Board of Adjustment Staff Report

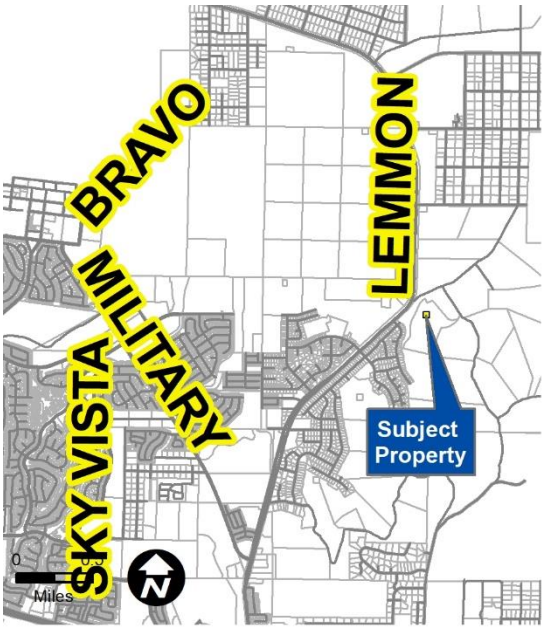
Meeting Date: November 2, 2023 **Agenda Item: 8G**

SPECIAL USE PERMIT CASE NUMBER:	WSUP23-0030 (TMWA Lemmon Valley Tank 1 Rebuild)
BRIEF SUMMARY OF REQUEST:	To approve a new water tank
STAFF PLANNER:	Katy Stark, Planner Phone Number: 775.328.3618 E-mail: krstark@washoecounty.gov

CASE DESCRIPTION

For hearing, discussion, and possible action to approve a special use permit for the construction and operation of a new water tank (utility services use type). An existing 440,000-gallon water tank is proposed to be replaced with a new 500,000-gallon water tank. The project will include demolition of the existing tank, connection to an existing underground water line, site grading, a retaining wall, a detention pond, new fencing, and revegetation of undeveloped surfaces. As part of this project, the applicant is requesting to vary landscaping standards found in WCC Section 110.412.40 by providing revegetation rather than landscaping. The applicant is also requesting to vary paving standards found in WCC Section 110.410.25(e) by using 6-inch compact gravel rather than asphalt or cement. In addition, the applicant is requesting to vary fencing standards found in WCC Section 110.412.40 (d) by installing a fence taller than seven (7) feet and by modifying the solid fence requirement along the property line to allow an 8-foot-tall chain link fence with one foot of barbed wire (total of nine feet in height).

Applicant/Owner:	Truckee Meadows Water Authority (TMWA)
Location:	0 Lemmon Drive
APN:	080-730-08
Parcel Size:	1.0 acre
Master Plan:	Rural
Regulatory Zone:	General Rural (GR)
Area Plan:	North Valleys
Development Code:	Authorized in Article 810, Special Use Permits
Commission District:	5 – Commissioner Herman



Vicinity Map

1001 E. Ninth St., Reno, NV 89512-2845
Telephone: 775.328.6100 – Fax: 775.328.6133
www.washoecounty.gov/csd/planning_and_development

STAFF RECOMMENDATION

APPROVE **APPROVE WITH CONDITIONS** **DENY**

POSSIBLE MOTION

I move that, after giving reasoned consideration to the information contained in the staff report and information received during the public hearing, the Washoe County Board of Adjustment approve with conditions Special Use Permit Case Number WSUP23-0030 for Truckee Meadows Water Authority (TMWA), including a larger water tank (utility services use type), the use of 6-inch compact gravel for driveways and maneuvering areas, the use of a revegetation seed mix rather than formal landscaping, and the allowance for an 8-foot chain link fence with one foot of barbed wire (total of 9 feet in height) surrounding the developed water tank area rather than a solid fence along the property line, with the conditions included as Exhibit A to this matter, having made all five findings in accordance with Washoe County Code Section 110.810.30 and an additional finding in accordance with North Valleys Area Plan Policy NV.12.3.

(Motion with Findings on Page 14)

Staff Report Contents

Exhibits Contents

Special Use Permit

The purpose of a special use permit is to allow a method of review to identify any potential harmful impacts on adjacent properties or surrounding areas for uses that may be appropriate within a regulatory zone; and to provide for a procedure whereby such uses might be permitted by further restricting or conditioning them so as to mitigate or eliminate possible adverse impacts. If the Board of Adjustment grants an approval of the special use permit, that approval is subject to conditions of approval. Conditions of approval are requirements that need to be completed during different stages of the proposed project. Those stages are typically:

