- ROCKERY RETAINING WALL B
GP6
- ROCKERY RETAINING WALL C
GP7
- ROCKERY RETAINING WALL D
GP8
- DRAIN - 8" PVC C-900 (DR-25)
(SEE PIPING PLAN SHEET PP5)
- TEMP. EXCAVATION SHORING
(SEE EXCAVATION PLAN SHEET GP1)
- BOULDER GALIARD RAIL
- BELOW GRADE COMBO AIR/ VAC ASSEMBLY
CD2
- 6" CONCRETE PAD ENCLOSING (3) VALVE BOXES

REF. NO.	COMMENT	DATE

PROFESSIONAL SEAL
01/07/2023
JENNIFER HANSEN
No. 5048199-2018
STATE OF KANSAS

SUNRISE
ENGINEERING

2036 LINCOLN AVENUE, SUITE 104
OBERLIN, UTAH 84051
TEL: 801.692.8513 • FAX: 801.692.7187
WWW.SUNRISE-ENG.COM

KANSVILLE CITY

1.0 MG WATER TANK

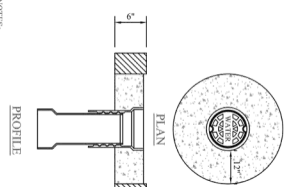
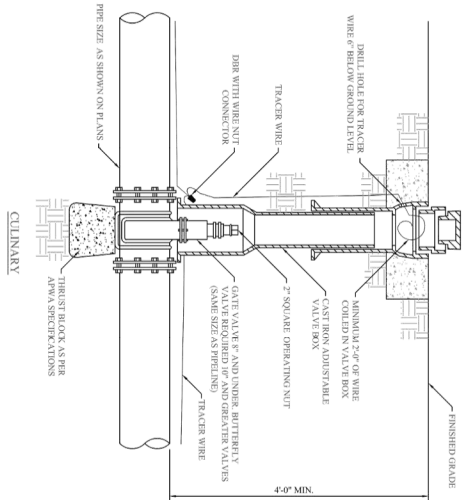
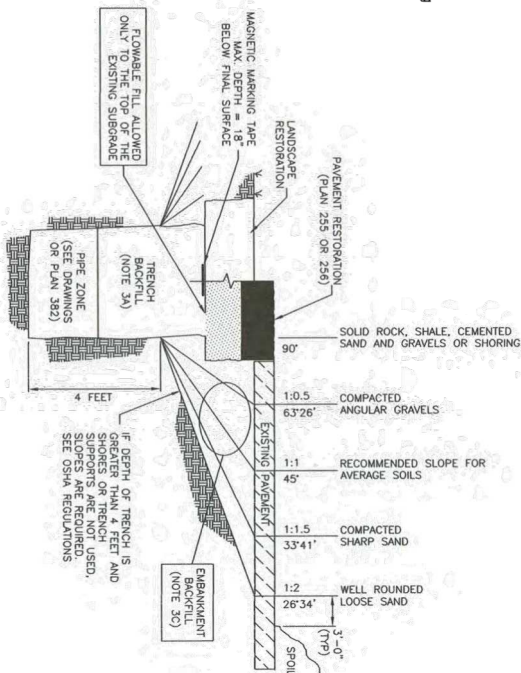
PLAN & PROFILE - RING DRAIN

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	PP6
07062	SH	TR	CL	20 of 39	PP6

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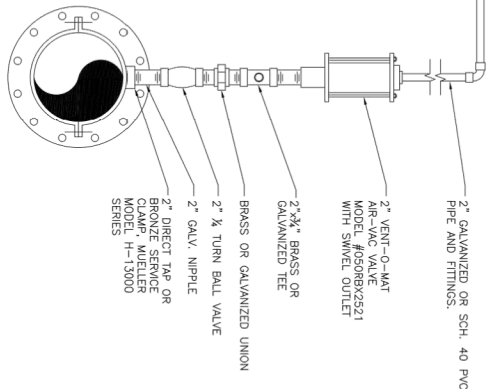
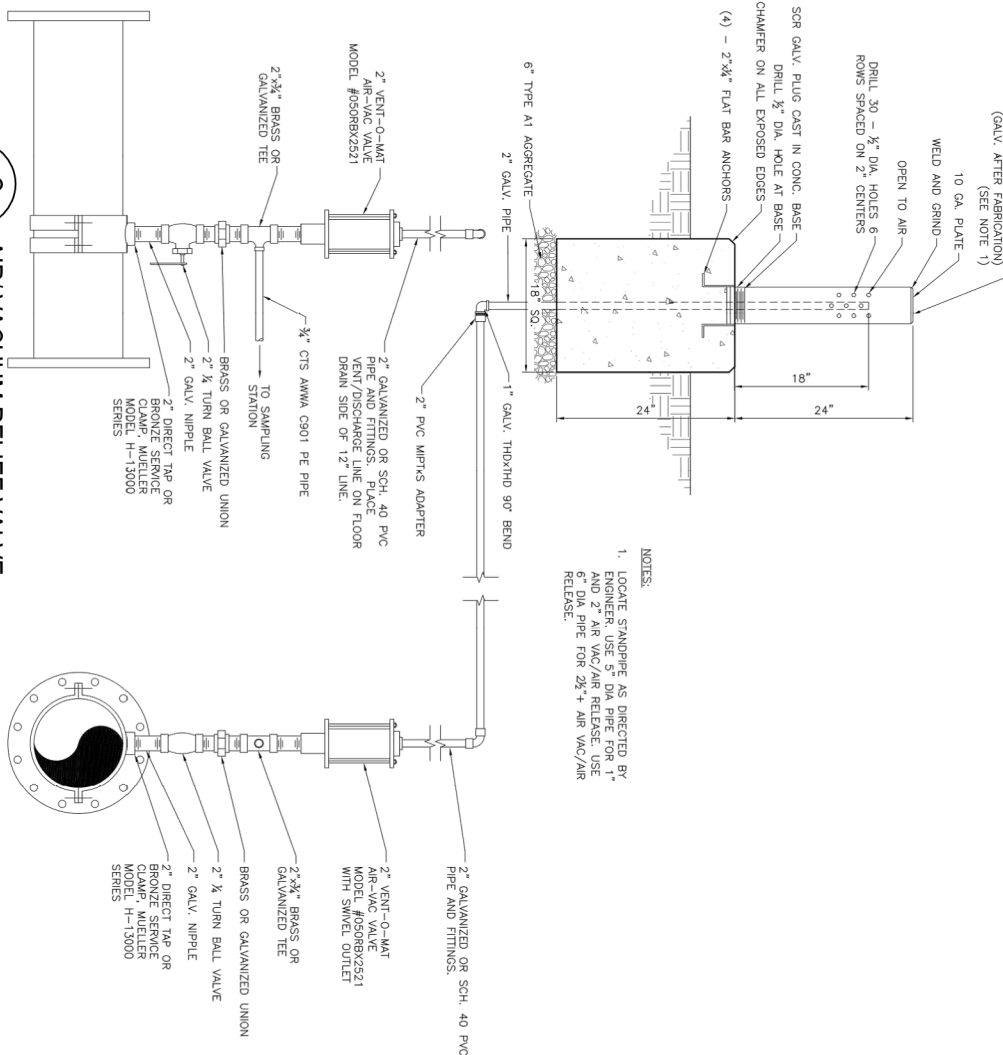
P:\Kaysville\1.0 MG Tank\Design3D\Civil3D\Sheets\KC1T-SITE REV 3.dwg Jan 07, 2020 3:10pm troberts

1. **GENERAL**
 - A. The drawing applies to backfilling a trench (and embankment) above the pipe zone.
2. **PRODUCTS**
 - A. Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 3-inches.
 - B. Flowable fill: APWA Section 31 05 15. Target is 60 psi in 28 days with 90 psi maximum in 28 days. It must flow easily requiring no vibration for consolidation.
3. **EXECUTION**
 - A. Trench Backfill Above the Pipe Zone: Follow requirement indicated in APWA Section 33 05 20 and the following provisions. See Standard Plan 382 for backfilling the pipe zone.
 - 1) DO NOT USE sewer rock, pea gravel, or recycled RAP aggregate as trench backfill.
 - 2) Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a standard proctor density, APWA Section 31 23 26.
 - 3) Water jetting is NOT allowed.
 - B. Flowable fill: If controlled low strength material is placed in the trench. Cure the material before placing surface restorations.
 - C. Embankment backfill: When trench sides are sloped proceed as follows.
 - 1) Maximum lift thickness is 8-inches before compaction.
 - 2) Compact per APWA Section 31 23 26 to 95 percent or greater relative to a standard proctor density.
 - 3) Submission of quality control compaction test result data may be requested by ENGINEER at any time. Provide results of tests immediately upon request.
 - D. Surface Restoration:
 - 1) Landscaped Surface: Follow APWA Section 32 92 00 (turf or grass) or APWA Section 32 93 03 (ground cover) requirements. Pave to match existing grade. Replace vegetation to match pre-construction conditions.
 - 2) Paved Surface: Follow APWA Section 33 05 26 (bituminous pavement surfacing) or APWA Section 33 05 25 (concrete pavement surfacing). Do not install surfacing until compaction density is acceptable to ENGINEER.

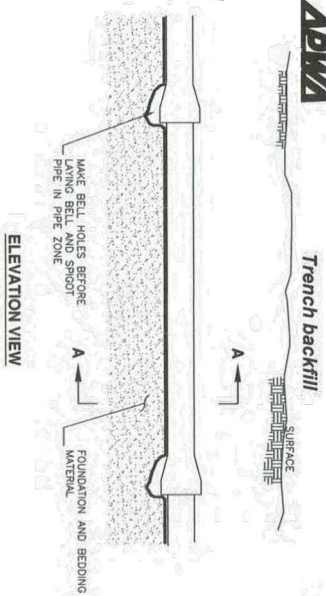


- NOTES:
1. VALVE BOX SHALL BE CLEAN, PLUMB AND PROPERLY ALIGNED ON THE VALVE.

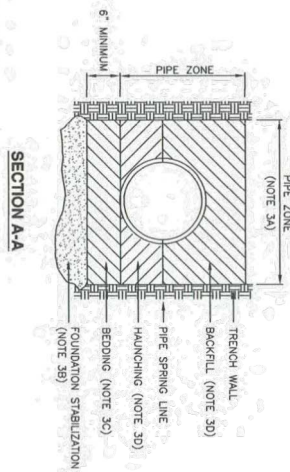
WATER VALVES



AIR/ VACUUM RELIEF VALVE



ELEVATION VIEW



SECTION A-A

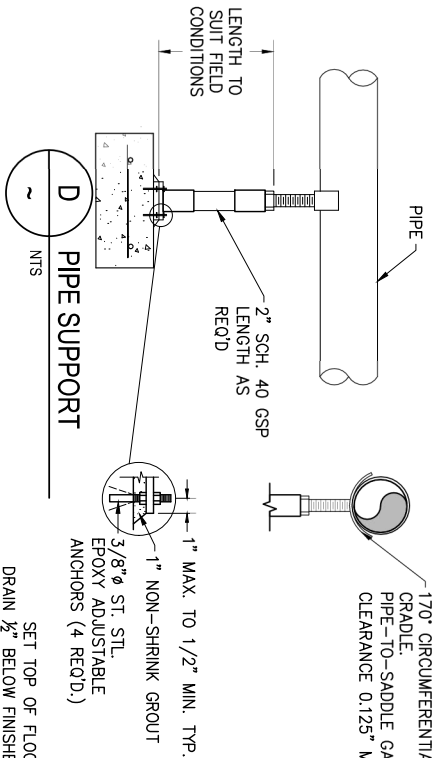
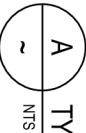
INSTALLATION

- 2) Submission of quality control compaction test result data developed for the haulroad may be requested by ENGINEER at any time. CONTRACTOR is responsible for providing the test results.
- 3) Flowable Fill (When required and if allowed by pipe manufacturer).
- 4) Place the controlled low strength material, APWA Section 31.05.15.
- 5) Prevent pipe flotation by installing in lifts and providing pipe restrainers as required by pipe manufacturer.
- 6) Reset pipe to line and grade if pipe "floats" out of position.

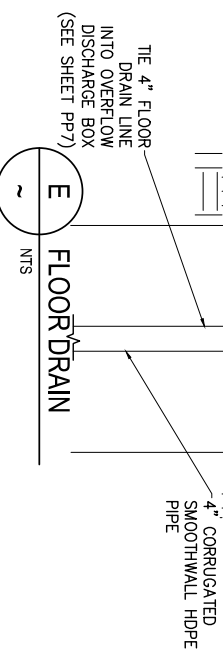
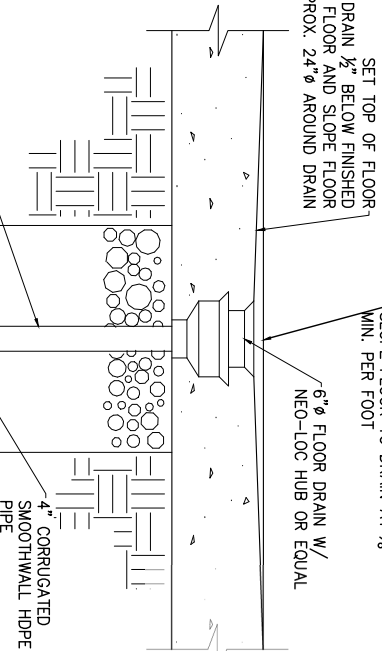
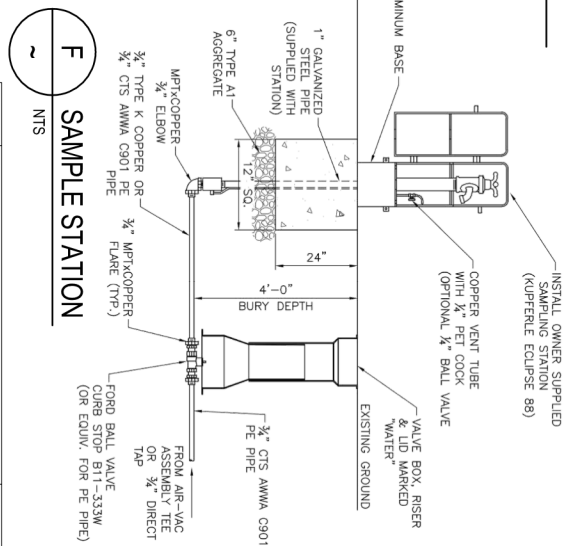
- | | |
|---|---|
| CONCRETE PIPE FOLLOW ASTM C 143 | CONCRETE PIPE FOR INSTALLATION OF CONCRETE SEWER, STORM DRAIN, AND CULVERT PIPE (SEE NOTE 1) |
| STANDARD PRACTICE FOR INSTALLATION OF CONCRETE PIPE | |
| PLASTIC PIPE FOLLOW ASTM D 2321 | PLASTIC PIPE FOR INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER DRAINAGE APPLICATIONS |
| STANDARD PRACTICE FOR INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER DRAINAGE APPLICATIONS | |
| CORRUPATED METAL PIPE FOLLOW ASTM A 798 | STANDARD PRACTICE FOR INSTALLING FACTORY-WELD CORRUPATED STEEL PIPE FOR SEWERS AND OTHER APPLICATIONS |
| UNGRADED CLAY PIPE FOLLOW ASTM C 12 | STANDARD RECOMMENDED PRACTICE FOR INSTALLING UNGRADED CLAY PIPE LINES |

TYPICAL CULINARY WATER TRENCH

382



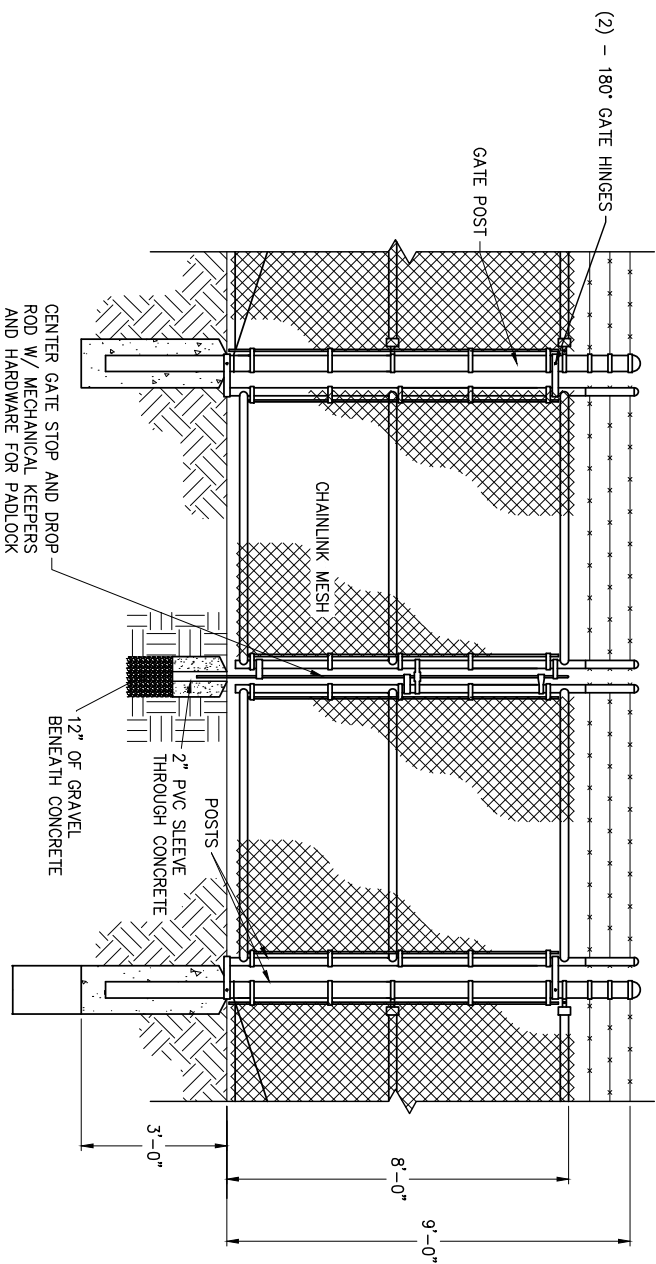
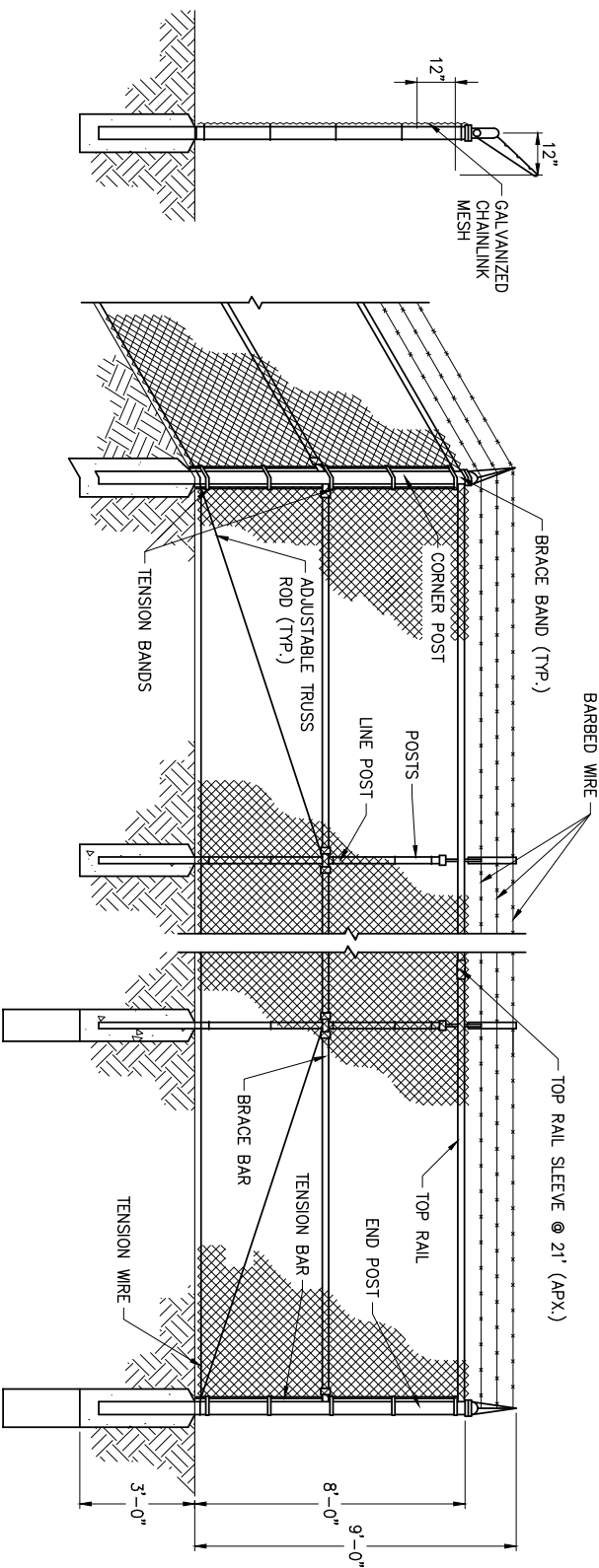
SAMPLE STATION



SET NO.	DESIGNED	BPM#	CHECKED	SHEET NO.
DRAWN	BY	TR	CL	Z.Z & J9
CD1				

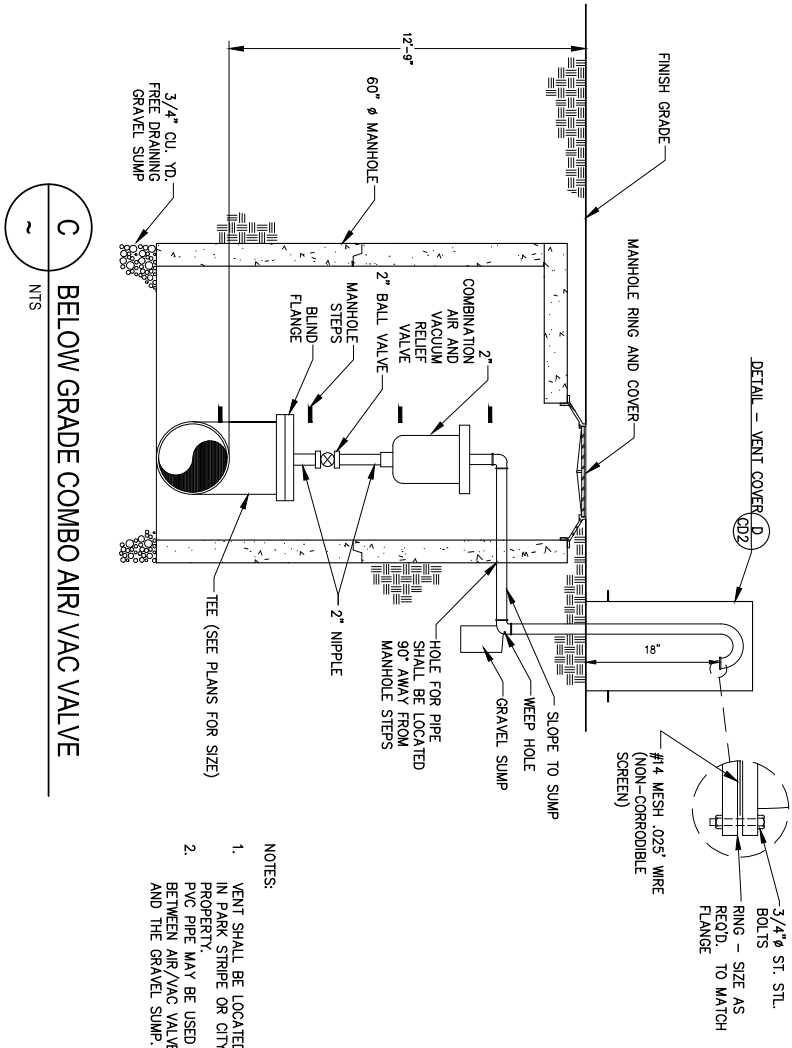
COMMIT	DATE
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2036 LINCOLN AVENUE, SUITE 104 CROFTON, UTAH 84001 TEL 801.892.8515 - FAX 801.693.7167 WWW.SUNRISE-COG.COM	
KAYSVILLE CITY	1.0 MG WATER TANK
CIVIL DETAILS	

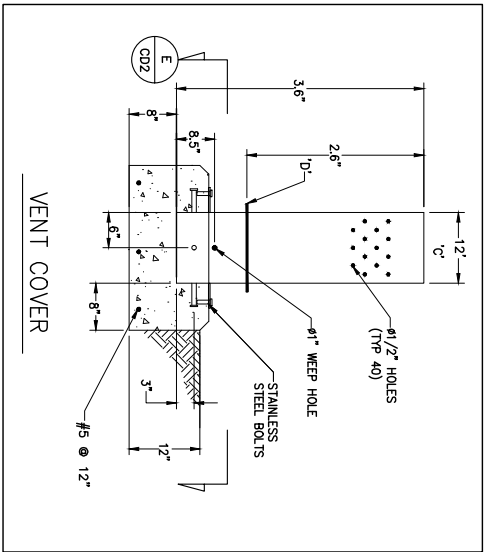


A
CHAINLINK FENCE
NTS

B
CHAINLINK GATE
NTS

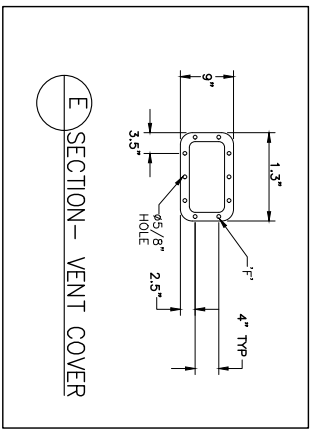
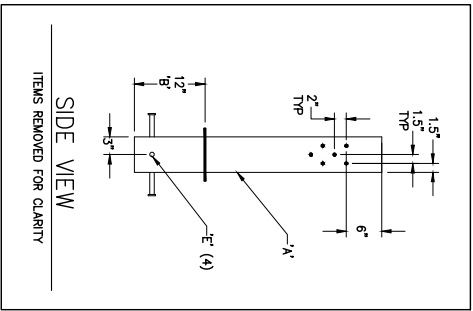


- NOTES:
1. VENT SHALL BE LOCATED IN PARK STRIPE OR CITY PROPERTY.
 2. PVC PIPE MAY BE USED BETWEEN AIR/VAC VALVE AND THE GRAVEL SUMP.



ITEM	QTY	PARTS LIST
A	1	TS 1/2" x 6" x 1/4" x 2'-6"
B	1	TS 1/2" x 6" x 1/4" x 12"
C	1	1/4" PL - 6" x 1'-0"
D	2	1/4" PL - 9" x 1'-3"
E	4	63/4" x 4" H.S.A.
F	10	61/2" x 3" BREAKAWAY BOLTS

1. HOT DIPPED GALVANIZED STEEL STAND PIPE FOR AIR VENT.
2. 1 1/2" MIN. CHAMFER ALL AROUND CONCRETE BASE.
3. CONCRETE SHALL BE POURED ON THE INSIDE OF THE VENT COVER TO THE SAME ELEVATION OF THE FAD.



D
DETAIL - VENT COVER
NTS

C
BELOW GRADE COMBO AIR/ VAC VALVE
NTS

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	TR	CL	23 of 39

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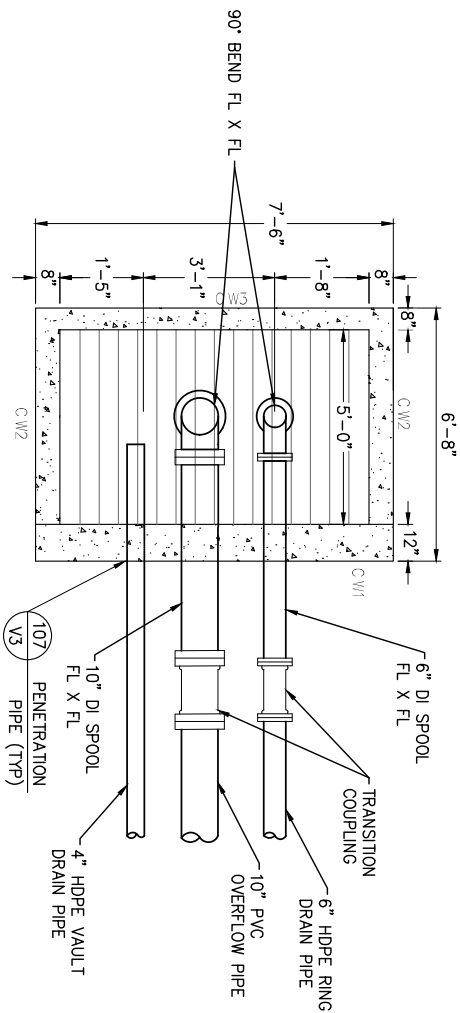
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OGDEN, UTAH 84401
TEL 801.592.5515 • FAX 801.592.7167
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KANSVILLE CITY

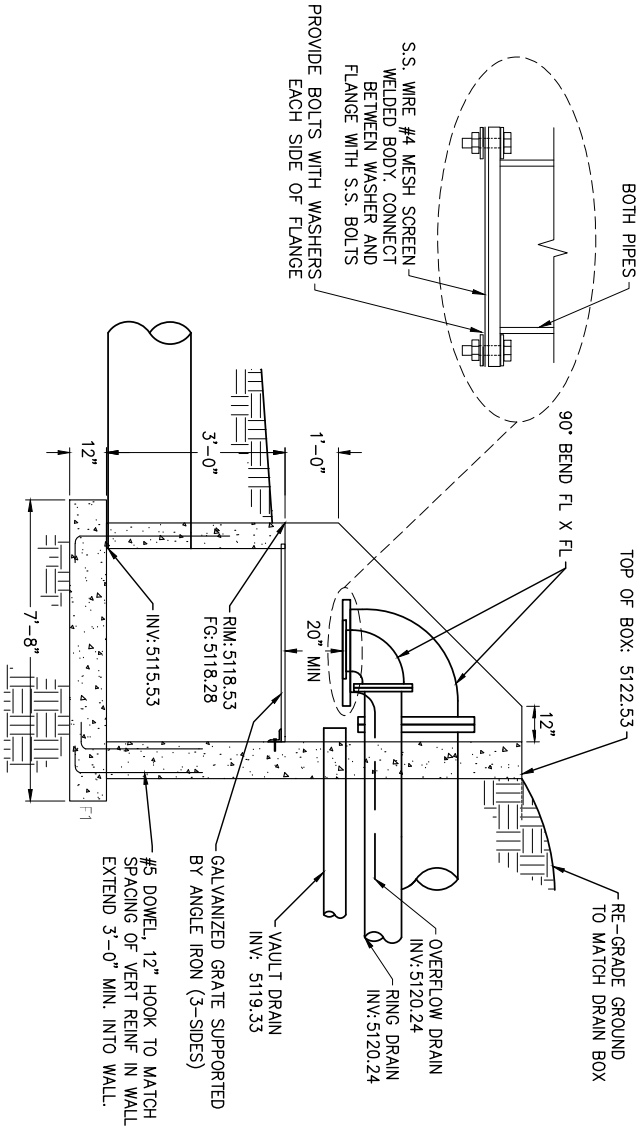
1.0 MG WATER TANK

CIVIL DETAILS

CD2



PLAN VIEW



SECTION VIEW

FOOTING AND WALL REINF. SCHEDULE				
CALCULOT	THICKNESS	HEIGHT	EXTERIOR REINF.	INTERIOR REINF.
F1	12"	N/A	#5 AT 12" O.C. B.W.	#5 AT 12" O.C. B.W.
C/W1	12"	7'-0"	#5 AT 12" O.C. B.W.	#5 AT 12" O.C. B.W.
C/W2	8"	7'-0" to 4'-0"	#5 AT 12" O.C. B.W.	N/A
C/W3	8"	3'-0"	#5 AT 12" O.C. B.W.	N/A

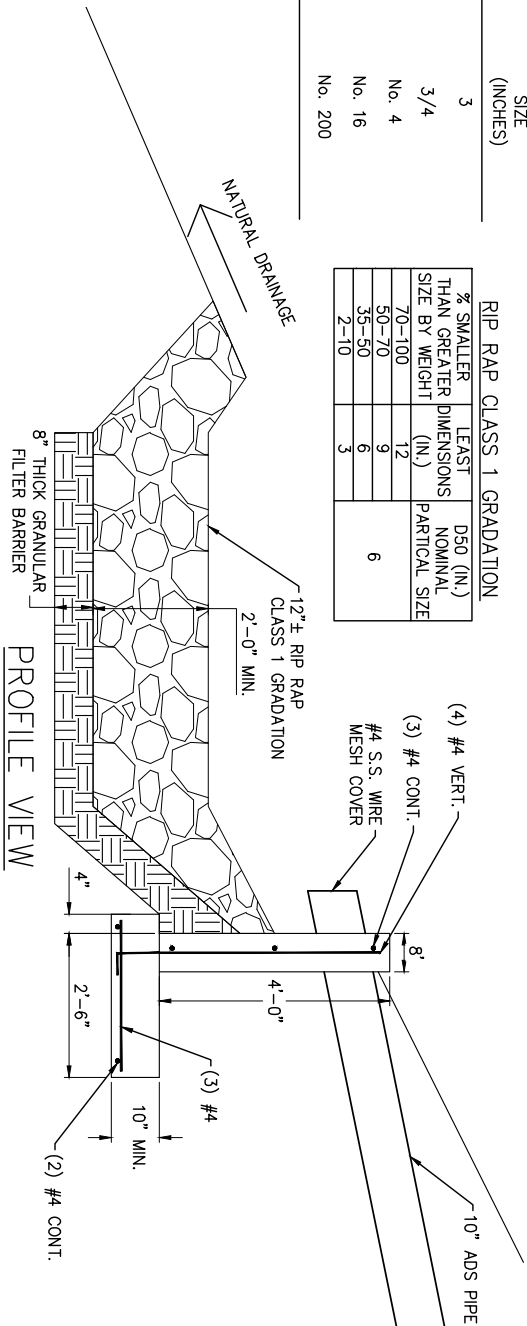
CONCRETE COMPRESSIVE STRENGTH SHALL BE $f'_c = 4500$ PSI. AIR CONTENT SHALL BE 5% +/- 1.5%. REBAR SHALL BE GRADE 60 KSI. STANDARD HOOK ON DOWELS INTO WALL SHALL BE 12 INCHES FOR #5 BAR.

A OVERFLOW DISCHARGE BOX
NTS

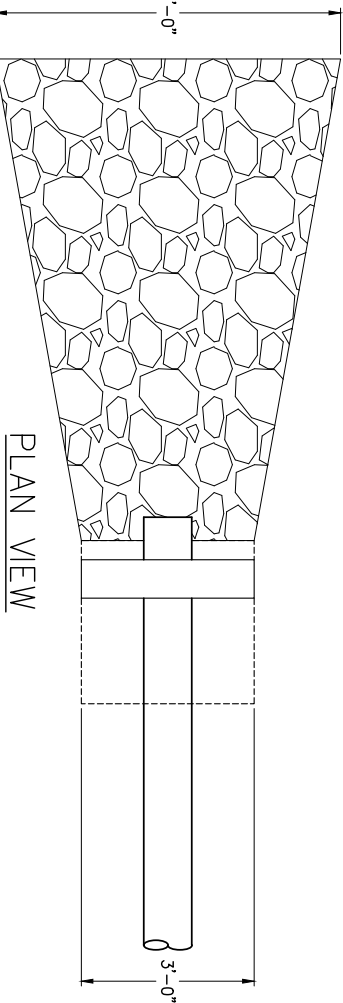
FILTER BARRIER GRADATION	
% SMALLER THAN GIVEN SIZE BY WEIGHT	SIZE (INCHES)

90-100	3
35-90	3/4
0-30	No. 4
0-15	No. 16
0-3	No. 200

RIP RAP CLASS 1 GRADATION		
% SMALLER THAN GIVEN SIZE BY WEIGHT	LEAST THICKNESS (IN.)	D50 (IN.) NOMINAL SIZE
70-100	12	6
50-70	9	
35-50	6	
2-10	3	



PROFILE VIEW



PLAN VIEW

C OVERFLOW OUTLET
NTS

REV. NO.

DATE

COMMENT

DATE

PROFESSIONAL SEAL

NO. 548190230

DATE 01/07/2020

HAASER

REGISTERED PROFESSIONAL ENGINEER

STATE OF UTAH

SUNRISE ENGINEERING

2036 LINCOLN AVENUE, SUITE 104

GORDEN, UTAH 84401

TEL 801.692.6515 • FAX 801.692.7167

WWW.SUNRISE-ENG.COM

KAYSVILLE CITY

1.0 MG WATER TANK

CIVIL DETAILS

SET NO.

DESIGNED

DRAWN

CHECKED

SHEET NO.

07062

SH

TR

CL

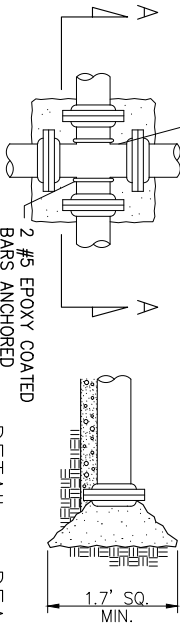
24 of 39

CD3

CONCRETE THRUST BLOCK

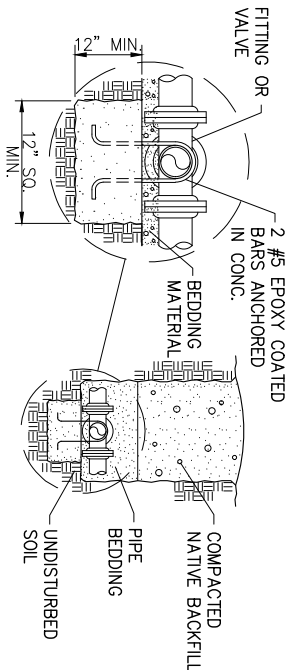
RESTRAINING SYSTEM DETAILS

NOTE:
CONTRACTOR SHALL USE EITHER MEGALUG OR CONCRETE THRUST RESTRAINING SYSTEM FOR THE ENTIRE PROJECT.



PLAN – THRUST BLOCK

DETAIL – DEAD END THRUST BLOCK



SECTION A-A

THRUST BLOCK BEARING AREA IN SQ. FT.											
PIPE SIZE	CROSS	TEE	WYE	DEAD END	VALVE	90° BEND	45° BEND	22.5° BEND	11.25° BEND		
4	2.4	1.7	1.7	1.7	—	2.4	1.3	1.0	1.0		
6	5.4	3.8	3.8	3.8	—	5.4	2.9	1.5	1.0		
8	9.6	6.8	6.8	6.8	—	9.6	5.2	2.7	1.4		
10	15.0	10.6	10.6	10.6	—	15.0	8.1	4.2	2.1		
12	21.5	15.2	15.2	15.2	15.2	21.5	11.7	6.0	3.0		
14	29.3	20.7	20.7	20.7	20.7	29.3	15.9	8.1	4.1		
16	38.2	27.0	27.0	27.0	38.2	27.0	10.6	5.3	2.7		
18	48.4	34.2	34.2	34.2	48.4	26.2	13.4	6.7	3.5		
20	59.7	42.2	42.2	42.2	59.7	32.3	16.5	8.3	4.3		
24	85.9	60.8	60.8	60.8	85.9	46.5	23.7	11.9	6.1		
REDUCER											
D2/D1	6	8	10	12	14	16	18	20	24		
4	2.1	5.1	8.8	13.4	—	—	—	—	—		
6	—	3.0	6.7	11.3	16.8	23.1	—	—	—		
8	—	—	3.8	8.4	13.8	20.1	27.2	—	—		
10	—	—	—	4.6	10.1	16.3	23.5	31.4	—		
12	—	—	—	—	5.5	11.7	18.8	26.8	45.2		
14	—	—	—	—	—	6.3	13.4	21.3	39.8		
16	—	—	—	—	—	—	7.1	15.1	33.5		
18	—	—	—	—	—	—	—	8.0	26.3		
20	—	—	—	—	—	—	—	—	18.4		

NOTE:

1. ALL THRUST BLOCK BEARING FACES SHALL BE PLACED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL.
2. SQUARE ALL EDGES TO RECEIVE CONCRETE.
3. CONCRETE SHALL BE CLASS C.
4. CALCULATED ON 250 PSI TEST PRESSURE AND ALLOWABLE BEARING PRESSURE OF 1500 LBS. PER SQ. FT.
5. IN POORER SOILS, SPECIAL DESIGN IS REQUIRED.
6. ALL FITTINGS AND VALVES SHALL BE ANCHORED WITH TWO EPOXY COATED #5 REBAR, ONLY ONE RECD FOR REDUCER.
7. CENTER ALL FITTINGS OVER THRUST BLOCKS.

VERTICAL BEND RESTRAINED LENGTHS, L, IN FT. (250 PSI TEST PRESS.)

		PVC							
		PIPE SIZE: L1/L2							
BEND ANGLE		8	10	12	14	16	18	20	
11.25	12/4	11/5	17/6	19/7	22/7	21/8	36/9	36/9	
22.5	24/8	29/10	34/11	39/13	43/14	48/16	53/17	53/17	
45	49/16	59/20	70/23	80/26	90/29	100/32	100/32	100/32	

NOTES:

1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER SPECIFICATION.
2. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION ON GENERAL NOTES FOR USE OF RESTRAINED JOINT LENGTHS.

HORIZONTAL BEND RESTRAINED LENGTHS, L, IN FT. (250 PSI TEST PRESS.)

PVC									
		PIPE SIZE							
BEND ANGLE	8	10	12	14	16	18	20		
11.25	4	5	6	7	7	8	9		
22.5	8	10	11	13	14	16	17		
45	16	20	23	26	29	32	35		
90	39	47	54	62	69	76	83		

NOTES:

1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER SPECIFICATION.
2. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION ON GENERAL NOTES FOR USE OF RESTRAINED JOINT LENGTHS.

TEE RESTRAINED LENGTHS, L, IN FT. (250 PSI TEST PRESS.)

		PVC							
		RUN SIZE DIAMETER							
BRANCH SIZE Ø		8	10	12	14	16	18	20	
6	*	*	*	*	*	*	*	*	
8	*	*	*	*	*	*	*	*	
10	*	*	*	*	*	*	*	*	
12	*	*	*	*	*	*	*	*	
14	*	*	*	23	*	*	*	*	
16	*	*	*	*	45	*	21	*	
18	*	*	*	*	*	68	46	*	
20	*	*	*	*	*	*	89	*	

* = FOR THIS CONDITION NEED ONLY RESTRAIN THE IMMEDIATE BRANCH OUTLET OF TEE FITTING AND THE TEE RUNS ACCORDING TO NOTE 1.

NOTES:

1. RESTRAIN THE TWO MECHANICAL JOINTS ON THE RUN SIDES OF THE TEE. THERE SHOULD BE A FULL 18' LENGTH OF PIPE INSTALLED ON EACH SIDE OF THE RUN. IF CONDITIONS DIFFER, CONSULT ENGINEER.
2. ALL JOINTS WITHIN THE LENGTH "L" ON THE BRANCH MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS ON PUSH-ON PIPE PER CITY SPECIFICATION.
3. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION ON GENERAL NOTES FOR USE OF RESTRAINED JOINT LENGTHS.

REDUCER RESTRAINED LENGTHS, L, IN FT. (250 PSI TEST PRESS.)

		PVC							
		LARGE SIDE, D1							
SMALL SIDE, D2 Ø		8	10	12	14	16	18	20	
6	49	87	122	133	153	182	210	236	
8	—	48	89	125	158	188	217	247	
10	—	—	49	91	128	162	194	227	
12	—	—	—	49	92	130	165	199	
14	—	—	—	—	49	93	131	203	
16	—	—	—	—	—	49	93	203	
18	—	—	—	—	—	—	49	93	

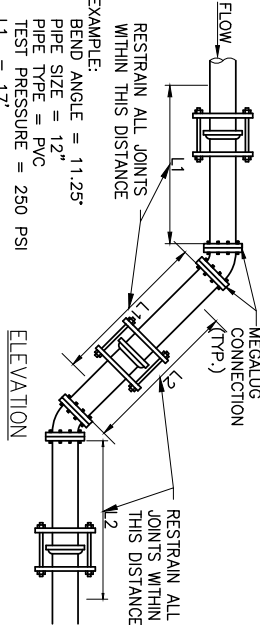
*ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DEAD END RESTRAINED LENGTHS, L, IN FT. (250 PSI TEST PRESS.)

		PVC					
		PIPE SIZE					
8	10	12	14	16	18	20	
117	142	167	192	216	240	263	

NOTES:

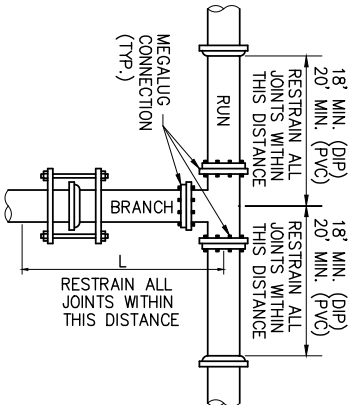
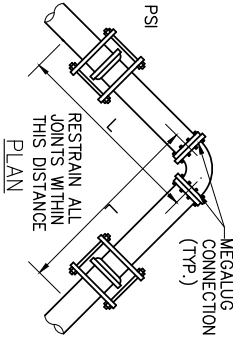
1. ALL JOINTS WITHIN LENGTH "L" MUST BE RESTRAINED. USE RETAINER GLAND AT MECHANICAL JOINTS AND HARNESS WITH PUSH-ON PIPE PER CITY SPECIFICATION.
2. FOR TEST PRESSURES AND LAYING CONDITIONS SEE SECTION ON GENERAL NOTES FOR USE OF RESTRAINED JOINT LENGTHS.
3. LENGTH MAY BE REDUCED BY USING STATIC PRESSURE. COORDINATE WITH ENGINEER.



EXAMPLE:
BEND ANGLE = 11.25°
PIPE SIZE = 12"
PIPE TYPE = PVC
TEST PRESSURE = 250 PSI

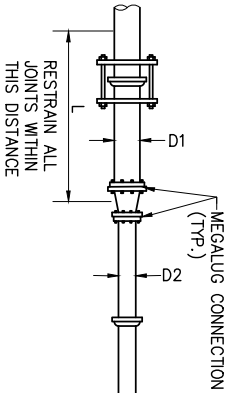
L1 = 17'
L2 = 6'

EXAMPLE:
BEND ANGLE = 45°
PIPE SIZE = 12"
PIPE TYPE = PVC
TEST PRESSURE = 250 PSI



EXAMPLE:
PIPE TYPE = PVC
RUN SIZE = 12"
BRANCH SIZE = 12"
TEST PRESSURE = 250 PSI

PLAN



EXAMPLE:
PIPE TYPE = PVC
D1 = 12"
D2 = 8"
TEST PRESSURE = 250 PSI

ALLOWABLE PIPE DEFLECTION

MAXIMUM RECOMMENDED OFFSET/20' PIPE SECTION TO ACHIEVE MINIMUM CURVE RADIUS BY DEFLECTING A STRAIGHT LENGTH OF PIPE AT THE JOINT (FOR ALL DR AND CLASS RATINGS)
*PVC BY IPEX, DIP BY U.S. PIPE

PIPE SIZE	MAX. OFFSET	DEFLECTION ANGLE
*PVC	INCHES	DEGREES
6"	6	1.0
10"	5.5	1.0
12"	5	1.0
16"	4.5	1.0
24"	4	1.0
*DIP	INCHES	DEGREES
4"-36" (18' LENGTH)	9.5	2.5
4"-36" (20' LENGTH)	10.5	2.5

MEGALUG

THRUST RESTRAINING SYSTEM DETAILS

RESTRAINED JOINT LENGTHS USAGE GENERAL NOTES:
RESTRAINED LENGTH CALCULATIONS ARE BASED ON THE FOLLOWING DESIGN TYPICALLY USED WITH BACKFILL IN WASHINGTON.

1. FOUR (4) FEET MINIMUM DEPTH OF COVER.
2. A SAFETY FACTOR OF 2.0
3. SOIL WELL GRADED SAND
4. TYPE 5 TRENCH COMPACTION FROM FOUR (4) INCHES MINIMUM UNDER THE PIPE TO THE CENTER LINE OF THE PIPE, AND COMPACTED GRANULAR OR SELECTED MATERIAL FROM THE CENTER LINE OF THE PIPE TO THE TOP OF THE PIPE (90% STANDARD PROCTOR DENSITY, AASHTO T-99).
5. 250 PSI TEST PRESSURES FOR FOUR (4) THROUGH THIRTY SIX (36) INCH SIZE PIPES.

IF ACTUAL CONDITIONS DIFFER FROM THOSE LISTED ABOVE OR THE REQUIRED RESTRAINED LENGTH CANNOT BE MET, THE RESTRAINED JOINT LENGTH SHALL BE DETERMINED BY THE ENGINEER.

NOTES:

1. D.I.P. RESTRAINTS SHALL BE FIELD LOCK TYPE GASKETS, RESTRAINT HARNESSSES, OR APPROVED EQUAL THAT MEET PRESSURE REQUIREMENTS AND ACCOMMODATE DEFLECTION. CONTRACTOR TO VERIFY THAT DEFLECTIONS SHOWN ON THE PLANS CAN BE MADE WITH FIELD LOCK GASKETS (NO ADDITIONAL FITTINGS).
2. RESTRAINTS FOR INDIVIDUAL FITTINGS ARE SHOWN ON THE PLANS. THESE SHEETS ARE FOR USE WHEN A FITTING IS REQUIRED BUT NOT SHOWN ON THE PLANS.
3. THESE TABLES SHOW RESTRAINT LENGTHS FOR DIP AND PVC AT 250 PSI TEST RESULTS. USE THE REQUIRED TEST PRESSURE TABLE IN THE SPECIFICATIONS TO DETERMINE THE MAXIMUM REQUIRED TEST PRESSURE AND ROUND UP TO 250 PSI.
4. COORDINATE WITH ENGINEER FOR RESTRAINT LENGTH OF VALVES (MAY BE TREATED AS A DEAD END).

REV. NO.

COMMENT

DATE



KAYSVILLE CITY

1.0 MG WATER TANK

CIVIL DETAILS

SHEET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	CD4
07062	SH	TR	CL	25 of 39	



TANK DESIGN REQUIREMENTS

1. TANK SHALL BE DESIGNED AS A RISK CATEGORY III STRUCTURE IN ACCORDANCE WITH ASCE 7-10. TANK SHALL BE DESIGNED TO CONFORM WITH REQUIREMENTS OF LATEST EDITION OF AWWA D115.
2. ROOF SLAB OF TANK SHALL BE DESIGNED FOR DEAD LOAD OF ROOF STRUCTURE, SNOW LOAD, LIVE LOAD, AND DEAD LOAD OF SOIL. ROOF SHALL BE DESIGNED FOR ANY CONSTRUCTION EQUIPMENT LIVE LOADS THAT WILL BE USED TO PLACE AND GRADE SOIL ON TOP OF THE TANK. DESIGN SHALL BE PERFORMED FOR A MAX. SOIL DEPTH OF 1'-0". ALL LOADS SHALL BE MULTIPLIED BY APPROPRIATE LOAD FACTORS AND DESIGNED USING LOAD COMBINATIONS SPECIFIED IN ACI 350, ASCE 7-10, AND IBC 2012. ROOF LOADS SHALL BE AS FOLLOWS:

DEAD LOAD = SELF-WEIGHT OF CONCRETE STRUCTURE
SOIL DEAD LOAD = WEIGHT OF SOIL = 125 PCF
ROOF LIVE LOAD = 40 PSF (ASCE 7-10 TABLE 4-1)
CONSTRUCTION EQUIPMENT LIVE LOAD = TO BE DETERMINED BY CONTRACTOR AND TANK DESIGNER
ROOF SNOW LOAD = 60 PSF GROUND.
3. UTAH AMENDMENT 15A-3-107 SHALL BE APPLIED TO THE DESIGN OF THE TANK ROOF WHEN CONSIDERING ROOF SNOW LOADS IN CONJUNCTION WITH SEISMIC LOADS FOR LOAD COMBINATIONS. ELEVATION ABOVE SEA LEVEL AT THE LOCATION OF THE STRUCTURE SHALL BE A = 5.2 (FT/1,000). GROUND SNOW LOAD SHALL BE USED FOR DESIGN OF ROOF.
4. TANK SHALL BE DESIGNED FOR ALL APPLICABLE LOAD CASES INCLUDING BUT NOT LIMITED TO:
4.1. TANK EMPTY WITH WALLS AND ROOF BACKFILLED.
4.2. TANK FULL WITH NO BACKFILL (LEAK TEST).
4.3. TANK FULL WITH WALLS AND ROOF BACKFILLED COMBINED WITH SEISMIC PER UTAH AMENDMENT 15A-3-107.
4.4. TANK EMPTY WITH WALLS AND ROOF BACKFILLED COMBINED WITH SEISMIC PER UTAH AMENDMENT 15A-3-107.
5. LATERAL LOADS FOR DESIGN SHALL BE AS FOLLOWS PER THE GEOTECHNICAL REPORT:

ACTIVE SOIL PRESSURE = 35 PCF
AT REST SOIL PRESSURE = 60 PCF
PASSIVE SOIL PRESSURE = 250 PCF
SEISMIC ACTIVE = 70 PCF
SEISMIC PASSIVE = 120 PCF
6. LATERAL SEISMIC LOADS SHALL BE DETERMINED USING ACI 350.3 AND SHALL INCLUDE INERTIAL LOADS OF CONCRETE STRUCTURE, IMPULSIVE AND CONVECTIVE LOADING FROM FLUID, AND SEISMIC SOIL FORCES. SEISMIC DESIGN VALUES ARE AS FOLLOWS:

LATITUDE = 40.306 DEG N
LONGITUDE = -111.98 DEG W
SITE CLASS D
Ss = 1.246, Si = 0.483
Sas = 0.832, Sd1 = 0.488
SEISMIC DESIGN CATEGORY = D
7. ALL FOUNDATIONS SHALL BE DESIGNED PER RECOMMENDATIONS IN GEO-TECHNICAL REPORT PERFORMED BY SURISE ENGINEERING, "KAYSVILLE CITY WATER STORAGE TANK DATED NOVEMBER 27, 2018. FOUNDATIONS SHALL BE DESIGNED FOR A MAXIMUM NET ALLOWABLE BEARING PRESSURE OF 3,000 PSF.
8. CONCRETE MIXTURE IN ROOF SLAB SHALL INCLUDE XYPEX IN THE MIX DESIGN. QUANTITY SHALL BE PER REQUIREMENTS OF XYPEX SUPPLIER. TANK SHALL BE WATER TIGHT AND MEET LEAK TEST REQUIREMENTS OF SPECIFICATION. OTHER WATER-PROOFING AD MIXTURES WILL NOT BE ACCEPTED AS EQUIVALENT TO XYPEX.
9. TANK SHALL BE DESIGNED TO MEET ALL OTHER REQUIREMENTS OF PROJECT SPECIFICATION SP13310 "PRE-STRESSED CONCRETE WATER STORAGE TANK".

CONSTRUCTION NOTES

1. EQUIPMENT HATCH 4'-0" x 6'-0"

1

F

TD2
2. ACCESS HATCH 4'-0" x 6'-0"

2

G

TD2
3. ROOF VENT

3

A

TD2
4. 10" INLET LINE
5. 10" OUTLET LINE
6. 8" DRAIN LINE
7. 10" OVERFLOW LINE W/STANDPIPE THROUGH FLOOR
8. SUBMERSIBLE LEVEL TRANSDUCER: APG 500-15-PSI-LI-EO-P39-LEN-NO OR APPROVED EQUAL
9. MIXER HATCH 2'-0" x 2'-0"

9

F

TD2
10. PAX WATER TECHNOLOGIES PWM250 MIXER

REV. NO.

DATE

COMMENT

PROFESSIONAL SEAL
DATE: 01/07/2020
NO. 5481902200
KAYSVILLE
HANSEN

2036 LINCOLN AVENUE, SUITE 104
CODY, UTAH 84401
TEL 801.692.6515 • FAX 801.692.7167
WWW.SUNRISE-ENG.COM

SUNRISE

ENGINEERING

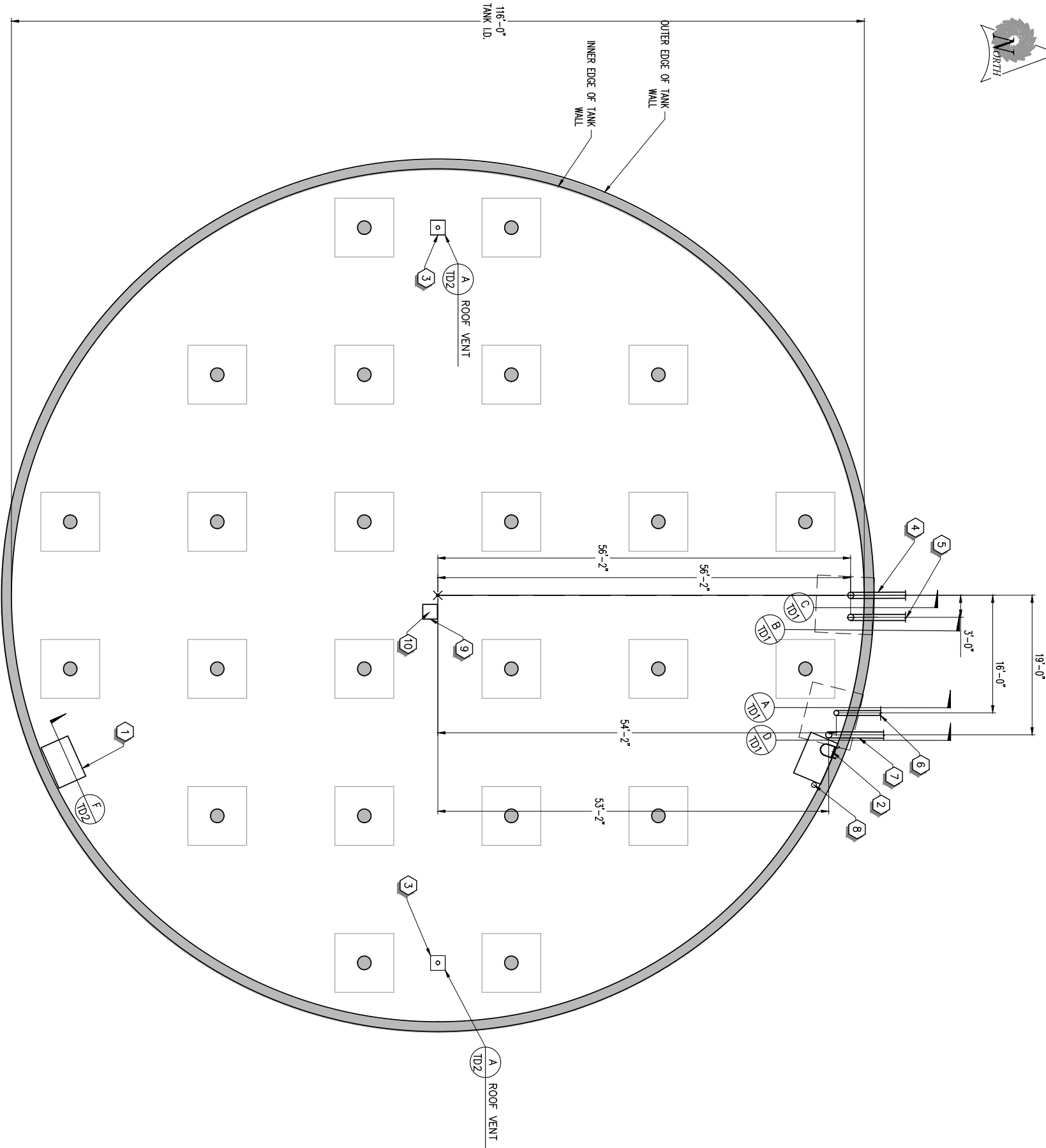
KAYSVILLE CITY

1.0 MG WATER TANK

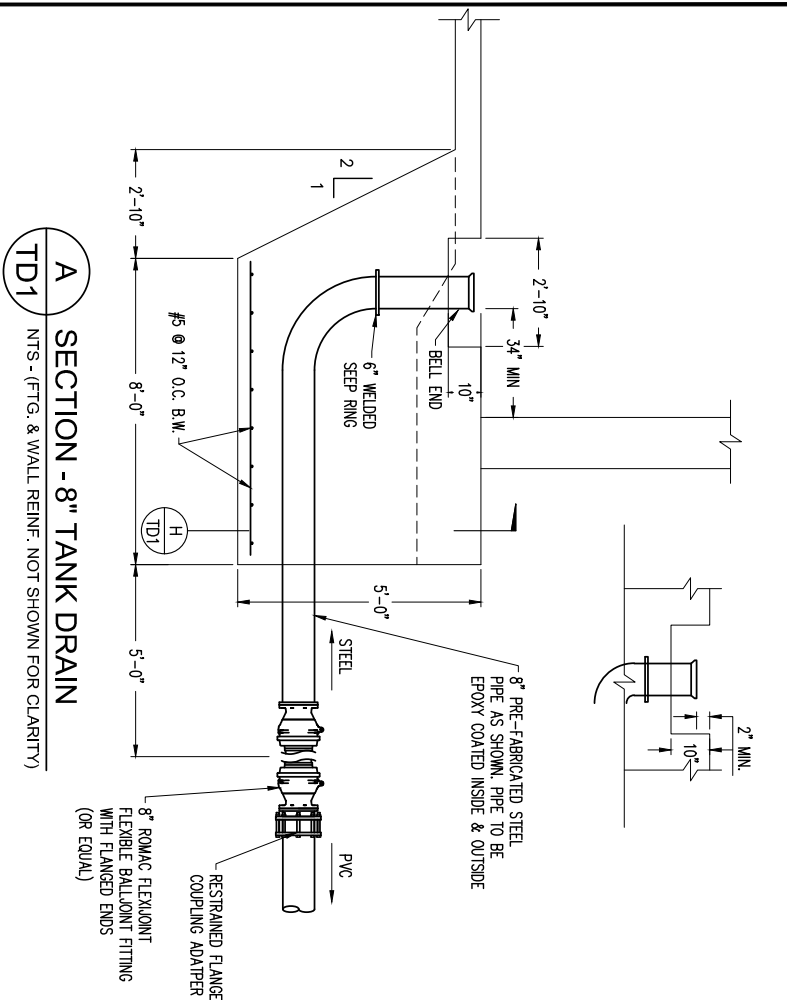
TANK LAYOUT SHEET

SST NO. 07062	DESIGNED SH	DRAWN TR	CHECKED SH	SHEET NO. 26 of 39	TL
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EXHIBIT B

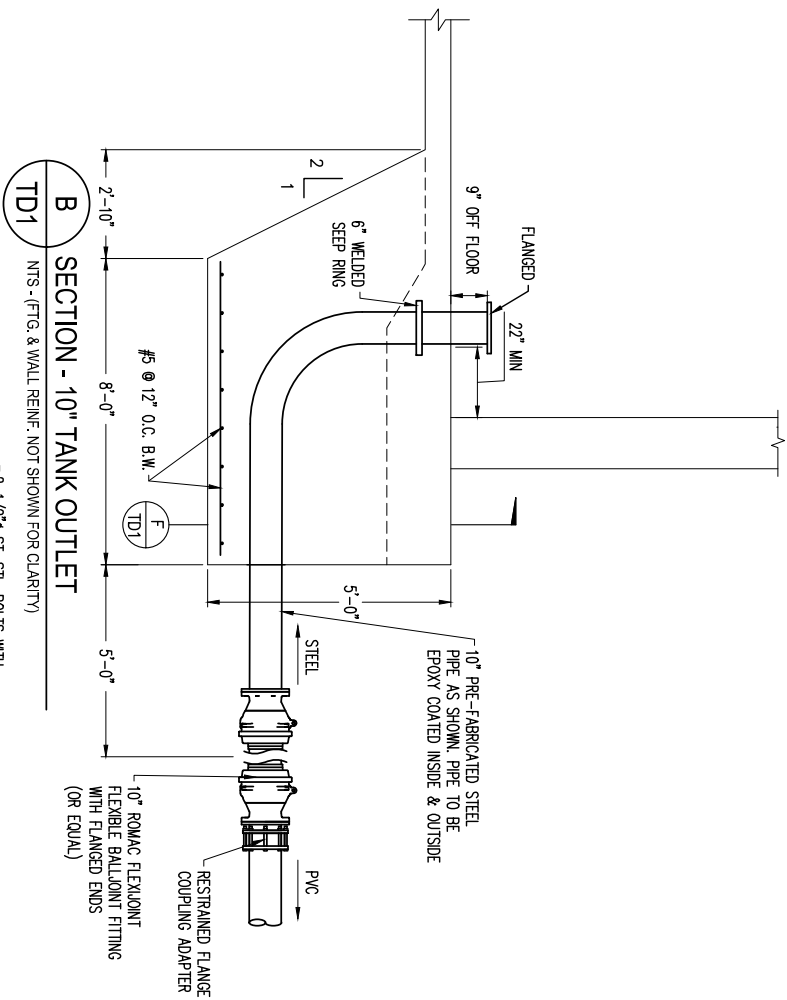


A TANK LAYOUT & APPURTENANCES
NTS



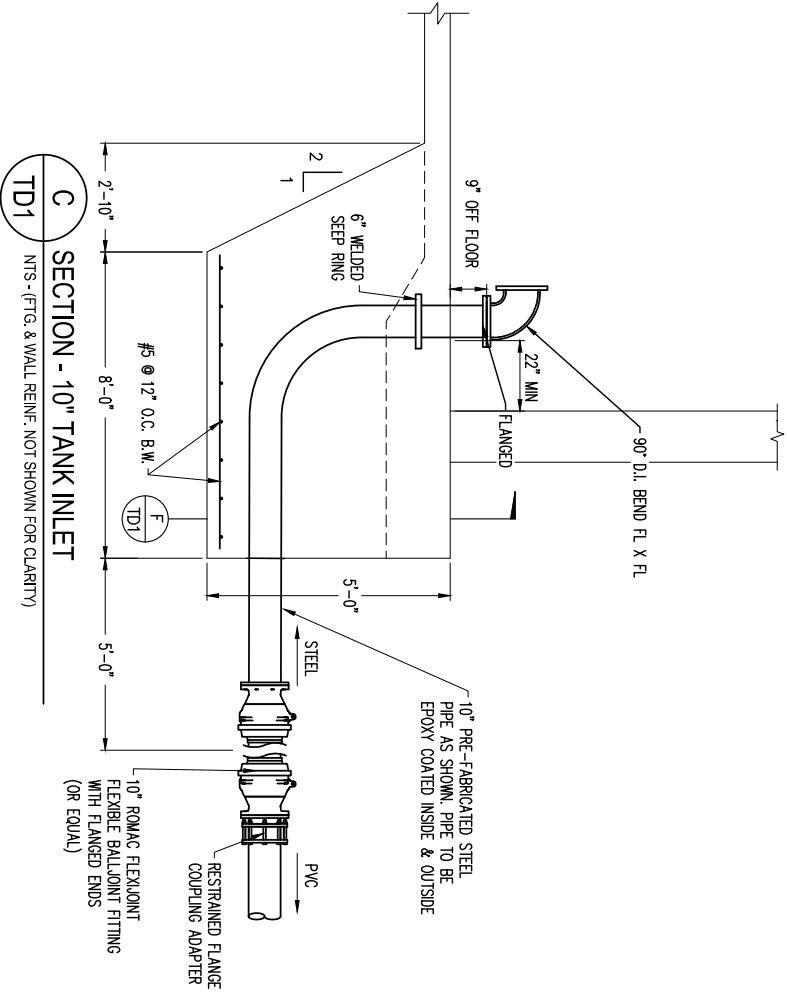
SECTION - 8" TANK DRAIN

TD1 / NTS - (FTG. & WALL REINF. NOT SHOWN FOR CLARITY)



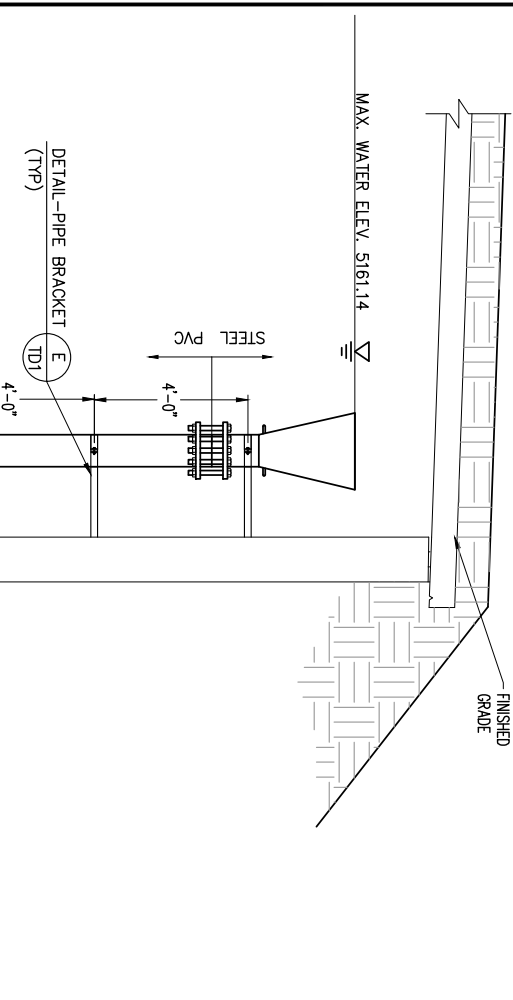
SECTION - 10" TANK OUTLET

NTS - (FTG. & WALL REINF. NOT SHOWN FOR CLARITY)

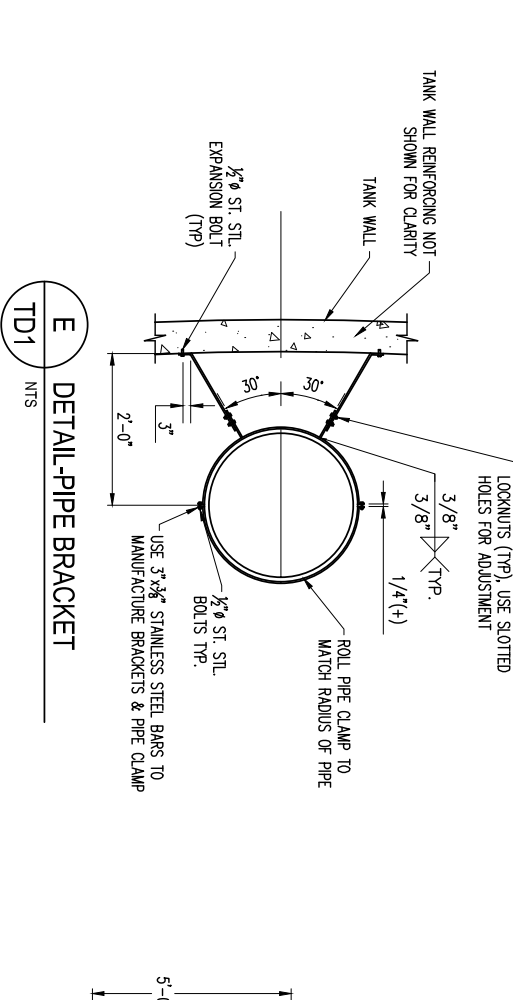


C) SECTION - 10" TANK INLET

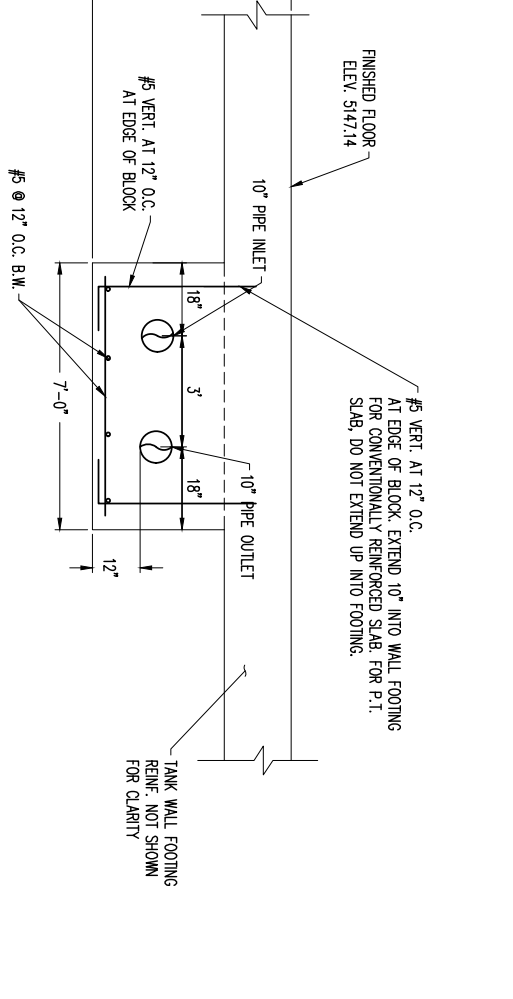
TD1 / NTS - (FTG. & WALL REINF. NOT SHOWN FOR CLARITY)



(TYP)

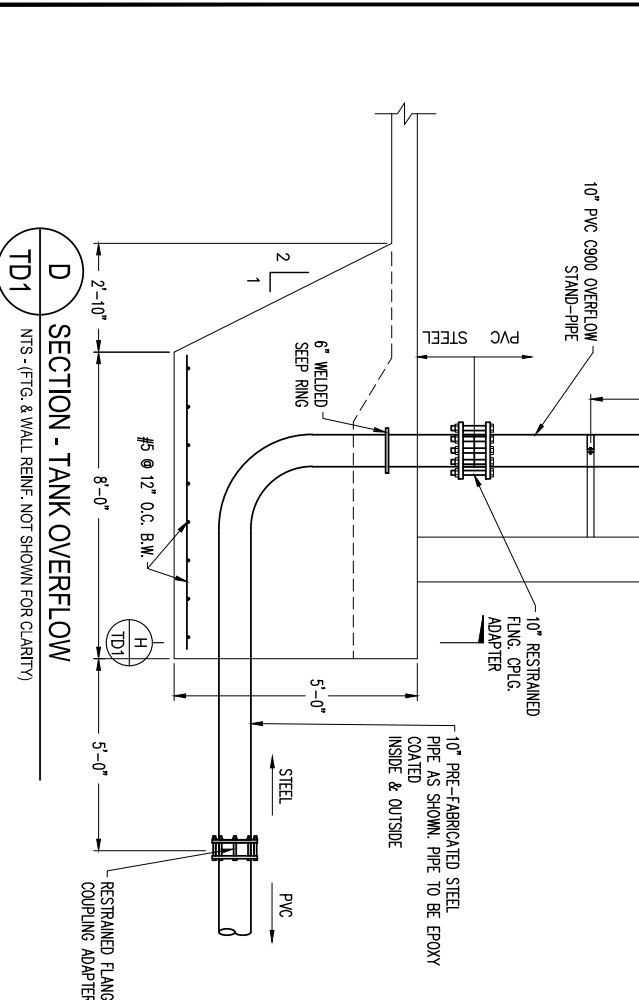


DETAIL-PIPE BRACKET

 TD1 | NTS |

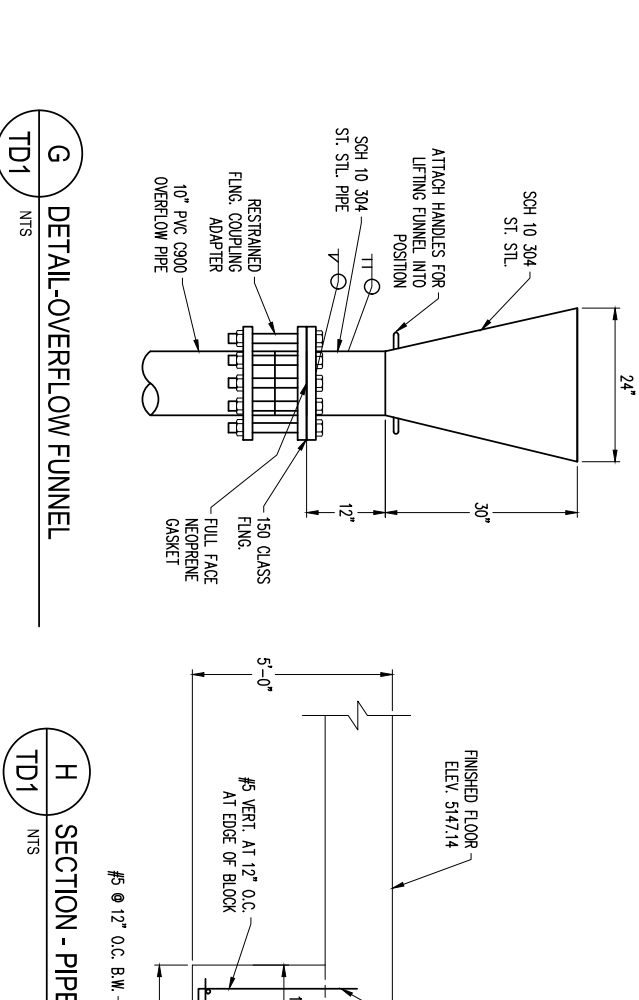
7'-0"

U.S. © 1978 O.C. P.

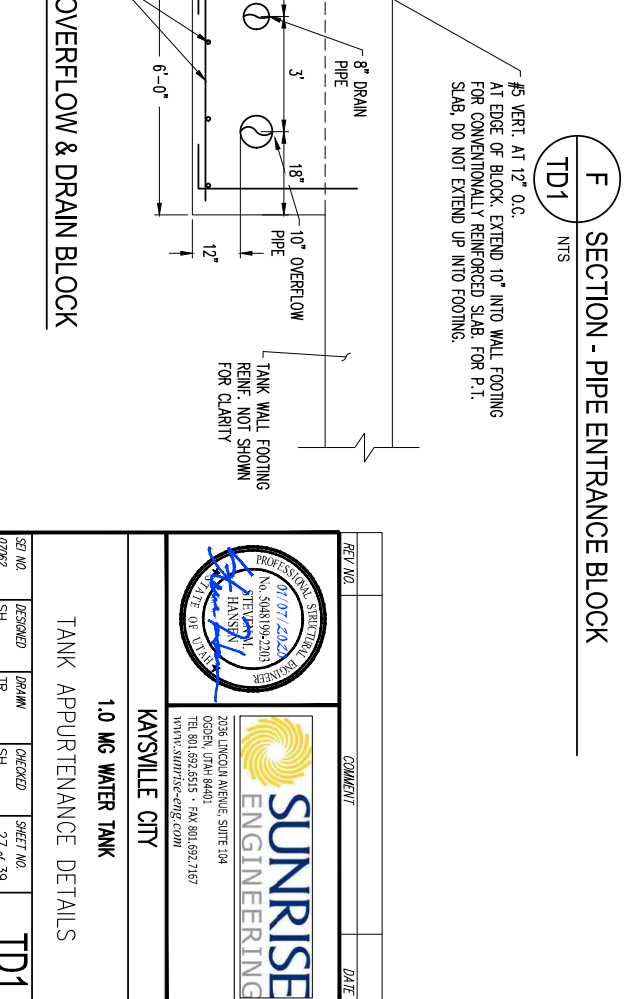


D SECTION - TANK OVERFLOW

TD1 / NTS - (FTG. & WALL REINF. NOT SHOWN FOR CLARITY)



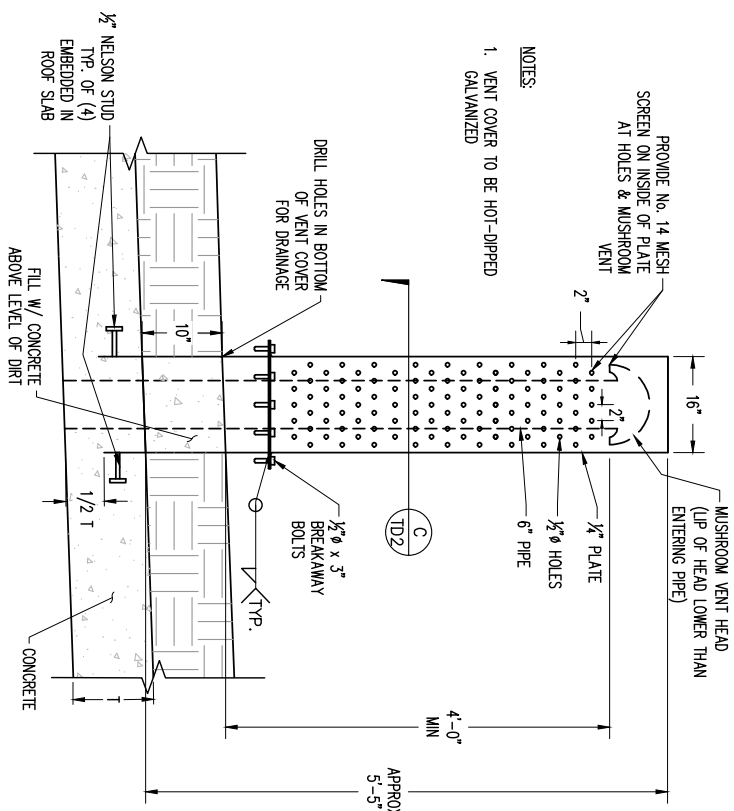
DETAIL-OVERFLOW FUNNEL

 TD1 | NTS |

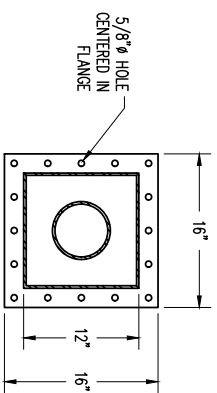
SECTION - PIPE OVERFLOW & DRAIN BLOCK

TD1) NTS

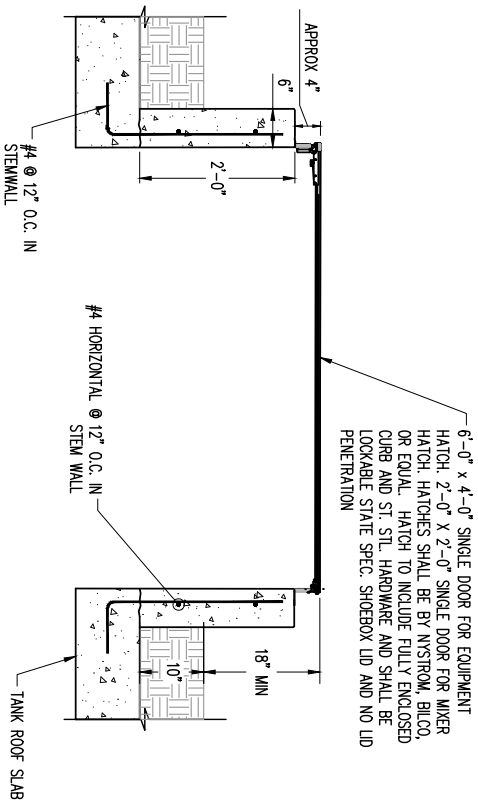
SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	TD1
07082	SH	TR	SH	27 of 39	
TANK APPURTENANCE DETAILS					
 01/07/2024 No. 5048195-2106 T. HANSEN LICENSED PROFESSIONAL ENGINEER STATE OF CALIFORNIA 2036 LINCOLN AVENUE, SUITE 104 OCEANA, UTAH 84001 TEL 801.692.6515 • FAX 801.693.7167 www.sunrise-eng.com					
KAYSVILLE CITY					
1.0 MG WATER TANK					



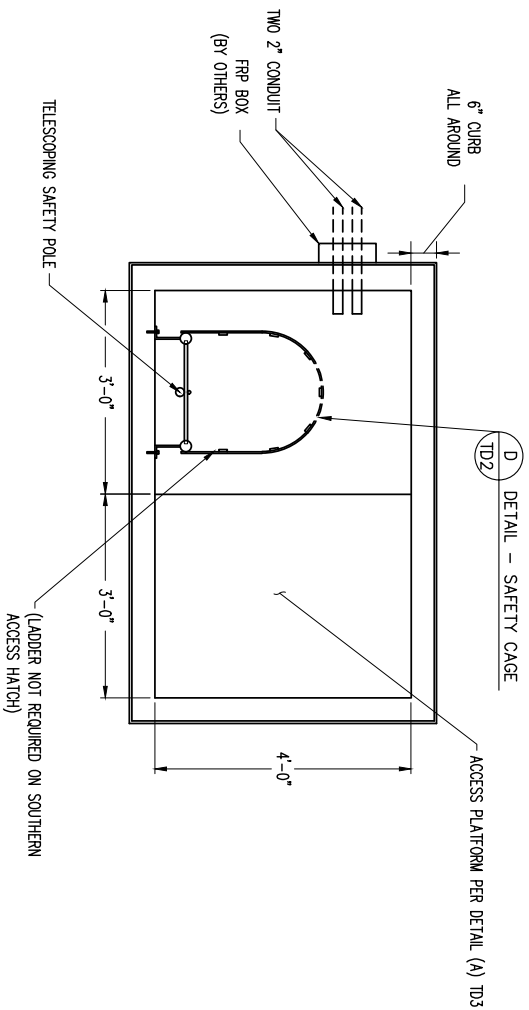
A TYP	DETAIL-TANK ROOF VENT NTS
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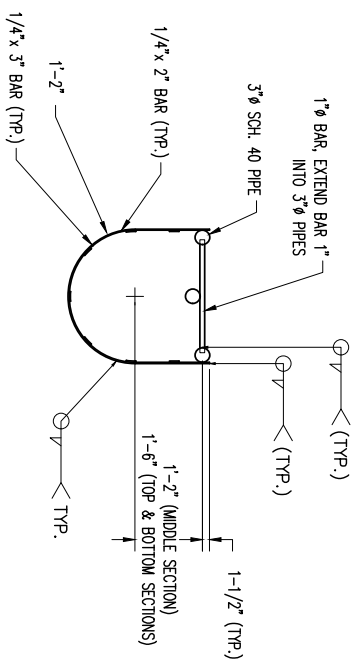
C	SECTION - ROOF VENT & COVER
TYP	NTS



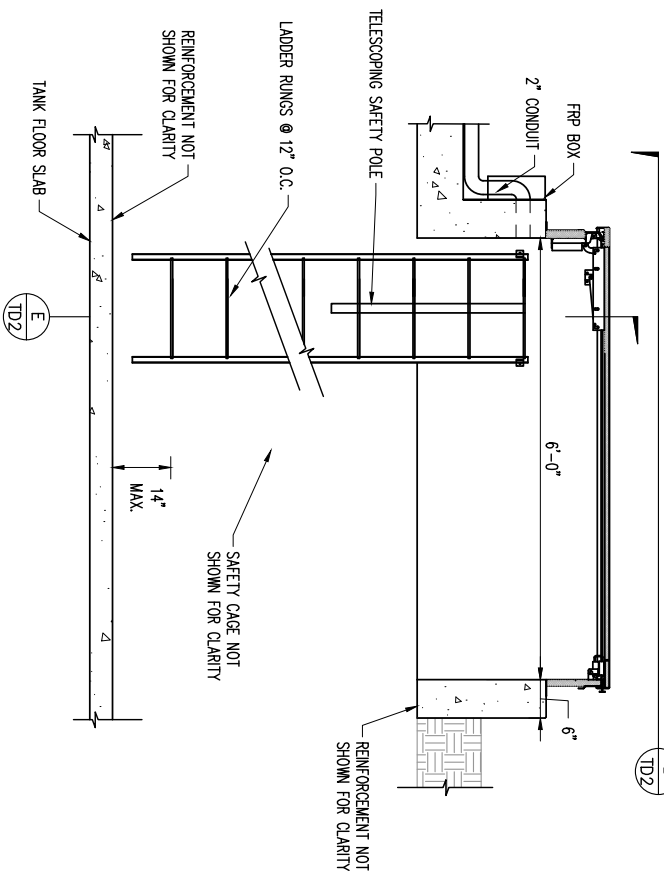
F	DETAIL - EQUIPMENT/ MIXER ROOF HATCH
TL	NTS



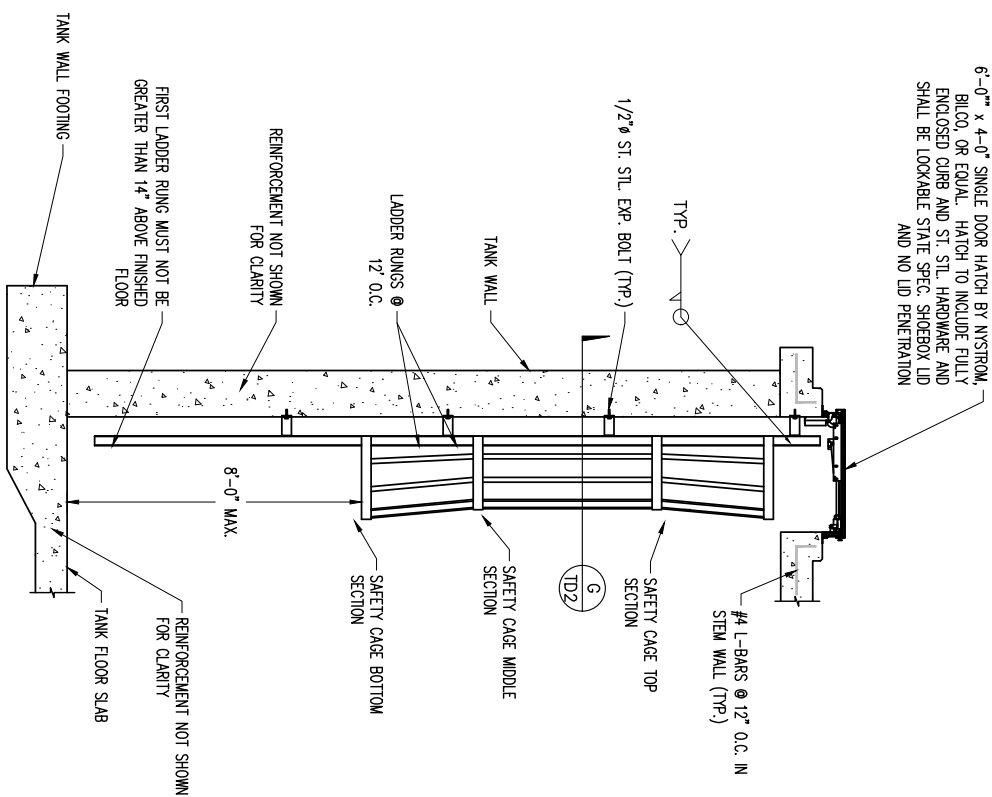
B	PLAN - ACCESS ROOF HATCH
TL	NTS



D SECTION - SAFETY CAGE
NTS



6	DETAIL - INTERIOR LADDER & ROOF HATCH
~	NTS

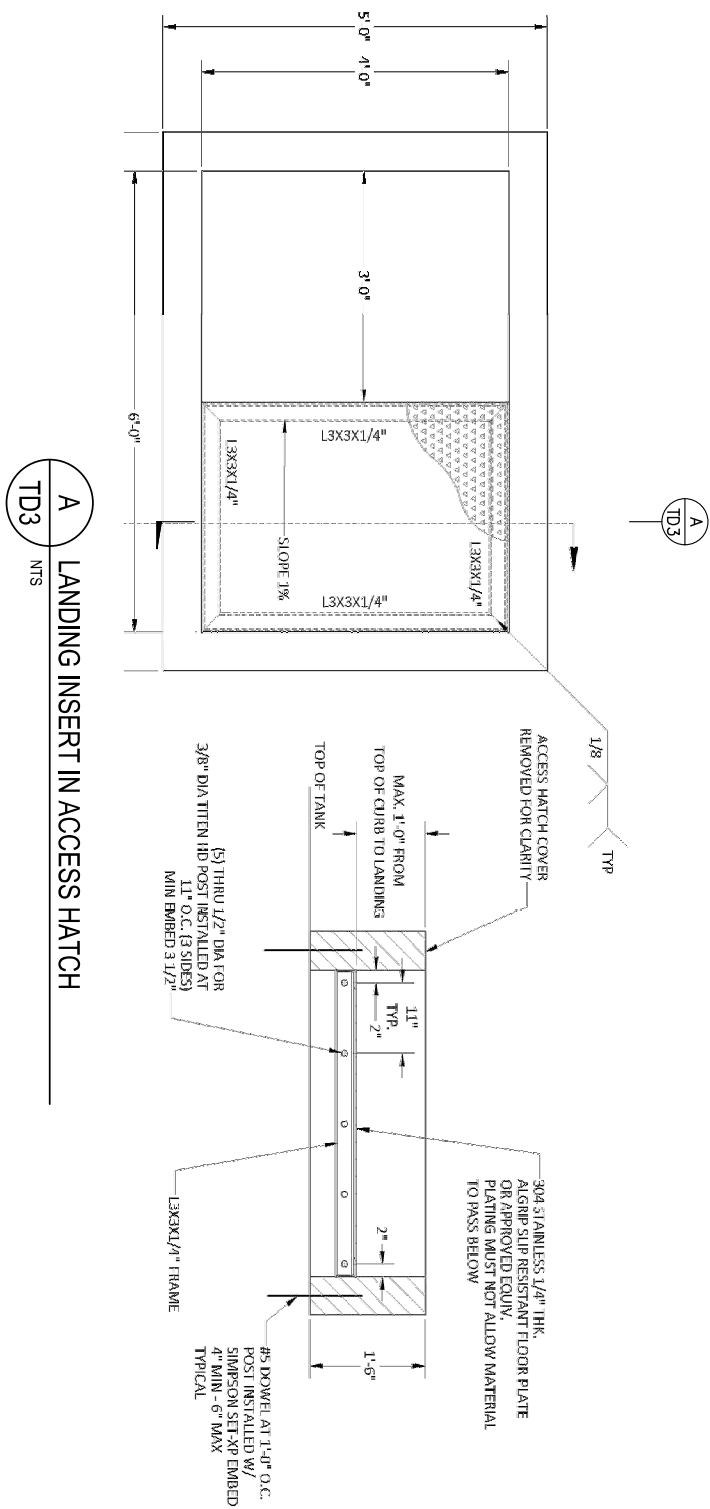


E SECTION - INTERIOR LADDER
2 NTS

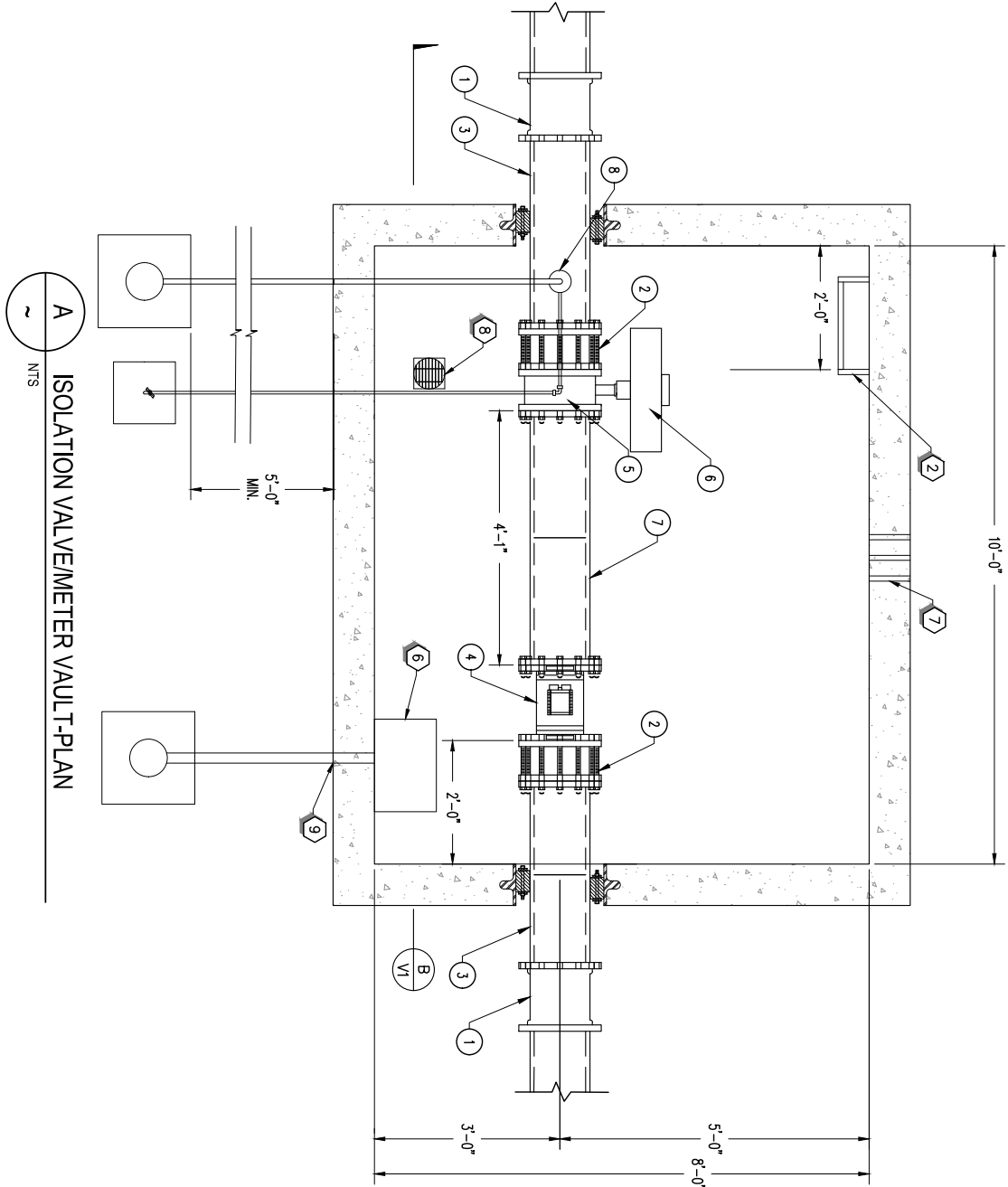
LADDER & ROOF HATCH NOTES:

- 1-ALL PARTS AND PIECES (EXCLUDING BOLTS) OF INTERIOR LADDER SHALL BE STAINLESS STEEL TYPE 304.
- 2-LADDER RUNGS SHALL BE SOLID RODS.
- 3-ALL WELDS SHALL BE 1/4" MINIMUM.
- 4- ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE SHALL BE COATED WITH A HEAVY BITUMASTIC COATING OR EPOXY PAINT.
- 5- USE ST. STL. 316 FOR ALL BOLTS UNLESS NOTED OTHERWISE.
- 6- WHERE ST. STL. BOLTS ARE IN CONTACT WITH DISSIMILAR METALS, USE INSULATING SLEEVES AND PHENOLIC WASHERS TO ELECTRICALLY ISOLATE THE BOLTS.

REV NO.	COMMENT	DATE
		
2036 LINCOLN AVENUE, SUITE 104 OAKGLEN, UTAH 84041 TEL 801.992.5515 - FAX 801.692.7167 www.sunrise-eng.com		
KAYSVILLE CITY		
SEAL NO.	DESIGNED	DRAWN
02/02/02	SH	TR
1.0 MG WATER TANK		
TANK DETAILS		
ORDERED	CHECKED	SHEET NO.
SH		28 of 39
TD2		



SET NO.	ISSUED	DRAM	CHECKED	SHEET NO.	TD3
07062	SH	TR	SH	29 of 39	
1.0 MG WATER TANK TANK DETAILS KAYSVILLE CITY					
  2026 LINCOLN AVENUE, SUITE 104 OGDEN, UTAH 84401 TEL 801.692.6515 • FAX 801.692.7167 WWW.SUNRISE-ENG.COM					
REF. NO.		COMMENT		DATE	



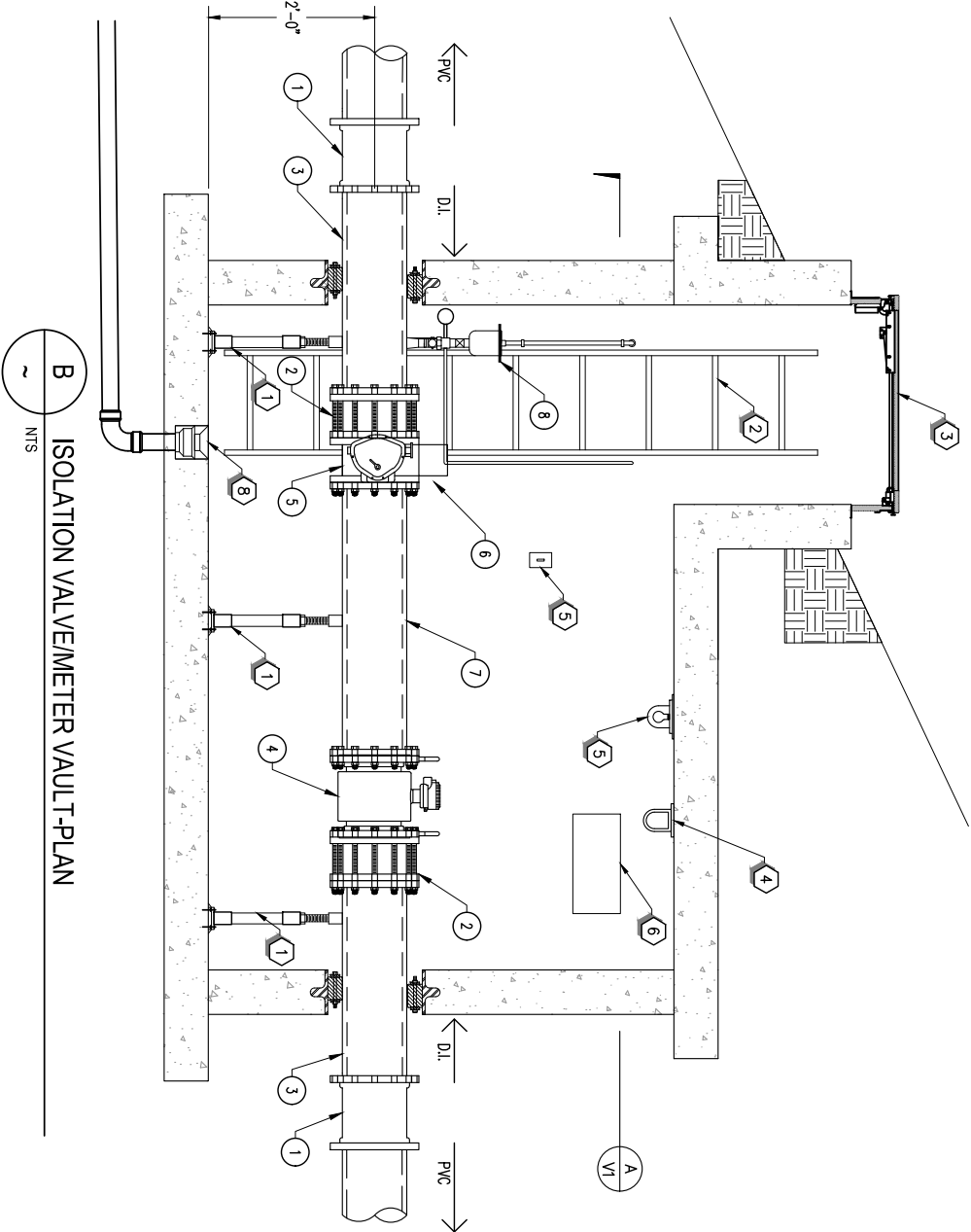
PIPING LAYOUT SCHEDULE				
NO.	DESCRIPTION	SIZE	QTY	REMARKS
1	TRANSITION COUPLING	10"	2	PVC TO DI ROMAC OR EQUAL
2	RESTRAINED FLANGE COUPLING ADAPTER	10"	2	
3	DUCTILE IRON SPOOL	10"	2	PE X PE
4	FLANGED FLOW METER	10"	1	ABB WATER MASTER FEW 325 115 VAC W/ REMOTE TRANSMITTER
5	DOUBLE ECCENTRIC BUTTERFLY VALVE	10"	1	AV-TEK DEX 2504 (OR EQUAL)
6	ROTARK IQIM ACTUATOR		1	WITH REMOTE HAND STATION
7	DUCTILE IRON SPOOL	10"	1	FL X FL
8	AIR-VAC AND SAMPLING TAP ASSEMBLY	2"	1	VENT-O-MAT AIR VAC VALVE MODEL #050RBX2521

- CONSTRUCTION NOTES**
- PIPE SUPPORT (D/CD1)
 - LADDER W/ EXTENDING SAFETY POST (STAINLESS STEEL 304)
 - 3' X 3' ACCESS HATCH (EJ OR EQUAL)
 - EYE BOLT LIFTING POINT
 - LIGHTING PER ELECTRIC
 - EXHAUST FAN PER ELECTRIC
 - 1-1/2" CONDUIT FOR CONTROL AND POWER SEE ELECTRIC
 - 6" DIA. FLOOR DRAIN (E/CD1)
 - EXHAUST VENT PENETRATION

NOTES:

1) ALL FITTINGS & VALVES SHALL BE EPOXY COATED AND UNED

2) ALL FASTENERS, HARDWARE, BOLTS, NUTS, AND ACCESSORIES SHALL BE STAINLESS STEEL



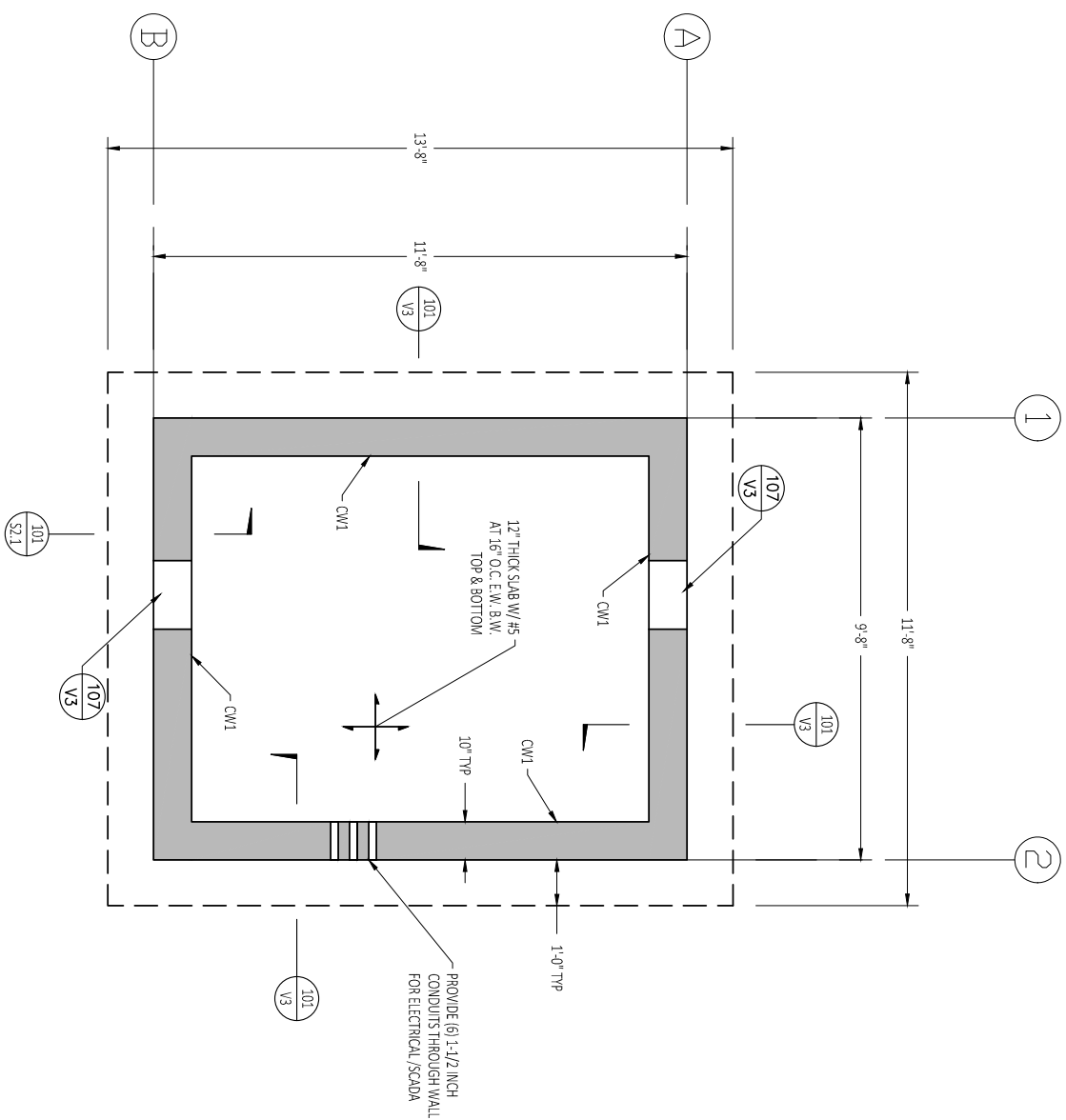
PROFESSIONAL SURVEILLANCE ENGINEER
No. 5406100-2200
THOMAS
STATE OF UTAH
06/07/2024

SUNRISE
ENGINEERING
2036 LINCOLN AVENUE, SUITE 104
COPPER, UTAH 84401
TEL 801.692.6515 • FAX 801.692.7167
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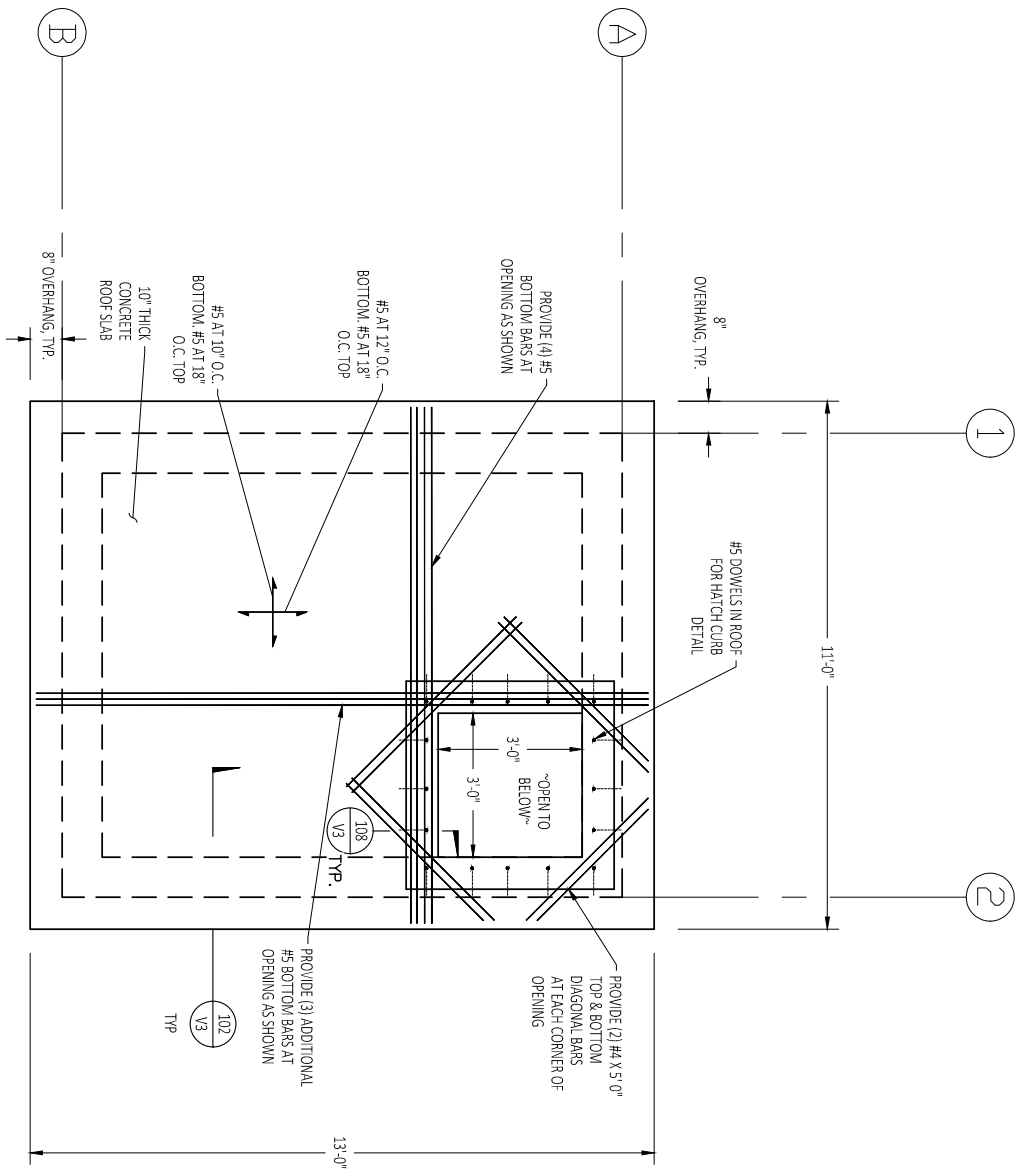
KAYSVILLE CITY

1.0 MG WATER TANK
ISOLATION VALVE/ METER VAULT
DETAILS

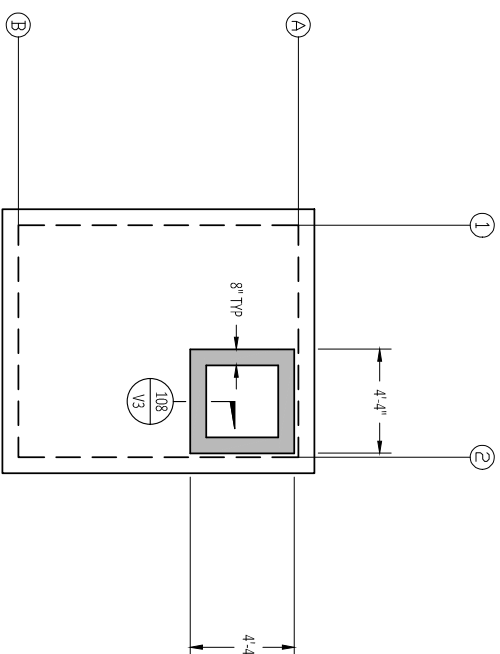
SZT NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	TR	SH	30 of 39
				V1



A PLAN - VAULT FOUNDATION & WALLS
SCALE: 1/4" = 1' 0" (11X17)



B PLAN - VAULT ROOF PLAN
SCALE: 1/4" = 1'-0" (11X17)

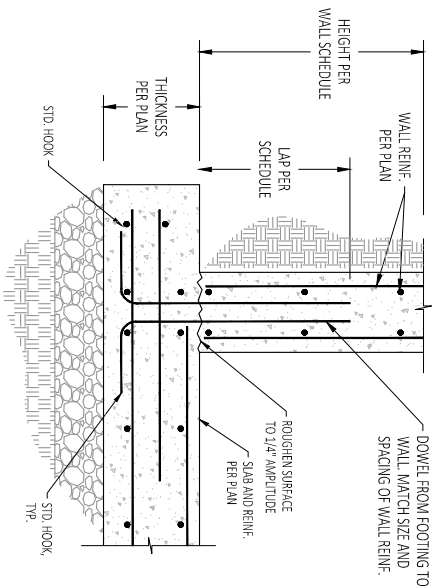


D PLAN - HATCH WALL
~
SCALE: 1/8" = 1' 0" (11X17)

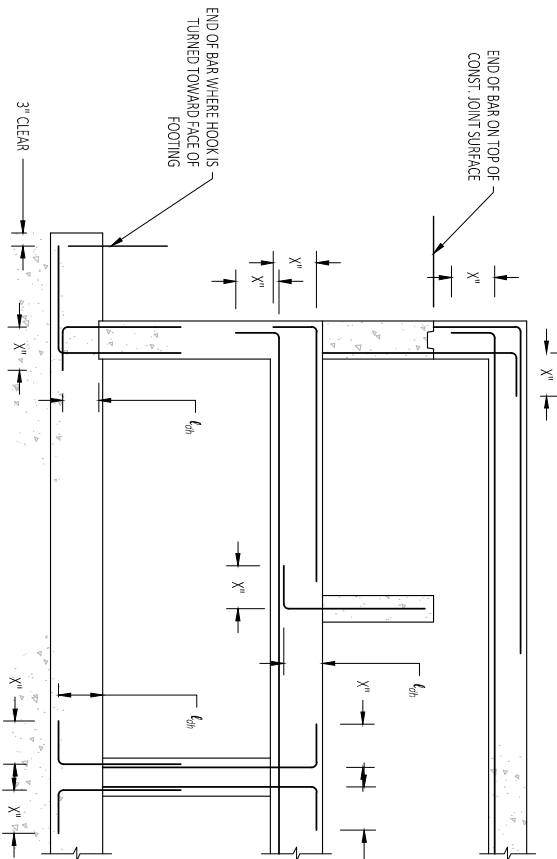
CONCRETE WALL SCHEDULE					
MARK	THICKNESS (IN)	HEIGHT	VERTICAL REINFORCING	HORIZONTAL REINFORCING	TOP OF WALL ELEV.
CW1	10"	8'-0"	#5 AT 16" O.C. E.F.	#5 AT 16" O.C. E.F.	

C CONCRETE WALL SCHEDULE

SET NO.		DESIGNED		DRAWN		CHECKED		SHEET NO.		31 of 39	
00002		SH		SH		SH		V2			
1.0 MG WATER TANK ISOLATION VALVE / METER VAULT CONC. FOUNDATION, WALLS, & ROOF											
KANSWILLE CITY											
 2025, LINCOLN AVENUE, SUITE 104 OCEOLA, ILL 64601 TEL 801.692.8515 • FAX 801.692.7167 WWW.SUNRISE-ENG.COM  SUNRISE ENGINEERING											
GET NO.				COMMENTS				DATE			



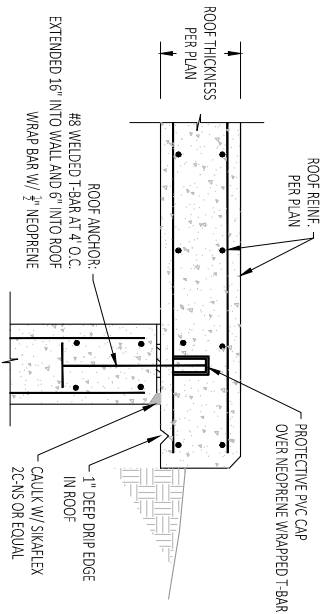
101 VAULT WALL AT FOUNDATION
NTS



BAR SIZE	90° HOOKS α_{90}
# 3	6°
# 4	6°
# 5	8°
# 6	9°
# 7	11°

UNLESS OTHERWISE NOTED ON THE DRAWINGS ALL LENGTHS OF BAR HOOKS IN FOOTINGS, COLUMNS, WALLS, AND SLABS SHALL BE AS GIVEN IN THE TABLE HEREIN. THE HOOK LENGTH "X" IS THE STANDARD 90° BAR HOOK LENGTH FOR GRADE 40 OR GRADE 60 REINFORCEMENT STEEL.

103 STD. HOOK CONFIGURATIONS
DEFORMED BARS IN TENSION IN CONCRETE

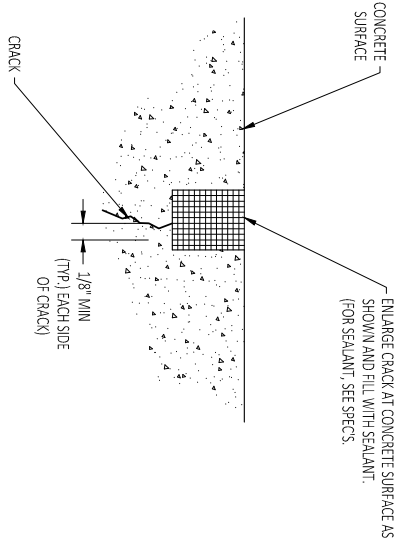


102	VAULT WALL AT ROOF
~	DEFORMED BARS IN TENSION IN CONCRETE

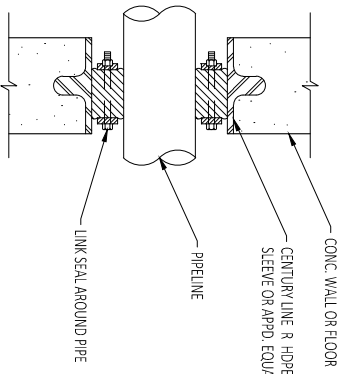
TYPE	BAR SIZE	MIN. INSIDE BEND DIA (IN)	STRAIGHT EXTENSION ⁽¹⁾ l_{ext} (IN)	TYPE OF STANDARD HOOK
90 DEG. HOOK	NO. 3 TO NO. 8	6d _b	12d _b	POINT AT WHICH BAR IS DEVELOPED
	NO. 9 TO NO. 11	8d _b		
	NO. 14 & NO. 18	10d _b		
180 DEG. HOOK	NO. 3 TO NO. 8	6d _b	GREATER OF 4d _b AND 2.5 IN.	POINT AT WHICH BAR IS DEVELOPED
	NO. 9 TO NO. 11	8d _b		
	NO. 14 & NO. 18	10d _b		

(1) A STANDARD HOOK FOR WELDED BARS IN TENSION INCLUDES THE SPECIFIC INSIDE BEND RADIUS, L₁, AND STRAIGHT EXTENSION LENGTH, L₂. IT SHALL BE PERMITTED TO USE LONGER STRAIGHT EXTENSION AT THE END OF A HOOK. A LONGER EXTENSION SHALL NOT BE CONSIDERED TO INCREASE THE ANCHORAGE CAPACITY OF THE HOOK.

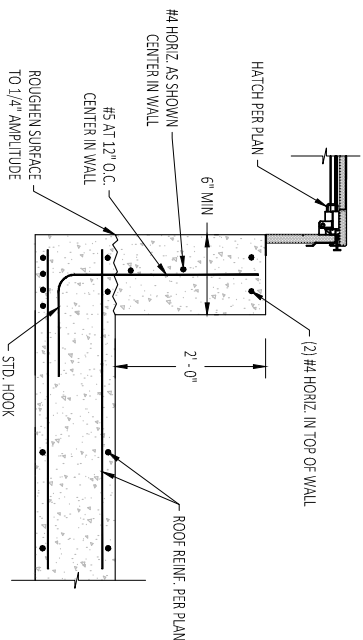
104	STD. HOOK GEOMETRY
~	DEFORMED BARS IN TENSION IN CONCRETE



106	CONCRETE CRACK REPAIR
~	NTS



107 PIPE PENETRATION AT WALL
~ NTS



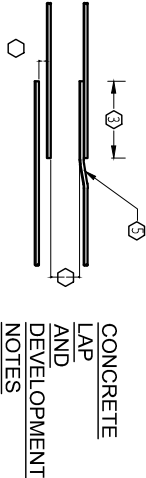
108	REINF. AT ROOF HATCH
~	NTS

REF. NO.	DATE
COMMENT	
 2036 LINCOLN AVENUE, SUITE 104 OGDEN, UTAH 84001 TEL. 801.692.5515 • FAX 801.692.7167 www.sunrise-eng.com	

1.0 MG WATER TANK				
STRUCTURAL DETAIL SHEET				
SER. NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
07062	SH	SH	SH	32 of 39
				V/3

CONCRETE LAP AND DEVELOPMENT SCHEDULE

F _c = 4500 PSI				
BAR SIZE #	TENSION			
	LTE TOP	LTE OTHER	LTS TOP	LTS OTHER
#3	15	12	20	15
#4	20	16	26	20
#5	25	19	32	25
#6	30	23	39	30
#7	54	42	71	54
#8	62	48	81	62



- A. ALL TABULATED VALUES ARE IN UNITS OF INCHES U.N.O.