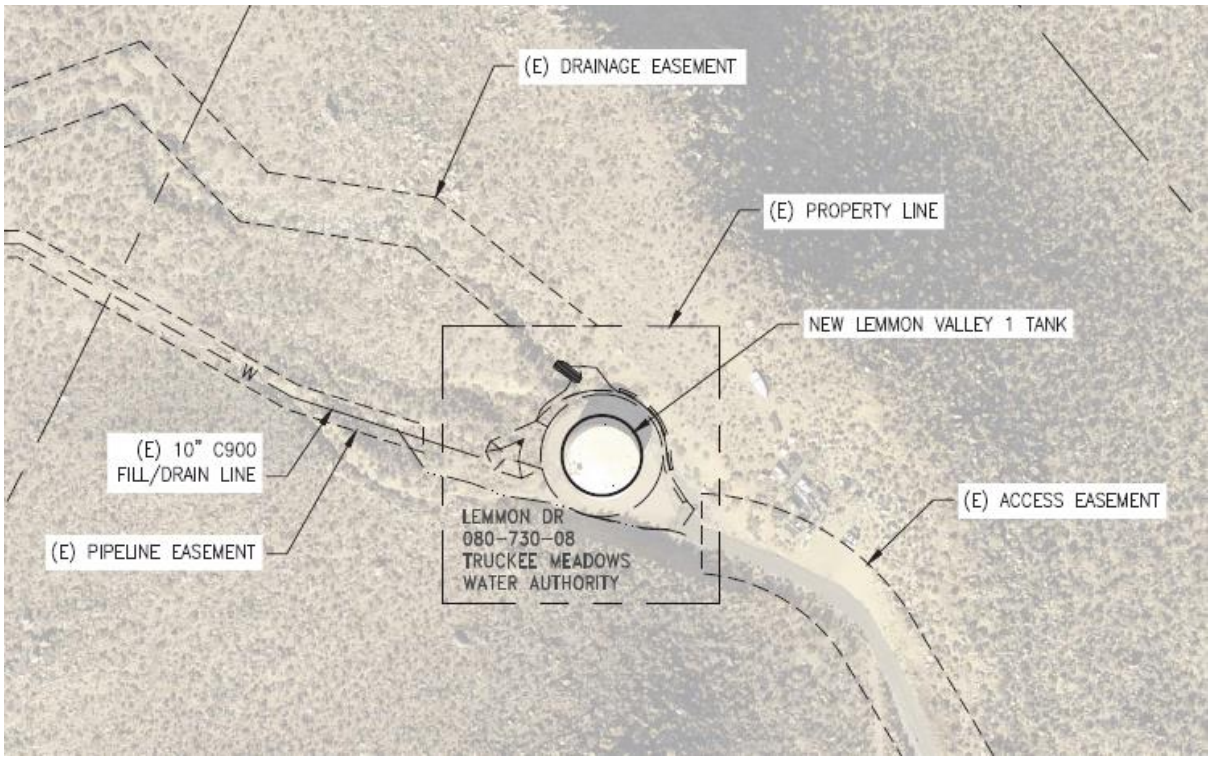
- Prior to permit issuance (i.e. a grading permit, a building permit, etc.)
- Prior to obtaining a final inspection and/or a certificate of occupancy on a structure
- Prior to the issuance of a business license or other permits/licenses
- Some conditions of approval are referred to as "operational conditions." These conditions must be continually complied with for the life of the business or project.

The conditions of approval for Special Use Permit Case Number WSUP23-0030 are attached to this staff report and will be included with the action order.