B. AT CONTRACTOR'S OPTION, MECHANICAL SPLICE COUPLERS PER G.S.N. MAY BE USED IN LIEU OF LAP SPLICES

C. SEE G.S.N. FOR ACTUAL CONCRETE SPECIFICATIONS AND MIN. CLR. COVER / CLR. SPACING REQUIREMENTS

D. SCHEDULED VALUES ARE BASED ON CLASS "B" TENSION LAP SPLICES U.N.O., NORMAL WT. CONCRETE, AND UNCOATED GRADE 60 REINF. FOR OTHER CONDITIONS NOTED BELOW, MODIFY TABULATED VALUES AS INDICATED:

E. E.1 FOR DEVELOPMENT LENGTH AND CLASS "A" LAP SPLICES, WHERE SPECIFICALLY NOTED ON PLANS OR DETAILS, DIVIDE TABULATED VALUES BY 1.3. CLASS "A" SPLICES SHALL BE LOCATED SUCH THAT NO MORE THAN 1/2 OF THE TOTAL REINF. IS LAPPED WITHIN THE REQUIRED LAP LENGTH
E.2 FOR LIGHTWEIGHT CONCRETE, MULTIPLY TABULATED VALUES BY 1.3
E.3 FOR EPOXY COATED REBAR, MULTIPLY TABULATED VALUES BY 1.5
E.4 FOR GRADE 75 REINF., MULTIPLY TABULATED VALUES BY 1.25

F. LCE = COMPRESSION EMBEDMENT LENGTH
LCS = COMPRESSION LAP SPLICE LENGTH
LTE = TENSION EMBEDMENT LENGTH
LTS = TENSION LAP SPLICE LENGTH

G. "TOP" BARS ARE HORIZONTAL. BARS PLACED SUCH THAT MORE THAN 12" IN. OF FRESH CONCRETE IS CAST BELOW BAR. ALL BARS THAT ARE NOT "TOP" BARS ARE "OTHER" BARS UNLESS NOTED OTHERWISE. ALL HOOKS SHALL EXTEND TO THE FAR FACE (LESS 2" COVER)
- TOP BARS ARE HORIZ. BARS PLACED SUCH THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN MEMBER BELOW SPLICE

WHERE BARS OF UNEQUAL SIZE LAP ONE ANOTHER, USE TABULATED LAP LENGTH FOR SMALLER BAR U.N.O.

LAP SPLICE LENGTH PER SCHEDULE

CLEAR DISTANCE BETWEEN ADJACENT BARS OR SPLICES TO BE USED IN DETERMINING APPLICABLE LAP LENGTH FROM SCHEDULE

OPTIONAL OFFSET. SEE STANDARD REBAR BEND DETAILS FOR OFFSET REQUIREMENTS

FOR NON-CONTACT LAP SPLICES, MIN. CLEAR DISTANCE BETWEEN SPICED BARS SHALL BE PER GENERAL STRUCTURAL NOTES. MAX. CLEAR DISTANCE SHALL BE 1/5 THE TABULATED LAP LENGTH OR (6" - "DB"), WHICHEVER IS LESS, WHERE "DB" = BAR DIA.

109 CONCRETE LAP/DEVELOPMENT SCHEDULE

REV. NO.	DATE
COMMENT	

2036 LINCOLN AVENUE, SUITE 104
ODGEN, UTAH 84401
TEL 801.692.6515 • FAX 801.692.7167
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KAYSVILLE CITY

1.0 MG WATER TANK

STRUCTURAL DETAIL SHEET

SET NO. 07062	DESIGNED SH	DRAWN SH	CHECKED SH	SHEET NO. 33 of 39	V4
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ELECTRICAL STANDARDS LEGEND
(ALL SYMBOLS MAY NOT BE USED IN DRAWINGS)

	DIRECT BURIED OR CONCRETE EMBEDDED CONDUIT		240 V RECEPTACLE
	CONDUIT RUN EXPOSED		DISCONNECT SWITCH
	PROCESS FLOW		CIRCUIT BREAKER – UPPER NUMBER INDICATES AMP TRIP RATING – LOWER NUMBER INDICATES POLES
	PNEUMATIC SIGNAL		MOTOR OVERLOAD
	ELECTRICAL SIGNAL		EQUIPMENT GROUND
	PANEL OR ENCLOSURE		LIGHT SWITCH, SINGLE POLE, MOUNT 4'-6" ABOVE FLOOR ON BUILDING WALL
	STAND-BY GENERATOR ??? DENOTES SIZE		GENERATOR MAIN BREAKER XXX DENOTES BREAKER SIZE
	GENERATOR MAIN BREAKER XXX DENOTES BREAKER SIZE		LIGHT SWITCH, SINGLE POINT MOUNT 4'-6" ABOVE FLOOR ON BUILDING WALL, WEATHER PROOF
	WALL PACK FIXTURE, MOUNTING HEIGHT AS INDICATED IN DRAWINGS		RELAY
	FLOOD LIGHT 7'-2" ABOVE FLOOR		TIMING RELAY
	EMERGENCY EXIT SIGN 7'-2" ABOVE FLOOR		TIMING DELAY RELAY
	EMERGENCY LIGHTING PACK 7'-2" ABOVE FLOOR		CONTROL RELAY COIL
	HIGH/LOW BAY LED FIXTURE AS INDICATED IN DRAWINGS AND EQUIPMENT SCHEDULE		MAGNETIC RELAY
	1' X 4' LED FIXTURE AS INDICATED IN DRAWINGS AND EQUIPMENT SCHEDULE		MOMENTARY PUSH-BUTTON SWITCH
	INDICATOR LAMP – LETTER INDICATES COLOR		HAND-OFF-AUTO SELECTOR SWITCH
	FLASHING BEACON – LETTER INDICATES COLOR		NORMALLY CLOSED PUSHBUTTON
	MOTION SENSOR		NORMALLY OPEN PUSHBUTTON
	EXHAUST FAN		RUNNING TIME METER
	OTHER LIGHT FIXTURE AS INDICATED IN DRAWINGS.		MOTOR STARTER – NUMBER INDICATES SIZE
	AUDIBLE ALARM OR HORN		NORMALLY CLOSED CONTACTS
	UNDERGROUND JUNCTION/PULLBOX – SIZE 5 UNLESS OTHERWISE INDICATED		NORMALLY OPEN CONTACTS
	STEEL JUNCTION/PULLBOX		CONTACTOR OR STARTER, NUMBER DENOTES NEMA SIZE
	ELECTRIC MANHOLE		MOTOR – NUMBER INDICATES HORSEPOWER RATING
	FUSE: XX – DENOTES AMPERAGE		CONDUIT IDENTIFICATION, REFER TO CONDUIT AND CONDUCTOR SCHEDULE FOR QUANTITY AND FILL: X = CONDUIT TYPE P=POWER C=CONTROL F=FIBER OPTIC CABLE X=OTHER YYY = ID
	120 V GROUND FAULT INTERRUPTER DUPLEX RECEPTACLE		OTHER SYMBOLS AS SHOWN ON DRAWINGS
	120 V DUPLEX RECEPTACLE, WP (WEATHERPROOF)		

GENERAL ELECTRICAL ABBREVIATIONS

MCP	MOTOR CIRCUIT PROTECTOR	CB	CIRCUIT BREAKER	EMH	ELECTRICAL MANHOLE	RTU	REMOTE TERMINAL UNIT
NC	NORMALLY CLOSED	CNTL	CONTROL	MTU	MASTER TERMINAL UNIT	SPD	SURGE PROTECTIVE DEVICE
NO	NORMALLY OPEN	IC	INSTRUMENTATION CONDUIT	TSP	TWISTED SHIELDED PAIRS	PP	POWER PANEL
SPC	SPARE CONDUIT	INST	INSTRUMENT	VFD	VARIABLE FREQUENCY DRIVE	PCP	PUMP CONTROL PANEL
PLC	PROGRAMMABLE LOGIC CONTROLLER	HMI	HUMAN MACHINE INTERFACE	SPIC	SPARE INSTRUMENT CONDUIT		
ATS	AUTOMATIC TRANSFER SWITCH	SSSS	SOLID STATE SOFT START	WP	WEATHERPROOF		
LCP	LOCAL CONTROL PANEL	ACB	AIR CIRCUIT BREAKER	OL	MOTOR OVERLOAD		
C	CONDUIT	AFG	ABOVE FINISHED GRADE	LP	LIGHTING PANEL		

GENERAL ELECTRICAL REQUIREMENTS

1. THE COMPLETED INSTALLATION SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE AND LOCAL CODE ORDINANCES AND REGULATIONS. CONTRACTOR SHALL OBTAIN NECESSARY PERMITS AND INSPECTIONS REQUIRED BY THE GOVERNING AUTHORITIES. ALL WORK SHALL BE DONE IN A NEAT, PROFESSIONAL, FINISHED AND SAFE MANNER, UNDER COMPETENT SUPERVISION. INSTALL GROUNDING AND ALL ELECTRICAL WORK AS REQUIRED BY THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AS WELL AS ANY OTHER APPLICABLE CODES.
2. MATERIAL, EQUIPMENT AND INSTALLATION SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS WHICH ARE PART OF THE CONTRACT DOCUMENTS FOR THIS PROJECT.
3. VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND ALL OTHER FACTORS WHICH MAY AFFECT THE EXECUTION OF THIS WORK. INCLUDE ALL RELATED COSTS IN THE INITIAL BID PROPOSAL.
4. ALL MATERIALS SHALL BE NEW AND OF THE BEST QUALITY, MANUFACTURED IN ACCORDANCE WITH NEMA, ANSI, U.L. OR OTHER APPLICABLE STANDARDS. THE USE OF MANUFACTURER'S NAMES, MODELS AND NUMBERS IS INTENDED TO ESTABLISH STYLE, QUALITY, APPEARANCE, USEFULNESS AND BID PRICE. PROPOSED SUBSTITUTIONS SHALL BE SUBMITTED IN WRITING AND APPROVED BY THE ENGINEER BEFORE ORDERING.
5. PROTECT ALL ELECTRICAL MATERIAL AND EQUIPMENT INSTALLED UNDER THIS PROJECT AGAINST DAMAGE BY OTHER TRADES. WEATHER CONDITIONS OR ANY OTHER CAUSES EQUIPMENT FOUND DAMAGED OR IN OTHER THAN NEW CONDITIONS WILL BE REJECTED AS DEFECTIVE.
6. LEAVE THE SITE CLEAN, REMOVE ALL DEBRIS, EMPTY CARTONS, TOOLS, CONDUIT, WIRE SCRAPS AND ALL MISCELLANEOUS SPARE EQUIPMENT AND MATERIALS USED IN THE WORK DURING CONSTRUCTION. ALL COMPONENTS SHALL BE FREE OF DUST, GRIT AND FOREIGN MATERIALS, LEFT AS NEW BEFORE FINAL ACCEPTANCE OF WORK.
7. ALL CONDUCTORS SHALL BE THHN/THWN COPPER, STRANDED RATED AT 600 VOLTS UNLESS OTHERWISE NOTED. ALUMINUM WIRE WILL NOT BE ALLOWED.
8. ALL CONDUCTORS SHALL BE INSTALLED IN A CONDUIT SYSTEM EXCEPT WHERE NOTED IN DRAWINGS. REFER TO CONDUIT AND CONDUCTOR SCHEDULE FOR CONDUIT TYPE AND SIZE. WHERE CONDUIT SIZE IS NOT CALLED OUT, CONDUIT SHALL BE INSTALLED PER SPECIFICATION 16010 AND SIZED PER LATEST ADOPTED EDITION OF THE NEC.
9. ALL UNDERGROUND CONDUIT TO BE SCHEDULE 40 PVC, MINIMUM DEPTH 30". MINIMUM SIZE 3/4" EXCEPT AS NOTED IN DRAWINGS AND SPECIFICATIONS. ALL UNDERGROUND ELBOWS SHALL BE RIGID LONG SWEEP WRAPPED WITH 3M--50 10 MIL PIPE WRAP OR APPROVED EQUAL EXCEPT FOR COMMUNICATIONS. CABLE AND CONDUIT WHEN SPECIFIED DIFFERENTLY ON THE DETAILED ELECTRICAL DRAWINGS.
9. ALL EXPOSED CONDUIT BELOW 4' SHALL BE IMC OR RIGID STEEL CONDUIT, WITH A MINIMUM SIZE OF 1" EXCEPT AS NOTED IN DRAWINGS AND SPECIFICATIONS. EMT WILL BE PERMITTED ONLY IN WALLS OR ABOVE 4' AFF. EXPOSED PVC CONDUIT SHALL NOT BE PERMITTED UNLESS NOTED OTHERWISE IN DRAWINGS.
10. ALL SAFETY SWITCHES AND OTHER DISTRIBUTION AND CONTROL ELECTRICAL EQUIPMENT SHALL BE RATED FOR HEAVY DUTY SERVICE.
11. ALL WIRING DEVICES SHALL BE SPECIFICATION GRADE GROUNDED BODY TYPE DEVICES.
12. THE CONTRACTOR SHALL INSTALL ALL INSTRUMENTS AND CONTROLS, INCLUDING HVAC AND CONTROL PANELS. THE CONTRACTOR SHALL OBTAIN AND REVIEW ALL INSTRUMENT, CONTROL AND HVAC DRAWINGS FOR TOTAL SCOPE OF WORK.
13. ALL PANELS, DISCONNECTS AND SWITCHGEAR ON THE OUTSIDE OF THE BUILDING SHALL BE NEMA 3R TYPE ENCLOSURES UNLESS OTHERWISE SPECIFIED. CT CABINET AND METER BASE SHALL BE OUTSIDE THE BUILDING.
14. SURGE PROTECTIVE DEVICES (SPD) SHALL BE SIZED FOR 160KA UNLESS OTHERWISE NOTED.
15. ALL CONDUIT FOR ALL EQUIPMENT, INCLUDING EQUIPMENT FURNISHED BY OTHERS, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
16. ALL CONDUIT, WHERE LEAVING ELECTRICAL EQUIPMENT TO GO UNDERGROUND, MUST BE ANCHORED TO THE FOUNDATION WITH STAND-OFF BRACKETS TO ALLOW FOR SUFFICIENT CLEARANCE FOR FOOTINGS AND WALL STUDS ON THE WALLS IN THE BUILDING. ALL RGS CONDUIT AND ELBOWS USED UNDERGROUND WILL BE WRAPPED WITH AN APPROVED PIPE WRAP. (TYP. FOR ALL BUILDINGS)
17. ALL WIRING IN CLASS I HAZARDOUS LOCATIONS SHALL COMPLY WITH NEC 501. WET WELL SHALL BE CONSIDERED CLASS I DIV 1, GROUPS C&D.

REV NO.

COMMENT

DATE



6875 SOUTH 900 EAST
SALT LAKE CITY, UTAH 84047
TEL 801.523.0100 • FAX 801.523.0990
WWW.SUNRISE-ENG.COM

KAYSVILLE CITY

1.0 MG TANK

ELECTRICAL NOTES AND SYMBOLS

SET NO.

DESIGNED

DRAWN

CHKD

APP'D

S06337

JRK

JRH

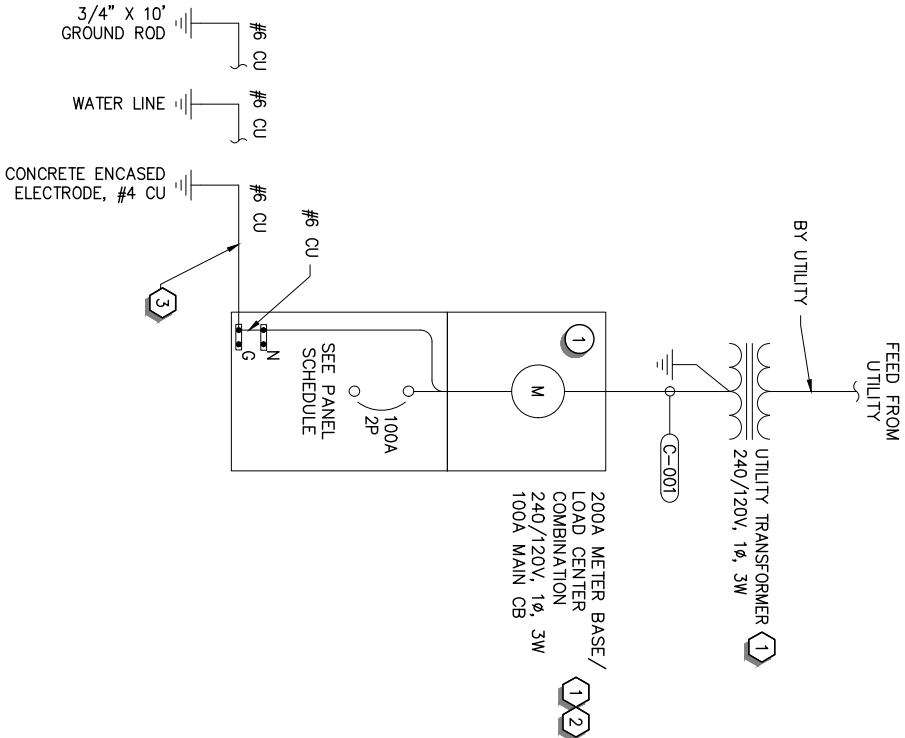
JRK

SHEET NO.

35 of 40

E100

P:\kaysville\1.0 mg tank\electrical\dwg\Electrical Notes & Symbols.dwg Dec 20, 2019 4:28pm rknapp



CONDUIT AND CONDUCTOR SCHEDULE											
CONDUIT TAG	DESCRIPTION	FROM	ROUTING	TO	MIN. CONDUIT QTY	SIZE	CONDUCTORS PER C. (QTY) & SIZE	GND	VOLTAGE	APPROX. LEN (FT.)	REMARKS OR REFERENCE DRAWING
C-000	UTILITY EXTENSION	UTILITY SECTIONALIZING CABINET	UTILITY TRANSFORMER								CONTRACTOR TO PROVIDE TRENCH ONLY PER KAYSVILLE REQUIREMENTS.
C-001	UTILITY SERVICE	UTILITY TRANSFORMER	METER BASE		1	2"	(3) #1 AWG ALUMINUM	#6 AL.	240		
C-002	FEEDER TO PANEL LP1	METER BASE	PANEL LP1		2	2"	(3) #3 AWG	#6	240		
C-003	FEEDER TO RTU	PANEL LP1-11	RTU		1	1"	(2) #12 AWG	#12	120		
C-004A	VAULT POWER	PANEL LP1-1,3,5,6	VALVE VAULT PULL-BOX		1	2"	(6) #12 AWG	#12	240		ACTUATOR, FAN, FLOW METER
C-004B	VAULT POWER	PANEL LP1-2,4	VALVE VAULT PULL-BOX		1	2"	(4) #12 AWG	#12	120		LIGHTING, RECEPTACLE
C-005	FEEDER TO VALVE ACTUATOR	VALVE VAULT PULL-BOX	ACTUATOR DISCONNECT SW.		1	3/4"	(2) #12 AWG	#12	240		
C-006	FEEDER TO VALVE ACTUATOR	ACTUATOR DISCONNECT SW.	VALVE ACTUATOR		1	3/4"	(2) #12 AWG	#12	240		
C-007	FEEDER TO EXHAUST FAN	VALVE VAULT PULL-BOX	FAN DISCONNECT		1	3/4"	(2) #12 AWG	#12	120		
C-008	FEEDER TO EXHAUST FAN	FAN DISCONNECT	EXHAUST FAN		1	3/4"	(2) #12 AWG	#12	120		ROUTE THROUGH FAN SWITCH NEAR HATCH
C-009	FLOW METER POWER	VALVE VAULT PULL-BOX	FLOW METER		1	3/4"	(2) #12 AWG	#12	120		
C-010	VAULT CONTROL	RTU	VAULT CONTROL PULL-BOX		1	1"	(6) #14 AWG (1) #16 TSP	#14	C1RL		VALVE CONTROL FLOW SIGNAL
C-011	CONTROL TO VALVE	VAULT CONTROL PULL-BOX	VALVE ACTUATOR		1	3/4"	(6) #14 AWG	#14	C1RL		VALVE CONTROL FLOW SIGNAL
C-012	FLOW METER SIGNAL	VAULT CONTROL PULL-BOX	FLOW METER		1	3/4"	(1) #16 TSP		C1RL		FLOW SIGNAL
C-013	TANK INSTRUMENTATION - DISCRETE	RTU	ACCESS HATCH PULL-BOX #1		1	1"	(8) #14 AWG	#14	C1RL		ROUTE THROUGH PULL-BOX ON SIDE OF TANK
C-014	TANK INSTRUMENTATION - ANALOG	RTU	ACCESS HATCH PULL-BOX #1		1	1"	(1) #16 TSP		C1RL		ROUTE THROUGH PULL-BOX ON SIDE OF TANK
C-015	TANK INSTRUMENTATION - ACCESS HATCH	ACCESS HATCH PULL-BOX #1	ACCESS HATCH PULL-BOX #2		1	1"	(2) #14 AWG	#14	C1RL		
C-016	TANK MIXER POWER	PANEL LP1-7,9	TANK MIXER CONTROL PANEL		1	1"	(2) #10 AWG	#10	240		
C-017	TANK MIXER POWER	TANK MIXER CONTROL PANEL	TANK MIXER		1	1"	(2) #10 AWG	#10	240		VIA PULL BOX LOCATED AT BASE OF TANK AND MIXER HATCH

ALL CONDUCTORS SHALL BE COPPER UNLESS OTHERWISE NOTED IN SCHEDULE.

LP1 – KAYSVILLE 1.0 MILLION GALLON TANK														CU Bus					
VOLTAG	PH	WIRE	PANEL SCHEDULE CIRCUIT										100 AMP MAIN BREAKER						
240/120	1	3 – WIRE	LOAD (VA)			AMPS				LOAD (VA)			DESCRIPTION	POLE	S AMP	OKT NO.			
CKT NO.	AMPS	POLE	DESCRIPTION	LIGHT	RECEP	OTHER	A	B	OTHER	RECEP	LIGHT								
1	20	2	VALVE ACTUATOR	0	0	2000	8.3	4.5		0	540	0	VAULT RECEPTACLE	1	20	2			
3	–	–	‘ ‘	0	0	0		8.3	1.3	0	0	150	VAULT LIGHTING	1	20	4			
5	20	1	FLOW METER	0	0	500	4.2	2.5	300	0	0	0	EXHAUST FAN MOTOR	1	20	6			
7	20	2	TANK MIXER 2HP	0	0	2760		11.5	0.0	0	0	0	SPARE	1	20	8			
9	–	–	‘ ‘	0	0	500	11.5	0.0	0	0	0	0	SPARE	1	20	10			
11	20	1	RTU	0	0	1200		10.0	0.0	0	0	0				12			
13	–	–		0	0	0	0.0	0.0		0	0	0				14			
15		–		0	0	0		0.0	0.0	0	0	0			–	16			
			Subtotal Watts	0	0	6960	31		31	300	540	150	Subtotal Watts	Total AMPS					
			Total Watts			6960						990	Average Amps						
						7950						31							
NEC DIVERSIFIED LOAD CALCULATIONS														PANEL NAME: A					
LIGHTING AND CONTINUOUS LOADS: (100% CONNECTED LOAD PLUS 25%)														0.2 kVA		Lighting		0.2	
RECEPTACLES: (FIRST 10KVA @ 100% REMAINDER @50%)														0.5 kVA		Receptacles		0.5	
ALL OTHER LOADS @ 100% MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED AT 125% PER NEC														7.3 kVA		Other Loads		8.0	
														DIVERSIFIED TOTAL kVA		8.7			
														AVERAGE AMPS PER PHASE		36.2			

- SHEET NOTES:**
- ONE-LINE DIAGRAM SHOWS PROPOSED CONFIGURATION. CONTRACTOR SHALL CONFIRM ACTUAL CONFIGURATION WITH UTILITY PRIOR TO CONSTRUCTION AND PROVIDE ALL NECESSARY EQUIPMENT PADS, PULL BOXES OR OTHER ITEMS REQUIRED BY UTILITY.
 - THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OWNER PRIOR TO CONSTRUCTION.
 - THE CONTRACTOR IS RESPONSIBLE FOR ALL TRENCHING, BACKFILL, COMPACTION, AND THE INSTALLATION OF CONDUIT SHOWN AS NEW OR TO BE EXTENDED TO NEW EQUIPMENT LOCATION.
 - PROVIDE BONDING AND GREEN INSULATED GROUND FOR ALL ELECTRICAL ENCLOSURES PER LATEST EDITION OF NEC.
 - REFER TO DRAWING E202 FOR CONDUIT AND CONDUCTOR SCHEDULE.
 - REFER TO DRAWING E202 FOR EQUIPMENT SCHEDULE.
 - REFER TO DRAWING E203 AND E204 FOR PUMP CONTROL SCHEMATICS.

KEY NOTES

- COORDINATE ALL SERVICE ENTRANCE WORK WITH UTILITY PRIOR TO CONSTRUCTION TO CONFIRM EXACT LOCATION, CONDUIT SIZE AND OTHER REQUIREMENTS AND UTILITY STANDARDS.
- METER BASE PROVIDED BY UTILITY AND INSTALLED BY CONTRACTOR. COORDINATE EXACT PLACEMENT WITH UTILITY.
- BOND TO ALL ELECTRODES PRESENT PER NEC 250 AND LOCAL AHJ.

1	ADDENDUM #1	2/3/20
REV NO.	COMMENT	DATE

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SUNRISE
ENGINEERING

KAYSVILLE CITY

1.0 MG TANK
ELECTRICAL
ONE-LINE DIAGRAM AND SCHEDULES

SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
S06337	JRK	JRK	JRK	36 of 40

E201



SHEET NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE TO LOCATE ALL EXISTING UNDERGROUND UTILITIES BEFORE ANY EXCAVATION IS PERFORMED. ANY DAMAGE TO EXISTING UTILITIES SHALL BE REPAIRED TO NEW CONDITION OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
2. NOT ALL CONDUITS ARE SHOWN. REFER TO CONDUIT AND CONDUCTOR SCHEDULE FOR INDIVIDUAL CONDUIT FILL REQUIREMENTS. CONDUIT LAYOUT SHOWN IS DIAGRAMMATIC ONLY. CONTRACTOR SHALL FIELD ROUTE AS NECESSARY TO ACCOMMODATE FIELD CONDITIONS AND AVOID OTHER STRUCTURES AS REQUIRED.
3. SEE DRAWING E201 FOR CONDUIT/CONDUCTOR SCHEDULE.
4. SEE DRAWING E401 FOR ELECTRICAL EQUIPMENT SCHEDULE.
5. PROVIDE BONDING AND GREEN INSULATED GROUND CONDUCTORS FOR ALL ELECTRICAL ENCLOSURES PER LATEST EDITION OF NEC.

KEY NOTES

1. TANK MIXER LOCATION. TANK MIXER TO BE SUSPENDED INSIDE TANK FROM MIXER HATCH. CONTRACTOR SHALL INSTALL MIXER PER MANUFACTURER'S RECOMMENDATIONS AND SHALL PROVIDE ALL CONDUIT, CONDUIT FITTINGS, MOUNTING HARDWARE, ANCHORS, AND ALL COMPONENTS REQUIRED FOR A FUNCTIONAL SYSTEM. SEAL ALL PENETRATIONS INTO HATCH AND TANK.
2. PROVIDE AND INSTALL FLOAT SWITCHES FOR LOW LEVEL AND HIGH LEVEL. CONTRACTOR SHALL PROVIDE ALL CONDUIT, CONDUCTOR, MOUNTING HARDWARE, AND ACCESSORIES REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.
3. PROVIDE AND INSTALL INTRUSION SWITCH IN EACH HATCH. SWITCHES SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL PROVIDE ALL CONDUIT, CONDUCTOR, MOUNTING HARDWARE AND ALL REQUIRED ACCESSORIES FOR A COMPLETE AND OPERABLE SYSTEM. COORDINATE EXACT LOCATION AND DEPTH SETTINGS WITH OWNER PRIOR TO INSTALLATION.
4. INSTALL JUNCTION BOX FOR TANK INSTRUMENTATION ON SIDE OF HATCH AS INDICATED IN DRAWINGS AND DETAILS. PROVIDE A WATER TIGHT SEAL FOR ALL PENETRATIONS AND CONDUIT INTO TANK HATCH AND JUNCTION BOX.
5. PROVIDE AND INSTALL SUBMERSIBLE PRESSURE TRANSMITTER. PROVIDE A 3" PERFORATED STILLING PIPE AS SHOWN IN DETAIL B, SHEET E502.
6. APPROXIMATE LOCATION SHOWN. COORDINATE INSTALLATION WITH UTILITY.

REV NO	ADDENDUM #1	DATE
1		2/3/20

REGISTERED PROFESSIONAL ENGINEER
J. RANDALL KNAPP
No. 362066
STATE OF UTAH

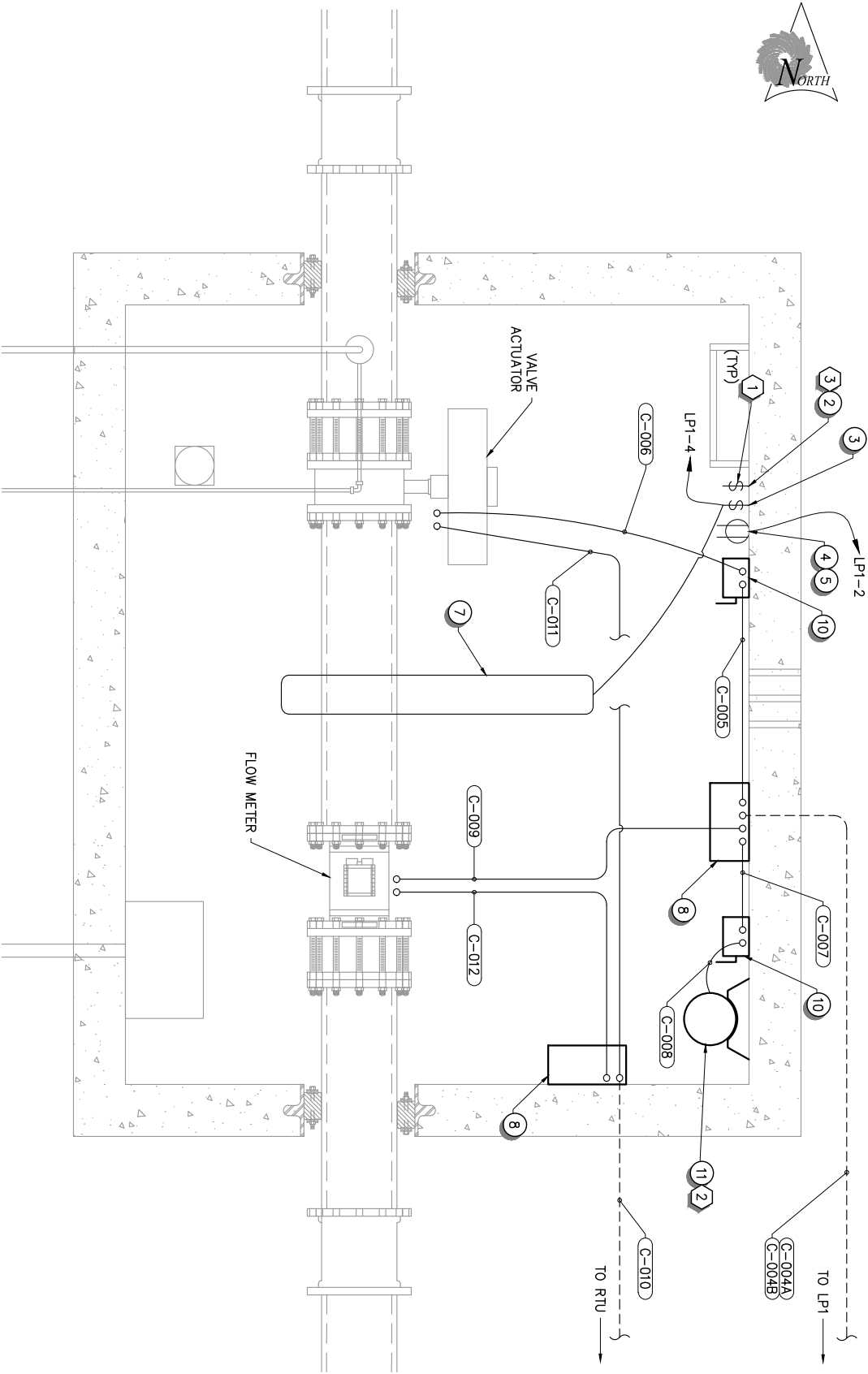
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TEL 801.523.0100 • FAX 801.523.0990
WWW.SUNRISE-ENG.COM

KAYSVILLE CITY

1.0 MG TANK
TANK SITE
ELECTRICAL SITE PLAN

SET NO	DESIGNED	DRAWN	CHECKED	SHEET NO	E301
S06337	JRK	JRH	JRK	37 of 40	



ELECTRICAL EQUIPMENT SCHEDULE					
ITEM #	DESCRIPTION	QUANTITY	MODEL / SPECIFICATION	MANUFACTURER	COMMENTS
①	METERBASE/LOAD CENTER COMBINATION, 240Y/120V, 1Ø, 3-WIRE, 200A, WITH 60A MAIN CB, 20 SPACE	1	PER UTILITY REQUIREMENTS	PER UTILITY REQUIREMENTS	COORDINATE WITH UTILITY FOR METER SOCKET REQUIREMENTS
②	20A HEAVY-DUTY SWITCH, HORSEPOWER RATED	1	TBD	HUBBELL OR APPROVED	ROUTE FAN POWER FROM DISCONNECT THROUGH SWITCH TO FAN
③	20A HEAVY-DUTY SWITCH	1	CSL120GY	HUBBELL OR APPROVED	PROVIDE 3-WAY OR 4-WAY SWITCHES AS INDICATED IN DRAWINGS.
④	20A GFCI RECEPTACLE	AS SHOWN	GFI5362SGGY	HUBBELL OR APPROVED	PROVIDE GFCI RECEPTACLES AS INDICATED IN DRAWINGS AND WHERE REQUIRED BY NEC OR LOCAL CODES.
⑤	WEATHER RESISTANT IN-USE COVER FOR DUPLEX RECEPTACLE	AS SHOWN	WP26EH	HUBBELL OR APPROVED	PROVIDE WEATHER RESISTANT, IN-USE COVERS WHERE SHOWN AND FOR ALL RECEPTACLES LOCATED OUTDOORS OR IN WET LOCATIONS.
⑦	4' SURFACE MOUNT VAPOR-TITE LED STRIP LIGHT	1	XWL L48 5000LM MVOLT 40K 80CRI	LITHONIA OR APPROVED EQUAL	
⑧	ELECTRICAL PULL BOX, STAINLESS STEEL, 12" X 12" X 6"	2	CSD12126SS	HOFFMAN OR APPROVED EQUAL	
⑨	INTRUSION SWITCH	2	SR-2505A	GE OR APPROVED	
⑩	DISCONNECT SWITCH, HD, 240V, 20A, NEMA3R	2	16010	SQUARE D OR APPROVED EQUAL	
⑪	EXHAUST FAN, 8", INLINE, xx CFM	1	TBD	TBD	PROVIDE MOUNTING BRACKET, HARDWARE AND DUCTING AS INDICATED
⑫	SUBMERSIBLE PRESSURE TRANSDUCER, 4-20mA, 15PSI	1	17310SP	WIKA TRONIC OR APPROVED	
⑬	LIQUID LEVEL FLOAT SWITCH	2	16315	DWYER OR APPROVED	
⑭	ELECTRICAL PULL BOX, 13" X 24"	AS SHOWN	POLYMER 1324	OLDCASTLE OR APPROVED	

A
DETAIL - POWER AND CONTROL PLAN
1" = 1'

GENERAL NOTES:

- CONTRACTOR TO COMPLY WITH GENERAL ELECTRICAL REQUIREMENTS ON DRAWING E100.
- CONDUITS SHOWN ARE SCHEMATIC ONLY. CONTRACTOR SHALL FIELD ROUTE CONDUIT AS NECESSARY TO AVOID OBSTACLES AND OTHER EQUIPMENT.
- NOT ALL CONDUITS ARE SHOWN FOR CLARITY. REFER TO CONDUIT AND CONDUCTOR SCHEDULE FOR ADDITIONAL CIRCUITING INFORMATION.
- SEE DRAWING E202 FOR CONDUIT/CONDUCTOR SCHEDULE, EQUIPMENT SCHEDULE, AND LIGHTING SCHEDULE.
- PROVIDE GFCI RECEPTACLES FOR ALL RECEPTACLES LOCATED IN VAULT.

KEY NOTES

- MOUNT SWITCHES AND RECEPTACLE AT TOP OF VAULT NEAR HATCH OPENING TO ALLOW ACCESS AND OPERATION WITHOUT ENTERING VAULT.
- PROVIDE AND INSTALL INLINE EXHAUST FAN. PROVIDE DUCT TO VENT LOCATED IN SIDE OF VAULT. PROVIDE 8" INTAKE DUCT TO WITHIN 6" OF VAULT FLOOR. ROUTE POWER FOR FAN THROUGH FAN SWITCH NEAR HATCH.

1	ADDENDUM #1	2/3/20
REV NO.	COMMENT	DATE

REGISTERED PROFESSIONAL ENGINEER
J. RANDALL KNABER
No. 362066
STATE OF UTAH

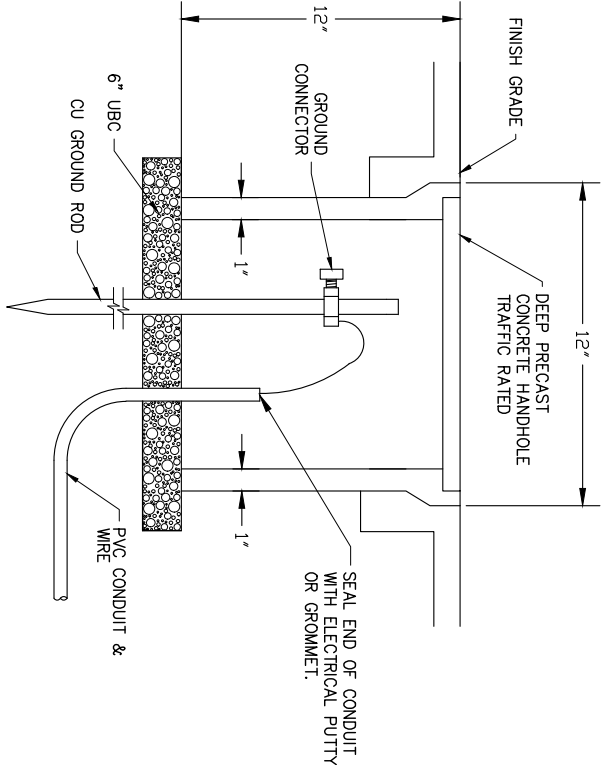
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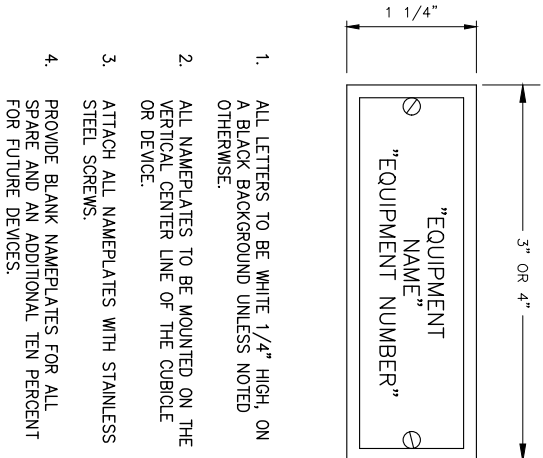
KAYSVILLE CITY

1.0 MG TANK

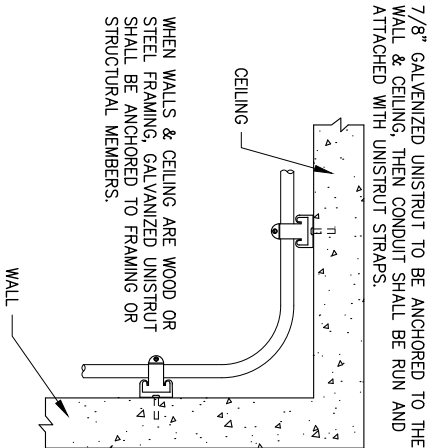
SET NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	E401
506337	JRK	JRH	JRK	38 of 40	
ELECTRICAL POWER AND CONTROL PLAN					



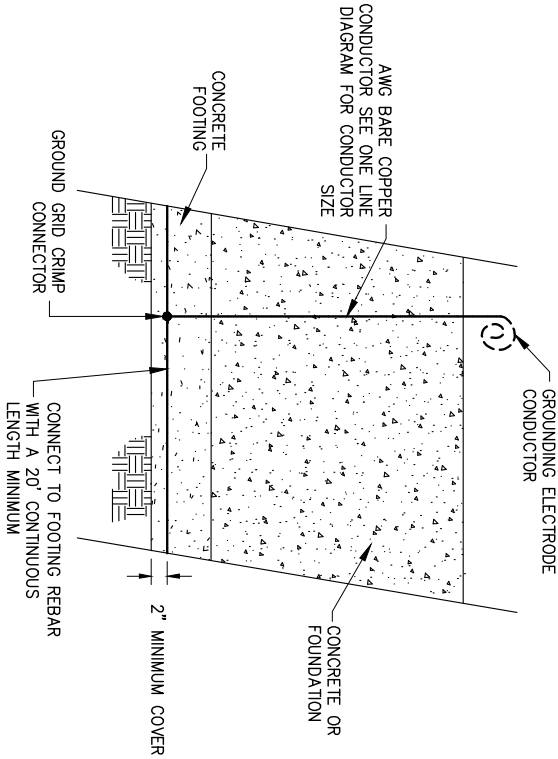
A DETAIL - GROUND WELL
N.T.S.



B DETAIL - NAMEPLATE
N.T.S.

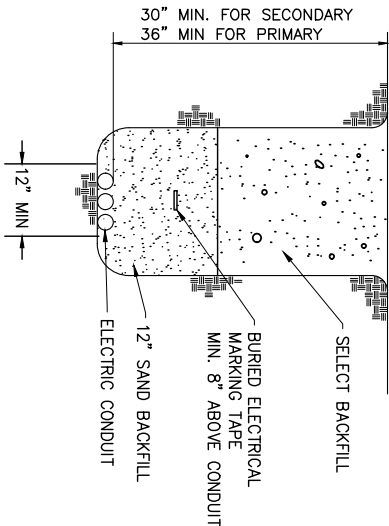


C DETAIL - CONDUIT MOUNT
N.T.S.

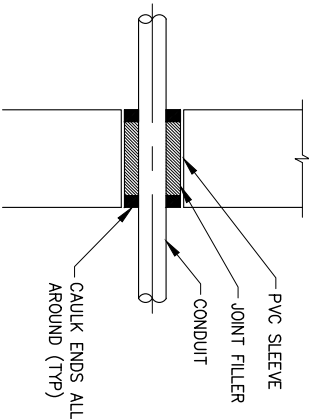


D DETAIL - UFER CONCRETE ENCASED
N.T.S.

1. WARNING TAPE MUST BE PLACED ON TOP OF CONDUIT (5 MILS THICKNESS)
2. ALL TRENCHES MUST BE INSPECTED PRIOR TO BACKFILLING
3. TRENCHES SHOULD BE SPOT BACKFILLED TO PREVENT MOVEMENT OF TAPE DURING BACKFILL.
4. SELECT BACKFILL MUST BE COMPACTED IN 1 FOOT LIFTS TO PREVENT



E DETAIL - UNDERGROUND CONDUIT POWER CABLE TRENCH
N.T.S.



F CONDUIT PENETRATION
N.T.S.

REV NO.	COMMENT	DATE



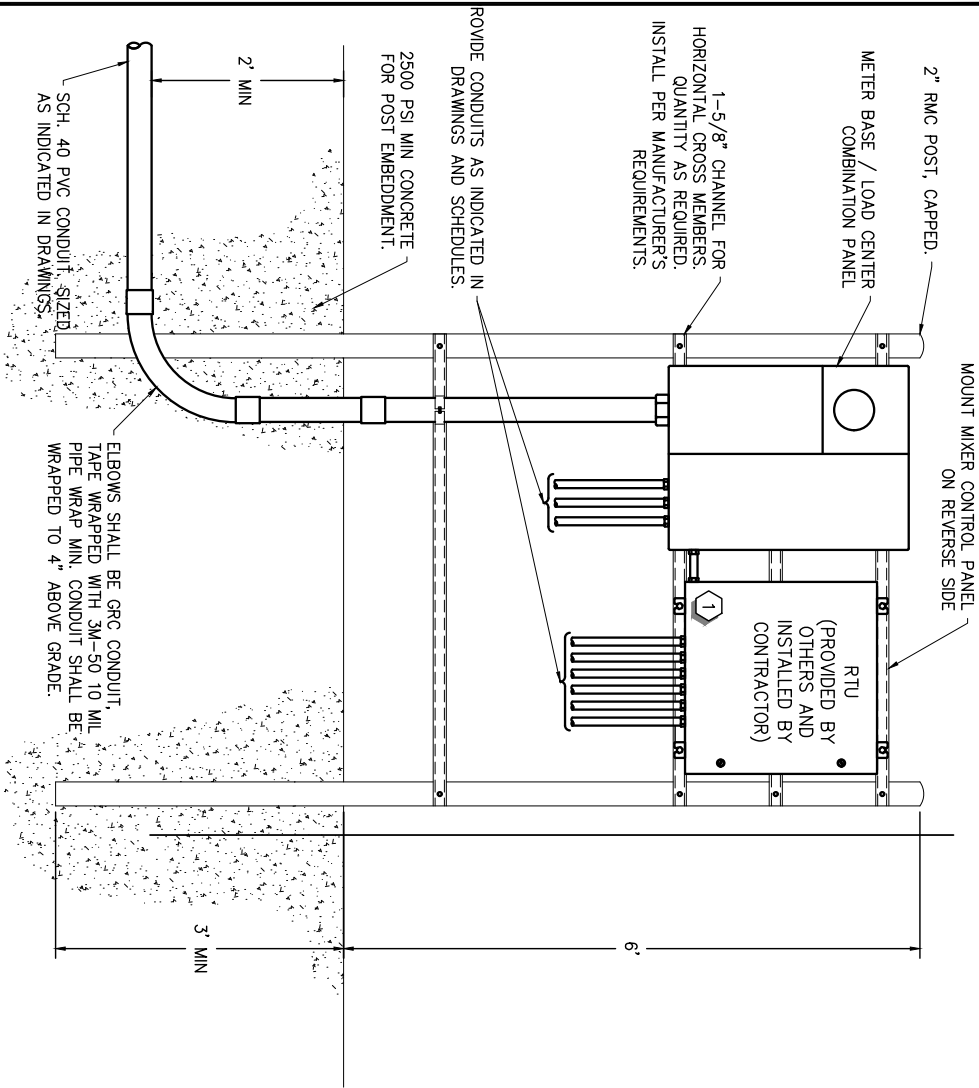
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J. RANDALL KNAPP
REGISTERED PROFESSIONAL ENGINEER
No. 362066
Exp. 12-31-2019
STATE OF UTAH

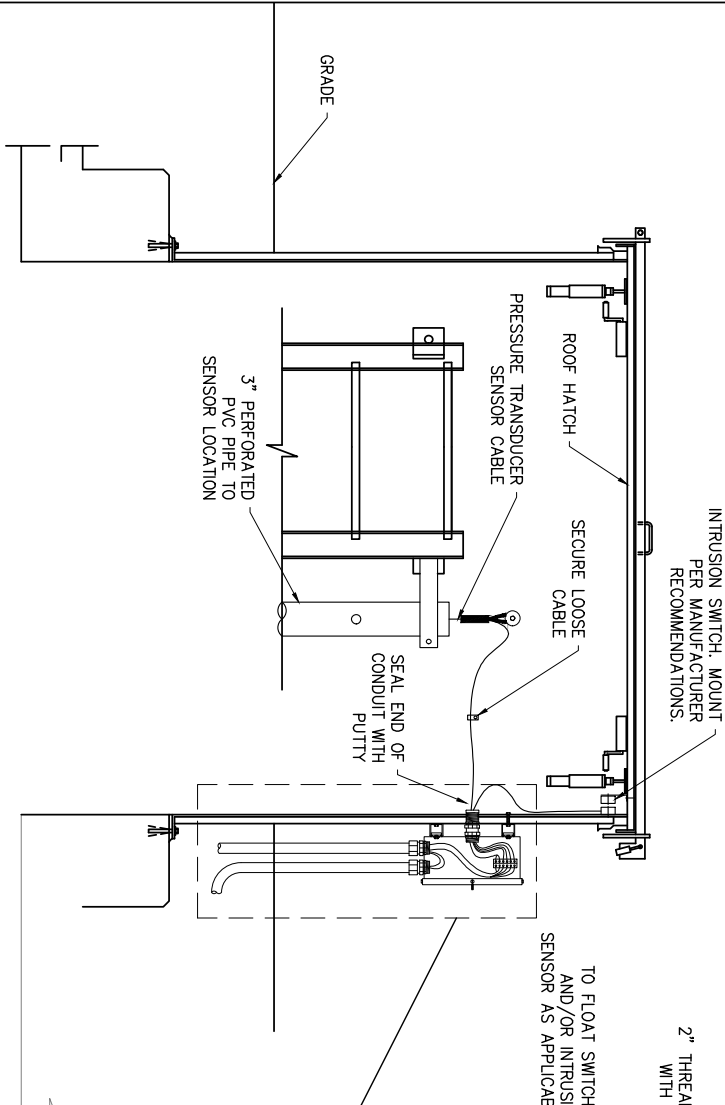
KAYSVILLE CITY
1.0 MG TANK

ELECTRICAL DETAILS			
SET NO.	DESIGNED	DRAWN	CHECKED
S06337	JRK	JRH	JRK
SHEET NO.			39 of 40
E501			



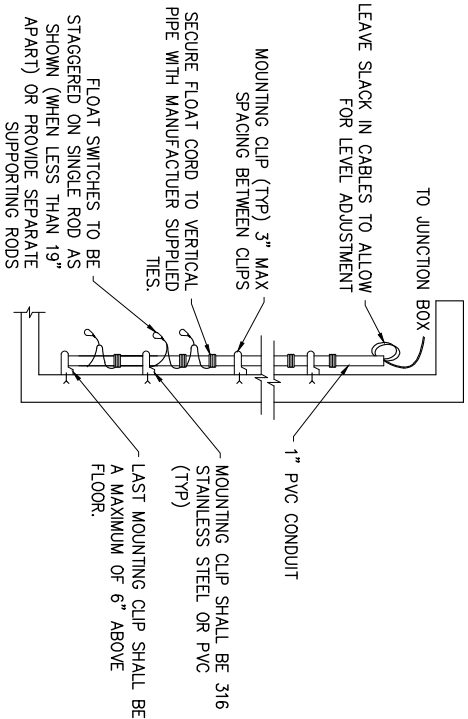
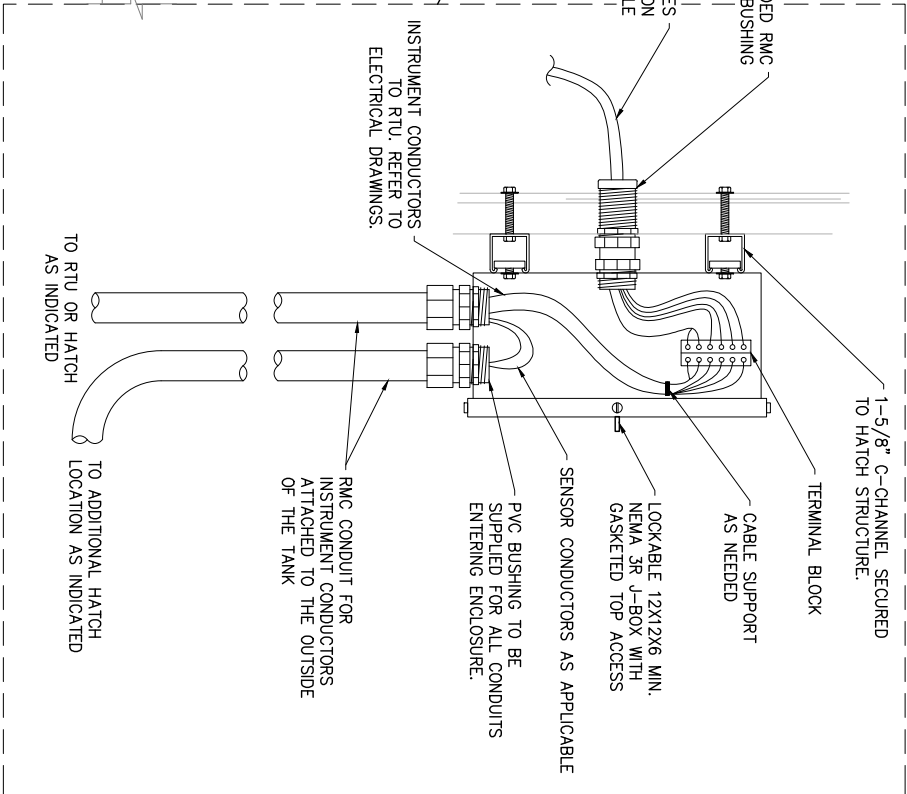
A ELEVATION - TANK EQUIPMENT

N.T.S.



B DETAIL - INSTRUMENT MOUNTING (SIDE OF HATCH)

N.T.S.



- NOTES:
1. TYPICAL FLOAT SWITCH ARRANGEMENT SHOWN. PROVIDE QUANTITY AS SHOWN ON DRAWINGS AND EQUIPMENT SCHEDULE.

C DETAIL - FLOAT SWITCH MOUNTING

N.T.S.

KEY NOTES

1. RTU PROVIDED BY OWNER'S SCADA SYSTEM INTEGRATOR. SYSTEM INTEGRATOR TO PROVIDE ALL RTU COMPONENTS INCLUDING PLC, RADIO, ANTENNA, I/O MODULES, POWER SUPPLIES, SCADA SYSTEM PROGRAMMING AND ALL ACCESSORIES REQUIRED FOR A COMPLETE AND OPERABLE SYSTEM.

REV NO.	COMMENT	DATE

SUNRISE ENGINEERING

68775 SOUTH 900 EAST
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KAYSVILLE CITY

1.0 MG TANK

ELECTRICAL DETAILS			
SET NO.	DESIGNED	DRAWN	CHECKED
S06337	JRK	JRK	40 of 40
E502			



CONTRACT DOCUMENTS AND SPECIFICATIONS

FOR

1.0 MG WATER TANK

FOR

KAYSVILLE CITY, UTAH

JANUARY 2020

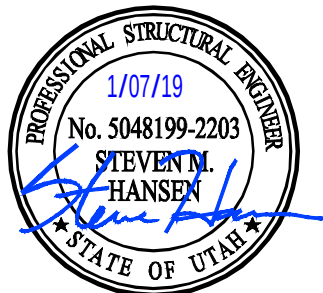


EXHIBIT C

BID FORMS & CONTRACT DOCUMENTS

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EXHIBIT C

SUPPLEMENTAL SPECIAL PROVISIONS

01 29 00 SP	MEASUREMENT & PAYMENT	22
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03 11 01 SP	WATERSTOPS	37
03 30 04 SP	CONCRETE.....	39
03 70 00 SP	WATER TIGHTNESS TESTING OF AWWA D115 TANK	40
31 25 00 SP	EROSION & SEDIMENTATION CONTROL	42
33 75 00 SP	TANK OVERFLOW STRUCTURE UTILITY	43
22 11 23 SP	BOOSTER PUMP SYSTEM HYDRO MPC-E BOOSTERPAQ	44
31 23 24 SP	ROCK RETAINING WALLS.....	57
32 94 00 SP	RE-SEEDING.....	60
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ELECTRICAL SPECIFICATIONS

16010	ELECTRICAL GENERAL REQUIREMENTS
16150	ELECTRICAL CONTROL DEVICES
16210	ELECTRICAL FIXTURES
16315	LIQUID LEVEL SWITCHES
16400	SERVICE AND DISTRIBUTION SYSTEMS
16410	FUSES
16960	INTRUSION SWITCH
16065 SP	LIGHTNING PROTECTION FOR STRUCTURES
17310SP	SUBMERSIBLE PRESSURE TRANSDUCER

EXHIBIT C

REFERENCE SPECIFICATIONS (APWA)

Reference Number	Title	No. of Pages
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DIVISION 1 - GENERAL REQUIREMENTS

01 71 13	Mobilization and Demobilization	2
01 55 26	Traffic Control	2
01 57 00	Temporary Controls	1

DIVISION 2-SITEWORK

02 41 14	Pavement Removal	3
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DIVISION 3-CONCRETE

03 11 00	Concrete Forming	6
03 20 00	Concrete Reinforcing	4
03 30 04	Concrete	10
03 30 05	Concrete Testing	5
03 30 10	Concrete Placement	6
03 35 00	Concrete Finishing	6
03 39 00	Concrete Curing	3
03 40 00	Precast Concrete	5
03 61 00	Cementitious Grouting	3

DIVISION 5-METALS

05 05 10	Metal Galvanizing.....	2
05 05 23	Bolts, Nuts and Accessories.....	2
05 12 00	Structural Steel Framing	6
05 53 00	Gratings and Floor Plates.....	2
05 56 00	Metal Castings	3

DIVISION 6-WOOD, PLASTICS, AND COMPOSITES

06 61 00	Rough Carpentry	8
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EXHIBIT C

DIVISION 7-THERMAL AND MOISTURE PROTECTION

07 19 00	Water Repellant	2
07 21 00	Insulation	5

DIVISION 9-FINISHES

09 91 00	Painting	6
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DIVISION 22- PLUMBING

22 05 00	Mechanical General Requirements.....	4
22 11 13	Facility Water Distribution Piping	6
22 13 33	Submersible Pump.....	5

DIVISION 31 EARTH WORK

31 05 13	Common Fill	4
31 05 15	Cement Treated Fill.....	4
31 05 19	Geotextiles.....	10
31 11 00	Site Clearing.....	2
31 23 16	Excavation	4
31 23 17	Rock Removal.....	2
31 23 23	Backfilling for Structures.....	5
31 23 26	Compaction	2
31 25 00	Erosion and Sedimentation Control.....	3
31 37 00	Riprap or Rock Lining	2
31 41 00	Shoring.....	4

DIVISION 32 EXTERIOR IMPROVEMENTS

32 05 10	Backfilling Roadways.....	6
32 11 23	Aggregate Base Course	8
32 12 05	Asphalt Concrete.....	9
32 12 13.13	Tack Coat.....	2
32 16 13	Driveway, Sidewalk, Curb, Gutter	6
32 31 13	Chain Link Fences and Gates	6
32 84 23	Underground Irrigation Systems.....	9

EXHIBIT C

32 91 13	Structural Soil Mix.....	2
32 91 19	Landscape Grading.....	2
32 93 43	Tree.....	4
32 98 00	Vegetation Establishment Period.....	2

DIVISION 33 UTILITIES

33 05 02	Concrete Pipe and Culvert.....	4
33 05 05	Ductile Iron Pipe.....	2
33 05 06	Polyethylene Pipe.....	4
33 05 07	Polyvinyl Chloride Pipe.....	4
33 05 09	Steel Pipe – Lined and Coated.....	6
33 05 14	Utility Grade Adjustment.....	3
33 05 20	Backfilling Trenches	6
33 05 25	Pavement Restoration	6
33 08 00	Commissioning of Water Utilities	5
33 11 00	Water Distribution and Transmission	8
33 12 16	Water Valves	4
33 13 00	Disinfection.....	4
33 41 00	Storm Drainage Systems.....	4
33 71 73	Electrical Utility Services.....	2

INVITATION TO BID for PREQUALIFIED BIDDERS

Separate sealed bids for construction of Kaysville City, 1.0 MG Water Tank will be received by Kaysville City from bidders.

Bids will be publicly opened and read aloud at 3:00 PM on February 6th, 2020 at the following location: 80 North Main Street, Kaysville, UT.

A five (5) percent Bid Bond is required with your bid.

Bidding documents will be issued only to pre-qualified bidders and interested suppliers. Bids will be received only from pre-qualified bidders and bids submitted from unqualified bidders will be returned unopened. An advertisement for qualification statements was published in the Salt Lake Tribune & Deseret News during the month of July/August 2019. Proof of publication is available upon request. Qualification statements were received from prospective bidders on September 4th, 2019.

The work to be performed under this project shall consist of furnishing all labor, materials and equipment required to construct the facilities and features described by the CONTRACT DOCUMENTS and as shown on the DRAWINGS.

Kaysville City, 1.0 MG Water Tank

This project is privately funded. All payments to contractor will be approved and paid for by Kaysville City.

Plans and specifications have been prepared by Sunrise Engineering, Inc. and will be made available through the Sunrise Sharefile site. Pre-qualified contractors will receive an email allowing them to access the site to download all applicable documents. Bidders must register and sign-in to access to CONTRACT DOCUMENTS and DRAWINGS. Notices regarding changes/amendments to the CONTRACT DOCUMENTS and DRAWINGS will be sent to the e-mail address associated with the bidder's pre-qualification. Bidders are responsible to maintain current and correct contact information and check the sharefile site often to receive updates or additional documents/changes/amendments. The ENGINEER for this Contract will be Sunrise Engineering, Incorporated and they will be represented by Steve Hansen, P.E. as Project Engineer.

This WORK will be constructed by award of a competitive, sealed bid contract awarded to the low bidder. Compensation to the CONTRACTOR will be made through progressive monthly payments in accordance with the General Conditions of these CONTRACT DOCUMENTS at the units and prices indicated in the BID Schedule.

When construction under this contract takes place on property owned or administered by agencies or organizations other than the OWNER, all construction shall be completed in accordance with the special requirements of that entity which are contained or referenced in these CONTRACT DOCUMENTS

Information will be provided on the DRAWINGS and in these documents to indicate areas of WORK which fall on property owned or administered by agencies or organizations other than the OWNER.

A pre-bid meeting will be held on January 21st at 1:30 PM, at the Kaysville Police Station located at 80 N. Main Street, Kaysville, UT 84043.

Attendance at the pre-bid tour is mandatory.

Names of those in attendance will be recorded.

INSTRUCTION TO BIDDERS

Complete sets of Bidding Documents may be obtained from the ENGINEER as designated in the Invitation to bid for prequalified bidders. Complete sets of Bidding Documents, which include the following 3 documents: 1) Contract Documents and Special Provisions, 2) Standard APWA Specifications for Construction, and 3) Drawings, shall be used for preparing BIDS. Neither the OWNER nor ENGINEER assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

Each BID must be submitted in a sealed envelope, addressed to: Kaysville City at 80 North Main Street, Kaysville, Utah 84037. Each sealed envelope containing a BID must be plainly marked on the outside as "BID for Kaysville 1.0 MG Water Tank" and the envelope should bear on the outside the name of the BIDDER, their address, license number if applicable and the name of the project for which the BID is submitted. If forwarded by mail, the sealed envelope containing the BID must be enclosed in another envelope addressed to the OWNER at 80 North Main Street, Kaysville, Utah 84037. All BIDS must be made on the required BID form. All blank spaces for BID prices must be filled in, in ink or typewritten, and the BID form must be fully completed and executed when submitted. Only one copy of the BID form is required.

The OWNER may waive any informalities or minor defects or reject any and all BIDS. Any BID may be withdrawn prior to the scheduled time for the opening of BIDS or authorized postponement thereof. Any BID received after the time and date specified shall not be considered. No BIDDER may withdraw a BID within (60) days after the date of the BID opening. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the OWNER and the BIDDER.

BIDDERS must satisfy themselves of the accuracy of the estimated quantities in the BID Schedule by examination of the site and a review of the drawings and specifications including ADDENDA. All bids will be checked by the ENGINEER for errors. If errors are made, unit prices shall govern, and corrections will be made according to the unit price or lump sum amounts and totals will be revised to reflect the corrections.

The OWNER shall provide to BIDDERS prior to BIDDING, all information which is pertinent to, and delineates and describes, the land owned, and rights-of-way acquired or to be acquired.

This WORK will be constructed by award of a competitive, sealed bid contract awarded to the lowest responsible, responsive bidder. Compensation to the CONTRACTOR will be made through progressive monthly payments in accordance with the General Conditions of these CONTRACT DOCUMENTS at the units and prices indicated in the BID Schedule.

When construction under this contract takes place on property owned or administered by agencies or organizations other than the OWNER, all construction shall be done in accordance with the special requirements of that entity which are contained or referenced in these CONTRACT DOCUMENTS

When requirements published by such entities are contained in, or referenced by, these CONTRACT DOCUMENTS, they shall be carefully complied with and the CONTRACTOR shall include sufficient compensation to cover the WORK required therein.

Information will be provided on the DRAWINGS and in these documents to indicate areas of WORK which fall on property owned or administered by agencies or organizations other than the OWNER.

The CONTRACT DOCUMENTS contain the provisions required for the construction of the PROJECT. Information obtained from an officer, agent, or employee of the OWNER or any other person shall not affect the risks or obligations assumed by the CONTRACTOR or relieve him from fulfilling any of the conditions of the contract.

EXHIBIT C

Form 402

Each BID must be accompanied by a BID BOND payable to the OWNER for five percent of the total amount of the BID. As soon as the BID prices have been compared, the OWNER will return the BONDS of all except the three lowest responsible, responsive BIDDERS. When the Agreement is executed, the bonds of the two remaining unsuccessful BIDDERS will be returned. The BID BOND of the successful BIDDER will be retained until the PAYMENT BOND and PERFORMANCE BOND have been executed and approved, after which it will be returned. A certified check may be used in lieu of a BID BOND.

A PERFORMANCE BOND and a PAYMENT BOND, each in the amount of 100 percent of the CONTRACT PRICE, with a corporate surety approved by the OWNER, will be required for the faithful performance of the contract.

Attorneys-in-fact who sign BID BONDS or PAYMENT BONDS and PERFORMANCE BONDS must file with each BOND a certified and effective dated copy of their power of attorney.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the PERFORMANCE BOND and PAYMENT BOND, when required, within ten (10) calendar days from the date when the NOTICE OF AWARD is delivered to the BIDDER. The NOTICE OF AWARD shall be accompanied by the necessary Agreement and BOND forms. In case of failure of the BIDDER to execute the Agreement, the OWNER may, at their option, consider the BIDDER in default, in which case the BID BOND accompanying the proposal shall become the property of the OWNER.

Within ten (10) days of receipt of the Agreement signed properly by the party to whom the contract was awarded, and accompanied by acceptable PERFORMANCE and PAYMENT BONDS, when required, the OWNER shall sign the Agreement and return to the BIDDER an executed duplicate of the Agreement. Should the OWNER not execute the Agreement within such period, the BIDDER may by WRITTEN NOTICE withdraw their signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the OWNER.

The NOTICE TO PROCEED shall be issued within ten (10) days of the execution of the Agreement by the OWNER. Should there be reasons why the NOTICE TO PROCEED cannot be issued within such period, the time may be extended by mutual agreement between the OWNER and CONTRACTOR. If the NOTICE TO PROCEED has not been issued within the ten (10) day period or within the period mutually agreed upon, the CONTRACTOR may terminate the Agreement without further liability on the part of either party.

The OWNER may make such investigations as deemed necessary to determine the ability of the BIDDER to perform the WORK and the BIDDER shall furnish to the OWNER all such information and data for this purpose as the OWNER may request. The OWNER reserves the right to reject any BID if the evidence submitted by, or investigation of, such BIDDER fails to satisfy the OWNER that such BIDDER is properly qualified to carry out the obligations of the Agreement and to complete the WORK contemplated therein.

A conditional or qualified BID will not be accepted.

Award will be made to the lowest responsible, responsive BIDDER of all tank options. However, the OWNER reserves the right to reject any and all the bids.

BIDDER and OWNER recognize that time is of the essence in this Agreement and that OWNER will suffer financial loss if the WORK is not completed within the time period specified in the Bid. OWNER and BIDDER agree that as liquidated damages for delay (but not as a penalty) BIDDER shall pay OWNER the specified amount for each day that expires after the specified time for substantial completion until the WORK is substantially complete.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the PROJECT shall apply to the contract throughout.

Each BIDDER is responsible for inspecting the site and for reading and being thoroughly familiar with the CONTRACT DOCUMENTS. The failure or omission of any BIDDER to do any of the foregoing shall in no way relieve any BIDDER from any obligation in respect to his BID.

EXHIBIT C

Form 402

The low BIDDER shall supply the names and addresses of major material SUPPLIERS and SUBCONTRACTORS when requested to do so by the OWNER.

BID FORM

Bid of _____
(Insert Contractor's Name)

(hereinafter called "BIDDER"), organized and existing under the laws of the State of Utah and doing

business as _____ to
(Insert "a corporation", "a partnership" or "an individual" as applicable)

_____ (hereinafter called "OWNER").

In compliance with the Invitation to Bid, BIDDER hereby proposes to perform all WORK for construction of the **Kaysville City, 1.0 MG Water Tank** in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below in the BID Schedule.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID, each party thereto certifies as to their own organization, that this BID has been prepared independently, without consultation, communication, or agreement as to any matter relating to the BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this Contract on or before a date specified in the NOTICE TO PROCEED (TBD) and to achieve substantial completion by October 1st, 2020 by leak testing tank and pressure testing and disinfecting piping and completing site improvements. BIDDER further agrees to pay liquidated damages, the sum of \$500.00, for each consecutive calendar day thereafter as provided in APWA GENERAL CONDITIONS. This BID will remain open for sixty (60) days after the date of Bid Opening. If awarded the Contract, the BIDDER will sign the Agreement and submit the security and the other documents required by the CONTRACT within ten (10) days after the date of the OWNER'S "Notice of Award".

BIDDER acknowledges receipt of the following ADDENDA:

The BID Schedule is provided on the following page. The BID Schedule must be completed in full by the BIDDER and signed properly to be considered responsible.

BID SCHEDULE

CONTRACT FOR: Kaysville City, 1.0 MG Water Tank

The undersigned Bidder, having examined and determined the scope of the Contract Documents, hereby proposes to perform the work described herein for the following unit prices or lump sum amounts.

Note: 1. Bids shall include sales tax and all other applicable taxes and fees
 2. All bids shall be checked for errors. If errors are made, unit prices shall govern and corrections will be made according to the unit price and totals will be revised to reflect the corrections.
 3. The contract will be awarded to the lowest responsible, responsive bidder when considering the total for the tank and booster station combined. The transmission line is optional work that may be awarded to the winning contractor after the start of the project.

No.	Item	Quantity	Unit	Unit Price	Amount
	1.0 MG TANK				
1.0	MOBILIZATION	1	LS		
2.0	QUALITY CONTROL & TESTING	1	LS		
3.0	SWPP PLAN & IMPLEMENTATION	1	LS		
4.0	CLEARING AND GRUBBING	1	LS		
5.0	REVEGETATION & EROSION CONTROL	1	LS		
6.0	EARTHWORK, ACCESS ROAD	1	LS		
7.0	EARTHWORK & TEMPORARY SHORING, TANK	1	LS		
8.0	IMPORT TANK BASE MATERIAL	880	TON		
9.0	IMPORT TANK STRUCTURAL FILL	880	TON		
10.0	IMPORT PIPE BEDDING	480	TON		
11.0	IMPORT PIPE ZONE BACKFILL	1,260	TON		
12.0	IMPORT PIPE TRENCH BACKFILL	2,090	TON		
13.0	WATER PIPE, PVC C900, 10"	1,440	LF		
14.0	RING DRAIN, CORRUGATED DUAL WALL HDPE, 6"	1,320	LF		
15.0	VAULT DRAIN, CORRUGATED DUAL WALL HDPE, 4"	110	LF		
16.0	VALVE, GATE, 10"	4	EA		
17.0	3 IN. AIR VAC ASSEMBLY W/ 5 FT MANHOLE	1	EA		
18.0	METER/ ISOLATION VALVE VAULT	1	LS		
19.0	OVERFLOW DISCHARGE BOX & OUTFALL	1	LS		
20.0	CHAIN-LINK FENCE & GATE	720	LF		
21.0	CONCRETE WATER TANK, 1.0 MG, AWWA D115	1	LS		
22.0	ELECTRICAL WORK	1	LS		
23.0	ROCK RETAINING WALL	1	LS		
24.0	TEMPORARY SHORING	1	LS		
				SUBTOTAL	
	BOOSTER STATION (ALL SHEETS EXCEPT PP SHEETS)				
25.0	MOBILIZATION	1	LS		
26.0	QUALITY CONTROL AND TESTING	1	LS		
27.0	SWPP PLAN & IMPLEMENTATION	1	LS		
28.0	CLEARING AND GRUBBING	1	LS		
29.0	BOOSTER STATION SITE WORK	1	LS		
30.0	BOOSTER STATION STRUCTURE AND APPURTENANCES	1	LS		
31.0	MECHANICAL PIPING AND EQUIPMENT	1	LS		
32.0	PRE-PACKAGED BOOSTER PAQ STATION AND PIPING	1	LS		
33.0	ELECTRICAL SYSTEM	1	LS		
				SUBTOTAL	
				TOTAL	

EXHIBIT C

Form 403A

The undersigned Bidder certifies that this proposal is made in good faith, without collusion or connection with any other person or persons bidding on the work.

Seal (if bid is by Corporation)

Respectfully Submitted:

Bidder: _____

Signature _____

Title: _____

License No. _____ Address: _____

Date: _____

BID OPTION (ADDITIONAL WORK)					
	TRANSMISSION LINE FROM BOOSTER TO TANK (PP SHEETS)				
34.0	MOBILIZATION	1	LS		
35.0	QUALITY CONTROL AND TESTING	1	LS		
36.0	SWPP PLAN & IMPLEMENTATION	1	LS		
37.0	IMPORT PIPE BEDDING	220	TON		
38.0	IMPORT PIPE ZONE BACKFILL	580	TON		
39.0	IMPORT PIPE TRENCH BACKFILL	1,160	TON		
40.0	WATER PIPE, PVC C900, 10"	2,000	LF		
41.0	VALVE, GATE, 10"	3	EA		
				SUBTOTAL	

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____
(Contractor's Name)

as Principal, and as Surety, are hereby _____
(SURETY'S Name)

held and firmly bound unto KAYSVILLE CITY as OWNER in the penal sum of _____
(OWNERS Name)

for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed this _____ day of _____, 2019.

The Condition of the above obligation is such that whereas the Principal has submitted to a certain BID, attached hereto and hereby made a part hereof to enter into a contract in writing, for

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a bond or bonds as may be specified in the CONTRACT DOCUMENTS with surety acceptable to the OWNER and shall in all other respects perform the agreement created by the acceptance of said BID,

then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

(Principal) (L.S.)

(Name of Surety)

By: _____
(Signature)

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS THAT:

Name of CONTRACTOR

Address of CONTRACTOR

a _____, hereinafter called PRINCIPAL and
(Corporation), (Partnership) or (Individual)

Name of SURETY

Address of SURETY

hereinafter called SURETY, are held and firmly bound unto

Kaysville City, 23 E Center Street, Kaysville, UT 84037

hereinafter called OWNER, in the total aggregate penal sum of _____ Dollars (\$_____) in lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that, whereas the PRINCIPAL entered into a certain contract with the OWNER, DATED THE _____ day of _____, 2019, a copy of which is hereto attached and made a part of the construction contract for Kaysville City 1.0 MG Water Tank.

NOW, THEREFORE, if the PRINCIPAL shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said CONTRACT during the original term thereof, and any extensions thereof which may be granted by the OWNER with or without notice to the SURETY and during the one year guaranty period; and if the PRINCIPAL shall satisfy all claims and demand incurred under such contract; and shall fully indemnify and save harmless the OWNER from all costs and damages which it may suffer by reason of failure to do so; and shall reimburse and repay the OWNER all outlay and expense which the OWNER may incur in making good any default; then this obligation shall be void, otherwise to remain in full force and effect.

PROVIDED, that the said SURETY, for value received hereby stipulates and agrees that no change, extension or time, alteration or addition to the terms of the CONTRACT or to the WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any way affect its obligation on this BOND; and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the CONTRACT or to the WORK or to the SPECIFICATIONS.

PROVIDED FURTHER, that it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto; upon amendment to the CONTRACT not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful

EXHIBIT C

Form 406

performance of the CONTRACT as amended. The term "AMENDMENT"; wherever used in this BOND and whether referring to this BOND, the CONTRACT or the LOAN DOCUMENTS shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiary hereunder.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall be deemed an original, this _____ day of _____, 2019.

PRINCIPAL'S ATTEST:

PRINCIPAL

By: _____

(SEAL)

Address: _____

Witness as to PRINCIPAL

Address

SURETY'S ATTEST:

SURETY

By: _____

(SEAL)

Address: _____

Witness as to SURETY

Address

PLEASE NOTE:

1. Date of BOND must not be prior to date of CONTRACT.
2. If CONTRACTOR is partnership, all partners should execute BOND.
3. Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.
4. Use of this form as an instrument of SURETY for this project is not mandatory. Use of other forms normally deemed acceptable in the State wherein the project is located may be allowed.

EXHIBIT C

Form 407

PRINCIPAL, the OWNER or the SURETY above named within ninety (90) days after such claimant did or performed the last of the WORK or labor, or furnished the list of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the WORK or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the PRINCIPAL, OWNER or SURETY, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the State in which the aforesaid project is located, save that such service need not be made by a public office. (b) After the expiration of one (1) year following the date of which PRINCIPAL ceased WORK on said CONTRACT, it being understood; however, that if any limitation embodied in the BOND is prohibited by any law controlling the construction hereof, such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

PROVIDED FURTHER, it is expressly agreed that this BOND shall be deemed amended automatically and immediately, without formal and separate amendments hereto; upon amendment to the CONTRACT not increasing the contract price more than 20 percent, so as to bind the PRINCIPAL and the SURETY to the full and faithful performance of the CONTRACT as amended. The term "AMENDMENT"; wherever used in this BOND and whether referring to this BOND, the CONTRACT or the LOAN DOCUMENTS shall include any alteration, addition, extension or modification of any character whatsoever.

PROVIDED FURTHER, that no final settlement between the OWNER and the PRINCIPAL shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied. The OWNER is the only beneficiary hereunder.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall be deemed an original, this _____ day of _____, 2019.

PRINCIPAL'S ATTEST:

PRINCIPAL

By: _____

(SEAL)

Address: _____

SURETY'S ATTEST:

SURETY

By: _____

Attorney-in-Fact

(SEAL)

Address: _____

PLEASE NOTE:

1. Date of BOND must not be prior to date of CONTRACT.
2. If CONTRACTOR is partnership, all partners should execute BOND.
3. Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.
4. Use of this form as an instrument of SURETY for this project is not mandatory. Use of other forms normally deemed acceptable in the State wherein the project is located may be allowed.

NOTICE OF AWARD

TO: _____
 (Insert Bidder's Name and Address)

CONTRACT FOR: Kaysville City, 1.0 MG Water Tank

The OWNER has considered the BID dated _____, 2019, submitted by you for the above described WORK in response to its Advertisement for Bids and Information for Bidders.

You are hereby notified that your BID has been accepted for items in the amount of: \$_____.

You are required by the Instruction to Bidders to execute the Agreement and furnish the required CONTRACTOR'S Performance BOND, Payment BOND, and Certificates of Insurance within ten (10) calendar days from the date of this Notice to you.

If you fail to execute said Agreement and to furnish said BONDS within ten (10) days from the date of this Notice, said OWNER will be entitled to consider all your rights arising out of the OWNER'S acceptance of you BID as abandoned and as a forfeiture of your BID BOND. The OWNER will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this NOTICE OF AWARD to the OWNER.

Dated this _____ day of _____, 2019.

OWNER: _____

BY: _____
 (Signature)

TITLE: _____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____
 (Contractor)

this _____ day of _____, 20____.

By: _____
 (Signature)

Title: _____

NOTICE TO PROCEED

TO: _____
(Insert Name of CONTRACTOR)

CONTRACT: Kaysville City, 1.0 MG Water Tank

Construction of Kaysville 1.0 MG Water Tank, water delivered to Kaysville City's water system and Access Road Improvements

In accordance with the AGREEMENT dated, _____, you are hereby notified to commence WORK on or before _____ and you are to complete the WORK within _____ consecutive calendar days thereafter. On date of completion of all WORK is, therefore, _____.

OWNER: _____
(Name of Owner)

BY: _____
(Signature)

TITLE: _____

DATE ISSUED _____, 20____

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____
(Contractor)

this ____ day of _____, 20____.

By: _____
(Signature)

Title: _____

APPLICATION FOR PAYMENT Kaysville City, 1.0 MG Water Tank				CONTRACT NO.	
				PAYMENT NO.	
				PAGE	OF
OWNER: Kaysville City		CONTRACTOR:		PERIOD OF ESTIMATE FROM: TO:	
CONTRACT CHANGE ORDER SUMMARY				TABULATION OF PAYMENT	
NO.	APPROVAL DATE	AMOUNT			
		ADDITIONS	DEDUCTIONS		
				1. Original Contract Price.....	\$ -
				2. Change Orders.....	\$ -
				3. Revised Contract Price (1 + 2).....	\$ -
				4. Total Value of Work Completed to Date *	\$ -
				5. Allowance for Materials Stored on this Date*	\$ -
				6. Subtotal (4+5).....	\$ -
				7. Previously earned by Contractor (Prev. #6).....	\$ -
				8. Value of Work Completed this Period (6-7).....	\$ -
				9. Retainage Held Prior to this Payment (Prev. #11)	\$ -
				10. Retainage to be Held from this Payment (10% of 8)	\$ -
				11. Total Retainage to be Held (9+10).....	\$ -
TOTALS		\$ -	\$ -	12. Payment Due Contractor this Period (8-10).....	\$ -
NET CHANGE		\$ -		* Detailed breakdown on attached continuation sheet	
CONTRACT TIME					
Original Contract Time (Days) _____		On Schedule ___ Yes ___ No		Starting Date: _____	
Revisions _____				Completion Date: _____	
Remaining Time (Days) _____					
ACCEPTED BY CONTRACTOR: By: _____ Date: _____			ENGINEER'S CERTIFICATION: The undersigned certifies that the work has been inspected and, to the best of their knowledge and belief, the quantities shown on this estimate are correct and the work has been performed in accordance with the contract documents. Engineer: SUNRISE ENGINEERING, INC. By: _____ Date: _____		
APPROVED BY OWNER: By: _____ Date: _____					

Form 410A

Value of Total Work Completed on Contract this Period

ALLOWANCE FOR MATERIALS STORED THIS PERIOD(d)

EXHIBIT C

Form 411

CONTRACT CHANGE ORDER					ORDER NO. DATE:	
CONTRACT FOR: Kaysville City, 1.0 MG Water Tank						
OWNER: Kaysville City						
CONTRACTOR:						
You are hereby requested to comply with the following changes from the contract plans and specifications. The following Bid Items will be revised on the Contractor's Bid Schedule						
Bid Item	Description of Changes (Supplemental Drawings & Specifications Attached)	Qty	Unit	Unit Price	Decrease in Contract Price	Increase in Contract Price
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
					\$ -	\$ -
	TOTALS					\$ -
NET CHANGE IN CONTRACT PRICE						
Change Order initiated by:						
JUSTIFICATION:						
The amount of the Contract will be increased by the sum of:					\$ -	DOLLARS
The Contract total including this and previous change orders will be:					\$ -	DOLLARS
The Contract period provided for completion will be unchanged.						
Original Completion date:						
This document will become a supplement to the Contract and all provisions will apply thereto.						
Requested (OWNER) _____				Date: _____		
Recommended (ENGINEER) _____				Date: _____		
Accepted (CONTRACTOR) _____				Date: _____		
Approved _____				Date: _____		
Approved _____				Date: _____		

FIELD WORK ORDER

Contract for: **Kaysville City 1.0 MG Water Tank**

Owner: KAYSVILLE CITY

Contractor: _____

You are hereby requested to: _____

SUNRISE ENGINEERING, INC.

Issued by: _____
(Signature)

(Title)

(Date)

ACCEPTANCE OF ORDER

OWNER APPROVAL OF ORDER

Receipt of this order is hereby acknowledged by:

(Contractor's Representative's Signature)

(Title)

(Date)

(Signature)

(Title)

(Date)

Note: This order is not intended to serve as a change order for this contract and does not modify the requirements thereof. See Section 13.3 of the General Conditions.

NOTICE OF SUBSTANTIAL COMPLETIONProject: **Kaysville City 1.0 MG Water Tank**Owner: KAYSVILLE CITY

To: CONTRACTOR

Name: _____

Address: _____

This Notice of Substantial Completion applies to all work included under the Contract Documents or to the following specified parts thereof:

Delivery of drinking water to the Kaysville System and completed access road

The work described above and performed under this Contract has been reviewed and found substantially complete and the date of SUBSTANTIAL COMPLETION for this work is hereby established as: _____.
The guarantee period shall commence on this date.

Definition of Date of Substantial Completion: That Date certified by the ENGINEER/ARCHITECT when the construction of the PROJECT, or a specified part thereof, is sufficiently completed in accordance with the CONTRACT DOCUMENTS so that the PROJECT, or specified part, can be utilized for the purpose for which it is intended.

A list of items to be completed or corrected, which are connected to or affected by the work described above, is attached hereto. The failure to include any items on such list does not alter the responsibility of the CONTRACTOR to complete all work in accordance with the CONTRACT DOCUMENTS. The date of commencement of guarantee for items in the attached list will be the date of final acceptance, unless agreed otherwise in writing.

SUNRISE ENGINEERING, INC.

Engineer_____
Date

Receipt of this notice is hereby acknowledged:

Contractor's Name

By: _____

Signature_____
Date

NOTICE OF FINAL ACCEPTANCETo: _____
Contractor's Name_____
Address

RE: **Kaysville City, 1.0 MG Water Tank**OWNER: KAYSVILLE CITY

A final inspection of the WORK completed under the Contract indicated above has been made and all WORK has been found to be completed. All known changes to the WORK have been documented and approved at this time and to the best of our knowledge, information and belief. The work required by this Contract has been performed and completed in accordance with the approved DRAWINGS, SPECIFICATIONS and other CONTRACT DOCUMENTS. Final payment for the Contract has therefore been requested and should follow shortly.

Thank you for your effort and cooperation towards the successful completion of this WORK.

ENGINEER: _____
Signature

Date: _____

OWNER'S Representative: _____
Signature

Date: _____

DISBURSEMENT SUMMARY

DISBURSEMENT SUMMARY FORM

Kaysville City, 1.0 MG Water Tank

TOTAL PROJECT BUDGET:

FUNDING AGENCY CONTRIBUTION:

CITY CONTRIBUTION:

DISBURSEMENT NO.

FROM:

TO:

NAME OF OWNER:					Project No.:	6550
DESCRIPTION OF JOB:						
PROJECT COST CLASSIFICATION	ORIGINAL BUDGET	BUDGET/ CONTRACT AMOUNT	PREVIOUSLY DISBURSED	THIS REQUEST	TOTAL TO DATE	BALANCE OF FUNDS
A. CONSTRUCTION Due Contractor Due Retainage						
B. ADMINISTRATION						
C. DESIGN						
D. SPECIAL SERVICES						
E. QUALITY CONTROL & INSPECTION						
F. LAND EASEMENTS						
G. LEGAL & FISCAL & R.O.W.						
H. CONTINGENCY						
NET COMMULATIVE						

SUNRISE ENGINEERING, INC.:

DATE:

CLIENT:

DATE:

CONTRACTOR:

DATE:

FUNDING AGENCY:

DATE:

SPECIAL PROVISION**01 29 00 SP MEASUREMENT & PAYMENT****PART 1 GENERAL**

- A. Units of measurement for each bid item are as given in the Bid Schedule(s).
- B. Payment Procedures shall be in conformance with APWA methods, as outlined in Section 01 29 00 of APWA's current edition of the Manual of Standard Specifications.
- C. All time, materials, equipment, expenses, operations and labor necessary to complete the Work in the manner intended by the Drawings, Contract Documents and Specifications shall be included in the Bid. Bid items not expressly listed in the Bid Schedule shall be considered incidental to the Work, shall be included in the Bid prices for the various line items and work classifications, and shall not cause CONTRACTOR to be eligible for additional payment by OWNER.
- D. All Bid items are considered to be deductible Bid items. OWNER reserves the right to reduce quantities or deduct Bid items as required to meet budget constraints.
- E. ENGINEER will take all measurements and compute all quantities. CONTRACTOR will verify measurement and quantities. CONTRACTOR will provide all equipment, workers, and survey crews to assist ENGINEER in making measurements.

PART 2 1.0 MG TANK BID ITEMS**2-1 MOBILIZATION (BID ITEM 1)**

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers cost of mobilization, demobilization, installation of temporary facilities and bringing all necessary construction equipment to the site. (Refer to Section 01 71 13, Mobilization and Demobilization)

2-2 QUALITY CONTROL & TESTING (BID ITEM 2)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment will cover the materials quality control and testing for all import materials, concrete work, earthwork, and strength as required in APWA and in the contract documents. If, during construction, additional control testing beyond what is required in the APWA and contract documents is requested by ENGINEER and testing shows product meets specification, such testing will be paid for by Change Order. (Refer to Section 01 45 00, Quality Control).

2-3 SWPP PLAN & IMPLEMENTATION (BID ITEM 3)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the CONTRACTOR in providing and maintaining a storm water pollution prevention plan and controls / best management practices, as outlined by the State of Utah DWQ. Permit No. UTR300000 found at: <http://www.waterquality.utah.gov/UPDES/stormwatercon.htm> which outlines the required steps for preparing and maintaining the SWPPP, provides guidelines, examples, templates, BMP specifications, etc. The CONTRACTOR will be listed as an operator along with Kaysville City. Payment also covers 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 APWA Section 31 25 00 and Special Provision 31 25 00)

2-4 CLEARING & GRUBBING (BID ITEM 4)

- A. Measurement will be made by lump sum (LUMP).
- B. Payment covers the cost of clearing, grubbing, and disposal of native topsoil, vegetation, trees, and other organic and deleterious materials from the construction site. (Refer to Section 31 11 00, Site Clearing)

2-5 RE-VEGETATION & EROSION CONTROL (BID ITEM 5)

- A. Measurement will be made by lump sum (LUMP).
- B. Payment covers the cost of furnishing erosion control blankets as specified in the construction documents (Refer to APWA 31 25 00). Payment also covers all material, equipment, and labor necessary to seed all disturbed areas (Refer to Special Provision 32 94 00). Seed is to be applied via one-step hydroseed or approved alternate method.

2-6 EARTHWORK, ACCESS ROAD (BID ITEM 6)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the cost of furnishing all necessary equipment and labor to excavate, fill, bring to grade, haul, haul-off, spoil on site, stockpile, and move and compact all earthwork as required to produce a workable and stable access road as described on the construction plans.
- C. Payment covers the cost of furnishing all material, labor, and equipment to place and compact the full thickness of aggregate road base layer for the access road installation. (Refer to APWA 32 11 23)
- D. Payment covers the cost of furnishing and installing trench drain culverts and guard rail boulders as indicated on the plans.

2-7 EARTHWORK, TANK (BID ITEM 7)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the cost of furnishing all necessary materials, equipment, and labor to excavate, fill, bring to grade, haul, haul-off, spoil on site, stockpile, and move any and all earthwork as required to produce a safe and workable construction and finished grade(s) in accordance with the construction drawings and OSHA requirements. (Refer to Section 31 05 13, Common Fill)
- C. Payments will be made in accordance with the following (retainage will be held in accordance with Contract Documents):
 - Up to 70% payment at completion of excavation and foundation preparation;
 - 90% payment at completion of backfill, compaction, and burial of tank; and,
 - 100% payment at completion of final site grading including installation of erosion control blankets.
- D. No payment for over excavation unless approved in writing by ENGINEER.

2-8 IMPORT TANK BASE MATERIAL (BID ITEM 8)

- A. Measurement will be made by ton (TON) as recorded on trucking tickets

- B. Payment covers the cost of material and transportation to the Site. Paid for separately (see bid item EARTHWORK, TANK) is all necessary labor, placement, and compaction of material to produce an acceptably thick base layer in accordance with the construction plans underneath all indicated structural and pipe components. (Refer to Section 31 23 23, Backfilling for Structures)

2-9 IMPORT TANK STRUCTURAL FILL (BID ITEM 9)

- A. Measurement will be made by ton (TON) as recorded on trucking tickets
- B. Payment covers the cost of material and transportation to the Site. Paid for separately (see bid item EARTHWORK, TANK) is all necessary labor, placement, and compaction of material to produce an acceptably thick structural fill layer in accordance with the construction plans underneath all indicated structural and pipe components. Structural Fill material is classified in the Geotech report titled "KAYSVILLE CITY – WATER STORAGE TANK, GEOTECHNICAL INVESTIGATION. AUGUST 3, 2018". (Refer to Section 31 23 23, Backfilling for Structures)

2-10 IMPORT PIPE BEDDING (BID ITEM 10)

- A. Measurement will be made by ton (TON) as recorded on trucking tickets
- B. Payment covers the cost of the material and transportation to the Site. Paid for separately is all necessary equipment, labor, on-site hauling, placement, and compaction to produce an acceptable pipe trench bedding. No allowance will be made for bedding materials required to fill voids caused by trenching operations which exceed the dimensions shown on the drawings. If native material meets specification requirements this bid item will not be used. Acceptability of native material will be approved by the ENGINEER. (Refer to Section 33 05 20, Backfilling Trenches)

2-11 IMPORT PIPE ZONE BACKFILL (BID ITEM 11)

- A. Measurement will be made by ton (TON) as recorded on trucking tickets
- B. Payment covers the cost of the material and transportation to the Site. Paid for separately is all necessary equipment, labor, on-site hauling, placement, haunching, and compaction to produce an acceptable pipe-zone backfill. No allowance will be made for backfill materials required to fill voids caused by trenching operations which exceed the dimensions shown on the drawings. If native material meets specification requirements this bid item will not be used. Acceptability of native material will be approved by ENGINEER. (Refer to Section 33 05 20, Backfilling Trenches)

2-12 IMPORT PIPE TRENCH BACKFILL (BID ITEM 12)

- A. Measurement will be made by ton (TON) as recorded on trucking tickets. Quantity shown in bid schedule assumes only 1/3 of the length will require import.
- A. Payment covers the cost of the material and transportation to the Site. Paid for separately is all necessary equipment, labor, on-site hauling, placement, and compaction to produce an acceptable trench backfill. No allowance will be made for backfill materials required to fill voids caused by trenching operations which exceed the dimensions shown on the drawings. If native material meets specification requirements this bid item will not be used. Acceptability of native material will be approved by ENGINEER. (Refer to Section 33 05 20, Backfilling Trenches)

2-13 WATER PIPE, PVC C-900, 10 INCH (BID ITEM 13)

- A. Measurement will be made by lineal feet with no reduction in length for valves and fittings (LF)

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- B. Payment covers the cost of the size and type of pipe indicated, with installation per Construction Plans, connections to structures, Utah DDW requirements including testing and disinfection, and surface restoration not identified as separate pay items in the price schedule. Payment covers the cost of incidental work including but not limited to: joint restraint systems, fittings, couplings, joint lubricants; removal and disposal of interfering structures and obstructions; jackhammer work; trench shoring or trench boxes as applicable; underground plastic line markers and tracer wire; removal and disposal of waste materials; restoration of all utilities damaged as a result of operations; site dewatering; pipe line cleaning; adjustments to grade of valve boxes or traffic lids or manholes; and similar work to complete the installation of the water line.
- C. Payment covers the cost of all required labor and equipment required to place and compact pipe bedding, pipe zone backfill, and trench backfill materials. In the event native materials are deemed unacceptable for these uses by the ENGINEER, import materials meeting specification(s) will be utilized. The cost for import (i.e. purchase and transport) will be paid for separately.

2-14 RING DRAIN, CORRUGATED DUAL WALL HDPE, 6 INCH (BID ITEM 14)

- A. Measurement will be made by lineal feet with no reduction in length for fittings (LF)
- B. Payment covers the cost of the size and type of pipe indicated, with installation per Construction Plans for the tank ring drain, connections to structures, conveyance to the outfall, and surface restoration not identified as separate pay items in the price schedule. Payment covers the cost of incidental work including but not limited to: drain rock, geotechnical fabric, fittings, couplings, joint lubricants; removal and disposal of interfering structures and obstructions; jackhammer work; trench shoring or trench boxes as applicable; underground plastic line markers and tracer wire; removal and disposal of waste materials; restoration of all utilities damaged as a result of operations; site dewatering; adjustments to grade of valve boxes or traffic lids or manholes; and similar work to complete the installation of the water line and attachment to the tank ring drain.
- C. Payment covers the cost of all required labor and equipment required to place and compact pipe bedding, pipe zone backfill, and trench backfill materials. In the event native materials are deemed unacceptable for these uses by the ENGINEER, import materials meeting specification(s) will be utilized. The cost for import (i.e. purchase and transport) will be paid for separately.

2-15 VAULT DRAIN, CORRUGATED DUAL WALL HDPE, 4 INCH (BID ITEM 15)

- A. Measurement will be made by lineal feet with no reduction in length for fittings (LF)
- B. Payment covers the cost of the size and type of pipe indicated, with installation per Construction Plans, connections to structures, and surface restoration not identified as separate pay items in the price schedule. Payment covers the cost of incidental work including but not limited to: fittings, couplings, joint lubricants; removal and disposal of interfering structures and obstructions; jackhammer work; trench shoring or trench boxes as applicable; underground plastic line markers and tracer wire; removal and disposal of waste materials; restoration of all utilities damaged as a result of operations; site dewatering; adjustments to grade of valve boxes or traffic lids or manholes; and similar work to complete the installation of the water line.
- C. Payment covers the cost of all required labor and equipment required to place and compact pipe bedding, pipe zone backfill, and trench backfill materials. In the event native materials are deemed unacceptable for these uses by the ENGINEER, import materials meeting specification(s) will be utilized. The cost for import (i.e. purchase and transport) will be paid for separately.

2-16 GATE VALVE, 10 INCH (BID ITEM 16)

- A. Measurement will be made by actual count per each installed (EACH)

- B. Payment covers the cost of excavation, foundation preparation, restraint devices, valve boxes, valve, concrete collar, backfill and other miscellaneous devices, materials, or equipment required for a complete installation. (Refer to Section 33 12 16, Water Valves)

2-17 3 IN. AIR VAC ASSEMBLY W/ 5 FT. MANHOLE, (BID ITEM 17)

- A. Measurement shall be Each by counting the numbers of each Air-vac assembly in place and accepted. Measurement will include all valves, couplings, enclosures, manhole covers, excavating and footings required and other necessary equipment and materials required to complete the assembly as shown on the Drawings.
- B. Payment covers furnishing and installing water system air vac assemblies with their enclosures and miscellaneous support equipment.

2-18 METER / ISOLATION VALVE VAULT (BID ITEM 18)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the cost of excavation, subgrade preparation, bedding and backfill, potholing, formwork, reinforcement, furnishing material, labor, and incidentals for constructing a concrete vault structure specified on the construction drawings including all hatches, sumps, ladders, items and work not identified as separate pay items in the bid schedule.
- C. Payment covers the cost of transition couplers, ductile iron piping and fittings, valve(s), actuator(s), flow meter, and appurtenances within the vault as shown on the construction plans and not identified as separate pay items in the bid schedule.

2-19 OVERFLOW DISCHARGE BOX & OUTFALL (BID ITEM 19)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the cost of excavation, subgrade preparation, bedding and backfill, potholing, formwork, reinforcement, furnishing material, labor, and incidentals for constructing concrete structure(s) specified on the construction drawings including all grates, transition couplers, ductile iron piping and fittings, and appurtenances and items not identified as separate pay items in the bid schedule.
- C. Payment covers the cost of excavation, subgrade preparation, formwork, reinforcement, materials, labor, and incidentals for constructing a concrete headwall and aggregate outfall structure specified on the construction drawings including and items not identified as separate pay items in the bid schedule.

2-20 CHAINLINK FENCE & GATE (BID ITEM 20)

- A. Measurement will be made by lineal feet (LF)
- B. The work consists of furnishing and installing chain link fencing complete with all posts, braces, 16'-0" wide gate shown on the construction plans, and all other appurtenances.
- C. Chain link fence fabric shall conform to the requirements of ASTM A 392, 2-inch mesh and 9-gauge galvanized steel wire. Zinc coating shall be class 2. Posts and fence framework shall conform to the requirements of ASTM F 1043 Group 1A, for Heavy Industrial Fence. Coatings shall be a type A galvanized coating for internal and external surfaces. Steel pipe posts shall conform to the requirements of ASTM F 1043 and F 1083. Fence fittings shall conform to the requirements of ASTM F 626. Fittings shall be galvanized steel. Wire ties and clips shall be 9-

gauge. Gates, gateposts, and gate accessories shall conform to the requirements of ASTM F 900. Coating shall be the same as selected for adjoining fence and framework. Barbed wire shall be 12.5 gauge and shall conform to the requirements of ASTM A 121, chain link fence grade.

2-21 CONCRETE WATER TANK, 1.0 MG, AWWA D115 (BID ITEM 21)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the cost of labor and materials associated with the construction of an AWWA D115 concrete water storage tank. Items and tasks include install bedding and backfill of ring drain, geofabric, and drain rock, concrete construction of the AWWA D115, associated pipes and penetrations, and other incidentals (hatches, air vents, ladders, sensors, etc.) required to complete the tank as shown on the construction drawings. All tank appurtenances, piping, piping connections are considered. SCADA and tank monitoring devices such as level sensors and intrusion alarms to be considered. No measurement will be made for concrete or backfill required to fill over-excavations for footings, walls, or slabs. (13 31 10 SP & 13 50 00 SP)

2-22 ELECTRICAL WORK (BID ITEM 22)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the purchase and installation of all electrical items and tank monitoring sensors. (both interior and exterior to the tank and tie in of SCADA system to Kaysville City), conduit, trenching, backfill and bedding, per Kaysville City specifications for SCADA control.

2-23 ROCK RETAINING WALL (BID ITEM 23)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the cost of material purchase, material transport to site, labor and equipment for installation of the rock retaining walls as shown in the construction documents. Payment covers all labor and material costs to install drainage system behind the wall. Materials for drainage system includes pipe, pipe fittings, geotextile fabric, and drainage rock as shown in details. (Refer to 31 23 24 SP)

2-24 TEMPORARY SHORING (BID ITEM 24)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment will cover the cost of temporary shoring design (plan to be reviewed and approved by Engineer) furnishing all materials, equipment and labor necessary to install temporary shoring on the east side of the tank. Cost also covers the cost to remove and haul-off temporary shoring if necessary (Refer to APWA standard specification 31 41 00)

PART 3 BOOSTER STATION**3-1 MOBILIZATION (BID ITEM 25)**

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers cost of mobilization, demobilization, installation of temporary facilities and bringing all necessary construction equipment to the site. (Refer to Section 01 71 13, Mobilization and Demobilization)

3-2 QUALITY CONTROL & TESTING (BID ITEM 26)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment will cover the materials quality control and testing for all import materials, concrete work, earthwork, and strength as required in APWA and in the contract documents. If, during construction, additional control testing beyond what is required in the APWA and contract documents is requested by ENGINEER and testing shows product meets specification, such testing will be paid for by Change Order. (Refer to Section 01 45 00, Quality Control).

3-3 SWPP PLAN & IMPLEMENTATION (BID ITEM 27)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the CONTRACTOR in providing and maintaining a storm water pollution prevention plan and controls / best management practices, as outlined by the State of Utah DWQ. Permit No. UTR300000 found at: <http://www.waterquality.utah.gov/UPDES/stormwatercon.htm> which outlines the required steps for preparing and maintaining the SWPPP, provides guidelines, examples, templates, BMP specifications, etc. The CONTRACTOR will be listed as an operator along with Kaysville City. Payment also covers 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 APWA Section 31 25 00 and Special Provision 31 25 00)

3-4 CLEARING & GRUBBING (BID ITEM 28)

- A. Measurement will be made by lump sum (LUMP).
- B. Payment covers the cost of clearing, grubbing, and disposal of native topsoil, vegetation, trees, and other organic and deleterious materials from the construction site. (Refer to Section 31 11 00, Site Clearing)

3-5 BOOSTER STATION SITE WORK (BID ITEM 29)

- A. Measurement will be made by lump sum (LUMP).
- B. Payment covers the cost of all items shown on the site plan including but not limited to catch basin w/ grate, 8 in. PVC SDR 35 overflow line, site grading and earthwork, 6 in concrete driveway w/ flare approach with base material, removal and replacing existing curb and gutter as necessary, rip rap at outfall, residual analyzer waterline connection, service connection, fencing and gates, landscaping, asphalt cutting for pipe install, and replacement of asphalt including base material.
- C. Payment covers the cost of the size and type of water pipe indicated on the plans, with installation per Construction Plans, connections to structures, Utah DDW requirements including testing and disinfection, and surface restoration not identified as separate pay items in the price schedule. Payment covers the cost of incidental work including but not limited to: joint restraint systems, fittings, couplings, joint lubricants; removal and disposal of interfering structures and obstructions; jackhammer work; trench shoring or trench boxes as applicable; underground plastic line markers and tracer wire; removal and disposal of waste materials; restoration of all utilities damaged as a result of operations; site dewatering; pipe line cleaning; adjustments to grade of valve boxes or traffic lids or manholes; and similar work to complete the installation of the water line. Payment also covers the cost to make Connection #1 as shown in the construction documents. Payment covers the cost of all valves shown on the site plan. Payment Limits of pipe for this item are as shown on the plans.

- D. Payment covers the cost of all required labor, equipment, and materials required to place and compact pipe bedding, pipe zone backfill, and trench backfill materials for site piping.

3-7 BOOSTER STATION STRUCTURE & APPURTENANCES (BID ITEM 30)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the cost of excavation, sub-grade preparation, foundation, floors, wood building, architectural stone, stucco, hardy panel, roof, interior framed walls, hatches, doors, windows, painting, floor drains, and any other work or components necessary to complete the Booster Station building not called out as specific bid items. (Refer to Section 13 34 20 SP, Booster Station Building)

3-8 MECHANICAL PIPING & EQUIPMENT, BOOSTER STATION (BID ITEM 31)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the cost of all piping, fittings, piping appurtenances, valves, meters, air-vacs, control valves, and chlorination system within the Booster Station building exclusive of the pumps and pump skid (Refer to APWA Section 22 05 00, Mechanical General Requirements)

3-9 PRE-PACKAGED BOOSTER PAQ STATION AND PIPING (BID ITEM 32)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the cost of the pre-packaged booster paq station and piping including the skid and control panel as shown on sheet MP4. (Refer to Special Provision 22 11 23 Booster Pump System Hydro MPC-E BoosterPAQ)

3-13 ELECTRICAL SYSTEM (BID ITEM 33)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the purchase and installation of all electrical items (both interior and exterior to the Booster Station), conduit, trenching, backfill and bedding as shown in the construction drawings and per Kaysville City. (Refer to Section 26 05 00, Electrical General Requirements and other specifications and special provisions in Division 26)

PART 4 TRANSMISSION LINE FROM BOOSTER TO TANK**4-1 MOBILIZATION (BID ITEM 34)**

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers cost of mobilization, demobilization, installation of temporary facilities and bringing all necessary construction equipment to the site. (Refer to Section 01 71 13, Mobilization and Demobilization)

4-2 QUALITY CONTROL & TESTING (BID ITEM 35)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment will cover the materials quality control and testing for all import materials, concrete work, earthwork, and strength as required in APWA and in the contract documents. If, during construction, additional control testing beyond what is required in the APWA and contract

documents is requested by ENGINEER and testing shows product meets specification, such testing will be paid for by Change Order. (Refer to Section 01 45 00, Quality Control).

4-3 SWPP PLAN & IMPLEMENTATION (BID ITEM 36)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the CONTRACTOR in providing and maintaining a storm water pollution prevention plan and controls / best management practices, as outlined by the State of Utah DWQ. Permit No. UTR300000 found at: <http://www.waterquality.utah.gov/UPDES/stormwatercon.htm> which outlines the required steps for preparing and maintaining the SWPPP, provides guidelines, examples, templates, BMP specifications, etc. The CONTRACTOR will be listed as an operator along with Kaysville City. Payment also covers 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 APWA Section 31 25 00 and Special Provision 31 25 00)

4-4 IMPORT PIPE BEDDING (BID ITEM 37)

- A. Measurement will be made by ton (TON) as recorded on trucking tickets
- B. Payment covers the cost of the material and transportation to the Site. Paid for separately is all necessary equipment, labor, on-site hauling, placement, and compaction to produce an acceptable pipe trench bedding. No allowance will be made for bedding materials required to fill voids caused by trenching operations which exceed the dimensions shown on the drawings. If native material meets specification requirements this bid item will not be used. Acceptability of native material will be approved by the ENGINEER. (Refer to Section 33 05 20, Backfilling Trenches)

4-5 IMPORT PIPE ZONE BACKFILL (BID ITEM 38)

- A. Measurement will be made by ton (TON) as recorded on trucking tickets
- B. Payment covers the cost of the material and transportation to the Site. Paid for separately is all necessary equipment, labor, on-site hauling, placement, haunching, and compaction to produce an acceptable pipe-zone backfill. No allowance will be made for backfill materials required to fill voids caused by trenching operations which exceed the dimensions shown on the drawings. If native material meets specification requirements this bid item will not be used. Acceptability of native material will be approved by ENGINEER. (Refer to Section 33 05 20, Backfilling Trenches)

4-6 IMPORT PIPE TRENCH BACKFILL (BID ITEM 39)

- A. Measurement will be made by ton (TON) as recorded on trucking tickets. Quantity shown in bid schedule assumes only 1/3 of the length will require import.
- B. Payment covers the cost of the material and transportation to the Site. Paid for separately is all necessary equipment, labor, on-site hauling, placement, and compaction to produce an acceptable trench backfill. No allowance will be made for backfill materials required to fill voids caused by trenching operations which exceed the dimensions shown on the drawings. If native material meets specification requirements this bid item will not be used. Acceptability of native material will be approved by ENGINEER. (Refer to Section 33 05 20, Backfilling Trenches)

4-7 WATER PIPE, PVC C-900, 10 INCH (BID ITEM 40)

- A. Measurement will be made by lineal feet with no reduction in length for valves and fittings (LF)
- B. Payment covers the cost of the size and type of pipe indicated, with installation per Construction Plans, connections to structures, Utah DDW requirements including testing and disinfection, and surface restoration not identified as separate pay items in the price schedule. Payment covers the cost of incidental work including but not limited to: joint restraint systems, fittings, couplings, joint lubricants; removal and disposal of interfering structures and obstructions; jackhammer work; trench shoring or trench boxes as applicable; underground plastic line markers and tracer wire; removal and disposal of waste materials; restoration of all utilities damaged as a result of operations; site dewatering; pipe line cleaning; adjustments to grade of valve boxes or traffic lids or manholes; and similar work to complete the installation of the water line.
- C. Payment covers the cost of all required labor and equipment required to place and compact pipe bedding, pipe zone backfill, and trench backfill materials. In the event native materials are deemed unacceptable for these uses by the ENGINEER, import materials meeting specification(s) will be utilized. The cost for import (i.e. purchase and transport) will be paid for separately.

4-8 GATE VALVE, 10 INCH (BID ITEM 41)

- A. Measurement will be made by actual count per each installed (EACH)
- B. Payment covers the cost of excavation, foundation preparation, restraint devices, valve boxes, valve, concrete collar, backfill and other miscellaneous devices, materials, or equipment required for a complete installation. (Refer to Section 33 12 16, Water Valves)

- END OF SECTION -

EXHIBIT C

SPECIAL PROVISION

03 70 00 SP PRE-STRESSED CONCRETE WATER STORAGE TANK**03 70 00.1 DESCRIPTION**

03 70 00.1.1 The Contractor shall be responsible to furnish all labor, equipment, and materials necessary to construct and erect a pre-stressed concrete water storage tank as shown on the Drawings, consisting of a concrete roof, concrete floor and a cast-in-place concrete wall. The tank shall conform to the dimensions and be equipped with the appurtenances, valves and piping within the pay limits for the tank, as shown on the Drawings and in accordance with these specifications. The tank shall be an AWWA D115 Tank.

03 70 00.1.2 RELATED WORK

Section 32 11 23 – Earthwork Materials
 Section 32 11 23 – Trench Excavation and Backfill
 Section 32 11 23 – Earthwork for Structures
 Section 03 11 00 & 03 70 00 SP – Portland Cement Concrete
 Section 03 35 00 & 03 70 00 SP – Concrete Forming, Finishing and Curing
 Section 03 11 00 & 03 70 00 SP – Concrete Reinforcement
 Section 03 11 00 & 03 70 00 SP – Concrete Structures and Slab work

03 70 00.1.3 GENERAL SUBMITTALS

03 70 00.1.3.1 Descriptive literature, which identifies the manufacturer and materials used for fabrication for all piping, valves, fittings, control valves, water stops, liners and appurtenances, shall be provided by the Contractor in accordance with Section 33 11 00 APWA Specifications.

03 70 00.1.3.2 The Contractor shall submit concrete mix design information along with certified strength test documentation for that design for approval by the Engineer at least two weeks prior to planned concrete placement.

03 70 00.1.3.3 The Contractor shall submit test documentation required for culinary water systems for all tests and disinfection activities performed on the tank and its associated piping in accordance with the Standard Specifications (See Section APWA 33 11 00).

03 70 00.2 AWWA D115 TANK

03 70 00.2.1 Contractors bidding on the tank shall submit their bid to be an AWWA D115 tank. The bid price shall include the cost to construct the tank and include the engineering of the tank to meet the requirements of AWWA D115, ACI 350, ACI 350.3, ASCE 7-10, and IBC 2015. The bid price shall also include the cost to produce the required submittals. Tank appurtenances and piping connections may be slightly modified or relocated, within reason, to accommodate the specific requirements and nuances of an AWWA D115 tank design and construction. The contractor will be required, during the submittal process, to submit an engineered tank design stamped by a licensed structural engineer in the State of Utah. The submittal needs to include plans, details and calculations. The submittal will demonstrate that the tank has been designed for the appropriate seismic forces and all other loads required by the local codes and governing jurisdiction.

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03 70 00.2.2 Qualifications and Experience of the AWWA D115 Tank Pre-stressor are as follows:

- A. The professional engineer in responsible charge of engineering work for the AWWA D115 tank shall have a minimum experience of ten years in the design of AWWA D115 tanks. The design engineer shall have been the engineer of record for a minimum of at least five AWWA D115 tanks located in an area that has a 5% damped, mapped spectral response acceleration parameter at short periods, S_s , of 0.75g equal to or greater than per AWWA D115 and shall have been in successful service for 5 years.
- B. In consideration of the unique nature of post-tensioned concrete construction, and the necessity of coordination between placement of post-tensioning and mild reinforcement for proper structure performance, the following are requirements shall be met by the post-tensioning contractor:
 - 1. Post-tensioning systems shall be produced by a Post-Tensioning Institute (PTI) Certified Plant owned and operated by the post-tensioning subcontractor.
 - 2. The subcontractor that supplies the post-tensioning system shall be required to superintend and place with its own personnel both the post-tensioning and mild reinforcing construction.
 - 3. The superintendent shall be a full-time employee of the post-tensioning supplier/installer and be on the project full-time during all placing, stressing and grouting operations, and shall have superintended the construction of at least three pre-stressed concrete tendon tanks in the last five years. The superintendent shall be a holder of a current Certified Grouting Technician certificate from the American Segmental Bridge Institute. The superintendent's qualifications shall be submitted to the owner for approval; the owner reserves the right to have the individual replaced if experience requirements are inadequate.
 - 4. The post-tensioning subcontractor shall have in its full-time employ a professional engineer designee with a minimum of 10 years' experience in the construction of internal tendon pre-stressed concrete tanks available to assist in technical issues as required for the success of the project. The designee's qualifications shall be submitted to the owner for approval; the owner reserves the right to have the individual replaced if experience requirements are inadequate.

03 70 00.2.3 AWWA D115 Tank Submittals

The contractor and pre-stressor shall provide the following submittals prior to construction:

- A. Plans and specifications for the AWWA D115 tank. Plans shall include design of floor, walls, roof, columns, and footings. Plans shall also include all appurtenances such as access hatches, piping connections, etc.
- B. Tank Post-Tensioning Contractor shall submit the following:
 - 1. Resume of the proposed on-site superintendent responsible for the construction with list of qualifying projects.
 - 2. Resume of the proposed engineer in responsible charge of the project with list of qualifying projects.
 - 3. Resume of the proposed post-tensioning subcontractor's superintendent with list of qualifying projects.

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4. Resume of the proposed post-tensioning subcontractor's professional engineer designee.
- C. The Tank Post-Tensioning Contractor shall submit an experience record for the tanks they have built in their own name or one of their divisions meeting the Qualifications and Experience criteria identified in AWWA D115. The record shall indicate the size of the tank, the name and address of the Owner, the year of construction, for each project.
- D. Failure to submit any of the above with the bid may cause the bid to be considered non-responsive and the bid may be rejected. In addition, the Contractor's bid will be rejected if the listed Tank Contractor's drawings and technical documents are not in conformance with the technical requirements of the project specifications.

03 70 00.3 MISCELLANEOUS COMPONENTS AND APPURTENANCES

- 03 70 00.3.1 The tank access roof hatch shall be by Bilco or approved equal with a fully enclosed curb and stainless-steel hardware, of the type and size specified on the Drawings. It shall be sealed through the use of a caulked neoprene gasket and shall be fastened to the tank by means of eight 3/8" x 4" long stainless-steel expansion anchors. The method of closure and closing hardware shall meet requirements of the Utah Administrative Code Section R309-545-14.
- 03 70 00.3.2 The air vents shall consist of a 6-inch diameter hot dip galvanized steel pipe fabricated with all appurtenances and as shown on the Drawings.
- 03 70 00.3.3 Tank ladders shall be fabricated of stainless steel as shown on the Drawings. All bolts and connectors shall be stainless steel.
- 03 70 00.3.4 Brackets and bands, which support and stabilize the piping, shall be fabricated from steel as shown on the Drawings. The brackets and bands shall be stainless steel and all bolts and fasteners shall be stainless steel.
- 03 70 00.3.5 Pipe and fittings inside the tank shall be of ductile iron, unless otherwise indicated on the Drawings, with flanged joints, meeting the requirements of Division 33 of APWA. All joints shall be fastened with stainless steel bolts and hardware. Pipe and fittings outside of the tank shall also meet the requirements of Division 33 of APWA and shall be of the material and in the configuration shown on the Drawings.
- 03 70 00.3.6 Gate valves, check valves, automatic control valves, air/vacuum relief valves and their boxes and enclosures shall be furnished and assembled in accordance with the Drawings and the Standard Specifications.
- 03 70 00.3.7 Prefabricated drainage panels to be installed prior to tank backfill, when required by the Drawings shall be furnished and installed in accordance with a separate Special Provisions Section.
- 03 70 00.3.8 NSF COMPLIANCE

All materials, which will be in contact with culinary water after construction is completed and the tank is placed in service, including ladders into tanks and other components shall comply with National Sanitary Foundation (NSF) Standard 61.

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03 70 00.4 CONSTRUCTION**03 70 00.4.1 EARTHWORK**

03 70 00.4.1.1 Earthwork shall be accomplished in accordance with Division 31 of APWA, and as noted below.

03 70 00.4.1.2 Unless directed otherwise by the Engineer, the entire site falling within the tank structural area shall be excavated to the lowest subgrade elevation, or to non-expansive bedrock, whichever is deeper, unless otherwise directed by the Engineer.

If site conditions are found to be different than expected (based on the geotechnical report), additional excavation may be required to provide adequate structural integrity for the tank. In lieu of or in addition to additional excavation, the Engineer may require the use of lean concrete as fill or foundation material for the tank. Additional requirements made by the Engineer as outlined in this paragraph shall constitute a changed condition, and the Contractor shall be compensated in accordance with Section 13 of the General Conditions.

03 70 00.4.1.3 After preparation of the subgrade in accordance with Division 31 of the APWA Specifications, the Contractor shall place base course material, in accordance with 32 11 23 of APWA, for the floor slab and tank footings as shown on the Drawings. This material shall be placed in loose lifts not to exceed 6 inches and then compacted in accordance with 32 11 23 of APWA to 95% of maximum density. The finished thickness of the material shall be as shown on the Drawings.

03 70 00.4.1.4 Compaction required for all subgrade and earthwork materials used in tank construction, within the tank structural area, shall be 95% of maximum density unless directed otherwise by the Engineer. The tank structural area shall be that portion of the subgrade under the tank and 5 feet outside of the tank footing radius, unless otherwise shown on the Drawings. Particular attention should be paid to compaction around footings. All compaction and testing shall be accomplished in accordance with Section 31 23 06 of the APWA Specifications.

03 70 00.4.1.5 Not Used

03 70 00.4.1.6 The finished subgrade and grade of the gravel fill under the floor and footings shall not vary more than minus 0.05 feet and plus 0.00 feet from the established grades and cross-sections shown on the Drawings.

03 70 00.4.1.7 After pipe blocks have been formed and constructed and the forms for the pipe blocks have been removed, the areas under floor and footings and around pipe blocks that require structural granular fill shall be built up in 6-inch loose lifts. This material shall be compacted in accordance with the Standard Specifications until the finished elevations, shown on the Drawings, have been reached.

In lieu of forming the pipe blocks, the structural granular fill may be completed to the required finished elevation after which the pipe blocks may be excavated. However, any loose or disturbed soil must be removed from the excavated areas and the compaction in the excavated areas must be rechecked for the required 95 percent minimum relative compaction under the supervision of a competent soils engineer.

03 70 00.4.1.8 If excavation of the subgrade is in rock, any over-blasted or unsuitable material under the tank shall be removed. Unless otherwise directed by the Engineer, all over-blasted or over-excavated material shall be replaced with a 3-sack per yard lean concrete mix. Lean concrete shall also be used to level the site and create the required slope to the outer perimeter ring drain, as applicable.

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Lean concrete aggregate shall meet requirements of Section 03 30 04 of the APWA Specifications. Lean concrete shall obtain a minimum compressive strength of 700 psi after 7 days when tested in accordance with Section 03 30 04 of the APWA Specifications of these Specifications.

- 03 70 00.4.1.9 Backfill shall not be commenced until leakage testing has been satisfactorily completed. Backfill shall be accomplished in accordance with 31 23 23 of the APWA Specifications, except as noted.
- 03 70 00.4.2 CLEANING AND WATERPROOFING
- 03 70 00.4.2.1 After construction is completed, the interior of the tank shall be completely hosed out and cleaned of all dirt and loose material.
- 03 70 00.4.3 DISINFECTING AND FILLING
- 03 70 00.4.3.1 Water containing 200 ppm of chlorine shall be sprayed on all walls, columns and underside of roof areas. The solution from the wash down shall be allowed to stand for no more than 24 hours prior to filling the tank. Disinfection procedures shall conform to AWWA Standard C652-02 "Disinfection of Water Storage Facilities."
- 03 70 00.4.3.2 The chlorine shall be monitored and adjusted while filling, so that when the reservoir is full the resulting chlorine solution is approximately 2 ppm. The disinfection shall be accepted if samples taken for the final bacteriological test are found to be satisfactory. Testing documentation shall be maintained in accordance with the requirements of Section 33 13 00 of the APWA Specifications of these Specifications.
- 03 70 00.4.3.3 The tank should only be filled during normal working hours, at the end of each day the reservoir and ring drain should be checked for any kind of visible leakage. If only damp spots and small puddles of water are noted, the filling can continue. If major leaks are noted, they should be thoroughly investigated prior to continuing to fill the tank.
- 03 70 00.4.4 PIPING AND APPURTENANCES
- 03 70 00.4.4.1 The Contractor shall install all piping and appurtenances and shall connect all piping as required on the tank drawings and details.

END OF SECTION

EXHIBIT C**SPECIAL PROVISION****03 11 01 SP WATERSTOPS****PART 1 GENERAL****1-1 DESCRIPTION:**

This section covers the furnishing and installation of waterstops.

1-2 QUALITY ASSURANCE:

Reference standards.

A. U.S. Corps of Engineers, CRD C-572

B. Tennessee Valley Authority (T.V.A.) Specification No. PF-1001.

1-3 PRODUCT HANDLING:

Protect waterstops from damage, sun and weather during storage.

1-4 INSPECTION:

Prior to concrete placement and after waterstops have been positioned, waterstops are to be inspected by the Engineer for correct splicing and for correct, secure, positioning.

PART 2 MATERIALS**2-1 MATERIALS**

Expansive rubber waterstops shall be Adeka MC-2010M, Spearfish SD, Greenstreak CJ-1020-2K Hydrotite, St. Louis MO, or equivalent acceptable to the Engineer unless noted otherwise on drawings.

PART 3 EXECUTION**3-1 PREPARATION FOR WATERSTOPS:**

A. Waterstops shall be cut and/or spliced so that they are at least the full length of the concrete joint.

B. End cuts shall be straight and square.

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3-2 INSTALLATION OF EXPANSIVE WATERSTOPS:

1. Concrete surfaces shall be clean, dry, frost-free and primed in accordance with the manufacturer's recommendations.
2. Waterstops shall be applied in accordance with the manufacturer's recommendations and shall adhere tenaciously to the primed concrete surface.

- END OF SECTION

EXHIBIT C

SPECIAL PROVISION

03 30 04 SP CONCRETE

Add the following subparagraph:

PART 1 MIX DESIGN

A. Selection of Cement:

- Concrete used for the this project on all elements other than the concrete tank shall be 4500 Class Concrete conforming to the following specification:

Concrete Properties	Concrete Classification
	4500
Coarse Aggregates (see requirements shown below)	
Maximum Water/Cement Ratio***	0.45
Slump (inches)**	4.0 +/- 1.0
Air Content (percent)	5.0 to 7.0
Required Average 28 Day Compression Strength Test (psi)****	4700
Required Minimum 28 Day Compression Strength Test (psi)****	4300

Notes:

- * All concrete installed shall be f'c 4500 unless otherwise required in the Contract Documents.
- ** When water reducing agents are not used. When using super-plasticizers, slump may be up to 6.0 inches.
- *** Cement content shall be appropriate to produce a mixture meeting the requirements for water/cement ratio and workability for the specific job conditions.
- **** One strength test shall be the average of the strengths of at least two 6x12 in. cylinders or at least three 4x8 in. cylinders made from the same sample of concrete and tested at 28 days or at test age designated for f'c. (ACI 318-14 26.12.1.1)

- END OF SECTION -

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03 70 00 SP WATER TIGHTNESS TESTING OF AWWA D115 TANK

PART 1 GENERAL

1-1 DESCRIPTION:

Furnish all labor, equipment, and materials necessary to test the water tanks for watertightness.

PART 2 PRODUCTS

2-1 MATERIALS:

Water, clean and free of deleterious substances.

PART 3 EXECUTION

3-1 PREPARATION:

After construction of the reservoir or tank has been completed, and before backfilling, the floor and inside of the walls shall be broom-cleaned. The floor shall be squeegeed of curing water and washed with clean water. After the sweeping and the removal of all debris, any cracks greater than 0.004 in. wide and joints shall be properly sealed in accordance with provisions of Section 03 30 11 SP, 3-7. Completely hose down the interior surfaces of the reservoir with water under pressure.

3-2 TESTING:

Watertightness testing shall be performed. Two tests are required. The first test shall be made on the overall watertightness of the tank. The second test shall be made on the visible surfaces of the tank.

A. Overall Watertightness Testing

1. Fill to the overflow and allow tank or basin to stand full for at least 24 hours. During the first 24 hours, the surface of the water may drop, and shall be refilled to the overflow.
2. The water level elevation shall be determined by using a surveyor's level and level rod or other acceptable means. Measure the drop in water level over the next 5 days to determine the water volume loss for comparison with the

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acceptance criteria. Floating “evaporation and precipitation pans” shall be used to remove these effects from the test. The liquid loss for each period of 24 hours shall not exceed 0.000125 of the tank capacity (or height), which shall be translated to the nearest 1/16 in. in the 5-day period.

B. Visible Surface Testing

Wet spots on the exterior wall surface or flowing water on the wall base shall not be permitted. Wet spots are defined as spots where moisture can be picked up on a dry hand. Wet spots shall be repaired in accordance with Section 03 30 11 SP, Part 3-7.

C. If the watertightness testing fails to meet the above requirements, the Engineer may require the reservoir or tank to be drained, repaired and again tested for watertightness.

- END OF SECTION -

SPECIAL PROVISION

31 25 00 SP EROSION & SEDEMENTATION CONTROL

This specification changes a portion of APWA Standard Specification Section 31 25 00. All other provisions of the section remain in full force and effect.

Add the following article to Part 1 General

1-1 SECTION INCLUDES

Storm water pollution and prevention plan.

1. The State of UTAH DWQ has provided a SWPP Template (Utah) Instructions found at:
<https://deq.utah.gov/legacy/permits/water-quality/utah-pollutant-discharge-elimination-system/storm-water-general-construction.htm>
2. Contractor to provide and maintain a storm water pollution prevention plan as outlined by the State of Utah DWQ. (DWQ-2017-003485.pdf) found at:
<https://documents.deq.utah.gov/water-quality/permits/updes/DWQ-2017-003485.pdf>
steps for preparing and maintaining the SWPPP, provides guidelines, examples, templates, BMP specifications, etc. The contractor will be listed as an operator along with Kaysville City. Payment also covers all erosion control that is not listed as separate bid items which includes silt fence, construction fence, inlet protection, and stabilized roadway entrances.

Add the following article to Part 1 General

1-2 SUBMITTALS

State of Utah DWQ Permit & SWPP Plan.

- END OF SECTION -

SPECIAL PROVISION**33 75 00 SP TANK OVERFLOW STRUCTURE UTILITY****PART 1 GENERAL****1-1 DESCRIPTION**

The Contractor shall construct and install the Tank Overflow Structure and all appurtenances as shown on the Drawings and as described in the APWA Specifications.

1-2 RELATED WORK

Division 31 – Earthwork for Structures
33 11 00 – Water Pipe Installation
03 30 04 – Portland Cement Concrete
03 11 00– Concrete Forming, Finishing and Curing
03 20 00 – Concrete Reinforcement
03 30 10 – Concrete Structures and Slab work
03 30 10 – Joints for Concrete Structures and Slab work
33 05 05 & 33 05 06 – Pipe & Piping Systems

PART 2 MATERIALS

Information regarding the materials used will be found in their respective section of these Specifications.

PART 3 CONSTRUCTION REQUIREMENTS**3-1 TANK OVERFLOW OUTLET**

The Tank Overflow Structure shall be constructed in a workmanlike manner to achieve the desired result. The Contractor shall be responsible for installing all concrete components, piping, fittings, rip-rap, scour pit, filter blanket, equipment and appurtenances as shown on the Construction Drawings or as directed by the Engineer. All earthwork related to the installation is also included.

- END OF SECTION –

SPECIAL PROVISION**22 11 23 SP BOOSTER PUMP SYSTEM HYDRO MPC-E BOOSTERPAQ****Part 1 GENERAL****1.1 WORK INCLUDED**

- A. Variable Speed Packaged Pumping System

1.2 REFERENCE STANDARDS

The work in this section is subject to the requirements of applicable portions of the following standards:

- A. Hydraulic Institute
- B. ANSI – American National Standards Institute
- C. ASTM – American Society for Testing and Materials
- D. IEEE – Institute of Electrical and Electronics Engineers
- E. NEMA – National Electrical Manufacturers Association
- F. NEC – National Electrical Code
- G. ISO – International Standards Organization
- H. UL – Underwriters Laboratories, Inc.

Part 2 PRODUCTS**2.1 VARIABLE SPEED PACKAGED PUMPING SYSTEM**

- A. Furnish and install a pre-fabricated and tested variable speed packaged pumping system to maintain constant water delivery pressure.
- B. The packaged pump system shall be a standard product of a single pump manufacturer. The entire pump system including pumps and pump logic controller, shall be designed, built, and tested by the same manufacturer.
- C. The complete packaged water booster pump system shall be certified and listed by UL (Category QCZJ – Packaged Pumping Systems) for conformance to U.S. and Canadian Standards.
- D. The complete packaged pumping system shall be NSF61 Annex G listed for drinking water and low lead requirements.

2.2 PUMPS

- A. All pumps shall be ANSI/NSF 61 Annex G listed for drinking water and low lead requirements.
- B. The pumps shall be of the in-line vertical multi-stage design.

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- C. The head-capacity curve shall have a steady rise in head from maximum to minimum flow within the preferred operating region. The shut-off head shall be a minimum of 20% higher than the head at the best efficiency point.
- D. Small Vertical In-Line Multi-Stage Pumps (Nominal flow from 3 to 125 gallons per minute) shall have the following features:
- a. The pump impellers shall be secured directly to the pump shaft by means of a splined shaft arrangement.
 - b. The suction/discharge base shall have ANSI Class 250 flange or internal pipe thread (NPT) connections as determined by the pump station manufacturer.
 - c. Pump Construction.
 - i. Suction/discharge base, pump head, motor stool: Cast iron (Class 30)
 - ii. Impellers, diffuser chambers, outer sleeve: 304 Stainless Steel
 - iii. Shaft 316 or 431 Stainless Steel
 - iv. Impeller wear rings: 304 Stainless Steel
 - v. Shaft journals and chamber bearings: Silicon Carbide
 - vi. O-rings: EPDM
 - d. Shaft couplings for motor flange sizes 184TC and smaller shall be made of cast iron or sintered steel. Shaft couplings for motor flange sizes larger than 184TC shall be made of ductile iron (ASTM 60-40-18).
 - e. Optional materials for the suction/discharge base and pump head shall be cast 316 stainless steel (ASTM CF-8M) resulting in all wetted parts of stainless steel.
 - f. The shaft seal shall be a balanced o-ring cartridge type with the following features:
 - i. Collar, Drivers, Spring: 316 Stainless Steel
 - ii. Shaft Sleeve, Gland Plate: 316 Stainless Steel
 - iii. Stationary Ring: Silicon Carbide
 - iv. Rotating Ring: Silicon Carbide
 - v. O-rings: EPDM
 - g. The Silicon Carbide shall be imbedded with graphite.
 - h. Shaft seal replacement shall be possible without removal of any pump components other than the coupling guard, shaft coupling and motor. The entire cartridge shaft seal shall be removable as a one piece component. Pumps with motors equal to or larger than 15 hp (fifteen horsepower) shall have adequate space within the motor stool so that shaft seal replacement is possible without motor removal.
- E. Large In-line Vertical Multi-Stage Pumps (Nominal flows from 130 to 500 gallons per minute) shall have the following features.

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- a. The pump impellers shall be secured directly to the smooth pump shaft by means of a split cone and nut design.
- b. The suction/discharge base shall have ANSI Class 125 or Class 250 flange connections in a slip ring (rotating flange) design as indicated in the drawings or pump schedule.
- c. Pump Construction.

i.	Suction/discharge base, pump head	Ductile Iron (ASTM 65-45-12)
ii.	Shaft couplings, flange rings:	Ductile Iron (ASTM 65-45-12)
iii.	Shaft	431 Stainless Steel
iv.	Motor Stool	Cast Iron (ASTM Class 30)
v.	Impellers, diffuser chambers, outer sleeve:	304 Stainless Steel
vi.	Impeller wear rings:	304 Stainless Steel
vii.	Intermediate Bearing Journals:	Tungsten Carbide
viii.	Intermediate Chamber Bearings:	Leadless Tin Bronze
ix.	Chamber Bushings:	Graphite Filled PTFE
x.	O-rings:	EPDM

- F. The shaft seal shall be a single balanced metal bellows cartridge with the following construction:

a.	Bellows:	904L Stainless Steel
b.	Shaft Sleeve, Gland Plate, Drive Collar:	316 Stainless Steel
c.	Stationary Ring:	Carbon
d.	Rotating Ring:	Tungsten Carbide
e.	O-rings:	EPDM

- G. Shaft seal replacement shall be possible without removal of any pump components other than the coupling guard, motor couplings, motor and seal cover. The entire cartridge shaft seal shall be removable as a one piece component. Pumps with motors equal to or larger than 15 hp (fifteen horsepower) shall have adequate space within the motor stool so that shaft seal replacement is possible without motor removal.

2.3 VARIABLE FREQUENCY DRIVES (Panel Mount)

- A. The VFD shall convert incoming fixed frequency single-phase or three-phase AC power into a variable frequency and voltage for controlling the speed of three-phase AC induction motors. The VFD shall be a six-pulse input design, and the input voltage rectifier shall employ a full wave diode bridge; VFD's utilizing controlled SCR rectifiers shall not be acceptable. The output waveform shall closely approximate a sine wave. The VFD shall be of a PWM output design utilizing current IGBT inverter technology and voltage vector control of the output PWM waveform.
- B. The VFD shall include a full-wave diode bridge rectifier and maintain a displacement power factor of near unity regardless of speed and load.

- C. The VFD shall produce an output waveform capable of handling maximum motor cable distances of up to 1,000 ft. (unshielded) without tripping or derating.
- D. The VFD shall utilize an output voltage-vector switching algorithm, or equivalent, in both variable and constant torque modes. VFD's that utilize Sine-Coded PWM or Look-up tables shall not be acceptable.
- E. VFD shall automatically boost power factor at lower speeds.
- F. The VFD shall be able to provide its full rated output current continuously at 110% of rated current for 60 seconds.
- G. An empty pipe fill mode shall be available to fill an empty pipe in a short period of time, and then revert to the PID controller for stable operation.
- H. Switching of the input power to the VFD shall be possible without interlocks or damage to the VFD at a minimum interval of 2 minutes.
- I. Switching of power on the output side between the VFD and the motor shall be possible with no limitation or damage to the VFD and shall require no additional interlocks.
- J. The VFD shall have temperature controlled cooling fans for quiet operation, minimized internal losses, and greatly increased fan life.
- K. VFD shall provide full torque to the motor given input voltage fluctuations of up to +10% to -15% of the rated input voltage.
- L. The VFD shall provide internal DC link reactors to minimize power line harmonics and to provide near unity power factor. VFD's without a DC link reactor shall provide a 5% impedance line side reactor.
- M. VFD to be provided with the following protective features:
 - a. VFD shall have input surge protection utilizing MOV's, spark gaps, and Zener diodes to withstand surges of 2.3 times line voltage for 1.3 msec.
 - b. VFD shall include circuitry to detect phase imbalance and phase loss on the input side of the VFD.
 - c. VFD shall include current sensors on all three-output phases to detect and report phase loss to the motor. The VFD will identify which of the output phases is low or lost.

- d. VFD shall auto-derate the output voltage and frequency to the motor in the presence of sustained ambient temperatures higher than the normal operating range, so as not to trip on an inverter temperature fault. The use of this feature shall be user-selectable and a warning will be exported during the event. Function shall reduce switching frequency before reducing motor speed.
 - e. VFD shall auto-derate the output frequency by limiting the output current before allowing the VFD to trip on overload. Speed can be reduced, but not stopped.
 - f. The VFD shall have the option of an integral RFI filter. VFD enclosures shall be made of metal to minimize RFI and provide immunity.
- N. VFD to be provided with the following interface features:
- g. VFD shall provide an alphanumeric backlit display keypad, which may be remotely mounted using standard 9-pin cable. VFD may be operated with keypad disconnected or removed entirely. Keypad may be disconnected during normal operation without the need to stop the motor or disconnect power to the VFD.
 - h. VFD shall display all faults in plain text; VFD's, which can display only fault codes, are not acceptable.
 - i. All VFD's shall be of the same series, and shall utilize a common control card and LCP (keypad/display unit) throughout the rating range. The control cards and keypads shall be interchangeable through the entire range of drives used on the project.
 - j. VFD keypad shall be capable of storing drive parameter values in non-volatile RAM uploaded to it from the VFD, and shall be capable of downloading stored values to the VFD to facilitate programming of multiple drives in similar applications, or as a means of backing up the programmed parameters.
 - k. A red FAULT light, a yellow WARNING light and a green POWER-ON light shall be provided. These indications shall be visible both on the keypad and on the VFD when the keypad is removed.
 - l. A start guide menu with factory preset typical parameters shall be provided on the VFD to facilitate commissioning.
 - m. VFD shall provide full galvanic isolation with suitable potential separation from the power sources (control, signal, and power circuitry within the drive) to ensure compliance with PELV requirements and to protect PLC's and other connected equipment from power surges and spikes.
 - n. All inputs and outputs shall be optically isolated. Isolation boards between the VFD and external control devices shall not be required.
 - o. There shall be three programmable digital inputs for interfacing with the systems external control and safety interlock circuitry. An additional digital input is preprogrammed for start/stop.

- p. The VFD shall have two analog signal inputs. One dedicated for sensor input and one for external set point input.
- q. One programmable analog output shall be provided for indication of a drive status.
- r. The VFD shall provide two user programmable relays with selectable functions. Two form 'C' 230VAC/2A rated dry contact relay outputs shall be provided.
- s. The VFD shall store in memory the last 5 faults with time stamp and recorded data.
- t. The VFD shall be equipped with a standard RS-485 serial communications port for communication to the multi-pump controller. The bus communication protocol for the VFD shall be the same as the controller protocol.

O. VFD service conditions:

- a. Ambient temperature operating range, -10 to 45°C (14 to 113°F).
- b. 0 to 95% relative humidity, non-condensing.
- c. Elevation to 1000 meters (3,300 feet) without derating.
- d. VFD's shall be rated for line voltage of 525 to 690VAC, 380 to 480VAC, or 200 to 240VAC; with +10% to -15% variations. Line frequency variation of $\pm 2\%$ shall be acceptable.
- e. No side clearance shall be required for cooling of the units.

2.4 FIXED SPEED MOTORS

A. Fixed Speed Motors are to be provided with the following basic features:

- a. Designed for continuous duty operation, NEMA design B with a 1.15 service factor.
- b. Totally Enclosed Fan Cooled or Open Drip Proof with Class F insulation.
- c. Nameplate shall have, as a minimum, all information as described in NEMA Standard MG 1-20.40.1.
- d. Motors shall have a NEMA C-Flange for vertical mounting.
- e. Drive end bearings shall be adequately sized so that the minimum L10 bearing life is 17,500 hours at the minimum allowable continuous flow rate for the pump.

2.5 PUMP SYSTEM CONTROLLER

- A. The pump system controller shall be a standard product developed and supported by the pump manufacturer.
- B. The controller shall be microprocessor based capable of having software changes and updates via personal computer (notebook). The controller user interface shall have a color display with a minimum screen size of 3-1/2" x 4-5/8" for easy viewing of system status parameters and for field programming. The display shall have a back light with contrast adjustment. Password protection of system settings shall be standard.
- C. The controller shall provide internal galvanic isolation to all digital and analog inputs as well as all fieldbus connections.
- D. The controller shall have the ability to be connected to a battery to maintain power on controller during periods of loss of supply power.
- E. The controller shall have built in data logging capability. Logged values shall be graphically displayed on the controller and able to be exported to computer via standard connection. A minimum of 3600 samples per logged value with the following parameters available for logging:
- Estimated flow-rate
 - Speed of pumps
 - Inlet pressure
 - Discharge pressure
 - Power consumption
 - Controlling parameter (process value)
- F. The controller shall display the following as status readings from a single display on the controller (this display shall be the default):
- Current value of the control parameter, (typically discharge pressure)
 - Most recent existing alarm (if any)
 - System status with current operating mode
 - Status of each pump with current operating mode and rotational speed as a percentage (%)
 - Estimated flow-rate, (not requiring flow meter connection)
- G. The controller shall have as a minimum the following hardware inputs and outputs:
- Three analog inputs (4-20mA or 0-10VDC)
 - Three digital inputs
 - Two digital outputs
 - Ethernet connection

- Field Service connection to PC for advanced programming and data logging

H. Pump system programming (field adjustable) shall include as a minimum the following:

- Water shortage protection (analog or digital)
- Transducer Settings (Suction and Discharge Analog supply/range)
- PI Controller (Proportional gain and Integral time) settings
- High system pressure indication and shut-down
- Low system pressure indication and shut-down
- Low suction pressure/level shutdown (via digital contact)
- Low suction pressure/level warning (via analog signal)
- Low suction pressure/level shutdown (via analog signal)
- Flow meter settings (if used, analog signal)

I. The system controller shall be able to accept up to seven programmable set-points via a digital input, (additional input/output module may be required).

J. The controller shall have advanced water shortage protection. When analog sensors (level or pressure) are used for water shortage protection, there shall be two indication levels. One level is for warning indication only (indication that the water level/pressure is getting lower than expected levels) and the other level is for complete system shut-down (water or level is so low that pump damage can occur). System restart after shut-down shall be manual or automatic (user selectable).

K. The system pressure set-point shall be capable of being automatically adjusted by using an external set-point influence. The set-point influence function enables the user to adjust the control parameter (typically pressure) by measuring an additional parameter. (Example: Lower the system pressure set-point based on a flow measurement to compensate for lower friction losses at lower flow rates).

L. The controller shall be capable of receiving a remote analog set-point (4-20mA or 0-10 VDC) as well as a remote system on/off (digital) signal.

M. The controller shall be able to adjust the ramp time of a change in set point on both an increase or decrease change in set point.

N. The pump system controller shall store up to 24 warning and alarms in memory. The time, date and duration of each alarm shall be recorded. A potential-free relay shall be provided for alarm notification to the building management system. The controller shall display the following alarm conditions:

High System Pressure	Low system pressure
Low suction pressure (warning and alarm)	Individual pump failure
VFD trip/failure	Loss of sensor signal (4-20 mA)

Loss of remote set-point signal (4-20mA) System power loss

- O. The pump system controller shall be mounted in a UL Type 12 rated enclosure. A self-certified NEMA enclosure rating shall not be considered equal. The entire control panel shall be UL 508 listed as an assembly. The control panel shall include a main disconnect, circuit breakers for each pump and the control circuit and control relays for alarm functions.

Control panel options shall include, but not be limited to:

Pump Run Lights	System Fault Light
Audible Alarm (80 db[A])	Surge Arrestor
Emergency/Normal Operation Switches	Service Disconnect Switches
Qty (9) Configurable Digital Outputs available for monitoring	

- P. The controller shall be capable of receiving a redundant sensor input to function as a backup to the primary sensor (typically discharge pressure).
- Q. The controller shall have a pump "Test Run" feature such that pumps are switched on during periods of inactivity (system is switched to the "off" position but with electricity supply still connected). The inoperative pumps shall be switched on for a period of two to three (3-4) seconds every 24 hours, 48 hours or once per week and at specific time of day (user selectable).
- R. The controller shall be capable of changing the number of pumps available to operate or have the ability limit the maximum power consumption by activation of a digital input for purposes of limited generator supplied power.
- S. The controller shall be capable of displaying instantaneous power consumption (Watts or kilowatts) and cumulative energy consumption (kilowatt-hours).
- T. The controller shall be capable of displaying instantaneous specific energy use (kw/gpm), (optional flow meter must be connected).
- U. The actual pump performance curves (5th order polynomial) shall be loaded (software) into the pump system controller or be able to input manually into controller based on three points on pump curve of pumps controlled.
- V. The controller shall be capable of displaying an estimated flow-rate on the default status screen.
- W. The controller shall have the ability to compensate for pipe friction loss by decreasing pressure set-point at lower flow-rates and increasing pressure set-point at higher flow-rates without the requirement of a flow meter.

- X. The controller shall have the ability to communicate common field-bus protocols, (BACnet, Modbus, Profibus, and LON), via optional communication expansion card installed inside controller.
- Y. The controller shall have a built in Ethernet connection allowing controller to connected to network and access of controller via web browser and internet any where around the world where internet communication is available.
- Z. The controller shall have a programmable Service Contact Field that can be populated with service contact information including: contact name, address, phone number(s) and website.

2.6 SEQUENCE OF OPERATION

- A. The system controller shall operate equal capacity variable speed pumps to maintain a constant discharge pressure (system set-point). The system controller shall receive an analog signal [4-20mA] from the factory installed pressure transducer on the discharge manifold, indicating the actual system pressure. As flow demand increases the pump speed shall be increased to maintain the system set-point pressure. When the operating pump(s) reach 96% of full speed (adjustable), an additional pump will be started and will increase speed until the system set-point is achieved. When the system pressure is equal to the system set-point all pumps in operation shall reach equal operating speeds. As flow demand decreases the pump speed shall be reduced while system set-point pressure is maintained. When all pumps in operation are running at low speed the system controller shall switch off pumps when fewer pumps are able to maintain system demand.
- B. The system controller shall be capable of switching pumps on and off to satisfy system demand without the use of flow switches, motor current monitors or temperature measuring devices.
- C. All pumps in the system shall alternate automatically based on demand, time and fault. If flow demand is continuous (no flow shut-down does not occur), the system controller shall have the capability to alternate the pumps every 24 hours, every 48 hours or once per week. The interval and actual time of the pump change-over shall be field adjustable.
- D. The system controller shall be able to control a pressure maintenance pump, (jockey pump), in the system. The set point of the pressure maintenance pump shall be able to be any value above or below the pump system's set point. The pressure maintenance pump shall be able to be staged on as back-up pump when capacity of pump system is exceeded.

2.7 LOW FLOW STOP FUNCTION

- A. The system controller shall be capable of stopping pumps during periods of low-flow or zero-flow without wasting water or adding unwanted heat to the liquid.

- B. Temperature based no flow shut-down methods that have the potential to waste water and add unwanted temperature rise to the pumping fluid are not acceptable.
- C. Standard Low Flow Stop and Energy Saving Mode.

If a low or no flow shut-down is required (periods of low or zero demand) a bladder type diaphragm tank shall be installed with a pre-charge pressure of 70% of system set-point. The tank shall be piped to the discharge manifold or system piping downstream of the pump system. When only one pump is in operation the system controller shall be capable of detecting low flow (less than 10% of pump nominal flow) without the use of additional flow sensing devices. When a low flow is detected, the system controller shall increase pump speed until the discharge pressure reaches the stop pressure (system set-point plus 50% of programmed on/off band). The pump shall remain off until the discharge pressure reaches the start pressure (system set-point minus 50% of programmed on/off band). Upon low flow shut-down a pump shall be restarted in one of the following two ways:

- a. Low Flow Restart: If the drop in pressure is slow when the start pressure is reached (indicating the flow is still low), the pump shall start and the speed shall again be increased until the stop pressure is reached and the pump shall again be switched off.
- b. Normal Flow Restart: If the drop in pressure is fast (indicating the flow is greater than 10% of pump nominal flow) the pump shall start and the speed shall be increased until the system pressure reaches the system set-point.

[OPTIONAL] Low Flow Stop and Energy Saving Mode

The pump system controller shall be capable receiving a digital signal from a flow switch or an analog signal from a flow meter to indicate a low flow condition. A bladder type diaphragm tank shall be installed with a pre-charge pressure of 70% of system set-point. The tank shall be piped to the discharge manifold or system piping downstream of the pump system. When low flow is detected (signal from flow switch or meter), the system controller shall increase pump speed until the discharge pressure reaches the stop pressure (system set-point plus 50% of programmed on/off band). The pump shall remain off until the discharge pressure reaches the start pressure (system set-point minus 50% of programmed on/off band). The pump shall remain in the energy saving on/off mode during low flow indication. When low flow is no longer present (low flow indication ceases), the pump(s) shall resume constant pressure operation.

It shall be possible to change from the standard low flow stop to the optional low flow stop (and vice-versa) via the user interface.

2.8 SYSTEM CONSTRUCTION

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- A. Suction and discharge manifold construction shall be in way that ensures minimal pressure drops, minimize potential for corrosion, and prevents bacteria growth at intersection of piping into the manifold. Manifold construction that includes sharp edge transitions or interconnecting piping protruding into manifold is not acceptable. Manifold construction shall be such that water stagnation can not exist in manifold during operation to prevent bacteria growth inside manifold.
- B. The suction and discharge manifolds shall be constructed of 316 stainless steel. Manifold connection sizes shall be as follows:
 - C. 3 inch and smaller: Male NPT threaded
 - D. 4 inch through 8 inch: ANSI Class 150 rotating flanges
 - E. 10 inch and larger: ANSI Class 150 flanges
- F. Pump Isolation valves shall be provided on the suction and discharge of each pump. Isolation valve sizes 2 inch and smaller shall be nickel plated brass full port ball valves. Isolation valve sizes 3 inch and larger shall be a full lug style butterfly valve. The valve disk shall be of stainless steel. The valve seat material shall be EPDM and the body shall be cast iron, coated internally and externally with fusion-bonded epoxy.
- G. A spring-loaded non-slam type check valve shall be installed on the discharge of each pump. The valve shall be a wafer style type fitted between two flanges. The head loss through the check valve shall not exceed 5 psi at the pump design capacity. Check valves 1-1/2" and smaller shall have a POM composite body and poppet, a stainless steel spring with EPDM or NBR seats. Check valves 2" and larger shall have a body material of stainless steel or epoxy coated iron (fusion bonded) with an EPDM or NBR resilient seat. Spring material shall be stainless steel. Disk shall be of stainless steel or leadless bronze.
- H. For systems that require a diaphragm tank, a connection of no smaller than 3/4" shall be provided on the discharge manifold.
- I. A pressure transducer shall be factory installed on the discharge manifold (or field installed as specified on plans). Systems with positive inlet gauge pressure shall have a factory installed pressure transducer on the suction manifold for water shortage protection. Pressure transducers shall be made of 316 stainless steel. Transducer accuracy shall be +/- 1.0% full scale with hysteresis and repeatability of no greater than 0.1% full scale. The output signal shall be 4-20 mA with a supply voltage range of 9-32 VDC.
- J. A bourdon tube pressure gauge, 2.5 inch diameter, shall be placed on the suction and discharge manifolds. The gauge shall be liquid filled and have copper alloy internal parts in a stainless steel case. Gauge accuracy shall be 2 1/2 %. The gauge shall be capable of a pressure of 30% above its maximum span without requiring recalibration.

- K. Systems with a flooded suction inlet or suction lift configuration shall have a factory installed water shortage protection device on the suction manifold.
- L. The base frame shall be constructed of corrosion resistant 304 stainless steel. Rubber vibration dampers shall be fitted between each pumps and baseframe to minimize vibration.
- M. Depending on the system size and configuration, the control panel shall be mounted in one of the following ways:
 - N. On a 304 stainless steel fabricated control cabinet stand attached to the system skid.
 - O. On a 304 stainless steel fabricated skid, separate from the main system skid
 - P. On its own base (floor mounted with plinth)

2.9 TESTING

- A. The entire pump station shall be factory tested for functionality. Functionality testing shall include the following parameters: Dry Run Protection, Minimum Pressure and Maximum Pressure alarms (where applicable), Setpoint Operation, and Motor Rotation.
- B. The system shall undergo a factory hydrostatic test at the end of the production cycle. The system shall be filled with water and pressurized to 1.5 times the nameplate maximum pressure. Systems with 150# flange connections shall be tested at 350 psig, and systems with 300# flange connections shall be tested at 450 psig. The pressure shall be maintained for a minimum of 15 minutes with no leakage (slight leakage around pump(s) mechanical seal is acceptable) prior to shipment.

2.10 WARRANTY

- A. The warranty period shall be a non-prorated period of 24 months from date of installation, not to exceed 30 months from date of manufacture.

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31 23 24 SP ROCK RETAINING WALLS

PART 1 GENERAL

1-1 DESCRIPTION

The Contractor shall construct and install the Rock Retaining Walls, backfill, and drainage system as shown on the Drawings and as described in the APWA Specifications.

1-2 RELATED WORK

Division 31 – Earthwork
31 05 10 – Common Fill
31 05 19- Geotextiles
31 23 16- Excavation
31 23 23- Backfilling for Structures
21 23 26- Compaction
31 25 00- Erosion and Sedimentation Control
33 05 05 & 33 05 06 – Pipe & Piping Systems

1-3 SUBMITTALS

Contractor to provide submittals for drainage system, free-draining granular backfill, foundation base material, and rock product used in retaining wall

PART 2 MATERIALS

2-1 GENERAL

Information regarding the materials used will be found in their respective section of these Specifications. Rock used for retaining wall shall be the size specified in the Construction Plans.

2-2 BACKFILL MATERIAL

Backfill material should be free of trash, organics, or otherwise unsuitable material. Backfill material shall be non-expansive with a liquid limit (LL) less than 30. Material shall be free of oversize material greater than 3 inches in greatest dimension and should have less than 15% by weight passing the no. 200 sieve.

Backfill material should have a friction angle (ϕ) greater than or equal to the value specified by the Geotechnical Engineer.

2-3 GEOTEXTILE FABRIC

Geotextile fabric shall be Type 1-B. Seams shall be overlapped a minimum of 12 inches.

PART 3 CONSTRUCTION REQUIREMENTS**3-1 ROCKERY RETAINING WALL GENERAL REQUIREMENTS**

Rock retaining walls shall be constructed as shown in the construction plans. Specifically, the following measures should be adhered to:

- 1- Drainage system as shown in the plans shall be installed. History has shown that where failures have been observed in rockery retaining walls, lack of drainage is a major factor.
- 2- Backfill material shall be as shown on the construction documents. Free draining granular backfill is required for proper drainage.
- 3- Rockery face must be constructed at the slope indicated in the construction plans. History has shown that where failures have been observed in rockery retaining walls, too steep of a rockery face is a major contributor to the failure.
- 4- Foundation beneath the rockery walls must be constructed as shown on the construction plans.
- 5- Rockery retaining wall must be constructed of sound rock, meaning the rock used must be solid with no fractures. Sandstone is not an acceptable rock material.
- 6- Overall workmanship of the rockery retaining wall must be quality. Care should be taken as to the stacking and positioning of rocks. Sizes of rocks must meet the requirements shown on the construction plans.

3-2 ROCKERY RETAINING WALL PRESCRIPTIVE REQUIREMENTS

The following prescriptive requirements apply to the construction of the rockery retaining wall.

- 7- The long rock dimension should be placed perpendicular to the slope.
- 8- Rocks should slope downward into the slope at an inclination of at least 5%
- 9- Drainage rock should be placed behind the wall. Drainage rock should be separated from the retained soil using geotextile filter fabric and drained to a suitable outlet using a minimum of 4 inch diameter PVC pipe.
- 10- Cap rocks should weigh at least 200 lb and not be moveable by hand
- 11- Voids greater than inches should be chinked, and chinking rocks should not be moveable by hand.
- 12- The outermost point of contact between an upper and lower rock should be within 6 inches of the face of the rockery.

3-3 FACING ROCK PLACEMENT

Successive lifts of facing rocks should be placed above the base rocks in accordance with the construction plans. Each rock should be placed according to the following guidelines:

- 1- Each rock should bear on at least two other rocks
- 2- Each rock should have at least three bearing points- tow in front and one in back
- 3- The front-most bearing points for each rock should be within 6 inches of the average face of the rockery.
- 4- The rear of the rocks should be aligned along an imaginary vertical plane. If rocks larger than the minimum specified in the size table on the construction plans are used, they can extend beyond the imaginary vertical plane, provided they do not interfere with rockery drainage.

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- 5- The tops of each rock should be sloped back towards the backdrain as previously described for the base rock.

3-3 CHINKING ROCKS

Because of the irregular nature of the rocks, it is difficult to ensure that every rock conforms to the shape of all adjacent rocks. As a result, gaps will occur between rocks. Where these gaps exceed 6 inches, they should be filled with chinking rocks consisting of spalls from the parent (facing) rock. The purpose of the chinking rocks is to improve aesthetics and prevent the screened backdrain material from falling out through the face of the rockery. Chinking rocks should not be movable by hand, and can be grouted in place if necessary. In addition, chinking rocks are not to provide primary support for overlying rocks.

- END OF SECTION -

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SPECIAL PROVISION

32 94 00 SP RE-SEEDING**PART 1 GENERAL****1-1 DESCRIPTION**

The Contractor shall Re-seed all disturbed areas as shown on the construction plans and in accordance with this specification.

1-2 RELATED WORK

31 25 00- Erosion and sedimentation control.
 32 01 90- Plant Maintenance.
 32 91 19- Landscape Grading
 32 92 00- Turf and Grasses
 32 93 13- Ground Cover
 32 93 43- Tree

1-3 SUBMITTALS

Contractor to provide submittals for seed mix and method of application.

1-4 QUALITY ASSURANCE

- A. Seed to conform to State and County regulations.
- B. Seed to be mixed by Supplier.
- C. Trees and shrubs to conform to State and County Regulations
- D. Work shall be performed by a professional licensed landscaping company

1-5 PRODUCT HANDLING AND STORAGE

- A. Protect materials from deterioration during delivery and while stored at the site.
- B. Store packaged materials in a weatherproof storage place to keep dry and effective. Materials which become wet, moldy, or otherwise damaged prior to use will not be acceptable.

1.6 JOB CONDITIONS

- A. Examine and verify the elevations, observe the conditions under which work is to be performed, and notify Engineer of unsatisfactory conditions.
- B. Do not proceed with work until unsatisfactory conditions have been corrected.
- C. Correlate planting time with specified maintenance periods and guarantee.
- D. Suspend seed installation when it may be subject to damage by climatic conditions.

PART 2 PRODUCTS**2-1 COMMON FILL**

Topsoil: APWA 31 05 13

2-2 SEED

Seed mix to be submitted and approved before application

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2-3 GROUND COVER

Hydro-seed to be installed over erosion control blankets as shown on the plan sheets.

PART 3 EXECUTION

3-1 INSTALLATION

- A. Plant seed in areas indicated.
- B. Plant trees and shrubs in the areas indicated

3-2 MAINTENANCE

- A. General: Per APWA 32 01 90.

- END OF SECTION -

EXHIBIT C**SPECIAL PROVISION****31 41 01 SP SHORING**

The following section shall be added to PART 3 "EXECUTION" of specification 31 41 00.

3.3 PROTECTION OF PERSONS AND PROPERTY

- E. The Contractor shall provide temporary shoring as shown on the construction plans on the east side of the tank. Construction is not allowed on the property to the east of the tank, no equipment is allowed to cross the property line, and vegetation, trees, and shrubs on the adjacent property shall be protected during construction and shoring activities.
- F. All shoring activities, products, and procedures shall comply with OSHA requirements. All temporary excavations for shoring and permanent excavations for shoring shall comply with OSHA requirements.

16010.1 DESCRIPTION

The General Conditions, Supplementary General Conditions, Alternates and Addenda, applicable drawings and the Technical Specifications herein shall apply to the providing and construction of a complete electrical system under the requirements of this Division 16.

16010.1.1 RELATED WORK AND REFERENCED SECTIONS

Section 01300 - Submittals
 Section 02200 - Trench Excavation and Backfill
 Section 16150 - Electrical Control Devices
 Section 16210 - Electrical Fixtures
 Section 16400 - Service and Distribution System

16010.1.2 SCOPE

- A. The Work required under this Section consists of the Electrical General Requirements and related items necessary to complete the Work indicated within the Contract Documents.
- B. This Section describes procedures and incidental items of Work relating to Electrical Division 16.
- C. The drawings are diagrammatic, intended to indicate the general scope and location of the Work to be installed and are not to be considered as complete in every detail. The Contractor shall install all Work indicated and/or specified herein, complete in every way to perform the function (s) intended without additional cost.
- D. Plans and Specifications are complementary; whatever is called for in either shall be as called for in both. In the event Work is called for in more than one place and is of conflicting requirements, the right shall be reserved to require the installation of the larger or the more expensive.

16010.1.3 CONTRACT DOCUMENTS

- A. Contract documents consist of drawings, specifications, and other documents issued by the Engineer. Each is complementary and requirements shown, written or reasonably inferable therefrom on one is considered as written, shown and implied in all.
- B. Electrical drawings are diagrammatic, but shall be followed as closely as actual construction and Work of other Contractors will permit. Runs to panels from outlets referred to as "home runs" are indicated, by pointing in the general direction of panels. Contractor shall continue such circuits to the panels as though the routes were completely indicated.
- C. Deviations from the Drawings required to make Work of this Contract conform to Building as constructed, or as to Work of other contractors or subcontractors, shall be made by the Contractor at his expense. The Engineer reserves the right to make minor changes in the location of equipment and outlets without additional charges.
- D. The Contractor shall familiarize himself with the architectural and mechanical plans. The Contractor shall perform all Work and provide all material required by the electrical Contractor shown under these and all other sections of the plans and specifications.

16010.1.4 SUBMITTALS

All submittals shall meet the requirements of Section 01300 of these Specifications.

16010.1.4.1 SHOP DRAWINGS – Submittal of shop drawings shall be as follows:

- A. Submittal of shop drawings shall meet the requirements of Section 01300 of these Specifications.
- B. Shop drawings shall be submitted within fifteen (15) days after the award of contract.
- C. Shop drawing shall include functional and descriptive literature of the particular item furnished complete with dimensional drawings, rough-in and installation instructions, knock-out locations, hangers or mounting devices, etc., as required for the proper checking and installation of the equipment. Catalog sheets without any reference made to the particular item will not be acceptable. All special features called for in the Contract Documents shall be noted. Where performance test results of a product design are called for in the technical sections of these specifications, test data sheets shall be provided with the shop drawing submittal.
- D. Shop drawings shall be submitted for all switch gear, motor control centers, motor starters, control panels, telemonitoring panels, alarms, electrical controls, electrical instrumentation, communication devices and circuitry, lighting fixtures, and equipment anchors and supports for seismically supported components.
- E. In connection with seismic restraint requirements, shop drawings are required for all equipment anchors, supports, and seismic restraints. Submittals shall include weights, dimensions, load/deflection data, centers of gravity, standard connections, manufacturer's recommendations, and behavior problems (vibration, thermal, expansion, etc.) associated with equipment so that the final design can be properly reviewed.
- F. Three preliminary sets shall be submitted to the Architect/Engineer for their review. Following review, two sets will be returned to the Contractor for correction. After corrections have been made, the formal six sets of the corrected shop drawings shall be submitted for final review and distribution.
- G. Each shop drawing required under this or other sections of Division 16 shall be bound together in sets in one hard back three ring binder per set, properly indexed for the formal submittal. Binders shall be properly sized to adequately contain all of the materials to be placed therein and shall be labeled to identify the Owner, the name of the job, the name of the Contractor and/or any sub-contractor (s), and any other pertinent information.

16010.1.4.2 MATERIALS LIST - A materials list including manufacturer, type, size, model number and other properties shall be submitted for all raceway, conduit, fittings, support materials, wire, cable, junction boxes, and wiring devices, including boxes for weather proof devices.

16010.1.4.3 EQUIPMENT/INSTRUMENT LIST - Equipment/Instrument list(s) including manufacturer, type, size, model number and other properties shall be submitted for all equipment and instruments.

16010.1.4.4 OPERATION AND MAINTENANCE MANUAL – The Contractor, or electrical subcontractor, shall assemble and deliver to the Owner an operation and maintenance (O&M) manual for the electrical systems furnished and installed in connection with the Work. O&M manuals shall be as follows:

- A. Number of copies shall be as specified in Section 01300 or as required in the Special

Provisions or by the Engineer or the Owner. The O&M manual shall be reviewed and approved prior to the final inspection.

- B. Each copy of the O&M manual shall be bound in a hard-backed binder. The front of each binder shall have the following information printed on it by silk screen process:

OPERATION AND MAINTENANCE MANUAL
FOR
(PROJECT NAME)
(SPECIFIC SYSTEM NAME AND/OR LOCATION, as appropriate)
(OWNER'S NAME)

- C. Each copy shall contain a master index at the beginning of the manual showing all items included.
- D. A separate section for each different type of item of equipment or information furnished shall be provided. Use plastic tab indexes for all sections of the book.
- E. The first section of the manual shall consist of the names, addresses and telephone numbers of the Mechanical Engineer, Electrical Engineer, General Contractor, Electrical Contractor.
- F. Descriptive literature (manufacturer's catalog cuts and other data) of each manufactured item shall be included. Literature shall show capacities and size of equipment used and shall be marked indicating each specific item with all applicable data underlined.
- G. Operating instructions shall, at a minimum, include:
1. General description of the electrical system.
 2. Where applicable, a step-by-step procedure to follow in putting each piece of electrical equipment in operation.
 3. Provide diagram for the electrical control system showing the wiring of all related electrical control items, such as fuses, interlocks, electrical switches and relays.
 4. Test results of all items requiring testing as called for in the technical section of specifications.
- H. Maintenance instructions shall, at a minimum, include:
1. Manufacturer's maintenance instructions for each piece of electrical equipment installed in the project. Instructions should include installation instructions, parts numbers and lists, operation instructions of equipment, name of vendor, and maintenance and lubrication instructions.
 2. A summary list of each piece of electrical equipment requiring lubrication, showing the name of the equipment, location, type and frequency of lubrication.
 3. A complete list of all electrical equipment used indicating name, model, serial number and nameplate data of each item, together with number and name of each system with which the item is associated.
- I. An approved copy of the manual shall be used during final inspection and shall be left with the Owner for its use and disposition.

16010.1.4.5 OTHER INFORMATION - Other information shall be provided as required by the Engineer.
16010.2 MATERIALS

All equipment and materials shall be as specified, new, of the best quality and free from defects. Each type of equipment or material shall be the same make and quality.

16010.2.1 UNDERWRITERS LABORATORIES

All equipment, materials, and devices shall be approved by Underwriters Laboratories, Inc. (UL). Custom designed items shall be fabricated using UL approved materials. All custom panels shall bear the UL label certifying UL-508 standards.

16010.2.2 MATERIALS AND EQUIPMENT TO BE SUPPLIED

The Contractor or electrical Subcontractor shall provide all materials, equipment, and any other fittings or devices required for a complete and finished installation. Materials and equipment shall be as shown on the Drawings and/or as called for in these Specifications, including the Special Provisions if any, unless otherwise approved, in writing, by the Engineer.

16010.2.3 APPROVAL OF SUBSTITUTIONS

Equipment and materials are designated by one or more manufacturer's name brands or numbers. It is not the intent of the Specifications to exclude other equipment or materials that equal the standard of those specified. If the Bidder, in its bid, desires to use equipment or materials other than those specified, the Bidder must obtain written approval from the Engineer in this regard at least seven (7) calendar days prior to bidding. Submit complete data, including detailed specifications and drawings with written request in duplicate. Samples may be requested if deemed necessary. Certificates of compliance with specifications or a list of all exceptions to the specifications shall be included with request.

16010.2.4 STORAGE OF EQUIPMENT AND MATERIALS

- A. The Contractor shall be responsible for the proper transportation, unloading, storage, and holding of all electrical systems, materials, and equipment until they are installed in the Work, and accepted by the Owner. This shall include responsibility for damage, loss, theft, and pilferage.
- B. Materials and equipment shall be handled and stored in accordance with the manufacturer's and/or supplier's instructions. Packaged items shall be stored in original, undamaged condition with manufacturer's seals and labels intact. Materials and equipment shall be stored in a neat and orderly condition at all times and allowing for easy access for inspection.

16010.2.5 RACEWAYS AND FITTINGS

The manufacturer shall be Republic Steel, Triangle, National, Carlon, Allied or approved equal. All conduits shall be in accordance with the requirements of the National Electric Code (NEC) and applicable local codes. Steel conduit shall be in accordance with recommendations of the latest edition of American Iron and Steel Institute "Design Manual on Steel Electric Raceways."

A. RIGID GALVANIZED STEEL CONDUIT (RGS)

- 1. Shall be USAS C80.1, zinc-coated by hot-dip galvanizing or sheradizing with additional enamel or lacquer coating.
- 2. Fittings shall be threaded type and of the same material as the conduit.
- 3. Unless otherwise noted, rigid metallic conduit shall be used for underground runs, under slab runs, and where runs are placed in concrete. It shall also be used

for exposed runs in mechanical rooms and for other exposed runs where the conduit is exposed to moisture, weather or mechanical injury.

4. Where rigid metallic conduit is used for underground installations, including elbows required to make sweeps in PVC conduit runs, the conduit shall be wrapped with 3m-50 10 mil pipe wrap or approved equal.

B. INTERMEDIATE METAL CONDUIT (IMC)

1. Shall be UL Standard 1242, hot-dip galvanized steel.
2. Fittings shall be threaded type and of the same material as the conduit.
3. It can be used for exposed runs in mechanical rooms and for other exposed runs where the conduit is exposed to moisture, weather or mechanical injury.
4. **This conduit shall not be used in hazardous areas.**

C. ELECTRICAL METALLIC TUBING (EMT)

1. Shall be in accordance with UL "Standard for Electrical Metallic Tubing" No. 797, galvanized mild steel with interior coat of enamel.
2. Fittings shall be steel compression type.
3. **Cast type, indenter, or set-screw type fittings shall not be used.**
4. EMT shall be used for exposed and concealed runs to lighting fixtures above 10 feet or above ceilings.
5. **Not approved for any exposed conduit runs or drops.**

D. NON-METALLIC CONDUIT (PVC)

1. Shall be PVC Schedule 40 heavy wall suitable for direct burial.
2. Fittings shall be threaded or solvent welded type of the same material as the conduit.
3. **Shall not be used above grade or embedded in concrete, except as noted specified for runs above 600 volts. PVC shall not be used where exposed or concealed in walls or floors.**
4. PVC may be used for all underground runs, except for bends exceeding 22 degrees where jacketed or wrapped rigid galvanized steel is required, and runs under concrete slabs. Runs under concrete slabs shall be embedded in earth a minimum of 4 inches below the bottom of the slab. Risers through concrete slabs shall be rigid steel or intermediate metal conduit.
5. Provide PVC to steel adapters as required.

E. FLEXIBLE LIQUID-TIGHT CONDUIT

1. Shall be galvanized steel, liquid-tight, with moisture and oil- proof extruded PVC cover.
2. Fittings shall be liquid-tight, compression type.
3. Approved for flexible connections to equipment, items or instruments subject to vibration such as motors, fans, pumps, dry transformers, etc.
4. **Flexible Liquid-tight conduit shall not be less than 18 inches in length and not more than 3 feet in length.**

F. FLEXIBLE STEEL CONDUIT

1. Shall be galvanized steel.
2. Fittings shall be compression type of the same material as the conduit.
3. Shall be used for lighting fixture runs above drop ceiling grid systems or other devices required or approved by NEC or as requested or approved by the Engineer. (Install ground conductor per NEC in runs over 6 feet in length.)

G. PVC COATED CONDUIT

1. Rigid Steel conduit coated with a minimum of 40 mil of PVC coating shall be used in all corrosive areas or where required by NEC or the Engineer.
2. **All fittings, boxes, support materials, clamps, etc., used with PVC coated conduit shall be PVC coated in a like manner.**
3. Wiring devices shall be corrosion resistant UL rated in corrosive areas requiring PVC coated conduit.

H. WALL AND FLOOR SLEEVES

Shall be galvanized sheet steel or pipe.

I. CLAMPS

1. Shall be galvanized malleable iron one-hole straps, beam clamps or other approved device with necessary bolts and expansion shields.
2. **Perforated metal straps shall not be used.**

J. CONDUIT SIZES

1. Shall be as indicated on the drawings.
2. **Shall not be smaller than $\frac{3}{4}$ inch exposed or 1 inch buried conduit unless otherwise specifically approved by the Engineer.**

K. CONDUIT BUSHINGS

1. For conduit 1-1/4 inch and larger use OZ type BLG or SBLG with Lay-in-Lug.
2. Use Lay-in-Lug bushings on multiple conduit entrances to enclosures or gutters.
3. Bonding bushings shall be used on conduits containing service entrance conductors.

L. ENTRANCE SEALS

Provide and install OZ entrance seals on all conduits entering building below grade.

M. RACKS AND SUPPORTS

1. Conduit support racks, Unistrut supports and fittings, etc., shall be hot-dipped galvanized, except in corrosive areas where the supports and fittings must be PVC coated.
2. **Painted metal supports are not allowed.**

N. PULL BOXES

1. Pull boxes, which are required for proper conduit installation, shall be sized according to the requirements of Article 314 of the NEC.
2. Conduit bodies shall be cast type with threaded hubs.
3. Outdoor, buried pull boxes shall be Oldcastle H-Series or equal.
 - a) Pull boxes shall be sized per NEC 314.28 but shall not be smaller than 24" x 24" x 24".
 - b) If fully enclosed pull boxes are used, they shall be coated with coal tar epoxy per specification 9900.3.2.4.

O. OUTLET/JUNCTION BOXES

1. Boxes shall be provided in the wiring or raceway systems wherever required for routing/pulling of wires, making connections and mounting of devices or fixtures.
2. Boxes in exposed conduit runs shall be cast metal condulets with threaded hubs installed exposed. **Non-metallic boxes are not allowed.**
3. Each box shall be metal and shall have the volume required by the National Electrical Code for the number of conductors enclosed in the box. Boxes for mounting lighting fixtures shall not be less than 4 inch octagonal or 4 inch square except that smaller boxes may be installed as required by fixture configuration, as approved. Boxes in the raceway system shall not be less than 1-1/2 inches deep, except where shallower boxes required by structural conditions are approved.
4. Boxes for other than lighting fixture outlets shall not be less than 4 inches square.
5. Boxes in concealed conduit runs shall be equipped with tile extension rings, device mounting straps and accessories required for the purpose of the outlet.

16010.2.6

A. CONDUCTORS

1. Shall be of the type, size, and locations as shown on the Drawings and meet the requirements of the latest addition of the National Electric Code (NEC).
2. Shall be soft-annealed coated copper in accordance with ASTM B33 or B189.
3. Conductors No. 10 and smaller shall be solid copper for lighting circuits only, all other circuits shall be stranded copper.
4. All conductors shall be THHN/THWN copper rated at 600 volts, unless otherwise noted.
5. **Aluminum conductors will not be allowed.**

B. GROUNDING CABLE

Shall be as called out on the drawings and per NEC. (Grounding lugs shall be the clamp type made of high conductivity copper alloy and shall be provided for all equipment to be grounded.)

C. VFD CABLE

Conductor size shall be as shown in Plans and shall meet the requirements of the latest addition of the National Electric Code (NEC). Cable shall meet the requirements below:

6. Cable shall be designed for VFD applications and shall be rated 600V/2kV, NEC Type TC with a 90°C rating.
7. Three Copper circuit conductors with XLPE insulation.

8. Three symmetrical copper ground wires.
9. Spiral copper tape shield with 100% coverage.
10. Outer PVC jacket.
11. Suitable for Indoor, Outdoor, Burial and Oil Resistance

Acceptable manufacturers:

1. Belden
2. Southwire
3. Approved Equal

16010.2.7 SPLICES, TAPS AND TERMINATIONS

- A. Splices, taps and terminations made in interior damp or wet locations, corrosive atmosphere locations or exterior boxes above or below grade shall be covered with 3M heat shrinkable ITCSN series sleeves or end caps or Raychem equal as approved by the Engineer.
- B. All splices shall require approval by the Engineer.

16010.2.8 SAFETY SWITCH DISCONNECTS

- A. Provide disconnect switches where shown and required by NEC as specified herein.
- B. Type: Heavy duty, manual, single throw, fusible or non-fusible as indicated.
- C. Rating: 600 volt, ampere size as noted or as required for load served.
- D. Enclosure: Nema 4, Gasketed stainless steel or as called out in equipment schedule on drawings. Stainless steel 316 shall be used in hazardous/corrosive areas. Stainless steel 304 shall be used in all other locations.
- E. Fuses: Switches shall be equipped with Type "R" fuse clips factory installed. Fuses shall be dual element type RK5 of size as noted.
- F. Non-Fusible Switches: For equipment 2 horsepower and smaller, shall be horsepower rated; toggle switch type; quantity of poles and voltage rating as indicated. For equipment larger than 2 horsepower, switches shall be the same as fusible type.

16010.2.9 JUNCTION BOXES

- A. Junction or pull boxes, which are required but not shown, shall be sized according to requirement of Articles 370 and 373 of NEC.
- B. Shall be cast type condulets with threaded hubs.

16010.2.10 WIRE DEVICES

- A. Switches: 20 ampere, 120/277 volt, toggle type. Single pole used as designation for entire series - double pole, 3-way, 4-way or lock type. Hubbell #1221, Bryant #1221, Leviton #1221. Switch and pilot shall be Hubbell #1221-PL or Leviton #1221-PL. Double pole toggle switch shall be Hubbell #1222-2.
- B. Ground Fault Interrupter Receptacles: 20 ampere, 125 volt, NEMA 5-20R, gray color. Leviton #6398.

- C. Receptacles: 20 ampere, 125 volt, NEMA 5-20R, gray color for locations where indicated. Hubbell #5352, Bryant #5352, or Leviton #5352.
- D. All devices shall be gray in color.
- E. Special receptacles other than those listed above shall be as designated on the drawings.
- F. Device Plates:
 - 1. For surface mounted boxes plates shall be stainless steel suitable for use on cast metal device boxes, conduit FS and FD types. Shall be complete with gaskets and approved for wet locations.
 - 2. For flush boxes in finished areas, plates shall be stainless steel. Gang plates shall be one-piece.

16010.3 CONSTRUCTION REQUIREMENTS

Unless notified otherwise, the Contractor responsible for the electrical Work shall perform all electrical work in accordance with the Drawings and with these Specifications.

16010.3.1 CODES, PERMITS, LICENSES AND STANDARDS

- A. PERMITS AND LICENSES – The Contractor shall secure all permits and licenses required in connection with this work.
- B. CODES AND STANDARDS - All work, labor, and equipment shall conform to applicable State and Local Codes and Standards and the applicable sections of the latest revisions of the following:
 - American Society for Testing and Materials (ASTM)
 - National Fire Protection Association, National Electrical Code (NEC)
 - Insulated Power Cable Engineers Association (IPCEA)
 - Underwriters Laboratories Inc. (UL)
 - American Steel and Iron Institute, “Design Manual on Steel Electrical Raceways”
 - National Electrical Manufacturer’s Association (NEMA)
 - American National Standards Institute (ANSI)
 - Institute of Electrical and Electronic Engineers (IEEE)
 - Uniform Building Code (UBC)
 - Uniform Fire Code (UFC)
 - Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

Conflicts between any of the above referenced codes and standards and between any of them and these Specifications and/or the Project Drawings shall be resolved by complying with the more stringent requirements.

16010.3.2 SAFETY

- A. REGULATIONS - The Contractor’s work shall conform to the Associated General Contractors of America, Inc. *Manual of Accident Prevention in Construction* and shall comply with all current regulations of the Occupational Safety and Health Act (OSHA) as required for work identified on the Drawings or in these Specifications.

- B. SAFETY GUARDS - All equipment, which the Contractor furnishes and installs, shall be provided with appropriate safety guards for prevention of accidents. The Contractor shall provide and maintain any other necessary construction required to secure safety of life or property, including the maintenance of sufficient lights to secure such protection.

16010.3.3 DIAGRAMMATIC DRAWINGS

- A. The electrical drawings are diagrammatic, intended to indicate the general scope and locations of the work to be installed and are not to be considered as complete in every detail. The Contractor shall install all work indicated and/or specified herein, complete to perform the function intended without additional cost.
- B. The electrical drawings are diagrammatic, however, they shall be followed as closely as actual construction and work of other contractors will permit. Runs to panels from outlets, referred to as "home runs", are indicated on the drawings by arrows pointing in the general direction of panels. Contractor shall continue such circuits to the panels as though the routes were completely indicated. Deviations from drawings required to make the work of this Contract conform to building as constructed, or as to work of other contractors, shall be made at the Contractor's expense. The Engineer reserves the right to make minor changes in the location of equipment and outlets without additional charges.

16010.3.4 SITE EXAMINATION

Examination of the site shall be made by the Contractor, who shall compare it with the drawings and specifications and satisfy himself as to the conditions under which the work is to be performed. The Contractor shall, at such time, ascertain and check all conditions which may affect its work. No allowance shall subsequently be made in the Contractor's behalf for any extra expenses to which the Contractor may be put due to failure or neglect on its part to make such examination and determination of the condition.

16010.3.5 SUPERVISION

- A. A competent foreman or superintendent, approved by the Owner's Representative, shall be at the site at all times to receive instructions and shall have the proper authority to act on behalf of the Contractor. The Contractor shall verify dimensions given on the electrical drawings and report any errors or inconsistencies to the Engineer before commencing the work. The Engineer or its representative will interpret the meaning of the Drawings and Specifications where questions arise.
- B. Contractor shall assign persons to be in direct charge of work who are thoroughly experienced in the types of construction work specified herein. All labor shall be performed in a workmanlike manner by skilled workmen under the supervision of competent foremen.

16010.3.6 WORKMANSHIP

Workmanship shall be in accordance with the best present-day construction methods and shall be neat and orderly throughout the project.

16010.3.7 COORDINATION OF CONSTRUCTION

- A. The Contractor shall coordinate work with other contractors, subcontractors, the Owner, and the Engineer to assure orderly and expeditious progress of work. The Contractor shall select order/sequence of work and establish schedule of working hours for

construction, all subject to review and direction by the Owner.

- B. This Contractor shall be held solely responsible for the proper installation of its work. The Contractor shall arrange with the proper contractors for the installation of anchors and other embedded devices, and for the leaving of required chases, openings, etc., and shall do all cutting and patching made necessary by its failure or neglect to make such arrangements with others. Any cutting or patching done by this Contractor shall be subject to the directions of the Engineer and shall not be started until approval has been obtained.
- C. All cutting, welding or drilling of concrete or structural members shall be properly reinforced and patched to match as nearly as possible the surrounding work. Before cutting, welding or drilling any concrete or structural member, the Contractor shall secure the approval of the Engineer. Where deemed appropriate by the Engineer, in the case of gross negligence pertaining to this issue, the Engineer reserves the right to back-charge the Contractor for the Engineers associated costs.

16010.3.8

INSTALLATION

RACEWAY AND FITTINGS

A. STANDARDS

- 1. All conduit to be installed in accordance with the requirements of the National Electrical Code, latest addition.
- 2. Steel conduit to be installed in accordance with recommendations of American Iron and Steel Institute "Design Manual on Steel Electrical Raceways", latest addition.
- 3. PVC coated conduit installed in accordance with manufacturer instructions.

B. ELECTRICAL CONTINUITY

All metallic conduit systems shall be electrically continuous throughout.

C. MOISTURE

- 1. All conduit raceway systems shall be essentially moisture tight.
- 2. Conduit drainage shall be accomplished by sloping conduits towards manholes or boxes.
- 3. Where pockets cannot be avoided in exposed conduits, provide drainage fittings or weep holes. Weep holes drilled through the walls of any conduit or fitting shall not produce burrs on the inside or outside surface.

D. ALIGNMENT OF EXPOSED CONDUIT

Install conduit runs parallel or at right angles to lines of structure.

E. FIELD CUTS AND THREADS

- 1. Field cuts shall be made square, threads clean and sharp.
- 2. Remove burrs, sharp or rough edges by reaming.
- 3. Before couplings or fittings are attached, apply a coat of red lead or zinc chromate to male threads of RGS or IMC conduit, also apply these coatings or other special compound recommended by the manufacturer of the conduit where the conduit protective coating is damaged.

4. PVC coated conduit system requires male threads on conduit, elbows and nipples and all female threads on fittings or conduit couplings to be protected by application of a urethane coating.
5. **Care must be taken to assure that concrete surfaces are protected from cutting oil, any/all damage will be the responsibility of the Contractor.**

F. BENDS

1. Uniform, whether job-fabricated or made with standard fittings or boxes.
2. Do not dent or flatten conduit
3. Conduit installation should be installed symmetrically insofar as practicable.
4. Unless approved otherwise, bends larger than 1-1/4 inch shall be factory made.
5. Bends in exposed conduit shall be symmetrical insofar as practicable.
6. Do not expose bends at floor or ceiling.

G. LOCATION

1. Conduit routing is generally shown in schematic fashion, unless dimensioned or noted to the contrary.
2. Contractor is responsible to route conduits as required to connect equipment or devices.
3. Vertical risers, equipment and device locations are approximately as indicated on the drawings. Contractor shall coordinate installation of conduit with structure and equipment.
4. Contractor is responsible to coordinate conduit installation with other contractors installations, in the event of conflict, field routed conduit shall be moved at the Contractors expense.
5. Conduit shall be located a minimum 6 inches away from steam, hot water, or other hot surface. Protect from heat, as Engineer approved, if the 6 inch separation is impracticable.
6. Diagonal installation is not permitted.

H. BURIED/EMBEDDED CONDUIT

1. RGS conduit installed underground, or used in PVC runs for sweeps larger than 22 degrees, must be wrapped with 3M-50 10 mil pipe wrap, approved asphalt compound or approved equal.
2. Mid-run weep holes and gravel drainage pockets will not be permitted.
3. Conduits embedded in concrete or masonry shall be securely held in place during concrete placement and construction operations.
4. In concrete floors, conduit shall be set before pouring of concrete begins. Conduit shall be routed in a direct line, with bends as long as possible, with 2 inches minimum from conduit to bottom of slab and maximum conduit size of 2 inch, unless otherwise approved.
5. Non-metallic conduits above 600 Volts shall be encased in red concrete covered by a minimum of 2 inches on all sides.
6. Buried conduit shall be placed 18" below grade, then filled to grade with flowable fill concrete.
7. If minimum of 18" cannot be reached, 3000 psi concrete shall fill the trench to grade .

I. WALL PENETRATIONS

1. Penetrations through exterior building walls to be by core drilling and providing appropriate conduit entrance seals.

2. Openings through existing partitions shall be provided at Contractor's expense. Holes through masonry construction shall be drilled with suitable core drilling machine.
3. All work is to be performed neatly.
4. Patches shall match original material in composition and appearance.
5. Provide fire seals as detailed or required by NEC where a fire rated wall or partition is penetrated.
6. A template shall be provided by the Contractor to hold conduit groups terminating together or passing through fire walls or floors.
7. In walls and partitions, conduit shall be installed vertically. If vertical installation is impracticable, the Engineer shall approve horizontal installation for each location.

J. EXPANSION FITTINGS

Install expansion fittings in all conduit runs crossing structural expansion joints and in all straight conduit runs exceeding 75 feet in length.

K. CONDUIT ENDS

1. Insulating bushings shall be installed at open conduit ends, terminating in panels, control centers, consoles or other similar locations.
2. Plug space around cables with oakum and/or an approved sealing compound where conduits enter switchboards, cabinets or similar locations.
3. Cap or plug all spare conduit ends to prevent the entrance of foreign material.

L. CONDUIT CONNECTIONS

1. At cabinets and boxes use double locknuts and insulating bushings for rigid conduit.
2. At cable tray securely clamp conduit to tray and install insulating bushings.
3. Install insulated grounding bushings with lay-in ground lugs where metallic conduit terminates in non-metallic manholes or pullboxes.
4. Flexible conduit for connection to movable/vibrating equipment shall be liquid-tight, Sealtite as manufactured by Anaconda Metal Hose Company, or approved equal, utilizing approved liquid-tight fittings.

M. SUPPORTS

1. Hangers and supports shall be galvanized or PVC coated.
2. Hangars generally are not detailed, but must be adequate to support combined weight of conduit. Rigid fastenings are to be spaced at a maximum of 6 feet.
3. Clamps will be galvanized malleable iron one-hole straps, beam clamps or other approved device with necessary bolts, washers and expansion shields.
4. **Perforated metal straps shall not be used.**
5. Adjustable hangers shall be used to support horizontal runs only, use trapeze hangers for parallel runs of conduit. Install u-bolts or other approved clamping device at each end and at each elbow. Install clamp every third intermediate hanger for each conduit.

N. CONDUIT CLEANING

Contractor is to clean and swab the inside of conduits, by mechanical means, to remove foreign materials and moisture before conductors are installed.

O. SPARE CONDUITS

1. Spare conduits shall have a nylon pulling line installed for future installation of cables.
2. Recessed panels shall have three 1 inch spare conduits in the wall space stubbed-out above ceiling and three 1 inch spare conduits stubbed under the floor.
3. Spare conduits shall be capped.

CONDUCTOR INSTALLATION**A. BENDING RADII**

Not to be less than permitted by ICEA and/or NEC.

B. SUPPORTS IN VERTICAL RUNS

To be in accordance with NEC requirements.

C. SPLICING

1. Will be permitted only with Engineers approval, and will be held to an absolute minimum.
2. Permitted only in junction boxes or similar accessible locations.
3. Cover with heat shrinkable sleeves to make moisture proof and corrosive resistant.
4. No splicing of instrument or control wiring shall be allowed without specific approval, by the Engineer.

D. CONNECTORS

1. Solderless compression or mechanical type will be utilized where screw does not bear directly on the wire.
2. Apparatus lugs, conductor, and coat shall be thoroughly cleaned with suitable oxidation inhibiting compound prior to connection.
3. Retaining cup washers shall be used where solid wire is used at terminal blocks.
4. Compression type connectors shall be installed using ratchet type crimping tools that will not release until full compression has been achieved.
5. Dies for the crimping tools shall be matched to the connector and approved for use by the Engineer and the connector manufacturer.
6. Twist on type, Scotch-lok or approved equal, connectors shall be restricted to the connection of lighting fixture wires only.

E. POWER CABLES

All power cables will be installed in strict accordance with the manufacturers instruction, and in conformance with NEC.

F. CONNECTIONS

All apparatus lugs shall be tandem single or multi-barrel lugs as detailed/required.

G. CONDUCTOR PULLING

1. Use pulling grips or eyes.

2. Firmly mount pulling reels on portable stand and secure against displacement
3. Use an approved by the Engineer commercial pulling compound for lubrication.
4. Monitor and do not exceed cable-pulling tension as specified by the cable manufacturer.

H. COLOR CODING

1. Single phase service - use white for neutral conductor, and black for ungrounded conductors.
2. Three phase service - feeder and branch conductors shall be color coded as follows:

	<u>120/208 Volt</u>	<u>277/480 Volt</u>
a.	Phase A – Black	Brown
b.	Phase B – Red	Orange
c.	Phase C – Blue	Yellow
d.	Neutral – White	Grey
e.	Ground – Green or Bare	Green or Bare

3. Coding shall be by insulation color or minimum 1 inch band of colored tape.
4. Green covering of conductors shall be solely for grounding.

I. PHASING

1. Where common neutral is run for two or three circuits, phase conductors shall be connected to breakers in the panel, which are connected to different phase legs.
2. Home runs may be combined at the option of the Contractor, providing not more than three circuits are installed in one conduit, unless otherwise approved by the Engineer.

J. SERVICE SYSTEMS

1. Incoming service systems shall be grounded at two points with the UFER (ground wire tied to the rebar of the footings) and to driven ground rods as indicated on the Standard Detail Drawing.
2. Jumpers shall be provided around water meters and any dielectric sections of pipe.
3. Size shall be as indicated on the Drawings and/or as required by NEC.
4. Connections shall be accessible for inspection.
5. Neutral conductor connection to grounding electrode conductor shall be at the main service enclosure only.
6. Type of equipment and details of installation shall be verified with Power Company representatives.
7. Metering equipment shall be provided as indicated on the Drawings or as required by these Specifications.

16010.3.9 INSTALLATION OF POWER AND CONTROLS TO EQUIPMENT

Contractor shall provide all power and control wiring required for the work of other trades as described on the drawings and in the specifications, except where the furnishing and installing of such wiring is specified elsewhere. Connect cord sets to Owner furnished equipment and make connections to all electric power consuming equipment whether furnished under contract or by Owner.

16010.3.10 TEMPORARY ELECTRIC SERVICE DURING CONSTRUCTION

- A. The Project Contractor is responsible for all project electrical work unless otherwise noted. The Contractor shall be aware, however, that some or all of the project electrical work may be performed by the Owner and/or an independent electrical contractor. The division of work to be performed by others may be indicated on the drawings, or may be as called for by the Engineer. But, the Contractor shall be responsible to review the Drawings and consult with the Engineer, to determine if its scope is less than one hundred percent of all project electrical work. The Contractor shall also be responsible to coordinate and schedule its work with that of the Owner or independent electrical contractor, and to leave its installations ready, with the connecting wires coiled, for the Owner or independent contractor to connect to or to terminate as necessary, thereby ensuring the most efficient completion of the project by all parties.
- B. The Contractor or electrical subcontractor doing the work shall provide temporary power, complete with metering and wiring, for lighting and power outlets for construction tools and equipment. This contractor will make arrangements with the local power company for temporary electrical service connections for construction power.
- C. No attempt shall be made herein to specify construction power requirements for equipment in detail. However, all temporary wiring shall meet NEC, Article 305, requirements. The service shall be provided with a main disconnect, and all power receptacles shall be, or be protected by, appropriately rated GFI single-pole devices.
- D. At completion of the Project, or sooner if directed, the temporary power supply shall be disconnected and removed from the construction site.
- E. During construction, if it becomes necessary to shut down power to a critical item of equipment or process, the Contractor or electrical subcontractor shall provide the necessary wiring and a portable generator or other source of electric power to keep such critical equipment or process in operation.

16010.3.11 SEISMIC RESTRAINT

- A. The appropriate Seismic Zone Classification will be provided on the Drawings or in the Special Provisions. All electrical equipment shall be securely anchored and seismically braced in accordance with the regulations contained in the most recently adopted edition of the UBC and with the *SMACNA Guidelines for Seismic Restraints of Electrical Systems* as they pertain to the Seismic Zone Classification given.
- B. Units mounted and secured directly to structures shall be provided with connectors of sufficient strength to meet the restraining criteria.
- C. All electrical equipment which is to be securely anchored (hard mounted) to the building or structure shall have supports designed to withstand lateral and vertical "G" loadings equal to or greater than UBC requirements and SMACNA guidelines for the given seismic zone.

16010.3.12 LABELING OF J-BOX COVERS

All J-Box covers shall be labeled with information showing the voltage and the circuit number in reference to each home run pulled through that J-Box and a particular run of conduit. The Contractor shall continue such circuits to the panels as though the routes were completely indicated.

16010.3.13 REPAIR OF WORK

- A. The work shall be carefully laid out in advance and where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support, or anchorage of the conduit raceways or other electrical work, this work shall be carefully done. Any damage to building, piping or equipment shall be repaired by skilled mechanics of the trades involved, at no additional cost to the Owner.
- B. Penetrations within fire rated wall assemblies shall be appropriately repaired and replaced to full integrity of the designed fire resistance of the wall.

16010.3.14 TESTING

On completion of the work, the installation shall be tested free from all grounds and short circuits. Normal feeders, circuits, and service entrance conductors with wire size #2 and larger shall be tested for leakage phase-to-ground and phase-to-phase prior to energizing the electrical system. The Contractor shall submit a written report to the Engineer showing methods used and readings taken. Voltage applied for testing shall not exceed two times normal operating voltage.

16010.3.15 GUARANTEE/WARRANTY

- A. The following guarantee is a part of the specification and shall be binding on the part of the Contractor:

"The Contractor guarantees that this installation is free from defects. The Contractor agrees to replace or repair, to the satisfaction of the Owner's Representative, any part of this installation which may fail or be determined unacceptable within a period of one (1) year after final acceptance."
- B. Electrical systems and equipment shall not be considered acceptable for substantial completion until they have performed in service continuously without malfunction for at least ten (10) days.

16010.3.16 DEFECTIVE EQUIPMENT

If equipment fails to conform to the Specifications or to operate satisfactorily, the Owner will have the right to operate said equipment until defects are corrected. The Owner will have the right to operate rejected equipment until it is replaced, without cost for depreciation use or wear. The Contractor shall remove defective equipment from operation for examination, adjustment, alteration, or change only at times approved by Owner.

16010.3.17 CLEAN-UP

- A. As the work progresses, and on a daily basis, the Contractor shall remove from the premises and surrounding streets, alleys, etc., all rubbish and debris resulting from its operations and shall leave all equipment and material furnished by the Contractor absolutely clean and ready for use.
- B. In addition, the Contractor shall periodically remove all debris and waste in order to maintain safe working and operating conditions, and shall dispose of the same in an approved manner. At the completion of work, The Contractor shall remove all its rubbish, tools, scaffolds and surplus materials from and about the site, leaving its work clean and the areas ready for occupancy.

16010.3.18 AS-BUILT DRAWINGS

Blue line white prints of drawings will be furnished by the Engineer, on which the Contractor shall accurately and neatly mark, in colored pencil, all changes or deviations from the drawings as such changes are made in the work. These drawings shall be reviewed with the Engineer on a timely basis, not to exceed at least once each month. Failure to keep as-built drawings up to date shall be cause for withholding monthly or final payment.

16010.3.19 FINAL INSPECTION AND ACCEPTANCE

The Contractor shall notify the Engineer when work is considered to be complete, in full operating condition, and ready for final inspection. The Engineer, after determining that the installation is ready for final inspection, will conduct the final inspection and tests as are deemed necessary to determine that the provisions of the specifications are satisfied. The Owner will not accept work nor make final payment to the Contractor until Engineer has certified that the work of the Contractor is complete and in conformance with the specifications and guarantees.

16010.4 METHOD OF MEASUREMENT

16010.4.1 NO SEPARATE MEASUREMENT

Separate measurement shall NOT be made for furnishing or installing electrical systems, components, materials required to be installed within the pay limits for a building or enclosure identified in the Bid schedule to be furnished by the Contractor.

16010.4.2 SEPARATE MEASUREMENT

- A. NEW BUILDINGS - Separate measurement shall be made for installation of electrical systems, components, and materials, required for a building or enclosure shown on the Drawings and as called for in these Specifications and identified in the Bid Schedule, when such electrical systems, components, and materials are identified and listed in the Bid Schedule.
- B. EXISTING BUILDINGS - Separate measurement will be made for installation of electrical systems, components, and materials, required to be installed or replaced in an existing building or enclosure, as shown on the Drawings and as called for in these Specifications, when such electrical systems, components, and materials are identified and listed in the Bid Schedule.

ELECTRICAL GENERAL REQUIREMENTS**SECTION
16010****16010.5 BASIS OF PAYMENT**

- 16010.5.1 No separate payment shall be made for furnishing or installing electrical systems, components, or materials required to be installed within the pay limits for a building or enclosure identified in the BID schedule to be furnished by the Contractor.

PAY ITEM	UNIT
Electrical System (<i>Indicate Building</i>)	Lump Sum
Install Electrical (<i>Describe Component</i>)	Lump Sum
Install Electrical (<i>Describe Component</i>)	Each
Install Electrical (<i>Describe material</i>)	Lump Sum
Install Electrical (<i>Describe material</i>)	Lineal Foot
Replace Electrical (<i>Describe Component</i>)	Lump Sum
Replace Electrical (<i>Describe Component</i>)	Lump Sum
Replace Electrical (<i>Describe material</i>)	Lump Sum
Replace Electrical (<i>Describe material</i>)	Lineal Foot

16065.1 GENERAL

16065.1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions

16065.1.2 SUMMARY

- A. Section includes lightning protection for structures.

16065.1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For air terminals and mounting accessories.
 - 1. Layout of the lightning protection system, along with details of the components to be used in the installation.
 - 2. Include indications for use of raceway, data on how concealment requirements will be met and calculations required by NFPA 780 for bonding of grounded and isolated metal bodies.

16065.1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified installer and manufacturer. Include data on listing or certification by UL.
- B. Certification, signed by Contractor, that roof adhesive is approved by manufacturer of roofing material.
- C. Field quality-control reports.
- D. Comply with recommendations in NFPA 780, Annex D, "Inspection and Maintenance of Lightning Protection Systems," for maintenance of the lightning protection system.
- E. Other Information Submittals: Plans showing dimensioned as-built locations of grounding features, including the following:
 - 1. Ground rods
 - 2. Ground loop conductor

16065.1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Certified by LPI as a Master Installer/Designer, trained and approved for installation of units required for this Project.
- B. System Certificate:
 - 1. UL Master Label
 - 2. LPI System Certificate
 - 3. UL Master Label Recertification
- C. Electrical Components, Devices and Accessories: Listed and labeled as defined in NFPA 780, "Definitions" Article.

16065.1.6 COORDINATION

- A. Coordinate installation of lightning protection with installation of other building systems and components, including electrical wiring, supporting structures and building materials, metal bodies requiring bonding to lightning protection components and building finishes.

16065.2 PRODUCTS

16065.2.1 LIGHTNING PROTECTION SYSTEM COMPONENTS

- A. Comply with UL 96 and NFPA 780
- B. Roof-Mounted Air Terminals: NFPA 780
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work included; but not limited to, the following:
 - 2. Basis of Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. VFC
 - b. East Coast Lightning Equipment, Inc.
 - c. ERICO International Corporation
 - d. Harger
 - e. Heary Bros. Lightning Protection Co., Inc.
 - f. Independent Protection Co.
 - g. Robbins Lightning, Inc.
 - h. Thompson Lightning Protection, Inc.
 - 3. Air Terminals More Than 24-inches Long: With brace attached to the terminal at not less than half the height of the terminal
 - 4. Single-Membrane, Roof-Mounted Air Terminals: Designed specifically for single-membrane roof system materials. Comply with requirements in roofing Sections.
- C. Main and Bonding Conductors: Copper or aluminum.
- D. Ground Loop Conductor: The same size and type as the main conductor excepted tinned.
- E. Ground Rods: Copper-clad steel (sectional type): 5/8-inch in diameter by 96-inches long.
- F. Heavy-Duty, Stack-Mounted, Lightning Protection Components: Stainless steel, solid copper, monel metal or lead sheathed.

16065.3 EXECUTION

16065.3.1 INSTALLATION

- A. Install lightning protection components and systems according to UL 96A and NFPA 780.
- B. Install conductors with direct paths from air terminals to ground connections. Avoid sharp bends.
- C. Conceal the following conductors:
 - 1. System conductors
 - 2. Down conductors
 - 3. Interior conductors
 - 4. Conductors within normal view of exterior locations at grade within 200 feet of building.
- D. Cable Connections: Use crimped or bolted connections for all conductor splices and connections between conductors and other components. Use exothermic-welded connections in underground portions of the system.
- E. Cable Connections: Use exothermic-welded connections for all conductor splices and connections between conductors and other components.
 - 1. Exception: In single-ply membrane roofing, exothermic-welded connections may be used only below the roof level.
- F. Air Terminals on Single-Ply Membrane Roofing: Comply with roofing membrane and adhesive manufacturer's written instructions.
- G. Bond extremities of vertical metal bodies exceeding 60 feet in length to lightning protection components.
- H. Ground Loop: Install ground-level, potential equalization conductor and extend around the perimeter of structure, area or item indicated.

1. Bury ground ring not less than 24 inches from building foundation.
 2. Bond ground terminals to the ground loop.
 3. Bond grounded building systems to the ground loop conductor within 12 feet of grade level.
- I. Bond lightning protection components with intermediate-level interconnection loop conductors to grounded metal bodies of building at 60-foot intervals.

16065.3.2 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

16065.3.3 CORROSION PROTECTION

- A. Do not combine materials that can form an electrolytic couple that will accelerate corrosion in the presence of moisture unless moisture is permanently excluded from junction of such materials.
- B. Use conductors with protection coatings where conditions cause deterioration or corrosion of conductors.

16065.3.4 FIELD QUALITY CONTROL

- A. Notify Architect at least 48 hours in advance of inspection before concealing lightning protection components.
- B. UL Inspection: Meet requirements to obtain a UL Master Label for system.
- C. LPI System Inspection: Meet requirements to obtain an LPI System Certificate.

16150.1 GENERAL

16150.1.1 QUALITY ASSURANCE

- A. Comply with NFPA 70 requirements for electrical materials and installation.
- B. Provide products and components which have been UL listed and labeled, including UL marks indicating special type usage whenever applicable.

16150.2 PRODUCTS

16150.2.1 MOTOR STARTERS

- A. Acceptable Manufacturers:
 - 1. Allen-Bradley Co.
 - 2. Eaton Corp/Power Distribution Div.
 - 3. Cutler Hammer
 - 4. General Electric Co. (GE Supply)
 - 5. Square D Co.
- B. Provide factory fabricated starters complying with NEMA Standards Publication ICS 2 with NEMA Type enclosures as specified in Section 16010.
- C. Provide starters with thermal overload protection on each phase utilizing interchangeable melting alloy, Class 20 (trip in 20 seconds or less when carrying a current equal to 600 percent of its current rating) overload heaters, sized in field for full load current rating indicated on each motor nameplate.
- D. Manual Motor Starter: Quick-make, quick-break trip free toggle or pushbutton operating mechanism; provisions for positive padlocking in OFF position.
- E. Magnetic Motor Starter: Non-reversing or reversing, as indicated; manual reset overload relay with reset button on face of enclosure; full voltage starting; control transformer of sufficient capacity to handle operating coil and associated controls, integral with each starter; 120 volts control circuit, fuse protected; equipped with pilot light.

16150.2.2 CONTACTORS

- A. Acceptable Manufacturers:
 - 1. Allen-Bradley Co.
 - 2. Eaton Corp/Power Distribution Div.
 - 3. Culter Hammer
 - 4. General Electric Co. (GE Supply)
 - 5. Square D Co.
- B. Provide contactors complying with NEMA Standards Publication ICS 2 with NEMA Type enclosures as specified in Section 16010, unless otherwise indicated.

16150.2.3 RELAYS

- A. Acceptable Manufacturers:
 - 1. Control Relays:

2. Allen-Bradley Co.
3. IDEC Systems & Controls Corp.
4. Omron Electronics, Inc./Control Components Div.
5. Potter & Brumfield
6. Square D Co.

- B. Provide relays complying with NEMA Standards Publication ICS 2 with NEMA Type enclosures as specified in Section 16010, unless otherwise indicated.

16150.2.4 CONTROL PANELS

- A. Acceptable Manufacturers:

1. Allen-Bradley Co.
2. Eaton Corp/Power Distribution Div.
3. Cutler Hammer
4. Square D Co.

- B. Provide factory fabricated oiltight pushbuttons, selector switches, pilot (indicating) lights, and pushbutton stations complying with NEMA Standards Publication ICS 2, heavy duty, with NEMA Type enclosures as specified in Section 16010.

1. Fabricate pushbutton stations for vertical or horizontal mounting, as indicated, and with button and light arrangements, as indicated on drawings.

- C. Pushbuttons: Momentary or maintained contacts, as indicated; contacts rated 10 amps continuous carrying current, 600 volts AC; quick-make, quick-break, snap action operating mechanism.

- D. Selector Switches: Rotary type; two or three position control, as indicated; legend plate with markings as indicated.

- E. Pilot Lights: Transformer type, 120 volts AC; glass or acrylic plastic prismatic lens, color as indicated; legend plate with markings as indicated.

16150.2.5 CIRCUIT AND MOTOR DISCONNECTS

- A. Acceptable Manufacturers:

1. Cutler Hammer
2. Allen-Bradley Co.
3. Siemens Corp/Electrical Apparatus Div.
4. Square D Co.
5. General Electric Co. (GE Supply)

- B. Provide factory fabricated switches complying with NEMA Standards Publication KS 1 with NEMA Type enclosures as specified in Section 16010.

- C. Safety Switches: 3 pole, heavy-duty, horsepower rated disconnect; rated at 600 volts; quick-make, quick-break operating mechanism; integral operating handle provided with means for positive padlocking in OFF position; current carrying parts constructed of high conductivity copper, with silver-tungsten type switch contacts; fusible or non-fusible as indicated; positive pressure type reinforced fuse clips for fusible switches.

- D. Fuses: Dual element type, with time delay; non-renewable; current limiting where indicated.

16150.2.6 TRANSFER SWITCHES – MANUAL**A. Acceptable Manufacturers:**

1. Cutler Hammer
2. Square D Co.
3. General Electric Co. (GE Supply)

B. Provide manual transfer switches complying with NEMA Standards Publication KS 1, specifically designed to transfer power from one load to another load, with NEMA Type enclosures as specified in Section 16010.**C. Manual Transfer Switches: Double throw, 3 pole, heavy-duty, safety switch; rated at appropriate amperes, 600 volts; quick-make, quick-break operating mechanism; blades visible from front of unit for positive indication that switch is OFF; integral three position operating handle provided with means for positive padlocking in OFF position; current carrying parts constructed of high conductivity copper, with silver-tungsten type switch contacts; non-fusible.****16150.3 METHOD OF MEASUREMENT AND BASIS OF PAYMENT****16150.3.1 These control devices shall be considered pertinent to the equipment which they are associated with. They will not be measured or paid for separately, but shall be included in other appropriate bid items.**

ELECTRICAL FIXTURES**SECTION
16210****16210.1 DESCRIPTION**

The Contractor shall provide and install all lighting systems for the Project, complete with lamps, brackets, hangers, mounting devices and all other miscellaneous components required to complete the lighting system as shown on the Drawings and in accordance with these Specifications.

16210.1.1 RELATED WORK

Section 16010 - Electrical General Requirements

16210.1.2 SUBMITTALS

Shop drawings shall be submitted for all light fixtures in accordance with Section 1300 of these Specifications.

16210.1.3 DEFINITIONS

Not used.

16210.2 MATERIALS**16210.2.1 LIGHTING FIXTURE TYPES AND SIZES**

Shall be as designated on the Drawings or as otherwise required by the Special Provisions. All work, equipment, and materials shall be in accordance with UL "Standards for Electric Lighting Fixtures", No. 57, and the NEC (National Electric Code).

16210.2.2 INCANDESCENT FIXTURES

Shall be complete with medium base socket, all hardware required for installation, and lamps. Lamps shall be medium base, inside frosted, general purpose, or the project type as referenced in the electrical schedule.

16210.2.3 FLUORESCENT FIXTURES

Shall be provided complete with Class "P" high power factor, electronic type ballast with a -20°F temperature rating, together with all miscellaneous hardware and lamps. Ballast shall be CBM certified, ETL rated, with maximum sound level equivalent to General Electric Company Sound Rating "A". Lamps shall be cool white unless otherwise required on the Drawings.

16210.2.4 HIGH INTENSITY DISCHARGE FIXTURES

Shall be ballast type, complete with all miscellaneous hardware and lamps. Photocells shall be used as required on the Drawings. Ballast shall be constant wattage, high power factor type. Lamps shall be inside frosted and of the wattage indicated.

16210.2.5 HIGH PRESSURE SODIUM FIXTURES

High-pressure sodium and metal halide fixtures shall be suitable for all burning positions as specified for each type of luminaire.

16210.3 CONSTRUCTION REQUIREMENTS

ELECTRICAL FIXTURES**SECTION
16210**

16210.3.1 Fixtures and related materials shall be installed as nearly as possible in the locations shown on the Drawings. The Contractor shall coordinate the exact locations with structure, equipment, and other devices as approved by the Engineer and/or the Owner. Mounting heights shall be as indicated on the Drawings.

16210.3.2 Conductors serving grid ceiling fixtures shall be enclosed in 1/2 inch flex conduit from a junction box attached to the building structure. Fixture locations shall be coordinated with ceiling system. Fixtures shall be securely fastened to the ceiling framing members.

16210.4 METHOD OF MEASUREMENT

Measurement for the lighting fixtures will not be made separately but will be included in the measurement for the building listed in the Bid Schedule.

16210.5 BASIS OF PAYMENT

Separate payment will not be made for light fixtures. Payment will be included in the contract unit price for the building in which the fixtures are installed and listed in the Bid Schedule.

LIQUID LEVEL SWITCHES**SECTION
16315****16315.1 DESCRIPTION**

The Contractor shall furnish, test, install, and place into satisfactory operation the liquid level switches with all spare parts, accessories, and appurtenances as herein specified and as shown on the Drawings.

16315.1.1 RELATED WORK

Section 17000 – Instrumentation & Control, General

16315.1.2 SUBMITTALS

The Contractor shall provide descriptive information which indicates the model number, manufacturer's name, dimensions, measuring range and manufacturer's certification of performance in accordance with the requirements of Section 01300.

16315.2 MATERIALS**16315.2.1 LIQUID LEVEL SWITCHES**

1. Device identification: See Section SP17000.
2. Float actuated switch shall be a dry contact type switch in a hermetically sealed polypropylene casing, suspended on a PVC coated cable.
3. The number of floats per level system shall be as shown.
4. The switch rating shall be at least 5 amps at 120 VAC.
5. Switch set points shall be as shown on the drawings.
6. Mercury switch type capsules are not allowed.
7. As manufactured by:
 - a) Dwyer CFS2
 - b) B/W Controls
 - c) MagneTek
 - d) or approved equal.

16315.3 CONSTRUCTION REQUIREMENTS

The Contractor shall provide all materials needed to install equipment in accordance with the manufacturer's recommendations and at the locations shown on the Drawings.

16315.4 METHOD OF MEASUREMENT

Separate measurement of this equipment will not be made. Measurement will be included as per Section 17000.

16315.5 BASIS OF PAYMENT

Separate payment for this equipment will not be made.

16400.1 GENERAL**16400.1.1 APPLICABLE SECTIONS**

The General Conditions, Supplementary General Conditions, Special Conditions, Alternates and addenda, applicable drawings and the technical specifications herein shall apply to all work under this Division 16.

16400.1.2 SCOPE

Provide all operations, methods, labor and equipment and provide and install all materials and incidentals necessary for the completion of the work as specified herein or included on the drawings.

16400.1.3 WORK INCLUDED

- A. Electrical work required for this work is shown on the drawings and includes, but is not necessarily limited to:
 - 1. Complete new electrical distribution system for power and lighting as shown.
 - 2. Complete system of raceways and outlets for Control and all other auxiliary systems of this Division 16. Unless noted otherwise, the equipment and wiring of these auxiliary systems will be furnished and installed under their respective sections; however, the conduit raceway systems will be furnished and installed under this Section 16400.
 - 3. All excavating, backfilling, compacting, and grading required for the installation of all work covered under this Division 16.
- B. Shall furnish and install all component parts of all the systems required for their safe and proper operation, whether or not specifically mentioned or noted on the drawings, except those items or articles which are specifically noted hereinafter as being supplied otherwise.
- C. Perform all trenching and backfilling required in connection with the work of this section in strict accordance with the provisions of Division 02000 of these specifications.
- D. Provide all required electrical connections and service to items described in all other sections of these specifications. Provide all those services outlined in other divisions of the specifications as being done by the electrical sub-contractor.

16400.1.4 RELATED WORK SPECIFIED ELSEWHERE:

Section 16010 – Electrical General Requirements
Section 16410 – Fuses
Section 16210 – Electrical Fixtures

16400.2 PRODUCTS**16400.2.1 DISTRIBUTION PANELBOARDS**

- A. Distribution panelboards shall be factory assembled dead front, wall mounted as scheduled and braced for the indicated ampere rms symmetrical with equipment, bussing connections, circuit breakers and all similar components indicated on the drawings or required for proper completion. Each breaker shall have an etched micarta nameplate secured by two cadmium plated screws. Nameplates shall indicate equipment served as shown in schedule. Busses shall be copper of a maximum current density of 1000 amperes per inch and shall be equipped with uninsulated equipment ground bus. Three phase, 4-wire panels shall have full capacity neutral bus.
- B. All floor mounted panels shall be mounted on a **4" housekeeping pad** and therefore to comply with NEC, the operating handles of switches and breakers shall be no more than 6'-2" above the bottom of the panel.
- C. Distribution panel boards shall be wall mounted as indicated in schedules. For access to wiring gutters, panel shall be door within door construction. Shall be Square D, I-Line or equal of Siemens I.T.E., Cutler Hammer/Westinghouse or General Electric.

16400.2.2 BRANCH CIRCUIT PANELBOARDS

- A. Branch circuit panelboards shall be Square D for the scheduled voltage, 3 phase, 4 wire operation or equal of Siemens, or General Electric. Shall be equipped with bolt-on breakers. Minimum width shall be 20 inches. Minimum depth shall be 5.75 inches. Panel trims shall be of the door within door construction.
- B. Busses shall be copper.
- C. Branch circuit breakers shall be provided per schedules on drawings. All multi-pole breakers shall be common trip.
- D. Doors shall be complete with corrected circuit schedule on inside. Panels shall be NEMA 3R type construction.

16400.2.3 DRY TYPE TRANSFORMERS

- A. General Purpose Dry-Type Transformers: (Under 600 volts)
 - 1. General: Furnish and install at locations shown on the drawings dry-type two winding power transformers for general power and lighting applications indicated. Transformers shall be UL listed and bear the required Listing Mark.
 - 2. Electrical Rating: Shall be 60 hertz of sizes, phases, high voltage and low voltage as scheduled on the drawings. Each transformer, unless specifically noted otherwise, shall have six (6) 2-1/2% full capacity taps, two above and four below nominal voltage in the high voltage winding. Temperature Classification: Each transformer shall utilize an insulation system that has been properly temperature classified and approved by Underwriters' Laboratories. Unless specifically noted otherwise, the insulation classification shall be 220 C with 150 C winding temperature rise in accordance with Underwriters' Laboratories specification UL506.

EXHIBIT C

SERVICE AND DISTRIBUTION SYSTEMS

SECTION

16400

3. Load Rating:

- a. Each transformer supplied to this specification shall be capable of operating at 100% of nameplate rating (NPR) continuously while in an ambient temperature not exceeding 40°C and shall be capable of meeting the daily overload requirements of ANSI Standard C57.96 as stated in the following chart:

PERMISSIBLE ONCE DAILY OVERLOADS WITH NORMAL LIFE MAINTAINED			
Peak Load Following and Followed by a Constant Load of			
Peak Load Time (Hours)	90% NPR	70% NPR	50% NPR
1/2	162% NPR	185% NPR	200% NPR
1	138% NPR	148% NPR	152% NPR
2	123% NPR	128% NPR	133% NPR
4	113% NPR	115% NPR	118% NPR
8	106% NPR	107% NPR	108% NPR
NPR = Nameplate Rating			

- b. Transformer loaded in accordance with this paragraph shall be capable of long service life under the thermal conditions specified. There shall be no need for derating.

4. Sound Rating: Each transformer shall have sound levels equal or lower than those established in the latest revision of ANSI Standard C89 as shown in the following chart:

Transformer Rating KVA	Maximum Sound Level Decibels
10-50	45
51-150	50
150-300	55

5. Other Requirements: The following requirements shall be in accordance with Underwriters' Laboratories specification UL506:

- a. Enclosure:
- (i) Ventilation openings
 - (ii) Corrosion resistance
 - (iii) Cable bending space
 - (iv) Grounding provisions
 - (v) Surface temperature rise
 - (vi) Wiring compartment temperature rise
 - (vii) Terminations

6. Test Requirements:
 - a. Each transformer furnished to this specification shall be subjected to the following production tests:
 - (i) Applied potential
 - (ii) Induced potential
 - (iii) No load losses
 - (iv) Voltage ratio
 - (v) Polarity
 - (vi) Continuity
 - b. The manufacturer shall have performed the following additional tests on units identical to the design type being furnished to this specification. Proof of performance of these tests in the form of test data sheets shall be provided as part of the shop drawing submittal.
 - (i) Sound levels
 - (ii) Temperature rise tests
 - (iii) Full-load losses
 - (iv) Regulation
 - (v) Impedance
7. Shop Drawings: Submit shop drawing for review prior to delivery to job site.

16400.3 EXECUTION**16400.3.1 INSTALLATION OF GROUNDING SYSTEM**

- A. The conduit system and neutral conductor of the wiring system shall be grounded to the cold water pipe having a continuous path to earth in compliance with grounding provisions as outlined in the NEC. Point of connection to the water system shall be as near as practicable to the service entrance. Provide bonding jumper same size as system ground to provide ground continuity from customer's side of metallic lines service entrance and street side of metallic mains. The neutral and ground shall be connected together at the main service switch only.
- B. Where the water main is not metallic, delete water pipe ground requirements and provide a concrete encased electrode consisting of a 20-foot length of #3/0 bare copper conductor tied to the steel reinforcing bars and encased within a concrete footing. This footing shall be in direct contact with earth and located near the main panel.
- C. The Contractor shall also install a made electrode ground system consisting of copperclad rods spaced not closer than six feet apart. Grounding conductors and connections to ground rods shall be protected from damage and shall be placed to avoid disconnect by unauthorized personnel. Interconnect with water pipe ground system.
- D. The equipment grounding system shall be such that all metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items in close proximity with the electrical circuits operate continuously at ground potential and provide a low impedance path for the possible ground fault currents. The system shall comply with the National Electrical Code, modified as indicated on the drawings or specifications and as hereinafter specified to incorporate a maximum 25 ohms ground resistance. Grounding connections shall be accessible for inspection.

- E. The distributions system shall be provided with a separate equipment grounding conductor for each single or three-phase feeder, each branch circuit with a multi-pole protective device and each single phase receptacle and motor circuit as indicated. The required grounding conductor shall be installed in the common raceway with the related phase and/or neutral conductors. Single-phase branch circuits required for lighting, shall consist of phase and neutral conductors installed in common metallic conduit which shall serve as the grounding conductor. Conduit equipment connections utilized in conjunction with the above single-phase branch circuits shall be provided with suitable bonding jumpers connected to approved grounding type bushings. Single-phase branch circuits and all branch circuits installed in flexible conduits shall be provided with a separate grounding conductors as hereinbefore specified for the multi-pole branch circuits.

16400.3.2 INSTALLATION OF PANELS

- A. Installation: Unless otherwise indicated on the drawings, install wall panels with the top of the trim 6'-0" above the finished floor. Panels located in equipment rooms and wire closets shall be surface mounted. Floor mounted panels shall be provided with a 4" concrete housekeeping pad. Floor mounted panels shall be anchored to floor at all four corners and to wall or structural member at top for seismic restraint.
- B. Directories: Mount a typewritten directory behind glass or plastic on the inside of each panel door. On the directory, show the circuit number and complete description of all outlets with specific locations on each circuit. In addition, provide a typewritten label inside door showing source of power to panel both as to feeder switch, panel designation and location within buildings.

16400.3.3 GENERAL PURPOSE DRY TYPE TRANSFORMERS

General purpose dry transformers shall be mounted on floor at locations shown on drawings. Each shall be anchored to floor by means of a minimum of four 1/2" x 6" anchor bolts grouted in existing concrete floor.

16400.3.4 TESTING

- A. General: Upon completion of this portion of the work, test all parts of the electrical system in the presence of the Engineer Owner's Representative.
- B. Test Requirements: All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than that required by the National Electrical Code.

16400.3.5 FINAL INSPECTION

- A. This Division 16 contractor's job foreman shall be present at the final inspection of the work by the Owner.
- B. Electrical job foreman shall have pad and pencil to list all deficient items noted. Corrections and adjustments of deficient items shall be done after the inspection, not during.
- C. See Section 16010 for other requirements for final inspection.

SERVICE AND DISTRIBUTION SYSTEMS**SECTION****16400****16400.4 METHOD OF MEASUREMENT**

- 16400.4.1 SERVICE ENTRANCE. Provide all conduit, sweeps, support members, concrete transformer pads & pad vaults, grounding equipment, breakers, disconnects, enclosures, conductors, and appurtenances as required by the local utility, and as shown on the drawings and as defined in the applicable sections of the specifications required for a complete and fully functioning system.
- 16400.4.2 GROUNDING SYSTEM. Provide all grounding conductors, connections, ground rods, ground wells, and associated appurtenances and as shown on the drawings, and as defined in the applicable sections of the specifications.
- 16400.4.3 POWER PANEL (PP) OR MOTOR CONTROL CENTER (MCC). Provide all conduit, sweeps, pull boxes, power panels, motor starters, motor savers, receiving and installation of motor control center, transient voltage surge suppressor (TVSS), support members, grounding equipment, breakers, disconnects, enclosures, conductors and connections, and appurtenances as shown on the drawings and as defined in the applicable sections of the specifications required for a complete and functioning system.
- 16400.4.4 DRY TYPE TRANSFORMERS. Provide dry type transformer and appurtenances as shown on the drawings and as defined in the applicable sections of the specifications required for a complete and functioning system.
- 16400.4.5 LIGHTING PANEL (LP). Provide all conduit, sweeps, support members, grounding equipment, breakers, disconnects, enclosures, conductors and connections, switches, receptacles, and appurtenances as shown on the drawings and as defined in the applicable sections the specifications required for a complete and functioning system. Where lighting fixtures are not called out in the pay item, they are included in the LIGHTING PANEL (LP).
- 16400.4.6 LIGHTING FIXTURES. Material cost for lighting fixtures and all appurtenances. Note: conduit, wire and switches and included in LIGHTING PANEL (LP) section(s).
- 16400.4.7 HEATING VENTILLATION AIR CONDITIONING (HVAC). Provide all conduit, sweeps, support members, grounding equipment, breakers, disconnects, enclosures, conductors, switches, receptacles, and appurtenances as shown on the drawings and as defined in the applicable sections the specifications required for a complete and functioning system. Note: conduit, wire and switches and included in LIGHTING PANEL (LP) section(s).
- 16400.4.8 CONTROL PANELS. Provide all conduit, signal and power conductors and connections, and appurtenances for all control panels as shown on the drawings and as defined in the applicable sections of the specifications required to provide a complete and functioning system.

16400.5 BASIS OF PAYMENT

- 16400.5.1 No separate payment shall be made for furnishing or installing electrical systems, components, or materials required to be installed within the pay limits for a building or enclosure identified in the BID schedule to be furnished by the Contractor.
- 16400.5.2 When electrical systems, components, or materials are measured for a new building or enclosure as shown on the Bid Schedule, separate payment will be made as listed below.
- 16400.5.3 When initial installation or replacement of electrical systems, components, or materials is made in an existing building as shown on the Bid Schedule, the accepted quantity will be paid for at the contract price listed below:

EXHIBIT C**SERVICE AND DISTRIBUTION SYSTEMS****SECTION
16400**

PAY ITEM	UNIT
Service Entrance	Lump Sum
Grounding System	Lump Sum
Lighting Panel LP1 & Control Panel	Lump Sum
Lighting Fixtures	Lump Sum
HVAC	Lump Sum
Control Panels	Lump Sum

FUSES**SECTION
16410****16410.1 GENERAL****16410.1.1 ACCEPTABLE MANUFACTURERS**

- A. Manufacturer: Bussmann.
- B. Other acceptable manufacturer: Gould Shawmut, Littlefuse.
- C. All fuses shall be of one manufacturer. Fuses shall have a 200,000 ampere RMS symmetrical interrupting rating unless noted otherwise.

16410.1.2 FUSE TYPES AND RATINGS

- A. Fuses from 0 to 600 ampere for each circuit serving a single motor shall be UL Class RK5 dual-element Low Peak, LPN-RK (250 volt).
- B. All other fuses in the 0 to 600 ampere range shall be UL Class J, dual-element, time delay, low peak, LPJ-SP (250 volt).
- C. Fuses larger than 600 ampere shall be UL Class L with time delay, Hi Cap, KRP-C.

16410.1.3 METHOD OF MEASUREMENT**16410.1.4 NO SEPARATE MEASUREMENT**

Separate measurement shall NOT be made for furnishing or installing electrical systems, components, materials required to be installed within the pay limits for a building or enclosure identified in the Bid schedule to be furnished by the Contractor.

16410.5 BASIS OF PAYMENT

16410.5.1 No separate payment shall be made for furnishing or installing electrical systems, components, or materials required to be installed within the pay limits for a building or enclosure identified in the BID schedule to be furnished by the Contractor.

16410.5.2 When electrical systems, components, or materials are measured for a new building or enclosure as shown on the Bid Schedule, separate payment will be made as listed in specification 16400.

MAGNETIC INTRUSION SWITCH**SECTION
16960****16960.1 DESCRIPTION**

The Contractor shall furnish, test, install, and place into satisfactory operation the magnetic intrusion switches with all spare parts, accessories, and appurtenances as herein specified and as shown on the Drawings.

16960.1.1 SUBMITTALS

The Contractor shall provide descriptive information which indicates the model number, manufacturer's name, dimensions, measuring range and manufacturer's certification of performance in accordance with the requirements of Section 01300.

16960.2 MATERIALS**16960.2.1 MAGNETIC INTRUSION SWITCH**

1. Device identification: See Plans.
2. Magnetic industrial contact type with stainless steel armored cable.
3. Sealed unit.
4. UL Listed
5. Form A Contact or Form C Contact.
6. Supports gaps up to 3"
7. Manufacturers:
 - a) GE Security SR-2505A
 - b) GE Security SR-2507AH
 - c) or approved equal.

16960.3 CONSTRUCTION REQUIREMENTS

The Contractor shall provide all materials needed to install equipment in accordance with the manufacturer's recommendations and at the locations shown on the Drawings. Contractor shall provide all mounting brackets, fasteners and other appurtenances required for a complete installation and to accommodate required offsets based on site conditions.

16960.4 METHOD OF MEASUREMENT

Separate measurement of this equipment will not be made.

16960.5 BASIS OF PAYMENT

Separate payment for this equipment will not be made.

SUBMERSIBLE PRESSURE TRANSMITTERS**SECTION
17310SP****17310.1 DESCRIPTION**

The Contractor shall furnish, test, install, and place into satisfactory operation the submersible pressure transmitter (level transducer) with all spare parts, accessories, and appurtenances as herein specified and as shown on the Drawings.

17310.1.1 RELATED WORK

Section 17000 – Instrumentation & Control, General

17310.1.2 SUBMITTALS

The Contractor shall provide descriptive information which indicates the model number, manufacturer's name, dimensions, measuring range and manufacturer's certification of performance in accordance with the requirements of Section 01300.

17310.2 MATERIALS**17310.2.1 SUBMERSIBLE PRESSURE TRANSMITTERS**

1. Device identification: See project drawings.
2. The level transmitter shall be a two-wire type and have an accuracy of 0.25% of full scale, unless noted otherwise in drawings.
3. The transmitter shall produce a 4-20 mA DC signal proportionate to the span range of the transmitter.
4. An integral electrical cable shall be supplied with strain relief that shall have the capability of suspending the transmitter to the proper depth and reaching the local RTU without cable splicing.
5. The cable shall be of vented polyurethane capable of supporting sensor and cable weight with strain relief.
6. Operating range and other specifications as indicated in project drawings.
7. Proof Pressure: 2 times range. Burst Pressure: 4 times range.
8. Measuring element shall include cage seal.
9. Electrical Protection: Reverse polarity protection, short circuit protection. Optional lightning protection required if noted in drawings.
10. Manufacturers:
 - a) NOSHOK 613 Series
 - b) Wika Tronic LS-10
 - c) or approved equal.

17310.3 CONSTRUCTION REQUIREMENTS

The Contractor shall provide all materials needed to install equipment in accordance with the manufacturer's recommendations and at the locations shown on the Drawings.

17310.4 METHOD OF MEASUREMENT

Separate measurement of this equipment will not be made. Measurement will be included as per Section 17000.

17310.5 BASIS OF PAYMENT

Separate payment for this equipment will not be made.

DOCUMENT 00 90 10

ADDENDUM No. 1

PART 1 GENERAL

1.0 DOCUMENT INCLUDES

- A. Changes to the Bid Documents
- B. Changes to Specifications
- C. Changes to Plan Set
- D. Clarifications and Response to Questions
- E. Frost Property Geotechnical Report

1.1 CONSTRUCTION CONTRACT

- A. The Construction Contract is known as:

KAYSVILLE CITY 1.0 MG WATER TANK

- B. Date of this Addendum: 2/5/2020
- C. All other provisions in the contract to remain in full force and effect.

PART 2 CHANGES TO BID DOCUMENTS

2.0 DOCUMENTS INCLUDED

- A. INFORMATION FOR BIDDERS
- B. BID FORM

2.1 CHANGES TO INFORMATION FOR BIDDERS

- A. Bid submittal time has been changed. Bids will now be received until 3:00 p.m. local time on February 13, 2020

2.2 CHANGES TO BID FORM

- A. Substantial Completion Date has been changed to November 1st, 2020.
- B. Definition of substantial completion has been clarified.
- C. Bid schedule has been revised as follows:
 - a. Title of Item 7.0 has been revised to "EARTHWORK, TANK". "Temporary Shoring" has been removed from the title of Bid Item 7.
 - b. Added Bid Item 42, Water Distribution Pipe, PVC C900, 8".
 - c. Added Bid Item 43, Valve, Gate, 8".
 - d. Added Bid Item 44, Earth Work, Access Road.

PART 3 CHANGES TO SPECIFICATIONS

3.0 DOCUMENTS INCLUDED

- A. 01 29 00 SP MEASUREMENT & PAYMENT



3.1 CHANGES TO MEASUREMENT & PAYMENT

- A. Section 3-5 – Removed “asphalt cutting for pipe install, and replacement of asphalt including base material.” Pipe to be installed prior to any asphalt.
- B. Section 4-9 - Added bid item to explain measurement and payment for the installation of water pipe, PVC C-900, 8 inch.
- C. Section 4-10 - Added bid item to explain measurement and payment for the installation of gate valve, 8 inch.
- D. Section 4-11 - Added bid item to explain measurement and payment for the task earthwork, subdivision road.

PART 4 CHANGES TO PLAN SET

4.0 Documents Added

- A. Added Temporary Access Road Plan Set from Ensign Engineering

Clarification: Temporary road section is shown in Detail 3 on C-300. Temporary road to be built per this detail. Detail represents both cut and fill configurations. A plan view of the temporary road grading is shown on sheet C-100. Quantities for bidding are also shown on C-100. Other sheets are included for profiles only showing difference between existing grade and proposed grade. Per comments of design engineer it is not anticipated to need road base for the temporary road, thus road base is not being required on the temporary road. However, as part of bid item 4-11, the contractor shall ensure accessibility for all construction vehicles for construction of the tank by providing gravel and road base as needed. The Geotechnical report for the Frost Property is being provided as part of the Addendum.

4.1 Revised Sheet PP1 of Booster Station Project

- A. Added 8” distribution line with appurtenances.
- B. Added 60 LF 20” diameter steel pipe casing for distribution line.
- C. Added additional callouts to Construction Notes.

4.2 Revised Sheet PP2 of Booster Station Project

- A. Added 8” distribution line with appurtenances.
- B. Added additional callouts to Construction Notes.

4.3 Revised Sheet PP3 of Booster Station Project

- A. Added 8” distribution line with appurtenances.
- B. Added additional callouts to Construction Notes.

4.4 Revised Sheet PP4 of Booster Station Project

- A. Added 8" distribution line with appurtenances.
 - B. Added additional callouts to Construction Notes.
- 4.5 Revised Sheet PP5 of Booster Station Project
 - A. Added 8" distribution line with appurtenances.
 - B. Added additional callouts to Construction Notes.
- 4.6 Revised Sheet D1 of Booster Station Project
 - A. Added Detail E for Trench Detail.
- 4.7 Revised Sheet E201 of Booster Station Project
 - A. Revised and added conduits C-000 and C-001.
- 4.8 Revised Sheet E301 of Booster Station Project
 - A. Revised utility service to show the extension of primary power from cul-de-sac to utility transformer at electrical equipment rack location. (see clarification below for responsibilities of contractor)
 - B. Added utility transformer near equipment rack. (see clarification below for responsibilities of contractor)
 - C. Corrected callouts to tank equipment and conduit.
- 4.9 Revised Sheet E401 of Booster Station Project
 - A. Added item 14 to electrical equipment schedule.
- PART 5 CLARIFICATION AND RESPONSE TO QUESTIONS
 - 5.0 Clarification and Response to Questions
 - A. Excess Material?
Answer: The excess material from the tank excavation needs to be disposed of off site. A temporary location for stockpiling backfill material excavated from the tank location will be provided before bid due date. The excess material from the temporary road construction can be stockpiled on the lots designated on sheet C-100.
 - B. Xypex needed?
Answer: Xypex required in roof slab only.
 - C. Quality Control Testing?
Answer: Quality control testing (soil proctors, compaction testing, concrete testing, etc.) to be included in contractor's bid. Special inspections for concrete tank and for booster

station building not included in bid (Kaysville City will contract with third party to perform special inspections.)

D. Can Soil Nails be Used for Temporary Shoring

Answer: For bid item 24, please provide a cost for temporary shoring that will not use soil nails and not cross the property line. Temporary shoring plan to be provided to engineer for review two weeks before construction of the shoring.

We are still pursuing other options with the forest service that may allow soil nails or temporary easements for excavation, but nothing has been finalized and may be rejected by the Forest Service.

E. Power to site?

Answer: Kaysville Power to provide power to end of cul-de-sac with sectionalizing cabinet. Contractor to trench from sectionalizing cabinet to transformer location near meter as shown on the revised plan sheet. Kaysville Power will run conduit and conductor from the sectionalizing cabinet to the transformer. Kaysville Power will provide and set the transformer. Contractor to provide conduit and conductor from the transformer to meter.

F. Can pre-cast concrete blocks be used instead of rocks that are shown on the plans?

Answer: Pre-cast concrete block walls are an acceptable alternative to the rock wall. Bid item cost shall include the cost to engineer pre-cast retaining wall, purchase all materials, transport all materials to site, and install all materials per the engineered plans. Engineered plans must be stamped by an engineer licensed in Utah.

G. Where is the closest construction water access and is there a cost for this?

Answer: Water for construction will be pulled from a hydrant located in the Orchard Ridge Subdivision Phase 1. City will provide a meter for the hydrant. Contractor will not be charged for water.

INVITATION TO BID for PREQUALIFIED BIDDERS

Separate sealed bids for construction of Kaysville City, 1.0 MG Water Tank will be received by Kaysville City from bidders.

Bids will be publicly opened and read aloud at 3:00 PM on February 13th, 2020 at the following location: 80 North Main Street, Kaysville, UT.

A five (5) percent Bid Bond is required with your bid.

Bidding documents will be issued only to pre-qualified bidders and interested suppliers. Bids will be received only from pre-qualified bidders and bids submitted from unqualified bidders will be returned unopened. An advertisement for qualification statements was published in the Salt Lake Tribune & Deseret News during the month of July/August 2019. Proof of publication is available upon request. Qualification statements were received from prospective bidders on September 4th, 2019.

The work to be performed under this project shall consist of furnishing all labor, materials and equipment required to construct the facilities and features described by the CONTRACT DOCUMENTS and as shown on the DRAWINGS.

Kaysville City, 1.0 MG Water Tank

This project is privately funded. All payments to contractor will be approved and paid for by Kaysville City.

Plans and specifications have been prepared by Sunrise Engineering, Inc. and will be made available through the Sunrise Sharefile site. Pre-qualified contractors will receive an email allowing them to access the site to download all applicable documents. Bidders must register and sign-in to access to CONTRACT DOCUMENTS and DRAWINGS. Notices regarding changes/amendments to the CONTRACT DOCUMENTS and DRAWINGS will be sent to the e-mail address associated with the bidder's pre-qualification. Bidders are responsible to maintain current and correct contact information and check the sharefile site often to receive updates or additional documents/changes/amendments. The ENGINEER for this Contract will be Sunrise Engineering, Incorporated and they will be represented by Steve Hansen, P.E. as Project Engineer.

This WORK will be constructed by award of a competitive, sealed bid contract awarded to the low bidder. Compensation to the CONTRACTOR will be made through progressive monthly payments in accordance with the General Conditions of these CONTRACT DOCUMENTS at the units and prices indicated in the BID Schedule.

When construction under this contract takes place on property owned or administered by agencies or organizations other than the OWNER, all construction shall be completed in accordance with the special requirements of that entity which are contained or referenced in these CONTRACT DOCUMENTS

Information will be provided on the DRAWINGS and in these documents to indicate areas of WORK which fall on property owned or administered by agencies or organizations other than the OWNER.

A pre-bid meeting will be held on January 21st at 1:30 PM, at the Kaysville Police Station located at 80 N. Main Street, Kaysville, UT 84043.

Attendance at the pre-bid tour is mandatory.

Names of those in attendance will be recorded.

BID FORM

Bid of _____
(Insert Contractor's Name)

(hereinafter called "BIDDER"), organized and existing under the laws of the State of Utah and doing

business as _____ to
(Insert "a corporation", "a partnership" or "an individual" as applicable)

_____ (hereinafter called "OWNER").

In compliance with the Invitation to Bid, BIDDER hereby proposes to perform all WORK for construction of the **Kaysville City, 1.0 MG Water Tank** in strict accordance with the CONTRACT DOCUMENTS, within the time set forth therein, and at the prices stated below in the BID Schedule.

By submission of this BID, each BIDDER certifies, and in the case of a joint BID, each party thereto certifies as to their own organization, that this BID has been prepared independently, without consultation, communication, or agreement as to any matter relating to the BID with any other BIDDER or with any competitor.

BIDDER hereby agrees to commence WORK under this Contract on or before a date specified in the NOTICE TO PROCEED (TBD) and to achieve substantial completion by November 1st, 2020. Substantial completion is defined by having passed the leak test for the tank, by having pressure tested, disinfected, and connected the transmission line and distribution line to the water system such that water can be boosted to the tank and developer can receive water from the tank, and having the booster station functional to boost water to the tank. BIDDER further agrees to pay liquidated damages, the sum of \$500.00, for each consecutive calendar day thereafter as provided in APWA GENERAL CONDITIONS. This BID will remain open for sixty (60) days after the date of Bid Opening. If awarded the Contract, the BIDDER will sign the Agreement and submit the security and the other documents required by the CONTRACT within ten (10) days after the date of the OWNER'S "Notice of Award".

BIDDER acknowledges receipt of the following ADDENDA:

The BID Schedule is provided on the following page. The BID Schedule must be completed in full by the BIDDER and signed properly to be considered responsible.

BID SCHEDULE

CONTRACT FOR: Kaysville City, 1.0 MG Water Tank

The undersigned Bidder, having examined and determined the scope of the Contract Documents, hereby proposes to perform the work described herein for the following unit prices or lump sum amounts.

Note: 1. Bids shall include sales tax and all other applicable taxes and fees

2. All bids shall be checked for errors. If errors are made, unit prices shall govern and corrections will be made according to the unit price and totals will be revised to reflect the corrections.

3. The contract will be awarded to the lowest responsible, responsive bidder when considering the total for the tank and booster station combined. The transmission line is optional work that may be awarded to the winning contractor after the start of the project.

No.	Item	Quantity	Unit	Unit Price	Amount
	1.0 MG TANK				
1.0	MOBILIZATION	1	LS		
2.0	QUALITY CONTROL & TESTING	1	LS		
3.0	SWPP PLAN & IMPLEMENTATION	1	LS		
4.0	CLEARING AND GRUBBING	1	LS		
5.0	REVEGETATION & EROSION CONTROL	1	LS		
6.0	EARTHWORK, ACCESS ROAD	1	LS		
7.0	EARTHWORK, TANK	1	LS		
8.0	IMPORT TANK BASE MATERIAL	880	TON		
9.0	IMPORT TANK STRUCTURAL FILL	880	TON		
10.0	IMPORT PIPE BEDDING	480	TON		
11.0	IMPORT PIPE ZONE BACKFILL	1,260	TON		
12.0	IMPORT PIPE TRENCH BACKFILL	2,090	TON		
13.0	WATER PIPE, PVC C900, 10"	1,440	LF		
14.0	RING DRAIN, CORRUGATED DUAL WALL HDPE, 6"	1,320	LF		
15.0	VAULT DRAIN, CORRUGATED DUAL WALL HDPE, 4"	110	LF		
16.0	VALVE, GATE, 10"	4	EA		
17.0	3 IN. AIR VAC ASSEMBLY W/ 5 FT MANHOLE	1	EA		
18.0	METER/ ISOLATION VALVE VAULT	1	LS		
19.0	OVERFLOW DISCHARGE BOX & OUTFALL	1	LS		
20.0	CHAIN-LINK FENCE & GATE	720	LF		
21.0	CONCRETE WATER TANK, 1.0 MG, AWWA D115	1	LS		
22.0	ELECTRICAL WORK	1	LS		
23.0	ROCK RETAINING WALL	1	LS		
24.0	TEMPORARY SHORING	1	LS		
				SUBTOTAL	
	BOOSTER STATION (ALL SHEETS EXCEPT PP SHEETS)				
25.0	MOBILIZATION	1	LS		
26.0	QUALITY CONTROL AND TESTING	1	LS		
27.0	SWPP PLAN & IMPLEMENTATION	1	LS		
28.0	CLEARING AND GRUBBING	1	LS		
29.0	BOOSTER STATION SITE WORK	1	LS		
30.0	BOOSTER STATION STRUCTURE AND APPURTENANCES	1	LS		
31.0	MECHANICAL PIPING AND EQUIPMENT	1	LS		
32.0	PRE-PACKAGED BOOSTER PAQ STATION AND PIPING	1	LS		
33.0	ELECTRICAL SYSTEM	1	LS		
				SUBTOTAL	
				TOTAL	

EXHIBIT C

Form 403A

The undersigned Bidder certifies that this proposal is made in good faith, without collusion or connection with any other person or persons bidding on the work.

Seal (if bid is by Corporation)

Respectfully Submitted:

Bidder: _____

Signature _____

Title: _____

License No. _____ Address: _____

Date: _____

BID OPTION (ADDITIONAL WORK)					
	TRANSMISSION LINE FROM BOOSTER TO TANK (PP SHEETS)				
34.0	MOBILIZATION	1	LS		
35.0	QUALITY CONTROL AND TESTING	1	LS		
36.0	SWPP PLAN & IMPLEMENTATION	1	LS		
37.0	IMPORT PIPE BEDDING	220	TON		
38.0	IMPORT PIPE ZONE BACKFILL	580	TON		
39.0	IMPORT PIPE TRENCH BACKFILL	1,160	TON		
40.0	WATER PIPE, PVC C900, 10"	2,000	LF		
41.0	VALVE, GATE, 10"	3	EA		
42.0	WATER PIPE, PVC C900, 8"	1,970	LF		
43.0	VALVE, GATE, 8"	11	LS		
44.0	EARTH WORK, ACCESS ROAD	1	LS		
				SUBTOTAL	

3-2 QUALITY CONTROL & TESTING (BID ITEM 26)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment will cover the materials quality control and testing for all import materials, concrete work, earthwork, and strength as required in APWA and in the contract documents. If, during construction, additional control testing beyond what is required in the APWA and contract documents is requested by ENGINEER and testing shows product meets specification, such testing will be paid for by Change Order. (Refer to Section 01 45 00, Quality Control).

3-3 SWPP PLAN & IMPLEMENTATION (BID ITEM 27)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the CONTRACTOR in providing and maintaining a storm water pollution prevention plan and controls / best management practices, as outlined by the State of Utah DWQ. Permit No. UTR300000 found at: <http://www.waterquality.utah.gov/UPDES/stormwatercon.htm> which outlines the required steps for preparing and maintaining the SWPPP, provides guidelines, examples, templates, BMP specifications, etc. The CONTRACTOR will be listed as an operator along with Kaysville City. Payment also covers 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 APWA Section 31 25 00 and Special Provision 31 25 00)

3-4 CLEARING & GRUBBING (BID ITEM 28)

- A. Measurement will be made by lump sum (LUMP).
- B. Payment covers the cost of clearing, grubbing, and disposal of native topsoil, vegetation, trees, and other organic and deleterious materials from the construction site. (Refer to Section 31 11 00, Site Clearing)

3-5 BOOSTER STATION SITE WORK (BID ITEM 29)

- A. Measurement will be made by lump sum (LUMP).
- ~~B. Payment covers the cost of all items shown on the site plan including but not limited to catch basin w/ grate, 8 in. PVC SDR 35 overflow line, site grading and earthwork, 6 in concrete driveway w/ flare approach with base material, removal and replacing existing curb and gutter as necessary, rip rap at outfall, residual analyzer waterline connection, service connection, fencing and gates, and landscaping, asphalt cutting for pipe install, and replacement of asphalt including base material.~~
- C. Payment covers the cost of the size and type of water pipe indicated on the plans, with installation per Construction Plans, connections to structures, Utah DDW requirements including testing and disinfection, and surface restoration not identified as separate pay items in the price schedule. Payment covers the cost of incidental work including but not limited to: joint restraint systems, fittings, couplings, joint lubricants; removal and disposal of interfering structures and obstructions; jackhammer work; trench shoring or trench boxes as applicable; underground plastic line markers and tracer wire; removal and disposal of waste materials; restoration of all utilities damaged as a result of operations; site dewatering; pipe line cleaning; adjustments to grade of valve boxes or traffic lids or manholes; and similar work to complete the installation of the water line. Payment also covers the cost to make Connection #1 as shown in the construction documents. Payment covers the cost of all valves shown on the site plan. Payment Limits of pipe for this item are as shown on the plans.

4-7 WATER PIPE, PVC C-900, 10 INCH (BID ITEM 40)

- A. Measurement will be made by lineal feet with no reduction in length for valves and fittings (LF)
- B. Payment covers the cost of the size and type of pipe indicated, with installation per Construction Plans, connections to structures, Utah DDW requirements including testing and disinfection, and surface restoration not identified as separate pay items in the price schedule. Payment covers the cost of incidental work including but not limited to: joint restraint systems, fittings, couplings, joint lubricants; removal and disposal of interfering structures and obstructions; jackhammer work; trench shoring or trench boxes as applicable; underground plastic line markers and tracer wire; removal and disposal of waste materials; restoration of all utilities damaged as a result of operations; site dewatering; pipe line cleaning; adjustments to grade of valve boxes or traffic lids or manholes; and similar work to complete the installation of the water line.
- C. Payment covers the cost of all required labor and equipment required to place and compact pipe bedding, pipe zone backfill, and trench backfill materials. In the event native materials are deemed unacceptable for these uses by the ENGINEER, import materials meeting specification(s) will be utilized. The cost for import (i.e. purchase and transport) will be paid for separately.

4-8 GATE VALVE, 10 INCH (BID ITEM 41)

- A. Measurement will be made by actual count per each installed (EACH)
- B. Payment covers the cost of excavation, foundation preparation, restraint devices, valve boxes, valve, concrete collar, backfill and other miscellaneous devices, materials, or equipment required for a complete installation. (Refer to Section 33 12 16, Water Valves)

4-9 WATER PIPE, PVC C-900, 8 INCH (BID ITEM 42)

- A. Measurement will be made by lineal feet with no reduction in length for valves and fittings (LF)
- B. Payment covers the cost of the size and type of pipe indicated, with installation per Construction Plans, connections to structures, Utah DDW requirements including testing and disinfection, and surface restoration not identified as separate pay items in the price schedule. Payment covers the cost of incidental work including but not limited to: joint restraint systems, fittings, couplings, joint lubricants; removal and disposal of interfering structures and obstructions; jackhammer work; trench shoring or trench boxes as applicable; underground plastic line markers and tracer wire; removal and disposal of waste materials; restoration of all utilities damaged as a result of operations; site dewatering; pipe line cleaning; adjustments to grade of valve boxes or traffic lids or manholes; and similar work to complete the installation of the water line.
- C. Payment covers the cost of all required labor and equipment required to place and compact pipe bedding, pipe zone backfill, and trench backfill materials. In the event native materials are deemed unacceptable for these uses by the ENGINEER, import materials meeting specification(s) will be utilized. The cost for import (i.e. purchase and transport) will be paid for separately.

4-10 GATE VALVE, 8 INCH (BID ITEM 43)

- A. Measurement will be made by actual count per each installed (EACH)
- B. Payment covers the cost of excavation, foundation preparation, restraint devices, valve boxes, valve, concrete collar, backfill and other miscellaneous devices, materials, or equipment required for a complete installation. (Refer to Section 33 12 16, Water Valves)

4-11 EARTHWORK, ACCESS ROAD (BID ITEM 44)

- A. Measurement will be made by lump sum (LUMP)
- B. Payment covers the cost of furnishing all necessary equipment and labor to excavate, fill, bring to grade, haul, haul-off, spoil on site, stockpile, and move and compact all earthwork as required to produce a workable and stable access road as described on the construction plans. Placement and backfill of fill areas of roadway shall be constructed per APWA 32 05 10 "Backfilling Roadways". Per Kaysville City standards compaction of material shall be 96% or greater relative to a standard proctor density, with a lift thickness of 12 inches when using riding compaction equipment. Compaction testing of materials shall be required for every 1000 square yards of every lift. Contractor to ensure accessibility to the tank site by all required construction equipment and provided gravel and road base as needed.

- END OF SECTION -

DOCUMENT 00 90 20

ADDENDUM No. 2

PART 1 GENERAL

1.0 DOCUMENT INCLUDES

- A. Changes to Plan Set
- B. Clarifications and Response to Questions
- C. Addition Documents

1.1 CONSTRUCTION CONTRACT

- A. The Construction Contract is known as:

KAYSVILLE CITY 1.0 MG WATER TANK

- B. Date of this Addendum: 2/10/2020
- C. All other provisions in the contract to remain in full force and effect.

PART 2 CHANGES TO PLAN SET

2.0 Revised Sheet G4 of 1.0 MG Tank Project

- A. Revised Section C Note 3.4 to read "Xypex admixture required in tank roof. Refer to tank pre-stressing plans from supplier for Xypex requirements in other elements."

2.1 Revised Sheet SP1 of Booster Station Project

- B. Changed inlet pipe from 10" to 8"
- C. Clarified Connection #1 from 8" inlet to existing 8" distribution watermain.
- D. Clarified transition from ductile iron pipe to PVC pipe.

2.2 Revised Sheet MP1 of Booster Station Project

- A. Changed type of transition joint from solid sleeve coupler to Romac Flexijoint Flexible Balljoint fitting (or Equal).
- B. Added Restrained Flanged Coupling Adapter after Flexible Balljoint.
- C. Added Note clarifying ductile iron as pipe material within booster station.

2.3 Revised Sheet MP2 of Booster Station Project

- A. Changed type of transition joint from solid sleeve coupler to Romac Flexijoint Flexible Balljoint fitting (or Equal).
- B. Added Restrained Flanged Coupling Adapter after Flexible Balljoint.
- C. Added Note clarifying ductile iron as pipe material within booster station.



2.4 Revised Sheet MP3 of Booster Station Project

- A. Added Note clarifying ductile iron as pipe material within booster station.

2.5 Revised Sheet CD2 of 1.0 MG Tank Project

- A. Added table to identify size of fence posts, frames, and rails.

PART 3 CLARIFICATION AND RESPONSE TO QUESTIONS

3.0 Clarification and Response to Questions

- A. Clarify scope that relates to access road area.

Answer: See Clarification Exhibit A

- B. At the pre-bid it was mentioned that the utilities (Bid Option Additional Work) deep cuts shown on the PP plans would not be that deep based on the developer providing rough grade?

Answer: It is now part of the scope of work to provide rough grade for the road (Bid Option Additional Work). The utilities should be installed after road is rough cut in.

- C. Engineers Estimate?

Answer: \$2M for Tank and Booster, \$450,000 for Bid Option

- D. Fencing Detail? What size are the line posts? What size are the Terminal Posts? What size is the Gate frame? What size is the top and middle rail?

Answer: Per APWA Spec 32 31 13. We have also updated the detail to show sizes. See attached document CD2 for fence detail updates.

- E. Map showing nearby water tank and other key items?

Answer: See attached document EXH 1 for map.

- F. Piping inside of Pump Station DIP?

Answer: All piping in the booster station is Ductile Iron. See revised sheet MP1.

- G. Exterior slab by other?

Answer: Note on S1.1 is incorrect. For Detailed description of required work on booster site, see measurement and payment section 3-5 in Addendum. The concrete driveway is part of the booster station project and will be installed as part of this project by the contractor. The developer is only responsible for the laying out of curb, gutter, and sidewalk. Any damage to the curb, gutter, and sidewalk during construction of the booster station will be replaced by the contractor.

- H. It was mentioned that the waterlines are in place to the pump station location so that part of the work is to go out and remove existing fitting, install a tee and 2 gate valves? From that point it is the optional work in the bid correct?

Answer: There is only one waterline currently installed. The line is an 8-inch PVC distribution line. The inlet line to the booster station will be tied to this 8-inch line using an 8x8x10 tee (See Sheet SP1). This represents the extent of inlet piping for the booster station project. The Outlet pipe will leave the booster station and, in the road, will have (2) 45-degree bends. After the second bend, the pipe shall be terminated with blind flange and thrust block per the plans. This represents the extent of outlet piping for the booster station project.

Transmission Line for the optional work starts at the blind flange. Distribution line for the optional work starts at the existing 90-degree bend in the existing 8-inch line that heads to the south. This 90-degree bend will be replaced by a tee as shown on sheet PP1 from Addendum #1.

- I. Is the 20" casing for only the 8" W line or for the 10" also? It calls out for 60' which is only enough for the 8" W.

Answer: See Addendum plan sheet PP1. The casing for the 8" water line was added in the Addendum. The casing for the 10" line was in the original plan. The note for this is below the casing. A 20" diameter steel casing is required for the 8" distribution waterline. A 24" diameter steel casing is required for the 10" transmission line. Both steel casing will be 60 feet long.

- J. Final date for questions?

Answer: Final day for questions is 4:00 pm on Tuesday, February 11.

PART 4 Additional Documents

4.0 Additional documents for clarification

- A. Added Clarification Exhibit A to clarify limits of disturbance for 1.0 MG Tank project.
- B. Added EXH 1 to show nearby water tank and other key items using aerial photography.

EXHIBIT D

WORK RELEASE NO. 2018-1 COVER SHEET

KAYSVILLE 1.0 MG TANK

KAYSVILLE CITY
23 EAST CENTER STREET
KAYSVILLE, UT 84037

EXECUTION AND EFFECTIVE DATE

This Work Release No. 2018-1 has been executed by the duly authorized representatives of the parties and shall be effective as of the date of execution by CLIENT.

ENGINEER

SUNRISE ENGINEERING, INC.

By: _____

Name: _____

Title: _____

Date: _____

CLIENT

KAYSVILLE CITY

By: Katie Witt

Name: Katie Witt

Title: MAYOR

Date: April 19, 2018

WORK RELEASE NO. 2018-1

This Work Release is entered into by and between KAYSVILLE CITY (CLIENT) and SUNRISE ENGINEERING, INC. (ENGINEER).

RECITAL

Pursuant to Article 1 of the Agreement for Engineering and Technical Services, dated 10 APRIL 2018, hereinafter referred to as the "Contract", CLIENT and ENGINEER desire to identify certain work and service to be performed by ENGINEER pursuant to the Contract. CLIENT intends to construct a new 1.0 MG underground concrete water tank for which ENGINEER agrees to perform various professional engineering services.

PROJECT DESCRIPTION

Highway 89 is scheduled to be widened in the year 2019. As part of the road widening, an existing one-million gallon tank will need to be demolished and removed in order to create space for the road widening. The CLIENT will need a new 1.0 MG Tank in order to replace the tank being removed. The ENGINEER submitted a proposal for the tank project that was accepted by the CLIENT. The proposal was presented as if the tank, water pipelines, and appurtenances would be located at 1301 Green Road on property owned by Kaysville City. This work release is for the scope of work that was proposed in the submitted proposal.

After meeting with the CLIENT to discuss the project, it is probable that the CLIENT will move the tank site based upon a new development that has been proposed to the CLIENT. Any additional engineering services required by moving the tank site will be negotiated and performed as a new work release. Construction management and observation services will also be negotiated and performed as a new work release.

ARTICLES

It is therefore agreed that ENGINEER will perform the following:

ARTICLE 1. SCOPE OF WORK**Phase 0001- Preliminary Engineering**

Task 001 Topographical Survey- A topographical survey will be performed for the desired tank site property. As part of this task we will provide a surface model in CAD. The survey will be performed by ENGINEER's surveyors.

Task 002 Geo-technical Report- ENGINEER will perform a geotechnical evaluation for the tank. Three borings will be drilled using an auger drill rig. Two borings will be drilled to 30-feet below grade or until refusal and the other to 50 feet below grade or until refusal. Soil samples will be collected at 5-foot intervals. A written report will be provided for the tank site.

Task 003 Project Kick-off Meeting- ENGINEER's project manager will meet with CLIENT for one (1) kick-off meeting to discuss all design criteria and to kick-off the project.

Phase 0002- Detailed Design

Task 001- Project Management and Administration: ENGINEER will provide project management for the project. This will include reviewing invoices and communicating with CLIENT on the progress and status of the tank design.

Task 002- UDOT Coordination: This task will account for preliminary coordination with UDOT for any required permits for the project including encroachment permits, access permits, and determining limits of proposed highway 89 project.

Task 003- Civil Design: ENGINEER's civil design team will provide the following plan sheets:

- General Sheets- These sheets include site location map, design criteria, and abbreviations
- Site Plan- Site plan for the 1301 Green Road Site to include overview of required elements on site along with physical coordinates of infrastructure for construction
- Tank Excavation Plan- Includes required excavation requirements for the tank including excavation and fill estimates
- Piping Plan- Piping plan includes one plan sheet for inlet/outlet line of the tank. The sheet shall include a plan and profile for the piping including required fittings and valves. (approximately 600 lineal feet)
- Overflow Piping Plan- Overflow pipe plan includes one plan sheet for overflow pipe. The sheet shall include a plan and profile for the piping including required fittings and valves. (approximately 600 lineal feet)
- Control Vault Plan- Piping plan for a control vault as required
- Final Grading Plan- Final grading plan for the site shall include final grades for the site

Task 004- Structural Design: ENGINEER's structural engineering team will prepare construction drawings for a one million conventional reinforced buried concrete tank along with providing structural design of any required vaults.

Task 005- Electrical Design/SCADA: ENGINEER's electrical design team will meet with CLIENT to evaluate the existing SCADA system in order to ensure compatibility of the new components at the tank site. The team will provide power design for the SCADA system and will spec out level sensors, intrusion alarms, required panels, and control valve requirements.

Task 006- Contract Documents and Specifications: ENGINEER will produce bid documents, contract documents, and technical specifications.

Task 007- Drinking Water Approval: ENGINEER will submit the plans to the Drinking Water Division and obtain approval to construct the water tank.

Phase 0003- Bidding

Task 001- Bidding: ENGINEER will assist the CLIENT with bidding of the project by holding a pre-bid meeting and responding to clarification requests and producing addenda as necessary.

ARTICLE 2. COMPENSATION

Compensation for Work Release No.2018-1 will be as follows:

CLIENT agrees to compensate ENGINEER for Phase 0001 for the lump sum amount of Ten Thousand One Hundred Dollars (\$10,100.00).

CLIENT agrees to compensate ENGINEER for Phase 0002 for the lump sum amount of Twenty-Eight Thousand Four Hundred Dollars 28,400.00.

CLIENT agrees to compensate ENGINEER for Phase 0003 for the lump sum amount of Three Thousand Five Hundred Dollars (\$3,500.00).

****The total Lump Sum amount for the combined scope of services is Forty-Two Thousand Dollars (\$42,000.00). These payments shall be considered complete compensation for all engineering services outlined in this agreement.**

Any additional services requested in writing by the CLIENT, not listed above and agreed to by ENGINEER, will be performed as a new work release or as an amendment to this work release at the rates and fees shown in the attached Exhibit A.

ARTICLE 3. INVOICING

Instructions and invoices submitted pursuant to this Work Release shall be sent to:

KAYSVILLE CITY
23 EAST CENTER STREET
KAYSVILLE, UT 84037

Invoices shall be submitted monthly based on the prior month's effort, and are due and payable within (30) thirty days.

EXHIBIT D

WORK RELEASE NO. 2018-2 COVER SHEET

KAYSVILLE 1.0 MG TANK

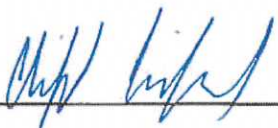
Kaysville City
23 East Center Street
Kaysville, UT 84037

EXECUTION AND EFFECTIVE DATE

This Work Release No. 2018-2 has been executed by the duly authorized representatives of the parties and shall be effective as of the date of execution by CLIENT.

ENGINEER

SUNRISE ENGINEERING, INC.

By: 

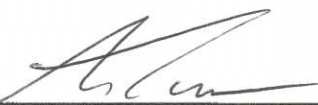
Name: Cliff Linford

Title: SLC civil Dept. manager

Date: 8-30-2018

CLIENT

KAYSVILLE CITY

By: 

Name: Andy Thompson

Title: City Engineer

Date: 9/6/18

WORK RELEASE NO. 2018-2

This Work Release is entered into by and between KAYSVILLE CITY (CLIENT) and SUNRISE ENGINEERING, INC. (ENGINEER).

RECITAL

Pursuant to Article 1 of the Agreement for Engineering and Technical Services, dated 10, APRIL, 2010, hereinafter referred to as the "Contract", CLIENT and ENGINEER desire to identify certain work and service to be performed by ENGINEER pursuant to the Contract. CLIENT intends to construct a new 1.0 MG underground concrete water tank for which ENGINEER agrees to perform various professional engineering services.

After meeting with the city to discuss the 1.0 MG tank project, the city desires to move the tank site based upon a new development that is being constructed within City boundaries. The new site will require preliminary engineering to determine the feasibility of the new site. The new site is located in the special fault study area that is required by the Utah Department of Natural Resources. This work release is for the additional services that will be required for preliminary engineering due to the moving of the tank site.

ARTICLES

It is therefore agreed that ENGINEER will perform the following:

ARTICLE 1. SCOPE OF WORK**Phase 0001- New Tank Site Preliminary Engineering**

Task 001- Tank Siting and Access: Sunrise Engineering will perform up to two site visits to determine the new location of the tank and provide an exhibit showing temporary access to the site for geotechnical field work and fault study field work. Sunrise will also assist with access options to the new tank site. Sunrise will also provide tank staking for location of tank as required for special fault study.

Task 002- Special Fault Study: The new site location falls within the special fault study area as defined by the Utah Division of Natural Resources. This task involves procurement and management of a qualified geological engineer to perform the fault study along with the required professional fees to perform the study.

Task 003- Geotechnical Drilling Adder: The new site location will require special access requirements for the geotechnical driller. This task is for the additional cost to get the specialized drilling rig to the new tank site.

ARTICLE 2. COMPENSATION

Compensation for Work Release No.2018-2 will be as follows:

Kaysville 1.0 MG Tank WR-2				
Fee Summary				
Phase	Task	Phase Description	Proposed Fee	Fee Type
1		New Tank Site Preliminary Engineering		
	1	Tank Siting and Access	\$1,600	Lump Sum
	2	Special Fault Study	\$7,500	Lump Sum
	3	Geotechnical Drilling Adder	\$3,000	Lump Sum
		Work Release Total	\$12,100	Lump Sum

These payments shall be considered complete compensation for all engineering services outlined in this agreement.

Any additional services requested in writing by the CLIENT, not listed above, will be performed as a new work release or as an amendment to this work release at the rates and fees shown in the attached Exhibit A.

ARTICLE 3. INVOICING

Instructions and invoices submitted pursuant to this Work Release shall be sent to:

KAYSVILLE CITY
23 EAST CENTER STREET
KAYSVILLE, UT 84037

Invoices shall be submitted monthly based on the prior month's effort, and are due and payable within (30) thirty days.

EXHIBIT D

WORK RELEASE NO. 2018-3 COVER SHEET

KAYSVILLE 1.0 MG TANK

Kaysville City
23 East Center Street
Kaysville, UT 84037

EXECUTION AND EFFECTIVE DATE

This Work Release No. 2018-3 has been executed by the duly authorized representatives of the parties and shall be effective as of the date of execution by CLIENT.

ENGINEER

SUNRISE ENGINEERING, INC.

By: Cliff Linford

Name: Cliff Linford

Title: SLC Civil Dept MANAGER

Date: 1/9/2019

CLIENT

KAYSVILLE CITY

By: JOSH BELNAP

Name: JB

Title: P.W. DIRECTOR

Date: 1/9/18

WORK RELEASE NO. 2018-3

This Work Release is entered into by and between KAYSVILLE CITY (CLIENT) and SUNRISE ENGINEERING, INC. (ENGINEER).

RECITAL

Pursuant to Article 1 of the Agreement for Engineering and Technical Services, dated 10, April, 2018, hereinafter referred to as the "Contract", CLIENT and ENGINEER desire to identify certain work and services to be performed by ENGINEER pursuant to the Contract. CLIENT intends to construct a new 1.0 MG underground concrete water tank for which ENGINEER agrees to perform various professional engineering services.

After meeting with the City to discuss the 1.0 MG tank project, the City desires to move the tank site based upon a new development that is being constructed within City boundaries. Preliminary Engineering as defined in Work Release No. 2 has been performed on the new site. In order to provide water to the tank at the new tank site, a new booster station and transmission line will be required. The transmission line will be designed in the road right of way and access road provided by the developer of the property to the west of the tank. This work release is for the additional services that will be required for scope of work that will be added to the project due to the moving of the tank site.

ARTICLES

It is therefore agreed that ENGINEER will perform the following:

ARTICLE 1. SCOPE OF WORK

Phase 0001- Additional Design Level Survey

Task 001- Field Work- Booster Station Site & Transmission Line

Sunrise engineering will perform a topographic survey of the site for the new booster station along with the proposed transmission line alignment.

Phase 0002- Booster Station Geotechnical

Task 001- Special Fault Study

The new site location falls within the special fault study area as defined by the Utah Division of Natural Resources for structures of seismic Risk Category II or higher. This task involves procurement and management of a qualified geological engineer to perform the fault study along with the required professional fees to perform the study.

Task 002- Geotechnical Report

Sunrise engineering will prepare a Geotechnical report of the site where the new booster station will be located. The geotechnical report will include the fieldwork, soil sampling, and soil analysis as required by the International Building Code (IBC).

Phase 0003- Detailed Design of Booster Station**Task 001- Detailed Design of Booster Station**

Sunrise will prepare construction plans required for the construction of the new booster station. The construction plan set will include general sheets, site plan, grading plan, site-piping plan, mechanical piping plan, and architectural and structural sheets as required. The detailed design will also include the pump design along with pump controls.

Task 002- Detailed Electrical & HVAC design of Booster Station

Sunrise will prepare construction plans for the electrical components required for the booster station. This will include design of the power requirements for the pumps along with power to the building, lighting, and other miscellaneous electrical equipment. The limits for the electrical design will be at the meter provided by Layton City Power. This task will also include the HVAC construction plans for the booster station building.

Task 003- Technical Specifications

Sunrise will provide the technical specifications required for the booster station and any additional specifications required for the transmission lines.

Phase 0004- Detailed Design of Transmission Line**Task 001- Detailed Design of Transmission Line**

Sunrise will provide construction plans for the transmission line to the new tank site. The limits of our transmission line design will be from the booster station to the tie in at the development, and then from the development cul-de-sac up to the tank. Construction plans will include plan and profile sheets along with required detail sheets.

Task 002- Additional Overflow Piping and Outlet Box Design

At the new proposed tank site, the overflow piping requirements will be substantially different from the original site for the tank. The new elements of design include approximately 500 additional linear feet of pipe and a bubble-up box that will be required at the development cul-de-sac.

Phase 0005- Additional Design Coordination and Administration**Task 001- Coordination and Administration**

This task includes the additional coordination required for the additional scope of work as shown above. Additional coordination includes coordination between disciplines for

EXHIBIT D

Work Release No. 2018-3
KAYSVILLE 1.0MG TANK

the booster station and coordination with the developer and the developer's engineers. This also covers (2) additional project update meetings.

ARTICLE 2. COMPENSATION

Compensation for Work Release No.2018-3 will be as follows:

Kaysville 1.0 MG Tank WR-3- Booster Station				
Fee Summary				
Phase	Task	Description	Proposed Fee	Fee Type
0001		Additional Design Level Survey		
	001	Field Work- Booster Site and Transmission Line	\$2,000	Lump Sum
		Subtotal	\$2,000	Lump Sum
0002		Booster Station Geotechnical Report		
	001	Special Fault Study (Sub-Consultant)	\$4,500	Lump Sum
	002	Geotechnical Report	\$7,000	Lump Sum
		Subtotal	\$11,500	Lump Sum
0003		Detailed Design of Booster Station		
	001	Detailed Design of Booster Station	\$25,300	Lump Sum
	002	Electrical Design of Booster Station	\$8,500	Lump Sum
	003	Technical Specifications	\$3,000	Lump Sum
		Subtotal	\$36,800	Lump Sum
0004		Detailed Design of Water Transmission Line and Access Road		
	001	Detailed Design of Transmission Line	\$8,600	
	003	Additional Overflow Piping and Outlet Box Design	\$3,800	
		Subtotal	\$12,400	Lump Sum
0005		Additional Design Coordination and Administration		
	001	Coordination and Administration	\$4,500	Lump Sum
		Subtotal	\$4,500	Lump Sum
		WORK RELEASE 3 TOTAL	\$67,200	Lump Sum

We have included a man-hour breakdown of the compensation showing the required hours for each task in Exhibit B.

These payments shall be considered complete compensation for all engineering services outlined in this agreement.

Any additional services requested in writing by the CLIENT, not listed above, will be performed as a new work release or as an amendment to this work release at the rates and fees shown in the attached Exhibit A.

ARTICLE 3. INVOICING

EXHIBIT D

Work Release No. 2018-3
KAYSVILLE 1.0MG TANK

Instructions and invoices submitted pursuant to this Work Release shall be sent to:

KAYSVILLE CITY
23 EAST CENTER STREET
KAYSVILLE, UT 84037

Invoices shall be submitted monthly based on the prior month's effort, and are due and payable within (30) thirty days.

EXHIBIT D

WORK RELEASE NO. 2019-1 COVER SHEET

KAYSVILLE 1.0 MG TANK

Kaysville City
23 East Center Street
Kaysville, UT 84037

EXECUTION AND EFFECTIVE DATE

This Work Release No. 2019-1 has been executed by the duly authorized representatives of the parties and shall be effective as of the date of execution by CLIENT.

ENGINEER

SUNRISE ENGINEERING, INC.

By: 

Name: Cliff Linford

Title: SLC - Civil Opt Manager

Date: 9/18/19

CLIENT

KAYSVILLE CITY

By: 

Name: JOSH BELNAP

Title: PW DIRECTOR

Date: 9/18/19

WORK RELEASE NO. 2019-1

This Work Release is entered into by and between KAYSVILLE CITY (CLIENT) and SUNRISE ENGINEERING, INC. (ENGINEER).

RECITAL

Pursuant to Article 1 of the Agreement for Engineering and Technical Services, dated 10, April, 2018, hereinafter referred to as the "Contract", CLIENT and ENGINEER desire to identify certain work and services to be performed by ENGINEER pursuant to the Contract. CLIENT intends to construct a new 1.0 MG underground concrete water tank for which ENGINEER agrees to perform various professional engineering services.

After several meetings with the City to discuss the 1.0 MG tank project, additional work has been added to the project. The location of the booster station has been moved to within the Orchard Ridge Development. The building type has been revised from a masonry building to a wood framed building to match the architectural theme of the neighboring houses. The exact location of the tank on the site needs to be moved in order to accommodate the tank access road. Re-grading of the tank site will be required. This work release also includes final design of the access road to the tank site. As part of the permitting process for the tank overflow, Layton City is requiring that a drainage swale analysis be performed for the drainage swell leading to the Layton City storm drain. This analysis and calculations will be included in this work release. The additional work also includes the coordination effort by ENGINEER with the City, developer, and UDOT for the project and associated administrative costs.

ARTICLES

It is therefore agreed that ENGINEER will perform the following:

ARTICLE 1. SCOPE OF WORK**Phase 0001- Booster Station Design Orchard Ridge****Task 001- Detailed Design of Booster Station in New Location**

Sunrise will prepare construction plans required for the construction of the new booster station at the new location. The construction plan set will include general sheets, site plan, grading plan, site-piping plan, mechanical piping plan, and architectural and structural sheets as required.

Phase 0002- Tank Access Road Final Design**Task 001- Detailed Design of Tank Access Road**

Sunrise will coordinate with developer on preliminary alignment for the access road.
Sunrise will complete final design and construction plans of access road including plan

view showing road alignment, grading plan, road sections, and required details necessary for construction. Sunrise will also revise inlet, outlet, and overflow pipe alignments as necessary.

Phase 0003- Drainage Swell Analysis and Calculations (Overflow)

Task 001- Drainage Swell Analysis and Calculations

Drainage swell analysis for the swell located at the proposed overflow that flows between two residential structures in Layton City. SEI will deliver summary of analysis and calculations.

Phase 0004- Additional Design Coordination and Administration

Task 001- Coordination and Administration

This task includes the additional coordination required for the additional scope of work as shown above. Additional coordination includes coordination between disciplines for the booster station and coordination with the developer, the developer's engineers, and UDOT.

ARTICLE 2. COMPENSATION

Compensation for Work Release No.2019-1 will be as follows:

Kaysville 1.0 MG Tank WR-2019-1- Tank & Booster Station				
Fee Summary				
Phase	Task	Description	Proposed Fee	Fee Type
0001		Booster Station Design Orchard Ridge		
	001	Detailed Design of Booster Station	\$12,700	Lump Sum
0002		Tank Access Road Final Design		
	001	Detailed Design of Access Road	\$4,900	Lump Sum
0003		Drainage Swell Analysis (Overflow)		
	001	Drainage Swell Calculations	\$1,200	Lump Sum
0004		Additional Design Coordination and Administration		
	001	Coordination and Administration	\$3,400	Lump Sum
		WORK RELEASE 4 TOTAL	\$22,200	Lump Sum

These payments shall be considered complete compensation for all engineering services outlined in this agreement.

Any additional services requested in writing by the CLIENT, not listed above, will be performed as a new work release or as an amendment to this work release at the rates and fees shown in the attached Exhibit A.

ARTICLE 3. INVOICING

Instructions and invoices submitted pursuant to this Work Release shall be sent to:

KAYSVILLE CITY
23 EAST CENTER STREET
KAYSVILLE, UT 84037

Invoices shall be submitted monthly based on the prior month's effort, and are due and payable within (30) thirty days.

SUNRISE ENGINEERING
FEE SCHEDULE
EXHIBIT A

WORK CODE	WORK CLASSIFICATION	HOURLY RATE	WORK CODE	WORK CLASSIFICATION	HOURLY RATE
101	Engineer Intern (E.I.T.) I	\$99	404	CAD Drafter IV	\$104
102	Engineer Intern (E.I.T.) II	\$108	451	Training Specialist I	\$130
103	Engineer III	\$137	456	Training Manager	\$156
104	Engineer IV	\$154	460	Training Director	\$180
105	Engineer V	\$174	500	Funding Specialist	\$126
110	Principal Engineer	\$196	510	Plan Reviewer	\$110
121	Electrical Engineer Intern (E.I.T.) I	\$109	511	Building Inspector I	\$65
122	Electrical Engineer Intern (E.I.T.) II	\$122	512	Building Inspector II	\$87
123	Electrical Engineer III	\$138	513	Building Inspector III	\$108
124	Electrical Engineer IV	\$159	525	Building Official	\$126
125	Electrical Engineer V	\$175	601	GIS Tech	\$68
126	Principal Electrical Engineer	\$196	602	GIS Tech II	\$78
301	Engineering Tech I	\$77	611	GIS Specialist I	\$98
302	Engineering Tech II	\$95	613	GIS Analyst	\$112
303	Engineering Tech III	\$108	614	GIS Programmer	\$98
304	Engineering Tech IV	\$133	615	GIS Team Lead	\$128
311	Electrical Tech I	\$84	51	Administrative I	\$45
312	Electrical Tech II	\$95	52	Administrative II	\$59
313	Electrical Tech III	\$105	53	Administrative III	\$74
314	Electrical Tech IV	\$116	712	Project Manager II	\$165
315	Electrical Tech V	\$127	723	Water Rights Specialist III	\$123
351	Construction Observer I	\$67	921	Survey Tech	\$80
352	Construction Observer II	\$88	930	Survey CAD Tech	\$115
353	Construction Observer III	\$98	935	One Man Survey Crew	\$150
354	Construction Observer IV	\$108	940	Survey Manager	\$160
401	CAD Drafter I	\$69	945	Registered Surveyor	\$170
402	CAD Drafter II	\$79	950	Principal Surveyor	\$185
403	CAD Drafter III	\$94			

REIMBURSABLE EXPENSE SCHEDULE

Expense	Rate	Mark-Up
Mileage	\$0.59 per mile	N/A
Field Vehicle (on site)	\$50 per day	N/A
Per Diem Meals	\$57 per day	N/A
Troxler Nuclear Density Gauge	\$40 per day	N/A
High Density Scanner	\$150 per hour	N/A
Material Testing Lab Work	Actual Cost	15%
Outside Consultants, Aerial Photography, etc.	Actual Cost	15%
Lodging	Actual Cost	10%
Other Expenses incurred	Actual Cost	10%

Fees automatically change after the beginning of the year and are subject to change on other occasions.

Base 01-2019

EXHIBIT D

WORK RELEASE NO. 2020-1 COVER SHEET

KAYSVILLE 1.0 MG TANK

Kaysville City
23 East Center Street
Kaysville, UT 84037

EXECUTION AND EFFECTIVE DATE

This Work Release No. 2020-1 has been executed by the duly authorized representatives of the parties and shall be effective as of the date of execution by CLIENT.

ENGINEER

SUNRISE ENGINEERING, INC.

By: 

Name: Cliff Linford

Title: SLC Civil Dept. Manager

Date: 2/25/20

CLIENT

KAYSVILLE CITY

By: 

Name: JOSH BELNAP

Title: PW DIRECTOR / ENG.

Date: 2/25/20

WORK RELEASE NO. 2020-1

This Work Release is entered into by and between KAYSVILLE CITY (CLIENT) and SUNRISE ENGINEERING, INC. (ENGINEER).

RECITAL

Pursuant to Article 1 of the Agreement for Engineering and Technical Services, dated 10, April, 2018, hereinafter referred to as the "Contract", CLIENT and ENGINEER desire to identify certain work and services to be performed by ENGINEER pursuant to the Contract. CLIENT intends to construct a new 1.0 MG underground concrete water tank for which ENGINEER agrees to perform various professional engineering services.

After several meetings with the City and the developer to discuss the 1.0 MG tank project, additional work has been added to the project. This work release is for the additional design work required to complete the plans and specifications along with associated administrative costs. In general, the major design changes include adding the chlorination system to the booster station plan set, adding the temporary shoring and associated grading to the plans and the rock retaining wall required due to the new road location. During the bidding process, additional electrical work was required to meet the requirements of Kaysville power.

ARTICLES

It is therefore agreed that ENGINEER will perform the following:

ARTICLE 1. SCOPE OF WORK

Phase 0001- Tank Plan Set Additions

Task 001- Tank Plan Set Revisions

- 1- Temporary Shoring: revision to excavation plan (GP1) showing revised tank location and grading and construction requirements due to temporary shoring
- 2- Rock Retaining Wall: Revision to sheets GP3 and GP4 showing rock retaining wall. Addition of sheets GP5 to GP8 showing profile, sections, and drainage requirements for rock retaining wall. Revision to site plan (SP1) showing rock retaining walls and drainage requirements.
- 3- Incorporating Review Comments: Added tank by-pass piping, air vac relief valve to be used in case of tank by-pass, and gate valving required for by-passing tank.
- 4- Revision to Electrical Site Plan: Revisions to electrical site plan showing junction box locations, location of sectionalizing cabinet, transformer, and conduit from cul-de-sac up to the meter panel near the tank.

Phase 0002- Booster Station Plan Set Additions

Task 001- Revisions to Booster Station Plans:

- 1- Addition of chlorination system to the booster station plans

EXHIBIT D

Work Release No. 2020-01
KAYSVILLE 1.0MG TANK

- a. Site visit to West Haven to see desired chlorination system.
- b. Revisions to mechanical piping plan to include chlorination system
- c. Added detail sheets for chlorination system equipment
- d. Revised piping plans for chlorine residual analyzer

Phase 0004- Additional Design Coordination and Administration

Task 001- Coordination and Administration

This task includes the additional coordination required for the additional scope of work as shown above. Additional coordination includes coordination between disciplines for the booster station and coordination with the developer, the developer's engineers, and UDOT.

ARTICLE 2. COMPENSATION

Compensation for Work Release No. 2020-1 will be as follows:

Kaysville 1.0 MG Tank WR-2020-1 Tank & Booster Station				
Fee Summary				
Phase	Task	Description	Proposed Fee	Fee Type
0001		Tank Plan Set Additions	\$13,500	Lump Sum
0002		Booster Station Plan Set Additions	\$7,500	Lump Sum
0003		Additional Coordination, Administration, & Meetings	\$1,300	Lump Sum
		WORK RELEASE TOTAL	\$22,300	Lump Sum

A detailed breakdown of the fees shown above is provided in the attached Exhibit A.

These payments shall be considered complete compensation for all engineering services outlined in this agreement.

Any additional services requested in writing by the CLIENT, not listed above, will be performed as a new work release or as an amendment to this work release at the rates and fees shown in the attached Exhibit B.

ARTICLE 3. INVOICING

Instructions and invoices submitted pursuant to this Work Release shall be sent to:

KAYSVILLE CITY
23 EAST CENTER STREET
KAYSVILLE, UT 84037

Invoices shall be submitted monthly based on the prior month's effort, and are due and payable within (30) thirty days.

EXHIBIT A



Man-hour Estimate/Summary of Costs
Kaysville 1.0 MG Tank WR-2020-1 Tank & Booster Station

Engineering Services

Item	Task	Work Task Description	Principal Engineer	Engineer V	Engineer III	Engineer (E.I.T.) I	Electrical Engineer V	Task Total	Cost Summary
0001		Tank Plan Set Additions							
	001	Tank Plan Set Revisions							
		a. Temporary Shoring		4		20		Sub-Task Total	\$2,700
		b. Rock Retaining Wall	2	12		44		Sub-Task Total	\$6,800
		c. Incorporating Review Comments		1		10.75		Sub-Task Total	\$1,200
		d. Revision to electrical Site Plan		0.5			16	Sub-Task Total	\$2,800
								Phase Total	\$13,500
0002		Booster Station Plan Set Additions							
	001	Revision to Booster Station Plans							
		a. Site visit to West Haven to copy chlorination system	1	2		2		Sub-Task Total	\$700
		b. Revisions to mechanical piping plans	1	4		10		Sub-Task Total	\$1,900
		c. Added detail sheets for chlorination system equipment	2	9.5		24		Sub-Task Total	\$4,400
		d. Revised site plan for chlorine residual analyzer		0.5		4		Sub-Task Total	\$500
								Phase Total	\$7,500
0003		Additional Coordination, Administration, & Meetings							
	001	Coordination and Administration		7.5				Task Total	\$1,300
								Phase Total	\$1,300
Sub-total Hours/Miles/Days			6	41	0	114.75	16	177.75	
Hourly Billing Rate			\$174.00	\$174.00	\$133.00	\$99.00	\$170.00		
Total Dollars			\$1,044	\$7,134	\$0	\$11,360	\$2,720	SUBTOTAL	\$22,300
WORK RELEASE TOTAL									\$22,300

EXHIBIT D

Work Release No. 2020-01
KAYSVILLE 1.0MG TANK

SUNRISE ENGINEERING **FEE SCHEDULE** **EXHIBIT B**

WORK CODE	WORK CLASSIFICATION	HOURLY RATE	WORK CODE	WORK CLASSIFICATION	HOURLY RATE
101	Engineer Intern (E.I.T.) I	\$99	404	CAD Drafter IV	\$104
102	Engineer Intern (E.I.T.) II	\$108	451	Training Specialist I	\$130
103	Engineer III	\$137	456	Training Manager	\$156
104	Engineer IV	\$154	460	Training Director	\$180
105	Engineer V	\$174	500	Funding Specialist	\$126
110	Principal Engineer	\$196	510	Plan Reviewer	\$110
121	Electrical Engineer Intern (E.I.T.) I	\$109	511	Building Inspector I	\$65
122	Electrical Engineer Intern (E.I.T.) II	\$122	512	Building Inspector II	\$87
123	Electrical Engineer III	\$138	513	Building Inspector III	\$108
124	Electrical Engineer IV	\$159	525	Building Official	\$126
125	Electrical Engineer V	\$175	601	GIS Tech	\$68
126	Principal Electrical Engineer	\$196	602	GIS Tech II	\$78
301	Engineering Tech I	\$77	611	GIS Specialist I	\$98
302	Engineering Tech II	\$95	613	GIS Analyst	\$112
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311	Electrical Tech I	\$84	51	Administrative I	\$45
312	Electrical Tech II	\$95	52	Administrative II	\$59
313	Electrical Tech III	\$105	53	Administrative III	\$74
314	Electrical Tech IV	\$116	712	Project Manager II	\$165
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351	Construction Observer I	\$67	921	Survey Tech	\$80
352	Construction Observer II	\$88	930	Survey CAD Tech	\$115
353	Construction Observer III	\$98	935	One Man Survey Crew	\$150
354	Construction Observer IV	\$108	940	Survey Manager	\$160
401	CAD Drafter I	\$69	945	Registered Surveyor	\$170
402	CAD Drafter II	\$79	950	Principal Surveyor	\$185
403	CAD Drafter III	\$94			

REIMBURSABLE EXPENSE SCHEDULE

Expense	Rate	Mark-Up
Mileage	\$0.59 per mile	N/A
Field Vehicle (on site)	\$50 per day	N/A
Per Diem Meals	\$57 per day	N/A
Troxler Nuclear Density Gauge	\$40 per day	N/A
High Density Scanner	\$150 per hour	N/A
Material Testing Lab Work	Actual Cost	15%
Outside Consultants, Aerial Photography, etc.	Actual Cost	15%
Lodging	Actual Cost	10%
Other Expenses incurred	Actual Cost	10%

Fees automatically change after the beginning of the year and are subject to change on other occasions.

Base 01-2019

EXHIBIT D

WORK RELEASE NO. 2020-2 COVER SHEET

KAYSVILLE 1.0 MG TANK

Kaysville City
23 East Center Street
Kaysville, UT 84037

EXECUTION AND EFFECTIVE DATE

This Work Release No. 2020-2 has been executed by the duly authorized representatives of the parties and shall be effective as of the date of execution by CLIENT.

ENGINEER

SUNRISE ENGINEERING, INC.

By: _____

Name: _____

Title: _____

Date: _____

CLIENT

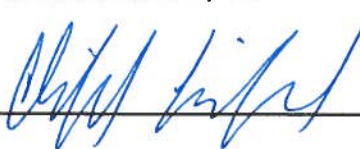
KAYSVILLE CITY

By: _____

Name: _____

Title: _____

Date: _____



Cliff Linford

SLC Civ. I Dpt Manager

2/25/20



JOSH BELNAP

PW DIRECTOR/ENG.

2/25/20

WORK RELEASE NO. 2020-2

This Work Release is entered into by and between KAYSVILLE CITY (CLIENT) and SUNRISE ENGINEERING, INC. (ENGINEER).

RECITAL

Pursuant to Article 1 of the Agreement for Engineering and Technical Services, dated 10, April, 2018, hereinafter referred to as the "Contract", CLIENT and ENGINEER desire to identify certain work and services to be performed by ENGINEER pursuant to the Contract. CLIENT intends to construct a new 1.0 MG underground concrete water tank for which ENGINEER agrees to perform various professional engineering services.

After several meetings with the City and the developer to discuss the 1.0 MG tank project, additional work has been added to the project. The original scope of work for bidding from Sunrise Engineering was outlined in Work Release 2018-1. This bidding item included bidding for the tank project only. The change in scope to bidding includes adding the booster station, transmission line, distribution line, and development road to the bidding process. Also, this includes adding enough of the distribution line to the plans so that contractors could bid the project, and coordination with the developers engineer to provide enough information on the temporary access road for bidding. Additional meetings and coordination includes the meeting held with the City and developer on Feb 4th, 2020, the meeting with City and UDOT on Feb 18th, 2020, and a future meeting to be held on Feb 27th, 2020. This work release also includes the hours to create exhibits and fill out the application forms for the Davis Aqueduct crossing permit with Weber Basin Water Conservancy District along with the application fees.

ARTICLES

It is therefore agreed that ENGINEER will perform the following:

ARTICLE 1. SCOPE OF WORK

Phase 0001- Additional Bidding Services

Task 001- Additions to Contract Documents: Revisions to bid form adding temporary access road and distribution line.

Task 002- Additions to specifications: Revisions to measurement and payment portions of specifications to account for retaining wall, temporary shoring, temporary access road and distribution line.

Task 003- RFI responses to new items: Responding to RFI's regarding booster station, temporary access road transmission line, or distribution line (not included in original bidding budget)

Task 004- Orchard Ridge Distribution Piping: Revisions to sheets PP1 to PP5 showing alignment of distribution line and valve locations and depth.

Task 005- Temporary Access Road: Partial construction plans from developers engineer added to the bid package. Plans show simple plan view of temporary access road location,

EXHIBIT D

Work Release No. 2020-2
KAYSVILLE 1.0MG TANK

general grading, and typical section. This time is for coordination with developers engineer and ensuring enough information was provided for bidders.

Task 006- Limits of Work and Stockpiling Exhibit- Exhibit included in bid documents showing extents of temporary access road, quantities, and locations available for stockpiling excess dirt

Phase 0002- Additional Design Coordination and Administration

Task 001- Coordination and Administration

This task includes the additional coordination required for the additional scope of work as shown above. Additional coordination includes coordination between disciplines for the booster station and coordination with the developer, the developer's engineers, and UDOT. Specific meetings include meetings held on Feb 4th, Feb 18th, and Feb 27th, 2020.

Task 002- Application for Davis Aqueduct Permit through Weber Basin Water

This task includes the coordination required to obtain the Davis Aqueduct crossing permit. The task also includes filling out separate applications for Kaysville City, Dominion Energy, Utopia Fiber, and Central Davis Sewer District. The task also includes paying the application fee for each separate application as required by Weber Basin Water Conservancy District.

ARTICLE 2. COMPENSATION

Compensation for Work Release No. 2020-2 will be as follows:

Kaysville 1.0 MG Tank WR-2020-2 Tank & Booster Station				
Fee Summary				
Phase	Task	Description	Proposed Fee	Fee Type
0001		Additional Bidding Services	\$6,900	Lump Sum
0002		Additional Coordination, Administration, & Meetings	\$5,600	Lump Sum
		WORK RELEASE TOTAL	\$12,500	Lump Sum

A detailed breakdown of the fees shown above is provided in the attached Exhibit A.

These payments shall be considered complete compensation for all engineering services outlined in this agreement.

Any additional services requested in writing by the CLIENT, not listed above, will be performed as a new work release or as an amendment to this work release at the rates and fees shown in the attached Exhibit B.

ARTICLE 3. INVOICING

Instructions and invoices submitted pursuant to this Work Release shall be sent to:

KAYSVILLE CITY
23 EAST CENTER STREET
KAYSVILLE, UT 84037

Invoices shall be submitted monthly based on the prior month's effort, and are due and payable within (30) thirty days.

EXHIBIT A**Man-hour Estimate/Summary of Costs**

Kaysville 1.0 MG Tank WR-2020-2 Tank & Booster Station

Engineering Services

Item	Task	Work Task Description	Principal Engineer	Engineer V	Engineer III	Engineer (E.I.T.) I	Direct Costs	Task Total	Cost Summary
0001		Additional Bidding Services							
	001	Additions to Contract Documents		10	1.5	1.25		Sub-Task Total	\$2,100
	002	Additions to Specifications		10	1.5	1.5		Sub-Task Total	\$2,100
	003	RFI responses to New Items		6				Sub-Task Total	\$1,000
	004	Orchard Ridge Distribution Piping		2		8		Sub-Task Total	\$1,100
	005	Temporary Access Road		2				Sub-Task Total	\$300
	006	Limits of Work and Stockpiling Exhibit		2				Sub-Task Total	\$300
								Phase Total	\$6,900
0002		Additional Coordination, Administration, & Meetings							
	001	Coordination and Administration							
		a. Attendance at Coordination Meetings		4.5				Task Total	\$800
		b. Project Coordination		8				Task Total	\$1,400
	002	Davis Aqueduct Permit Acquisition		4		13.5	\$ 1,320.00	Task Total	\$3,400
								Phase Total	\$5,600
Sub-total Hours/Miles/Days			0	48.5	3	24.25		75.75	
Hourly Billing Rate			\$174.00	\$174.00	\$133.00	\$99.00			
Total Dollars			\$0	\$8,439	\$399	\$2,401	\$1,320	SUBTOTAL	\$12,500
WORK RELEASE TOTAL									\$12,500

EXHIBIT D

Work Release No. 2020-2
KAYSVILLE 1.0MG TANK**SUNRISE ENGINEERING**
FEE SCHEDULE
EXHIBIT B

WORK CODE	WORK CLASSIFICATION	HOURLY RATE	WORK CODE	WORK CLASSIFICATION	HOURLY RATE
101	Engineer Intern (E.I.T.) I	\$99	404	CAD Drafter IV	\$104
102	Engineer Intern (E.I.T.) II	\$108	451	Training Specialist I	\$130
103	Engineer III	\$137	456	Training Manager	\$156
104	Engineer IV	\$154	460	Training Director	\$180
105	Engineer V	\$174	500	Funding Specialist	\$126
110	Principal Engineer	\$196	510	Plan Reviewer	\$110
121	Electrical Engineer Intern (E.I.T.) I	\$109	511	Building Inspector I	\$65
122	Electrical Engineer Intern (E.I.T.) II	\$122	512	Building Inspector II	\$87
123	Electrical Engineer III	\$138	513	Building Inspector III	\$108
124	Electrical Engineer IV	\$159	525	Building Official	\$126
125	Electrical Engineer V	\$175	601	GIS Tech	\$68
126	Principal Electrical Engineer	\$196	602	GIS Tech II	\$78
301	Engineering Tech I	\$77	611	GIS Specialist I	\$98
302	Engineering Tech II	\$95	613	GIS Analyst	\$112
303	Engineering Tech III	\$108	614	GIS Programmer	\$98
304	Engineering Tech IV	\$133	615	GIS Team Lead	\$128
311	Electrical Tech I	\$84	51	Administrative I	\$45
312	Electrical Tech II	\$95	52	Administrative II	\$59
313	Electrical Tech III	\$105	53	Administrative III	\$74
314	Electrical Tech IV	\$116	712	Project Manager II	\$165
315	Electrical Tech V	\$127	723	Water Rights Specialist III	\$123
351	Construction Observer I	\$67	921	Survey Tech	\$80
352	Construction Observer II	\$88	930	Survey CAD Tech	\$115
353	Construction Observer III	\$98	935	One Man Survey Crew	\$150
354	Construction Observer IV	\$108	940	Survey Manager	\$160
401	CAD Drafter I	\$69	945	Registered Surveyor	\$170
402	CAD Drafter II	\$79	950	Principal Surveyor	\$185
403	CAD Drafter III	\$94			

REIMBURSABLE EXPENSE SCHEDULE

Expense	Rate	Mark-Up
Mileage	\$0.59 per mile	N/A
Field Vehicle (on site)	\$50 per day	N/A
Per Diem Meals	\$57 per day	N/A
Troxler Nuclear Density Gauge	\$40 per day	N/A
High Density Scanner	\$150 per hour	N/A
Material Testing Lab Work	Actual Cost	15%
Outside Consultants, Aerial Photography, etc.	Actual Cost	15%
Lodging	Actual Cost	10%
Other Expenses incurred	Actual Cost	10%

Fees automatically change after the beginning of the year and are subject to change on other occasions.

Base 01-2019

EXHIBIT E

WORK RELEASE NO. 2020-3 COVER SHEET

KAYSVILLE 1.0 MG TANK

Kaysville City
23 East Center Street
Kaysville, UT 84037

EXECUTION AND EFFECTIVE DATE

This Work Release No. 2020-3 has been executed by the duly authorized representatives of the parties and shall be effective as of the date of execution by CLIENT.

ENGINEER

SUNRISE ENGINEERING, INC.

By: _____

Name: _____

Title: _____

Date: _____

CLIENT

KAYSVILLE CITY

By: _____

Name: _____

Title: _____

Date: _____

WORK RELEASE NO. 2020-3

This Work Release is entered into by and between KAYSVILLE CITY (CLIENT) and SUNRISE ENGINEERING, INC. (ENGINEER).

RECITAL

Pursuant to Article 1 of the Agreement for Engineering and Technical Services, dated 10, April, 2018, hereinafter referred to as the "Contract", CLIENT and ENGINEER desire to identify certain work and services to be performed by ENGINEER pursuant to the Contract. CLIENT intends to construct a new 1.0 MG underground concrete water tank for which ENGINEER agrees to perform various professional engineering services.

Sunrise Engineering, Inc has performed the design and bidding for a new 1.0 MG Tank located above the Orchard Ridge development. This work release is to perform engineering services during the construction of the project in accordance with the scope of work as outlined below.

ARTICLES

It is therefore agreed that ENGINEER will perform the following:

ARTICLE 1. SCOPE OF WORK**Phase 0001- Tank Construction Administration**

Attend and conduct pre-construction meeting, perform review of project submittals, review all pay requests, review change orders, issue field work orders, and respond to RFI's for the tank portion of the project. This phase also includes Engineer attendance at construction meetings. Hours estimated for construction meetings is 69 hours.

Phase 0002- Tank Construction Observation

For the tank portion of the project, construction observer (project representative) to perform construction observation, attend construction meetings, verify bid quantities with contractor, produce daily observation reports and field observations, and verify between the Engineer, City, and Contractor design/construction/installation conformance with the construction documents (plans and specifications). This task allows for 176 hours construction observation from Project representative.

Phase 0003- Tank Special Inspection

Provide special inspection services for tank pre-stressing and reinforcement through sub-consultant. Special inspection includes three pre concrete inspections for the floor and roof (4 hours each), six hours for wall (walls placed in 1 placement), inspections for tendon/rebar placement, three cable tensioning inspections (6 hours each for floor and roof, and one wall cable tensioning (8 hours).

Phase 0004- Pre-Construction Survey

Provide pre-construction survey for the tank and booster station project. This will include staking tank, waterlines, vaults, booster building, along with appropriate offsets. All of the construction survey will be performed at one time. If construction stakes are removed or disturbed by contractor, contractor will be responsible for cost to re-stake.

Phase 0005- Tank Project Close-Out

For tank project, issue final construction approvals, perform final walk-through, punch-list creation, verification of conformance with final punch-list items, O & M Manual, Lien Waivers, etc., notice of substantial completion, as well as final contract record drawings delivered to the City.

Phase 0006- Booster Station Construction Administration

Attend and conduct pre-construction meeting, perform review of project submittals, review all pay requests, review change orders, issue field work orders, and respond to RFI's for the booster station portion of the project. This phase also includes Engineer attendance at construction meetings. Hours estimated for construction meetings is 10 hours.

Phase 0007- Booster Station Construction Observation

For the booster station portion of the project, construction observer (project representative) to perform construction observation, attend construction meetings, verify bid quantities with contractor, produce observation reports and field observations, and verify between the Engineer, City, and Contractor design/construction/installation conformance with the construction documents (plans and specifications). This task allows for 88 hours construction observation from Project representative.

Phase 0008- Booster Station Project Close-Out

For booster station project, issue final construction approvals, perform final walk-through, punch-list creation, verification of conformance with final punch-list items, O & M Manual, Lien Waivers, etc., notice of substantial completion, as well as final contract record drawings delivered to the City.

Phase 0009- Owner's Allowance for Additional Services

Due to the nature of construction and construction administration, additional services may be required during the course of construction due to unforeseen circumstances. This allowance is intended for additional services (detailed description to be defined later) that will be provided upon written authorization.

A general ALLOWANCE in the amount of \$10,000 is provided for additional services not identified in this scope of work but determined by the City to be required for completion of the project. All tasks completed under this allowance shall be identified and authorized by the City's Project Manager in advance. This work will be performed at the hourly rates shown in Exhibit B.

ARTICLE 2. COMPENSATION

Compensation for Work Release No. 2020-3 will be as follows:

Kaysville 1.0 MG Tank WR-2020-3 Tank			
Fee Summary			
Phase	Description	Proposed Fee	Fee Type
0001	Tank Construction Administration	\$33,400	Time & Materials
0002	Tank Construction Observation	\$15,500	Time & Materials
0003	Tank Special Inspection (3rd Party)	\$3,500	Time & Materials
0004	Pre-Construction Survey	\$4,500	Time & Materials
0005	Tank Project Close-Out	\$2,800	Time & Materials
0006	Booster Station Construction Administration	\$13,100	Time & Materials
0007	Booster Station Construction Observation	\$7,700	Time & Materials
0008	Booster Station Project Close-Out	\$2,800	Time & Materials
	TOTAL	\$83,300	
0009	Owners Allowance	\$10,000	Time & Materials
	WORK RELEASE TOTAL	\$93,300	Lump Sum

A detailed breakdown of the fees shown above is provided in the attached Exhibit A.

These payments shall be considered complete compensation for all engineering services outlined in this agreement.

Any additional services requested in writing by the CLIENT, not listed above, will be performed as a new work release or as an amendment to this work release at the rates and fees shown in the attached Exhibit B.

ARTICLE 3. INVOICING

Instructions and invoices submitted pursuant to this Work Release shall be sent to:

KAYSVILLE CITY
23 EAST CENTER STREET
KAYSVILLE, UT 84037

Invoices shall be submitted monthly based on the prior month's effort, and are due and payable within (30) thirty days.

EXHIBIT E

Work Release No. 2020-3
KAYSVILLE 1.0MG TANK

EXHIBIT A

Man-hour Estimate/Summary of Costs

Kaysville 1.0 MG Tank WR-2020-3 Tank

Construction Engineering Services



Item	Task	Work Task Description	Principal Engineer	Engineer V	Engineer (E.I.T.) I	Construction Observer II	Direct Costs	Task Total	Cost Summary
0001		Tank Construction Administration							
	001	Submittal Review		6	40			Task Total	\$5,000
	002	Construction Meetings		69				Task Total	\$12,000
	003	Construction Administration		94				Task Total	\$16,400
								Phase Total	\$33,400
0002		Tank Construction Observation							
	001	On-Site Construction Observation							
		Tank Excavation- 2 days for 3 hr. per day				6		Sub-Task Total	\$500
		Tank Base Preparation				10		Sub-Task Total	\$900
		Foundation Concrete Pour- 10 hour				10		Sub-Task Total	\$900
		Wall Concrete Pour- 2 pours at 9 hour per wall				18		Sub-Task Total	\$1,600
		Column Pours- 8 total hours				8		Sub-Task Total	\$700
		Roof Concrete Pour- 8 hour				8		Sub-Task Total	\$700
		Backfilling Tank- 3 days a week for 4 hours per day				60		Sub-Task Total	\$5,300
		Rock Retaining Wall & Access Road Observation				40		Sub-Task Total	\$3,500
		Tank Inlet Piping at Tank (All other piping inspected by City)				16		Sub-Task Total	\$1,400
								Phase Total	\$15,500
0003		Tank Spedal Inspection (3rd Party)							
	001	Concrete, Reinforcement, and Pre-stressing Tendons					\$ 3,500.00	Task Total	\$3,500
								Phase Total	\$3,500
0004		Pre-Construction Survey							
	001	Tank Pre-Construction Survey					\$4,500	Task Total	\$4,500
								Phase Total	\$4,500
0005		Tank Project Close-Out							
	001	Project Close-Out		16				Task Total	\$2,800
								Phase Total	\$2,800
0006		Booster Station Construction Administration							
	001	Submittal Review		6	34			Task Total	\$4,400
	002	Construction Meetings		10					\$1,700
	003	Construction Administration		40					\$7,000
								Phase Total	\$13,100
0007		Booster Station Construction Observation							
	001	On-Site Construction Observation							
		Pump House Building Observation (6 weeks 1 days per week for 4 hours)				24		Sub-Task Total	\$2,100
		Pump House Piping-				10		Sub-Task Total	\$900
		Site Piping- (To be inspected by Kaysville Inspector)						Sub-Task Total	\$0
		Site Work (4 weeks, 3 observations per week for 4 hours)				48		Sub-Task Total	\$4,200
		Project Close-Out Observations				6		Sub-Task Total	\$500
								Phase Total	\$7,700
0008		Booster Station Project Close-Out							
	001	Project Close-Out		16				Task Total	\$2,800
								Phase Total	\$2,800
Sub-total Hours/Miles/Days			0	257	74	264		595	
Hourly Billing Rate			\$174.00	\$174.00	\$99.00	\$88.00			
Total Dollars			\$0	\$44,718	\$7,326	\$23,232	\$8,000	SUBTOTAL	\$83,300
								TOTAL	\$83,300

Item	Task	Work Task Description	Principal Engineer	Engineer V	Engineer (E.I.T.) I	Construction Observer II	Direct Costs	Task Total	Cost Summary
ADDITIONAL SERVICES									
0009		Owner's Allowance for Additional Services							
	001	Owners Allowance					\$10,000	Task Total	\$10,000
								Phase Total	\$10,000
								ADDITIONAL SERVICES TOTAL	\$10,000
								WORK RELEASE TOTAL	\$93,300

EXHIBIT B
SUNRISE ENGINEERING
FEE SCHEDULE

WORK CODE	WORK CLASSIFICATION	HOURLY RATE	WORK CODE	WORK CLASSIFICATION	HOURLY RATE
101	Engineer Intern (E.I.T.) I	\$99	404	CAD Drafter IV	\$104
102	Engineer Intern (E.I.T.) II	\$108	451	Training Specialist I	\$130
103	Engineer III	\$137	456	Training Manager	\$156
104	Engineer IV	\$154	460	Training Director	\$180
105	Engineer V	\$174	500	Funding Specialist	\$126
110	Principal Engineer	\$196	510	Plan Reviewer	\$110
121	Electrical Engineer Intern (E.I.T.) I	\$109	511	Building Inspector I	\$65
122	Electrical Engineer Intern (E.I.T.) II	\$122	512	Building Inspector II	\$87
123	Electrical Engineer III	\$138	513	Building Inspector III	\$108
124	Electrical Engineer IV	\$159	525	Building Official	\$126
125	Electrical Engineer V	\$175	601	GIS Tech	\$68
126	Principal Electrical Engineer	\$196	602	GIS Tech II	\$78
301	Engineering Tech I	\$77	611	GIS Specialist I	\$98
302	Engineering Tech II	\$95	613	GIS Analyst	\$112
303	Engineering Tech III	\$108	614	GIS Programmer	\$98
304	Engineering Tech IV	\$133	615	GIS Team Lead	\$128
311	Electrical Tech I	\$84	51	Administrative I	\$45
312	Electrical Tech II	\$95	52	Administrative II	\$59
313	Electrical Tech III	\$105	53	Administrative III	\$74
314	Electrical Tech IV	\$116	712	Project Manager II	\$165
315	Electrical Tech V	\$127	723	Water Rights Specialist III	\$123
351	Construction Observer I	\$67	921	Survey Tech	\$80
352	Construction Observer II	\$88	930	Survey CAD Tech	\$115
353	Construction Observer III	\$98	935	One Man Survey Crew	\$150
354	Construction Observer IV	\$108	940	Survey Manager	\$160
401	CAD Drafter I	\$69	945	Registered Surveyor	\$170
402	CAD Drafter II	\$79	950	Principal Surveyor	\$185
403	CAD Drafter III	\$94			

REIMBURSABLE EXPENSE SCHEDULE

Expense	Rate	Mark-Up
Mileage	\$0.59 per mile	N/A
Field Vehicle (on site)	\$50 per day	N/A
Per Diem Meals	\$57 per day	N/A
Troxler Nuclear Density Gauge	\$40 per day	N/A
High Density Scanner	\$150 per hour	N/A
Material Testing Lab Work	Actual Cost	15%
Outside Consultants, Aerial Photography, etc.	Actual Cost	15%
Lodging	Actual Cost	10%
Other Expenses incurred	Actual Cost	10%

Fees automatically change after the beginning of the year and are subject to change on other occasions.

Base 01-2019

STAFF REPORT



COUNCIL MEETING DATE: March 19, 2020

TYPE OF ITEM: Consent Item

PRESENTED BY: Josh Belnap

SUBJECT/AGENDA TITLE: Award of Bid for the Construction of a 1 MG Water Tank and Construction Inspection Services

EXECUTIVE SUMMARY:

As part of UDOT's highway 89 project, the new East Frontage Road (EFR) installation will require the demolition of the west Crestwood water tank. The City has designed a replacement tank to be installed on the far east end of the Orchard Ridge development, and UDOT and the developer have agreed to cover the costs associated with the project.

We pre-qualified contractors and then bid the project, with the low bidder being FX Construction at a total of \$3,528,330.00. This total includes the portions of the funds reimbursed by UDOT and by the developer.

In addition to awarding the bid for construction, Public Works does not have sufficient experience on such work to internally manage the construction inspections for this project. For this reason we are also wanting to enter a contract with the design engineer (Sunrise Engineering) to perform these duties and to help in overseeing portions of the overall project (the City is able to handle overseeing and inspecting the pipeline work). This amount is \$93,300, and would also be covered by UDOT and the developer.

Council Options: Approve/Disapprove

Recommended Options: Approve

Fiscal Impact & Fund Source for Recommended Action: UDOT funds, Developer Contributions

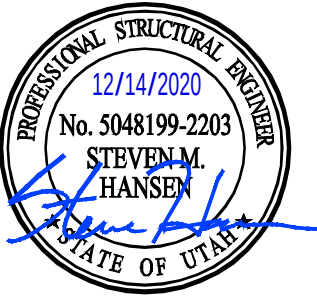
Attachments: Bid Tab and Sunrise Engineering Work Release

BID OPENING TABULATION FOR:
BID OPENING:

Kaysville City 1.0 MG Water Tank
Thursday, February 13, 2020

1.0 MG TANK				Engineer's Estimate		FX Construction		Dale Cox Construction		Gerber Construction		ProBuild Construction	
No.	Item	Quantity	Unit	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
	1.0 MG TANK												
1	MOBILIZATION	1	LS	\$ 150,000.00	\$ 150,000.00	\$ 74,000.00	\$ 74,000.00	\$ 250,000.00	\$ 250,000.00	\$ 190,000.00	\$ 190,000.00	\$ 150,000.00	\$ 150,000.00
2	QUALITY CONTROL & TESTING	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 12,800.00	\$ 12,800.00	\$ 34,500.00	\$ 34,500.00	\$ 31,000.00	\$ 31,000.00	\$ 30,000.00	\$ 30,000.00
3	SWPP PLAN & IMPLEMENTATION	1	HRS	\$ 5,000.00	\$ 5,000.00	\$ 17,400.00	\$ 17,400.00	\$ 17,250.00	\$ 17,250.00	\$ 17,000.00	\$ 17,000.00	\$ 20,000.00	\$ 20,000.00
4	CLEARING AND GRUBBING	1	LS	\$ 5,000.00	\$ 5,000.00	\$ 26,600.00	\$ 26,600.00	\$ 57,500.00	\$ 57,500.00	\$ 86,000.00	\$ 86,000.00	\$ 20,000.00	\$ 20,000.00
5	REVEGETATION & EROSION CONTROL	1	LS	\$ 12,000.00	\$ 12,000.00	\$ 35,800.00	\$ 35,800.00	\$ 34,500.00	\$ 34,500.00	\$ 30,000.00	\$ 30,000.00	\$ 20,000.00	\$ 20,000.00
6	EARTHWORK, ACCESS ROAD	1	TON	\$ 150,000.00	\$ 150,000.00	\$ 84,000.00	\$ 84,000.00	\$ 23,000.00	\$ 23,000.00	\$ 165,000.00	\$ 165,000.00	\$ 150,000.00	\$ 150,000.00
7	EARTHWORK, TANK	1	LF	\$ 100,000.00	\$ 100,000.00	\$ 172,100.00	\$ 172,100.00	\$ 230,000.00	\$ 230,000.00	\$ 262,000.00	\$ 262,000.00	\$ 250,000.00	\$ 250,000.00
8	IMPORT TANK BASE MATERIAL	880	LF	\$ 35.00	\$ 30,800.00	\$ 20.00	\$ 17,600.00	\$ 26.50	\$ 23,320.00	\$ 17.00	\$ 14,960.00	\$ 27.00	\$ 23,760.00
9	IMPORT TANK STRUCTURAL FILL	880	LF	\$ 35.00	\$ 30,800.00	\$ 20.00	\$ 17,600.00	\$ 22.75	\$ 20,020.00	\$ 14.00	\$ 12,320.00	\$ 26.00	\$ 22,880.00
10	IMPORT PIPE BEDDING	480	TON	\$ 25.00	\$ 12,000.00	\$ 20.00	\$ 9,600.00	\$ 26.50	\$ 12,720.00	\$ 13.00	\$ 6,240.00	\$ 28.00	\$ 13,440.00
11	IMPORT PIPE ZONE BACKFILL	1260	TON	\$ 25.00	\$ 31,500.00	\$ 20.00	\$ 25,200.00	\$ 33.25	\$ 41,895.00	\$ 16.00	\$ 20,160.00	\$ 26.00	\$ 32,760.00
12	IMPORT PIPE TRENCH BACKFILL	2090	TON	\$ 25.00	\$ 52,250.00	\$ 20.00	\$ 41,800.00	\$ 22.75	\$ 47,547.50	\$ 16.00	\$ 33,440.00	\$ 28.00	\$ 58,520.00
13	WATER PIPE, PVC C900, 10"	1440	LF	\$ 45.00	\$ 64,800.00	\$ 65.00	\$ 93,600.00	\$ 67.00	\$ 96,480.00	\$ 110.00	\$ 158,400.00	\$ 140.00	\$ 201,600.00
14	RING DRAIN, CORRUGATED DUAL WALL HDPE, 6"	1320	LF	\$ 45.00	\$ 59,400.00	\$ 25.00	\$ 33,000.00	\$ 44.00	\$ 58,080.00	\$ 39.00	\$ 51,480.00	\$ 120.00	\$ 158,400.00
15	VAULT DRAIN, CORRUGATED DUAL WALL HDPE, 4"	110	LF	\$ 45.00	\$ 4,950.00	\$ 31.00	\$ 3,410.00	\$ 46.50	\$ 5,115.00	\$ 57.00	\$ 6,270.00	\$ 100.00	\$ 11,000.00
16	VALVE, GATE, 10"	4	EA	\$ 3,500.00	\$ 14,000.00	\$ 2,800.00	\$ 11,200.00	\$ 2,975.00	\$ 11,900.00	\$ 4,100.00	\$ 16,400.00	\$ 4,000.00	\$ 16,000.00
17	3 IN. AIR VAC ASSEMBLY W/ 5 FT MANHOLE	1	EA	\$ 10,000.00	\$ 10,000.00	\$ 11,800.00	\$ 11,800.00	\$ 9,250.00	\$ 9,250.00	\$ 17,000.00	\$ 17,000.00	\$ 30,000.00	\$ 30,000.00
18	METER/ ISOLATION VALVE VAULT	1	EA	\$ 50,000.00	\$ 50,000.00	\$ 66,700.00	\$ 66,700.00	\$ 87,200.00	\$ 87,200.00	\$ 85,000.00	\$ 85,000.00	\$ 140,000.00	\$ 140,000.00
19	OVERFLOW DISCHARGE BOX & OUTFALL	1	EA	\$ 10,000.00	\$ 10,000.00	\$ 19,000.00	\$ 19,000.00	\$ 13,000.00	\$ 13,000.00	\$ 18,000.00	\$ 18,000.00	\$ 27,000.00	\$ 27,000.00
20	CHAIN-LINK FENCE & GATE	720	LF	\$ 35.00	\$ 25,200.00	\$ 34.00	\$ 24,480.00	\$ 35.00	\$ 25,200.00	\$ 31.00	\$ 22,320.00	\$ 28.00	\$ 20,160.00
21	CONCRETE WATER TANK, 1.0 MG, AWWA D115	1	EA	\$ 800,000.00	\$ 800,000.00	\$ 1,155,000.00	\$ 1,155,000.00	\$ 1,031,764.00	\$ 1,031,764.00	\$ 1,230,000.00	\$ 1,230,000.00	\$ 1,250,000.00	\$ 1,250,000.00
22	ELECTRICAL WORK	1	EA	\$ 15,000.00	\$ 15,000.00	\$ 41,000.00	\$ 41,000.00	\$ 43,500.00	\$ 43,500.00	\$ 24,000.00	\$ 24,000.00	\$ 74,000.00	\$ 74,000.00
23	ROCK RETAINING WALL	1	LF	\$ 15,000.00	\$ 15,000.00	\$ 191,700.00	\$ 191,700.00	\$ 184,000.00	\$ 184,000.00	\$ 188,000.00	\$ 188,000.00	\$ 250,000.00	\$ 250,000.00
24	TEMPORARY SHORING	1	EA	\$ 90,000.00	\$ 90,000.00	\$ 102,500.00	\$ 102,500.00	\$ 400,000.00	\$ 400,000.00	\$ 397,000.00	\$ 397,000.00	\$ 165,000.00	\$ 165,000.00
	SUBTOTAL				\$ 1,747,700.00		\$ 2,287,890.00		\$ 2,757,741.50		\$ 3,081,990.00		\$ 3,134,520.00
	BOOSTER STATION (ALL SHEETS EXCEPT PP SHEETS)												
25	MOBILIZATION	1	LS	\$ 20,000.00	\$ 20,000.00	\$ 14,300.00	\$ 14,300.00	\$ 30,000.00	\$ 30,000.00	\$ 67,000.00	\$ 67,000.00	\$ 30,000.00	\$ 30,000.00
26	QUALITY CONTROL AND TESTING	1	CY	\$ 10,000.00	\$ 10,000.00	\$ 3,200.00	\$ 3,200.00	\$ 8,625.00	\$ 8,625.00	\$ 3,400.00	\$ 3,400.00	\$ 10,000.00	\$ 10,000.00
27	SWPP PLAN & IMPLEMENTATION	1	TON	\$ 5,000.00	\$ 5,000.00	\$ 6,400.00	\$ 6,400.00	\$ 8,625.00	\$ 8,625.00	\$ 7,800.00	\$ 7,800.00	\$ 10,000.00	\$ 10,000.00
28	CLEARING AND GRUBBING	1	LF	\$ 5,000.00	\$ 5,000.00	\$ 1,990.00	\$ 1,990.00	\$ 8,625.00	\$ 8,625.00	\$ 10,000.00	\$ 10,000.00	\$ 2,500.00	\$ 2,500.00
29	BOOSTER STATION SITE WORK	1	LF	\$ 100,000.00	\$ 100,000.00	\$ 83,900.00	\$ 83,900.00	\$ 38,530.00	\$ 38,530.00	\$ 131,000.00	\$ 131,000.00	\$ 115,000.00	\$ 115,000.00
30	BOOSTER STATION STRUCTURE AND APPURTENANCES	1	LF	\$ 80,000.00	\$ 80,000.00	\$ 133,900.00	\$ 133,900.00	\$ 170,000.00	\$ 170,000.00	\$ 114,000.00	\$ 114,000.00	\$ 225,000.00	\$ 225,000.00
31	MECHANICAL PIPING AND EQUIPMENT	1	LF	\$ 30,000.00	\$ 30,000.00	\$ 68,000.00	\$ 68,000.00	\$ 50,500.00	\$ 50,500.00	\$ 93,000.00	\$ 93,000.00	\$ 162,000.00	\$ 162,000.00
32	PRE-PACKAGED BOOSTER PAQ STATION AND PIPING	1	SY	\$ 110,000.00	\$ 110,000.00	\$ 80,500.00	\$ 80,500.00	\$ 70,000.00	\$ 70,000.00	\$ 95,000.00	\$ 95,000.00	\$ 120,000.00	\$ 120,000.00
33	ELECTRICAL SYSTEM	1	TON	\$ 60,000.00	\$ 60,000.00	\$ 42,800.00	\$ 42,800.00	\$ 57,100.00	\$ 57,100.00	\$ 42,000.00	\$ 42,000.00	\$ 40,000.00	\$ 40,000.00
	SUBTOTAL				\$ 420,000.00		\$ 434,990.00		\$ 442,005.00		\$ 563,200.00		\$ 714,500.00
	TOTALS				\$ 2,167,700.00		\$ 2,722,880.00		\$ 3,199,746.50		\$ 3,645,190.00	.	\$ 3,849,020.00

BID OPTION (ADDITIONAL WORK)				Engineer's Estimate		FX Construction		Dale Cox Construction		Gerber Construction		ProBuild Construction	
No.	Item	Quantity	Unit	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
	TRANSMISSION LINE FROM BOOSTER TO TANK (PP SHEETS)												
34	MOBILIZATION	1	LS	\$ 20,000.00	\$ 20,000.00	\$ 42,000.00	\$ 42,000.00	\$ 41,000.00	\$ 41,000.00	\$ 57,000.00	\$ 57,000.00	\$ 25,000.00	\$ 25,000.00
35	QUALITY CONTROL AND TESTING	1	LS	\$ 10,000.00	\$ 10,000.00	\$ 11,700.00	\$ 11,700.00	\$ 11,500.00	\$ 11,500.00	\$ 11,000.00	\$ 11,000.00	\$ 10,000.00	\$ 10,000.00
36	SWPP PLAN & IMPLEMENTATION	1	LS	\$ 5,000.00	\$ 5,000.00	\$ 12,800.00	\$ 12,800.00	\$ 8,625.00	\$ 8,625.00	\$ 3,400.00	\$ 3,400.00	\$ 5,000.00	\$ 5,000.00
37	IMPORT PIPE BEDDING	220	TON	\$ 25.00	\$ 5,500.00	\$ 25.00	\$ 5,500.00	\$ 26.50	\$ 5,830.00	\$ 13.00	\$ 2,860.00	\$ 28.00	\$ 6,160.00
38	IMPORT PIPE ZONE BACKFILL	580	TON	\$ 25.00	\$ 14,500.00	\$ 25.00	\$ 14,500.00	\$ 26.50	\$ 15,370.00	\$ 16.00	\$ 9,280.00	\$ 26.00	\$ 15,080.00
39	IMPORT PIPE TRENCH BACKFILL	1160	TON	\$ 25.00	\$ 29,000.00	\$ 25.00	\$ 29,000.00	\$ 22.75	\$ 26,390.00	\$ 16.00	\$ 18,560.00	\$ 26.00	\$ 30,160.00
40	WATER PIPE, PVC C900, 10"	2000	LF	\$ 45.00	\$ 90,000.00	\$ 70.00	\$ 140,000.00	\$ 61.00	\$ 122,000.00	\$ 110.00	\$ 220,000.00	\$ 113.00	\$ 226,000.00
41	VALVE, GATE, 10"	3	EA	\$ 3,500.00	\$ 10,500.00	\$ 3,300.00	\$ 9,900.00	\$ 3,171.00	\$ 9,513.00	\$ 3,500.00	\$ 10,500.00	\$ 5,000.00	\$ 15,000.00
42	WATER PIPE, PVC C900, 8"	1970	LF	\$ 45.00	\$ 88,650.00	\$ 65.00	\$ 128,050.00	\$ 50.25	\$ 98,992.50	\$ 100.00	\$ 197,000.00	\$ 106.00	\$ 208,820.00
43	VALVE, GATE, 8"	11	LS	\$ 3,500.00	\$ 38,500.00	\$ 2,000.00	\$ 22,000.00	\$ 2,280.00	\$ 25,080.00	\$ 2,800.00	\$ 30,800.00	\$ 4,500.00	\$ 49,500.00
44	EARTH WORK, ACCESS ROAD	1	LS	\$ 150,000.00	\$ 150,000.00	\$ 390,000.00	\$ 390,000.00	\$ 300,000.00	\$ 300,000.00	\$ 273,000.00	\$ 273,000.00	\$ 400,000.00	\$ 400,000.00
	SUBTOTAL				\$ 461,650.00		\$ 805,450.00		\$ 664,300.50		\$ 833,400.00		\$ 990,720.00
	GRAND TOTAL				\$ 2,629,350.00		\$ 3,528,330.00		\$ 3,864,047.00		\$ 4,478,590.00		\$ 4,839,740.00



WORK RELEASE NO. 2020-3 COVER SHEET

KAYSVILLE 1.0 MG TANK

Kaysville City
23 East Center Street
Kaysville, UT 84037

EXECUTION AND EFFECTIVE DATE

This Work Release No. 2020-3 has been executed by the duly authorized representatives of the parties and shall be effective as of the date of execution by CLIENT.

ENGINEER

SUNRISE ENGINEERING, INC.

By: _____

Name: _____

Title: _____

Date: _____

CLIENT

KAYSVILLE CITY

By: _____

Name: _____

Title: _____

Date: _____

WORK RELEASE NO. 2020-3

This Work Release is entered into by and between KAYSVILLE CITY (CLIENT) and SUNRISE ENGINEERING, INC. (ENGINEER).

RECITAL

Pursuant to Article 1 of the Agreement for Engineering and Technical Services, dated 10, April, 2018, hereinafter referred to as the "Contract", CLIENT and ENGINEER desire to identify certain work and services to be performed by ENGINEER pursuant to the Contract. CLIENT intends to construct a new 1.0 MG underground concrete water tank for which ENGINEER agrees to perform various professional engineering services.

Sunrise Engineering, Inc has performed the design and bidding for a new 1.0 MG Tank located above the Orchard Ridge development. This work release is to perform engineering services during the construction of the project in accordance with the scope of work as outlined below.

ARTICLES

It is therefore agreed that ENGINEER will perform the following:

ARTICLE 1. SCOPE OF WORK

Phase 0001- Tank Construction Administration

Attend and conduct pre-construction meeting, perform review of project submittals, review all pay requests, review change orders, issue field work orders, and respond to RFI's for the tank portion of the project. This phase also includes Engineer attendance at construction meetings. Hours estimated for construction meetings is 69 hours.

Phase 0002- Tank Construction Observation

For the tank portion of the project, construction observer (project representative) to perform construction observation, attend construction meetings, verify bid quantities with contractor, produce daily observation reports and field observations, and verify between the Engineer, City, and Contractor design/construction/installation conformance with the construction documents (plans and specifications). This task allows for 176 hours construction observation from Project representative.

Phase 0003- Tank Special Inspection

Provide special inspection services for tank pre-stressing and reinforcement through sub-consultant. Special inspection includes three pre concrete inspections for the floor and roof (4 hours each), six hours for wall (walls placed in 1 placement), inspections for tendon/rebar placement, three cable tensioning inspections (6 hours each for floor and roof, and one wall cable tensioning (8 hours).

Phase 0004- Pre-Construction Survey

Provide pre-construction survey for the tank and booster station project. This will include staking tank, waterlines, vaults, booster building, along with appropriate offsets. All of the construction survey will be performed at one time. If construction stakes are removed or disturbed by contractor, contractor will be responsible for cost to re-stake.

Phase 0005- Tank Project Close-Out

For tank project, issue final construction approvals, perform final walk-through, punch-list creation, verification of conformance with final punch-list items, O & M Manual, Lien Waivers, etc., notice of substantial completion, as well as final contract record drawings delivered to the City.

Phase 0006- Booster Station Construction Administration

Attend and conduct pre-construction meeting, perform review of project submittals, review all pay requests, review change orders, issue field work orders, and respond to RFI's for the booster station portion of the project. This phase also includes Engineer attendance at construction meetings. Hours estimated for construction meetings is 10 hours.

Phase 0007- Booster Station Construction Observation

For the booster station portion of the project, construction observer (project representative) to perform construction observation, attend construction meetings, verify bid quantities with contractor, produce observation reports and field observations, and verify between the Engineer, City, and Contractor design/construction/installation conformance with the construction documents (plans and specifications). This task allows for 88 hours construction observation from Project representative.

Phase 0008- Booster Station Project Close-Out

For booster station project, issue final construction approvals, perform final walk-through, punch-list creation, verification of conformance with final punch-list items, O & M Manual, Lien Waivers, etc., notice of substantial completion, as well as final contract record drawings delivered to the City.

Phase 0009- Owner's Allowance for Additional Services

Due to the nature of construction and construction administration, additional services may be required during the course of construction due to unforeseen circumstances. This allowance is intended for additional services (detailed description to be defined later) that will be provided upon written authorization.

A general ALLOWANCE in the amount of \$10,000 is provided for additional services not identified in this scope of work but determined by the City to be required for completion of the project. All tasks completed under this allowance shall be identified and authorized by the City's Project Manager in advance. This work will be performed at the hourly rates shown in Exhibit B.

ARTICLE 2. COMPENSATION

Compensation for Work Release No. 2020-3 will be as follows:

Kaysville 1.0 MG Tank WR-2020-3 Tank			
Fee Summary			
Phase	Description	Proposed Fee	Fee Type
0001	Tank Construction Administration	\$33,400	Time & Materials
0002	Tank Construction Observation	\$15,500	Time & Materials
0003	Tank Special Inspection (3rd Party)	\$3,500	Time & Materials
0004	Pre-Construction Survey	\$4,500	Time & Materials
0005	Tank Project Close-Out	\$2,800	Time & Materials
0006	Booster Station Construction Administration	\$13,100	Time & Materials
0007	Booster Station Construction Observation	\$7,700	Time & Materials
0008	Booster Station Project Close-Out	\$2,800	Time & Materials
	TOTAL	\$83,300	
0009	Owners Allowance	\$10,000	Time & Materials
	WORK RELEASE TOTAL	\$93,300	Lump Sum

A detailed breakdown of the fees shown above is provided in the attached Exhibit A.

These payments shall be considered complete compensation for all engineering services outlined in this agreement.

Any additional services requested in writing by the CLIENT, not listed above, will be performed as a new work release or as an amendment to this work release at the rates and fees shown in the attached Exhibit B.

ARTICLE 3. INVOICING

Instructions and invoices submitted pursuant to this Work Release shall be sent to:

KAYSVILLE CITY
23 EAST CENTER STREET
KAYSVILLE, UT 84037

Invoices shall be submitted monthly based on the prior month's effort, and are due and payable within (30) thirty days.

EXHIBIT A

Man-hour Estimate/Summary of Costs Kaysville 1.0 MG Tank WR-2020-3 Tank



Construction Engineering Services

Item	Task	Work Task Description	Principal Engineer	Engineer V	Engineer (E.I.T.) I	Construction Observer II	Direct Costs	Task Total	Cost Summary
0001		Tank Construction Administration							
	001	Submittal Review		6	40			Task Total	\$5,000
	002	Construction Meetings		69				Task Total	\$12,000
	003	Construction Administration		94				Task Total	\$16,400
								Phase Total	\$33,400
0002		Tank Construction Observation							
	001	On-Site Construction Observation							
		Tank Excavation- 2 days for 3 hr. per day				6		Sub-Task Total	\$500
		Tank Base Preparation				10		Sub-Task Total	\$900
		Foundation Concrete Pour- 10 hour				10		Sub-Task Total	\$900
		Wall Concrete Pour- 2 pours at 9 hour per wall				18		Sub-Task Total	\$1,600
		Column Pours- 8 total hours				8		Sub-Task Total	\$700
		Roof Concrete Pour- 8 hour				8		Sub-Task Total	\$700
		Backfilling Tank- 3 days a week for 4 hours per day				60		Sub-Task Total	\$5,300
		Rock Retaining Wall & Access Road Observation				40		Sub-Task Total	\$3,500
		Tank Inlet Piping at Tank (All other piping inspected by City)				16		Sub-Task Total	\$1,400
								Phase Total	\$15,500
0003		Tank Spedal Inspection (3rd Party)							
	001	Concrete, Reinforcement, and Pre-stressing Tendons					\$ 3,500.00	Task Total	\$3,500
								Phase Total	\$3,500
0004		Pre-Construction Survey							
	001	Tank Pre-Construction Survey					\$4,500	Task Total	\$4,500
								Phase Total	\$4,500
0005		Tank Project Close-Out							
	001	Project Close-Out		16				Task Total	\$2,800
								Phase Total	\$2,800
0006		Booster Station Construction Administration							
	001	Submittal Review		6	34			Task Total	\$4,400
	002	Construction Meetings		10					\$1,700
	003	Construction Administration		40					\$7,000
								Phase Total	\$13,100
0007		Booster Station Construction Observation							
	001	On-Site Construction Observation							
		Pump House Building Observation (6 weeks 1 days per week for 4 hours)				24		Sub-Task Total	\$2,100
		Pump House Piping-				10		Sub-Task Total	\$900
		Site Piping- (To be inspected by Kaysville Inspector)						Sub-Task Total	\$0
		Site Work (4 weeks, 3 observations per week for 4 hours)				48		Sub-Task Total	\$4,200
		Project Close-Out Observations				6		Sub-Task Total	\$500
								Phase Total	\$7,700
0008		Booster Station Project Close-Out							
	001	Project Close-Out		16				Task Total	\$2,800
								Phase Total	\$2,800
Sub-total Hours/Miles/Days			0	257	74	264		595	
Hourly Billing Rate			\$174.00	\$174.00	\$99.00	\$88.00			
Total Dollars			\$0	\$44,718	\$7,326	\$23,232	\$8,000	SUBTOTAL	\$83,300
								TOTAL	\$83,300

Item	Task	Work Task Description	Principal Engineer	Engineer V	Engineer (E.I.T.) I	Construction Observer II	Direct Costs	Task Total	Cost Summary
ADDITIONAL SERVICES									
0009		Owner's Allowance for Additional Services							
	001	Owners Allowance					\$10,000	Task Total	\$10,000
								Phase Total	\$10,000
								ADDITIONAL SERVICES TOTAL	\$10,000
								WORK RELEASE TOTAL	\$93,300

EXHIBIT B
SUNRISE ENGINEERING
FEE SCHEDULE

WORK CODE	WORK CLASSIFICATION	HOURLY RATE	WORK CODE	WORK CLASSIFICATION	HOURLY RATE
101	Engineer Intern (E.I.T.) I	\$99	404	CAD Drafter IV	\$104
102	Engineer Intern (E.I.T.) II	\$108	451	Training Specialist I	\$130
103	Engineer III	\$137	456	Training Manager	\$156
104	Engineer IV	\$154	460	Training Director	\$180
105	Engineer V	\$174	500	Funding Specialist	\$126
110	Principal Engineer	\$196	510	Plan Reviewer	\$110
121	Electrical Engineer Intern (E.I.T.) I	\$109	511	Building Inspector I	\$65
122	Electrical Engineer Intern (E.I.T.) II	\$122	512	Building Inspector II	\$87
123	Electrical Engineer III	\$138	513	Building Inspector III	\$108
124	Electrical Engineer IV	\$159	525	Building Official	\$126
125	Electrical Engineer V	\$175	601	GIS Tech	\$68
126	Principal Electrical Engineer	\$196	602	GIS Tech II	\$78
301	Engineering Tech I	\$77	611	GIS Specialist I	\$98
302	Engineering Tech II	\$95	613	GIS Analyst	\$112
303	Engineering Tech III	\$108	614	GIS Programmer	\$98
304	Engineering Tech IV	\$133	615	GIS Team Lead	\$128
311	Electrical Tech I	\$84	51	Administrative I	\$45
312	Electrical Tech II	\$95	52	Administrative II	\$59
313	Electrical Tech III	\$105	53	Administrative III	\$74
314	Electrical Tech IV	\$116	712	Project Manager II	\$165
315	Electrical Tech V	\$127	723	Water Rights Specialist III	\$123
351	Construction Observer I	\$67	921	Survey Tech	\$80
352	Construction Observer II	\$88	930	Survey CAD Tech	\$115
353	Construction Observer III	\$98	935	One Man Survey Crew	\$150
354	Construction Observer IV	\$108	940	Survey Manager	\$160
401	CAD Drafter I	\$69	945	Registered Surveyor	\$170
402	CAD Drafter II	\$79	950	Principal Surveyor	\$185
403	CAD Drafter III	\$94			

REIMBURSABLE EXPENSE SCHEDULE

Expense	Rate	Mark-Up
Mileage	\$0.59 per mile	N/A
Field Vehicle (on site)	\$50 per day	N/A
Per Diem Meals	\$57 per day	N/A
Troxler Nuclear Density Gauge	\$40 per day	N/A
High Density Scanner	\$150 per hour	N/A
Material Testing Lab Work	Actual Cost	15%
Outside Consultants, Aerial Photography, etc.	Actual Cost	15%
Lodging	Actual Cost	10%
Other Expenses incurred	Actual Cost	10%

Fees automatically change after the beginning of the year and are subject to change on other occasions.

Base 01-2019

STAFF REPORT



COUNCIL MEETING DATE: March 19, 2020

TYPE OF ITEM: Consent Item

PRESENTED BY: Josh Belnap

SUBJECT/AGENDA TITLE: Asphalt Seal Coat Subcontract Award

EXECUTIVE SUMMARY:

Description:

Public Works has bid out a contract to install 560,000 square feet of preventative maintenance seal coat. Prior to any preventative treatments, all of the cracks must be sealed and any needed asphalt patching done. The City's streets department is comprised of 4 individuals, and they have typically performed this work, but they end up only finishing about 70% of all the asphalt repair they need to in a given year. For that reason, we included the crack seal and asphalt repair in the bid, to help them get farther with their other responsibilities. We advertised this with the potential to operate as a multi-year contract, with optional renewal years. Other Cities have adopted this approach with some of their more routine maintenance tasks, and we feel it is a great option to lock in good pricing, streamline the process and have better ability to take advantage of winter work. The first optional renewal year (2021) would keep the same unit prices, and allow for a discussion on minor pricing adjustments if extended for another year after that (2022). We don't anticipate extending beyond 2022, and instead re-bidding the contract again after that, to ensure best pricing and to allow for other products that the City may decide to use.

The City estimated about \$210,000 for the project, and 2 bids came in. The low bid was for \$212,580.58, but the bidder's material submittals did not meet the bid requirements that we advertised. The other bid (from Morgan Paving) did meet the submittal requirements, and came in at \$227,050.00. We propose awarding the bid to Morgan Paving.

The funds were budgeted for in FY20.

Council Options: Approve/Disapprove

Recommended Options: Approve

Fiscal Impact & Fund Source for Recommended Action: Road Utility Funds

Attachments: Bid Tab

THE CONSTRUCTION OF THE 2020 SEAL COAT SUBCONTRACT				MORGAN PAVEMENT		**CKC ASPHALT	
BID ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
1	TRAFFIC CONTROL	LS	1	\$ 2,500.00	\$ 2,500.00	\$ 16,224.00	\$ 16,224.00
2	MOBILIZATION	LS	1	\$ 1,500.00	\$ 1,500.00	\$ 13,520.00	\$ 13,520.00
3	FURNISH AND DELIVER DOOR HANGERS	EA	200	\$ 1.85	\$ 370.00	\$ 1.75	\$ 350.00
4	REMOVE EXISTING ASPHALT	TON	10	\$ 70.00	\$ 700.00	\$ 46.50	\$ 465.00
5	ROADWAY EXCAVATION	TON	15	\$ 25.00	\$ 375.00	\$ 23.50	\$ 352.50
6	IMPORT UNTREATED BASE COURSE MATERIAL	TON	15	\$ 45.00	\$ 675.00	\$ 37.70	\$ 565.50
7	FURNISH & INSTALL ASPHALT (PRIOR TO SEAL COAT)	TON	10	\$ 160.00	\$ 1,600.00	\$ 133.75	\$ 1,337.50
8	PREP AND SEAL CRACKS (PRIOR TO SEAL COAT)	TON	30	\$ 2,750.00	\$ 82,500.00	\$ 2,000.00	\$ 60,000.00
9	FURNISH AND INSTALL ONYX	SF	560,000	\$ 0.186	\$ 104,160.00	\$ 0.18	\$ 100,800.00
10	DEMO AND RAISE MANHOLE COLLAR	EA	5	\$ 975.00	\$ 4,875.00	\$ 950.00	\$ 4,750.00
11	DEMO AND RAISE VALVE COLLAR	EA	5	\$ 575.00	\$ 2,875.00	\$ 545.00	\$ 2,725.00
12	ASPHALT STRIPING - 6" DOUBLE YELLOW	LF	5,200	\$ 1.00	\$ 5,200.00	\$ 0.43	\$ 2,236.00
13	ASPHALT STRIPING - 6" DOUBLE YELLOW - SOLID/DASH	LF	12,000	\$ 0.65	\$ 7,800.00	\$ 0.27	\$ 3,240.00
14	ASPHALT STRIPING - 12" WHITE SOLID	LF	1,200	\$ 1.40	\$ 1,680.00	\$ 1.05	\$ 1,260.00
15	ASPHALT STRIPING - 4" WHITE DASHED	LF	10,000	\$ 0.50	\$ 5,000.00	\$ 0.27	\$ 2,700.00

16	ASPHALT STRIPING - BIKE SYMBOLS	EA	30	\$ 70.00	\$ 2,100.00	\$ 10.44	\$ 313.20
17	ASPHALT STRIPING - HI-VIS CROSSWALK (PER 2' X 10' BLOCK)	EA	45	\$ 35.00	\$ 1,575.00	\$ 21.02	\$ 945.90
18	ASPHALT STRIPING - ARROW	EA	25	\$ 45.00	\$ 1,125.00	\$ 16.70	\$ 417.50
19	ASPHALT STRIPING - SPEED LIMIT ("XX MPH") LEGEND	EA	4	\$ 70.00	\$ 280.00	\$ 63.13	\$ 252.52
20	ASPHALT STRIPING - "SCHOOL" LEGEND	EA	2	\$ 80.00	\$ 160.00	\$ 62.98	\$ 125.96
			TOTAL	\$ 227,050.00	\$ 212,580.58		

**CKC bid was rejected, as the submittals did not meet the requirements stated in the bid documents.

STAFF REPORT



COUNCIL MEETING DATE: March 19, 2020

ITEM NO.:

TYPE OF ITEM: ACTION

PRESENTED BY: Nic Mills

SUBJECT/AGENDA TITLE: An Ordinance Amending Provisions of the Kaysville City Code regarding participating in meetings by telephone

EXECUTIVE SUMMARY: Currently, the City Code establishes a procedure whereby the City Council can conduct telephonic meetings. This ordinance amends that code section and allows greater latitude in holding these meetings. Notably, It expands this authority to all public bodies; allows for technology other than a telephone, and eliminates some of the self-imposed restrictions.

Council Options: 1) Approve the Ordinance amending provisions of 2-2-4 of the City code; 2) Approve the Ordinance with any modifications that the Council deems appropriate; 3) Decline to adopt the Ordinance and remand to staff with further direction.

Recommended Options: Staff recommends that the City Council approve the Ordinance amending provisions of 2-2-4 of the City Code.

Fiscal Impact & Fund Source for Recommended Action: Amending this statute will not result in any foreseeable fiscal impact.

Attachments:

ORDINANCE ~~XX-XX-XX~~

AMENDING TITLE 2, CHAPTER 2, SECTION 4 OF THE KAYSVILLE MUNICIPAL CODE, AMENDING PROVISIONS REGARDING PARTICIPATING IN MEETINGS BY TELEPHONE

WHEREAS, Kaysville City would like the opportunity to continue to conduct public meetings during times when the members may not be able to be physically present; and

WHEREAS, the City would like to have the flexibility to conduct those public meetings when necessary; and

WHEREAS, the City Council of Kaysville City finds that this amendment to be in the best interests of the Citizens of Kaysville City and the health, safety, and welfare of the City.

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

SECTION I: Amendment. Title 2, Chapter 2, Section 4 of the Kaysville Municipal Code is hereby amended as follows:

2-2-4 Participation By Telephone

1. A member of the Governing Body, ~~or any of the city's other commissions, committees, or public bodies~~, may participate in meetings by ~~electronic communication telephone~~ in accordance with the provisions of this Section. Such participation ~~must~~ **should** provide for open access to the public which, at a minimum, means that the member participating by ~~electronic communication telephone~~ **must** **should** be able to hear comments from public participants in the meeting as well as other members and that public participants as well as other members ~~must~~ **should** be able to hear comments from the member participating by ~~electronic communication telephone~~.
- ~~2. Three (3) members of the City Council must be present in person at the meeting in order to form a quorum. Participation of a member by telephone shall not be included for the purpose of forming a quorum.~~
- ~~3. At least one member of the public body should be physically present at the meeting. No more than (2) members of the Governing Body may participate by telephone at any meeting of the Governing Body.~~
4. If the Mayor ~~or Chair~~ is not physically present at a ~~public~~ meeting of the Governing Body and is participating by ~~electronic communication telephone~~, the ~~public body~~ Governing Body ~~shall~~ **may** elect one of the members physically present to preside over the meeting as Mayor pro-tempore, ~~or acting chair~~. In such event, the Mayor ~~or chair~~ may participate by telephone, but the Mayor pro-tempore ~~or acting chair~~ ~~shall~~ **should** act as chairman and preside over such meeting.
5. If a member of the ~~public body~~ Governing Body desires to participate in a meeting of the Governing Body by telephone such member ~~must~~ **should** inform the City Recorder at least the day before the meeting so that proper arrangements can be made for telephone participation.
6. Participation by telephone should be engaged in only under circumstances when it would be difficult, burdensome, or onerous for the member to be physically present. ~~In order to prevent abuse of this privilege, no single member of the Governing Body may participate by telephone more than three (3) times in a calendar year.~~

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

SECTION III: Effective Date. This Ordinance shall become effective immediately upon passage.

PASSED AND ADOPTED by the City Council of Kaysville, Utah, this ____ day of _____, 2020.

Katie Witt, Mayor

ATTEST:

Annemarie Plaizier, City Recorder

STAFF REPORT



COUNCIL MEETING DATE: March 19, 2020

TYPE OF ITEM: Work Item

PRESENTED BY:

SUBJECT/AGENDA TITLE: Changes to Kaysville City Personnel Rules and Regulations – Section 3.17 Benefits Administration

EXECUTIVE SUMMARY:

The Kaysville City Personnel Rules and Regulations require that all full time employees enroll in City health insurance plans at the employee level of coverage.

Occasionally there are situations where an employee may want to waive coverage because coverage is provided by a spouse or a family member where the employee is covered as a dependent.

We have reviewed this with our health insurance provider and they don't believe that with the size of our group that there would be a negative effect on the underwriting of our plan.

We recommend that no additional financial allowance be provided for an employee that elects to waive coverage.

Attached is a proposed resolution adopting the change.

Council Options:

Recommended Options: Discussion – Move to Consent Items for Next Meeting

Fiscal Impact & Fund Source for Recommended Action:

Attachments: Proposed Resolution

RESOLUTION NO. _____

ADOPTION OF CHANGES TO KAYSVILLE CITY PERSONNEL RULES AND
REGULATIONS SECTION 3.17 BENEFITS ADMINISTRATION

WHEREAS, Section 3.17 of Kaysville City Personnel Rules and Regulations currently requires full time employees to enroll in City health insurance plans at the employee level of coverage; and

WHEREAS, There are certain circumstances where employees may elect to waive coverage if they have coverage in another health insurance plan, and

WHEREAS, the City finds it advisable to make changes to Section 3.17 of Kaysville Personnel Rules and Regulations to provide for these circumstances.

NOW THEREFORE, BE IT RESOLVED BY THE KAYSVILLE CITY COUNCIL:

1. The City Council hereby adopts the changes as follows:

Proposed Change:

Section 3.17 Benefits Administration

b. HEALTH INSURANCE – The City pays a contribution towards the medical and dental coverage on full-time employees. Health Insurance is available to part time employees who work an average of 30 or more hours per week calculated on an annual basis at a rate proportionate to the hours worked unless otherwise required by law. The health insurance contribution is established as part of the Compensation Plan. ~~All Full-time employees are required to maintain health insurance at the single employee level of coverage.~~ Employees may waive coverage upon proof of individual medical insurance coverage. Dependent coverage is optional as part of the group plan.

2. The Resolution shall be effective upon adoption.

APPROVED and ADOPTED this 16th day of April 2020.

Katie Witt
Mayor

ATTEST:

Annemarie Plaizier
City Recorder

STAFF REPORT



COUNCIL MEETING DATE: March 19, 2020

TYPE OF ITEM: Work Item

PRESENTED BY:

SUBJECT/AGENDA TITLE: Water Sales Contract – Weber Basin Water Conservancy District and Kaysville City

EXECUTIVE SUMMARY:

Several years ago Kaysville City purchased the right to use 286 acre feet of water for the City's future culinary water supply needs.

At that time, there was no formal agreement in how the water can be utilized and made available when needed. The City is approaching the time when we need to call on the additional water and Weber Basin desires to formalize the terms of the utilization of the water resource.

These terms of this agreement are similar to other water sales contracts with Weber Basin Water.

Council Options:

Recommended Options: Discussion – Move to Consent Items for next meeting.

Fiscal Impact & Fund Source for Recommended Action: Water Enterprise Funds

Attachments: Water Sales Contract

WATER SALES CONTRACT
between
WEBER BASIN WATER CONSERVANCY DISTRICT
and
KAYSVILLE CITY
for
PURCHASE OF TREATED DISTRICT WATER FOR MUNICIPAL USE

THIS WATER SALES CONTRACT (this “Agreement”), made and entered into this _____ day of _____, 2020, by and between **Weber Basin Water Conservancy District**, a water conservancy district organized under the laws of the State of Utah (the “District”), **Kaysville City**, a municipal corporation of the State of Utah (the “City”),

WITNESSETH:

WHEREAS, the District was organized, *inter alia*, to provide for the conservation and development of the water and land resources within its boundaries and for the greatest beneficial use of water therein, and to help provide municipalities with an adequate supply of water for the domestic use of their citizens; and

WHEREAS, the District, the City and the Davis and Weber Counties Canal Company, a Utah corporation (the “Canal Company”), have entered into an Agreement dated October 6, 2005 (the “Trilateral Agreement”) whereby, *inter alia*: (a) the District agreed to reserve that amount of water (the “Reserved Water”, estimated to be 816 acre-feet) which is yielded by those certain 136.0 shares of stock of the Canal Company which was purchased by the District from owners of certain lands within the master planned areas of the City who designated such lands for future development (the “Designated Lands”, more particularly described on Exhibit “A”, a spreadsheet attached hereto and by this reference incorporated herein); (b) the City agreed that the obligation of such owners, and their successors and assigns, to provide water for development of the Designated Lands was satisfied, to the extent of the volume of Reserved Water on the land, and further agreed to require each owner or developer of Designated Lands to purchase from the District the right to use that amount of Reserved Water which is required for the subject development at a rate of One Thousand Eight Hundred Dollars (\$1,800) per acre-foot, until all 816 acre-feet of Reserved Water have been fully used and paid for; and (c) the City would be entitled to obtain one-third of the volume of the water yielded from the Purchased Shares for the City’s future culinary needs, which amount would be approximately 286 acre-feet of Reserved Water; and

WHEREAS, the City purchased the right to use the 286 acre-feet of reserved water by paying the District \$514,800. One-half of the payment was initiated and paid on approximately November 23, 2012 and the second and final payment was received on August 9, 2013. The District and the City now desire to memorialize their understanding of how the 286 acre-feet of reserved water can be utilized and made available when needed for the City’s future drinking water supply;

NOW, THEREFORE, in consideration of the premises and the mutual promises and covenants set forth herein, the parties hereto do hereby agree as follows:

1. Petition for Allotment of Treated Water. At any time or from time to time, the City may execute a Petition for Allotment of Treated District Water (a “Petition”), on the District’s then standard form therefore, contracting for the allotment of the aforesaid approximately 286 acre-feet of Reserved Water as treated culinary water. Each Petition shall contain the following terms and conditions, together with other standard contract terms (including without limitation those set forth in paragraphs 4 through 11, below) and such other terms and conditions as the parties may mutually agree upon:

a. Subject to adjustment as provided below, payment to the District for water contracted for pursuant to each Petition shall be made in the initial annual amount of \$247.00 per acre-foot, comprised of the following components:

(i) \$44.00 per acre-foot representing the District’s capital cost for treatment and distribution facilities; and

(ii) \$117.76 per acre-foot (the “Initial O&M Rate”) representing the estimated operating and maintenance charges of the District with respect to the subject water; and

(iii) \$43.57 per acre-foot representing the District’s repair and replacement expenses, and other special expenses and costs incurred in operating, maintaining, repairing and replacing the separate facilities of the District used or required in servicing this Contract; and

(iv) \$41.67 per acre-foot representing the Canal Company’s assessment on the stock representing the subject water;

provided, however, that:

The Initial O&M Rate assumes that the subject water will be treated at the District’s Davis North Water Treatment Plant. In the event the capacity of that plant is reached before all of the subject water has been contracted for, the Initial O&M Rate will be adjusted to reflect any additional costs (including, but not limited to, capital costs of constructing new facilities and additional costs of treatment, pumping and distribution) with respect to water which is contracted for subsequently. The District agrees to notify the City, upon request not more frequently than annually, of the then remaining volume of capacity available at the Davis North Water Treatment Plant.

The Initial O&M Rate reflects the District’s estimated costs of operation and maintenance for the calendar year 2018. The Initial O&M Rate shall be adjusted at any time or from time to time to reflect any changes in the District’s costs of operation and maintenance in subsequent calendar years. The estimated amount of such increase shall be determined each year by the Board of Trustees of the District. If such estimate is more or less than the actual cost thereof, an appropriate adjustment, as determined by the District’s Board of Trustees in its sole absolute discretion, will be made in the annual amount for the year following the year for which the estimate was made.

The Initial O&M Rate does not include the cost of assessments by the Canal Company on the stock representing the subject water. The anticipated assessment costs through December 31, 2017, are included in the \$1,800 per acre-foot fee referred to in the recitals above. For all periods subsequent to January 1, 2018, the amount of all assessments by the Canal Company on the stock representing the subject water will be paid by the City to the District in accordance with the provisions of paragraph 2, below.

b. The amounts specified in paragraph a, above, shall be made by the City to the District on or before January 1 of the year immediately following the year in which the contracted water was used.

c. If in any calendar year the City calls for and uses less than 85% of the amount of water for which it has contracted, of the above referenced water, the City shall nevertheless pay the District for 85% of the amount of water for which it has contracted, at the rate determined according to paragraph 1.a, above. If in any calendar year the City calls for and uses at least 85% but not more than 110% of the amount of water for which it has contracted, the City shall pay the District for the exact amount of water that it used, at the rate determined according to paragraph 1.a, above. If the City calls for and uses over 110% of the amount of water for which it has contracted, it will be subject to the District's overuse policy then in effect. The District's current overuse policy, in short, dictates that if a contracting entity received more than the contracted amount, that entity must either pay a water lease fee in addition to the then current year's District treated water rate, or must contract for additional water. This overuse policy is subject to change, from time to time, by the District's Board of Trustees.

d. Water allotted pursuant to each Petition shall be delivered to the City and shall be measured at such place or places as the City and the District shall mutually agree at the time the water is contracted for. In the event the water is to be delivered to points other than those at which deliveries can be made at the time of execution of this Agreement, the City shall construct, at its own expense, any new facilities necessary to effect such new point(s) of delivery, including without limitation any costs to connect to existing facilities. The District will not charge the City any fee to connect such new facilities to existing facilities, but such new connections must be approved by the District and constructed according to District's design requirements. Such water shall meet minimum standards for municipal water established by the Utah Division of Drinking Water, and the United States Environmental Protection Agency. It shall not be the responsibility of the District to provide facilities to convey water from such point of delivery to the place of use unless otherwise agreed in writing by the District and the City. The District does not guarantee pressures and is not responsible for fluctuations in pressure, whether or not caused by the failure of devices regulating pressure. The City shall provide sufficient storage, at its own expense, to maintain a near constant rate of flow from the District. The City shall take and use water under this and all other contracts between the City and the District in accordance with normal annual demand patterns not to exceed a summer daily peaking factor of 2.0, which is determined by the maximum daily flow rate divided by the average daily flow rate. The average daily flow rate is the total annual delivered water under this and all other contracts between the City and the District divided by 365. If such demand pattern is exceeded, a capacity surcharge will be added to the cost of treatment and delivery. The surcharge will be calculated at 20% of the average water rate per acre foot of all contracted water multiplied by the difference between the actual

daily summer peaking factor and the allowed daily summer peaking factor of 2.0. For example, if the actual daily summer peaking factor is 2.2, and the then average water rate is \$190.00, the surcharge will be \$7.60 per acre foot ($.20 \times \$190.00 \times [2.2 - 2.0]$).

e. The City shall be responsible to conduct and enforce an ongoing cross-connection control program throughout the City. This is required so as to ensure good quality water is delivered to the City residences, as well as to other District customers. The program must comply with State regulations.

f. Every installment or charge required to be paid to the District under this Contract, which shall remain unpaid after its due date, shall bear interest from date of delinquency at a rate of 18% APR.

g. If the City shall fail to make any payment due under a Petition on or before the due date, the District may thereafter refuse the delivery of water. However, this remedy is not exclusive, and the District may exercise any other remedy given under the Petition or by the law to enforce collection of any payment due thereunder.

h. The right to the use of water allotted to the City pursuant to a Petition shall remain in effect for a period of fifty (50) years from the date the Petition has been executed and approved by all parties or, if earlier, until the water so allotted is no longer available. The City shall have no right to cancel all or any part of its rights and obligations under a Petition without the prior written approval of the District's Board of Trustees.

i. In the event there is a shortage of the District's or Canal Company's water supply caused by drought, inaccuracy in distribution not resulting from negligence, hostile diversion, prior or superior claims, or other causes not within the control of the District, no liability shall accrue against the District, or the United States, or any of their respective officers, trustees, agents or employees, for any damage, direct or indirect, arising therefrom, and the payments to the District provided for under a Petition shall not be reduced because of any such shortage or damage. During periods of water shortage, allocations of treated municipal water shall have first priority. In the event of a shortage of treated municipal water, deliveries of water allotted pursuant to a Petition shall be reduced in the proportion that the number of acre-feet of such shortage, as determined by the District, bears to the total number of acre-feet of treated municipal water allocated throughout the District.

j. Any allotment of water made pursuant to a Petition shall be subject to the Water Conservancy Act of Utah, Title 17A, Chapter 2, Part 14, Utah Code Annotated (1953, as amended), and the rules and regulations of the Board of Trustees of the District.

k. The City agrees that it will comply fully with all applicable Federal, State and District laws, orders, regulations and policies, all as administered by appropriate authorities, concerning the environmental impact of City's use of water under each Petition on streams, reservoirs, ground water, or water courses and with respect to pollution thereof resulting from thermal pollution or the discharge of refuse, garbage, sewage effluent, industrial waste, oil, mine

tailings, mineral salts or other materials not allowed to be discharged by applicable law or from any other source whatsoever.

1. Neither party may assign its rights or obligations under a Petition to a third party without the prior written consent of the other party.

m. The reuse of water delivered pursuant to any Petition shall not be allowed without the prior written permission of the District. The waste, seepage, or return flow from water delivered pursuant to each Petition shall belong to the Weber Basin Water Conservancy District for the use and benefit of the Weber Basin Project.

2. If requested to do so by the City, the District may be willing to treat and deliver water other than that represented by the Canal Company stock purchased by the District, such as water represented by Canal Company stock owned by the City or other water sources owned by the City. However, the District shall not be obligated to do so, and may deny such request if it determines in its sole and absolute discretion that it does not have sufficient treatment and delivery capacity or for any other reason.

3. Any notice or other communications required to be given to either of the parties hereto shall be personally delivered to such party or mailed to such party by registered or certified mail, return receipt requested, postage prepaid, at the address indicated below:

Notices to City:

Kaysville City
23 East Center St.
Kaysville, Utah 84037

Notices to District:

Weber Basin Water Conservancy District
2837 East Highway 193
Layton, Utah 84040

Either party may change the place of address aforesaid by written notice to the other party. Notice shall be deemed to have been given upon the date of delivery.

4. This Agreement sets forth the entire understanding of the parties with respect to the subject matter hereof, and all prior negotiations, understandings, representations, inducements and agreements, whether oral or written and whether made by a party hereto or by any one acting on behalf of a party, shall be deemed to be merged in this Agreement and shall be of no further force or effect. No amendment, modification, or change in this Agreement shall be valid or binding unless reduced to writing and signed by all of the parties hereto.

5. The provisions of this Agreement shall be governed by and construed in accordance with the laws of the State of Utah. The paragraph headings contained herein are for purposes of reference only and shall not limit, expand, or otherwise affect the interpretation of any provision

hereof. Whenever the context requires, the singular shall include the plural, the plural shall include the singular, the whole shall include any part thereof, any gender shall include the masculine, feminine and neuter gender, and the term "person" shall include any individual, firm, partnership (general or limited), joint venture, corporation, limited liability company, trust, association, or other entity or association or any combination thereof. If any provision of this Agreement or the application thereof to any person or circumstance shall be invalid or unenforceable to any extent, the remainder of this Agreement and the application of such provision to other persons or circumstances shall not be affected thereby and shall be enforced to the extent permitted by applicable law.

6. This Agreement shall not confer any rights or remedies upon any person other than the parties hereto and their respective permitted successors and assigns.

7. No failure or delay in exercising any right, power or privilege under this Agreement shall operate or be construed as a waiver thereof, nor shall any single or partial exercise of a right, power or privilege hereunder preclude any other or further exercise thereof or the exercise of any other right, power or privilege hereunder.

8. The provisions of this Agreement shall bind and inure to the benefit of the parties hereto and their respective permitted successors and assigns. The parties hereby agree for themselves, and for their successors and assigns, to execute any instruments and to perform any act which may be necessary or proper to carry out the purposes of this Agreement.

9. Any and all disputes arising out of or related to this Agreement or the parties' performance hereunder shall be submitted to mediation before a mutually-acceptable mediator prior to initiation of arbitration, litigation or any other binding or adjudicative dispute resolution process. The parties shall: (i) mediate in good faith; (ii) exchange all documents which each believes to be relevant and material to the issue(s) in dispute; (iii) exchange written position papers stating their position on the dispute(s) and outlining the subject matter and substance of the anticipated testimony of persons having personal knowledge of the facts underlying the dispute(s), and; (iv) engage and cooperate in such further discovery as the parties agree or mediator suggests may be necessary to facilitate effective mediation. Mediator, venue, and related costs shall be shared equally by the parties. Venue of the mediation shall be the state of Utah. In the event the parties are unable to agree upon a mediator, the mediator shall be appointed by a court of competent jurisdiction. This provision shall be specifically enforceable according to its terms, including but not limited to an action to compel mediation. The prevailing party in any action to enforce in whole or in part this mediation clause shall be entitled to reimbursement of attorney's fees and costs incurred in said action.

10. Should any party default in the performance of any of the covenants or agreements contained herein, the prevailing party shall be entitled to recover from the other party or parties all costs and expenses, including a reasonable attorney's fee, which may arise or accrue from enforcing, interpreting, rescinding, or terminating this Agreement or in pursuing any remedy provided hereunder or by applicable law, whether such remedy is pursued by filing suit or otherwise, and regardless of whether such costs, fees and/or expenses are incurred in connection with any bankruptcy proceeding.

11. For the purpose of this agreement, neither the City nor the District, as the case may be, nor any successor in interest shall be considered in breach or default of its obligations with respect to overuse or the exceeding of a peaking rate pursuant to this agreement, in the event that the overuse or the exceeding of the peaking rate is due to acts of god or of the public enemy, acts of the other party, floods, earthquakes, or violations due to the deliberate or negligent acts of third parties.

12. Upon execution of this Agreement, each party shall provide to the other parties a copy of the resolution of its governing board authorizing such execution.

IN WITNESS WHEREOF, the parties have executed this Agreement this _____ day of _____, 2020.

Attest:

**WEBER BASIN WATER CONSERVANCY
DISTRICT**

Tage I. Flint, General Manager/CEO

By: _____
Dee A. Waldron, President

Approved:

Attorney for District

Attest:

KAYSVILLE CITY

Recorder

By: _____
Katie Witt, Mayor

Attorney for City