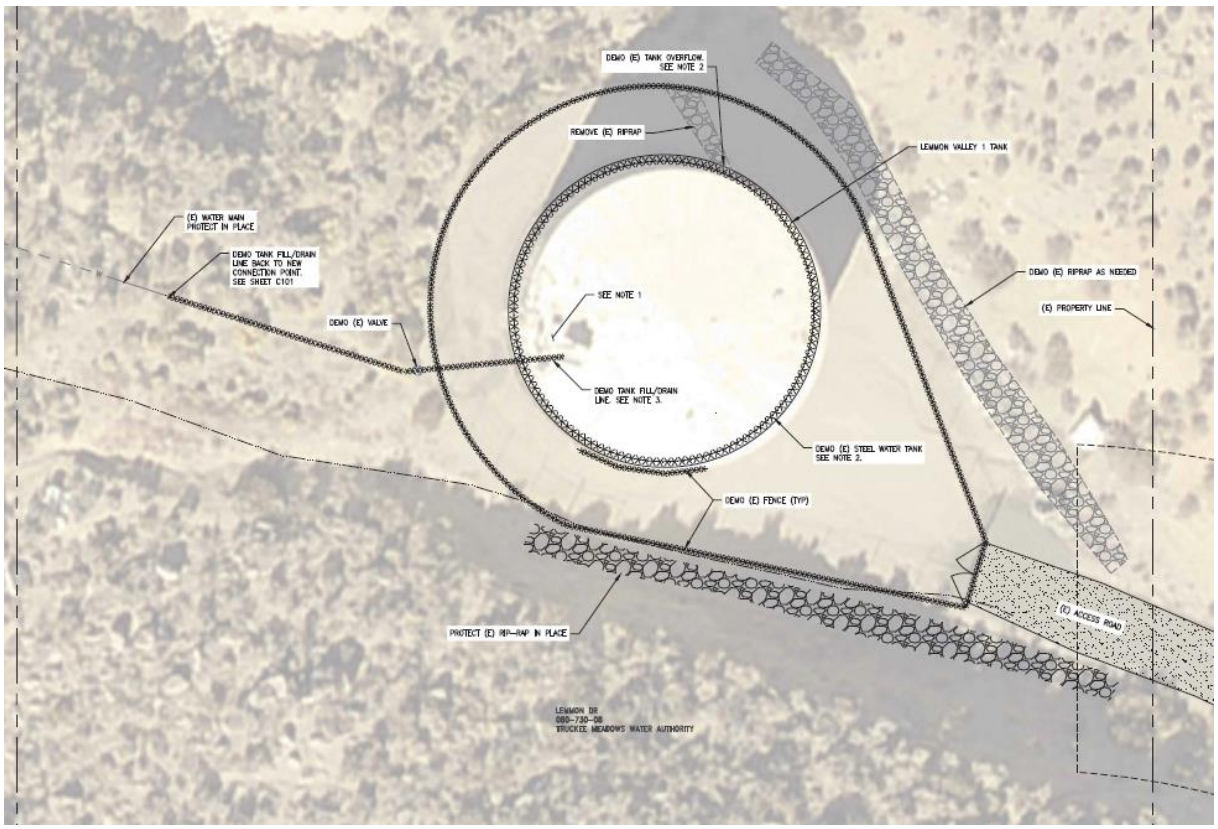
The subject property is designated as General Rural (GR). The proposed use of a water tank is classified as a utility services use type, which is permitted in GR with a special use permit per WCC Table 110.302.05.2. Therefore, the applicant is seeking approval of this SUP from the Board of Adjustment.

Additionally, Article 810, Special Use Permits, allows the Board of Adjustment to vary development code standards in conjunction with the approval process per WCC 110.810.20(e). Board of Adjustment will be ruling on the request(s) to vary standards below:

Variance(s) Requested	Relevant Code
Request to allow 6-inch compact gravel instead of asphalt or cement for driveways and maneuvering areas	WCC Section 110.410.25(e)
Request to waive formal landscape standards and to allow revegetation with a native seed mix	WCC Section 110.412.40
Request to allow a fence taller than 7 feet and request to waive the requirement for a solid fence along the property line	WCC Section 110.412.40 (d)



Site Plan – Proposed New Water Tank



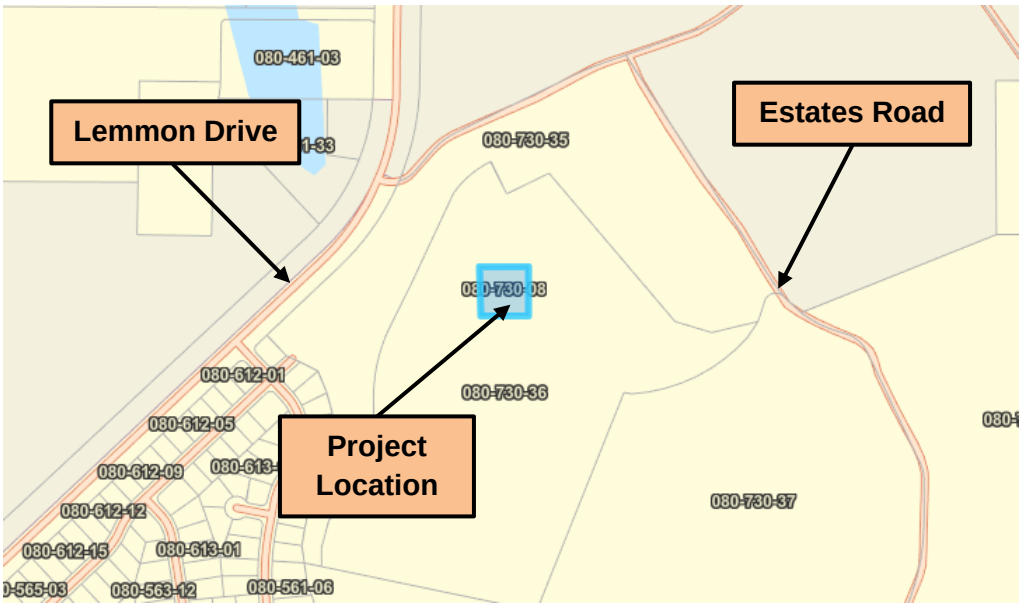
Demolition Plan – Remove Existing Water Tank

Project Evaluation

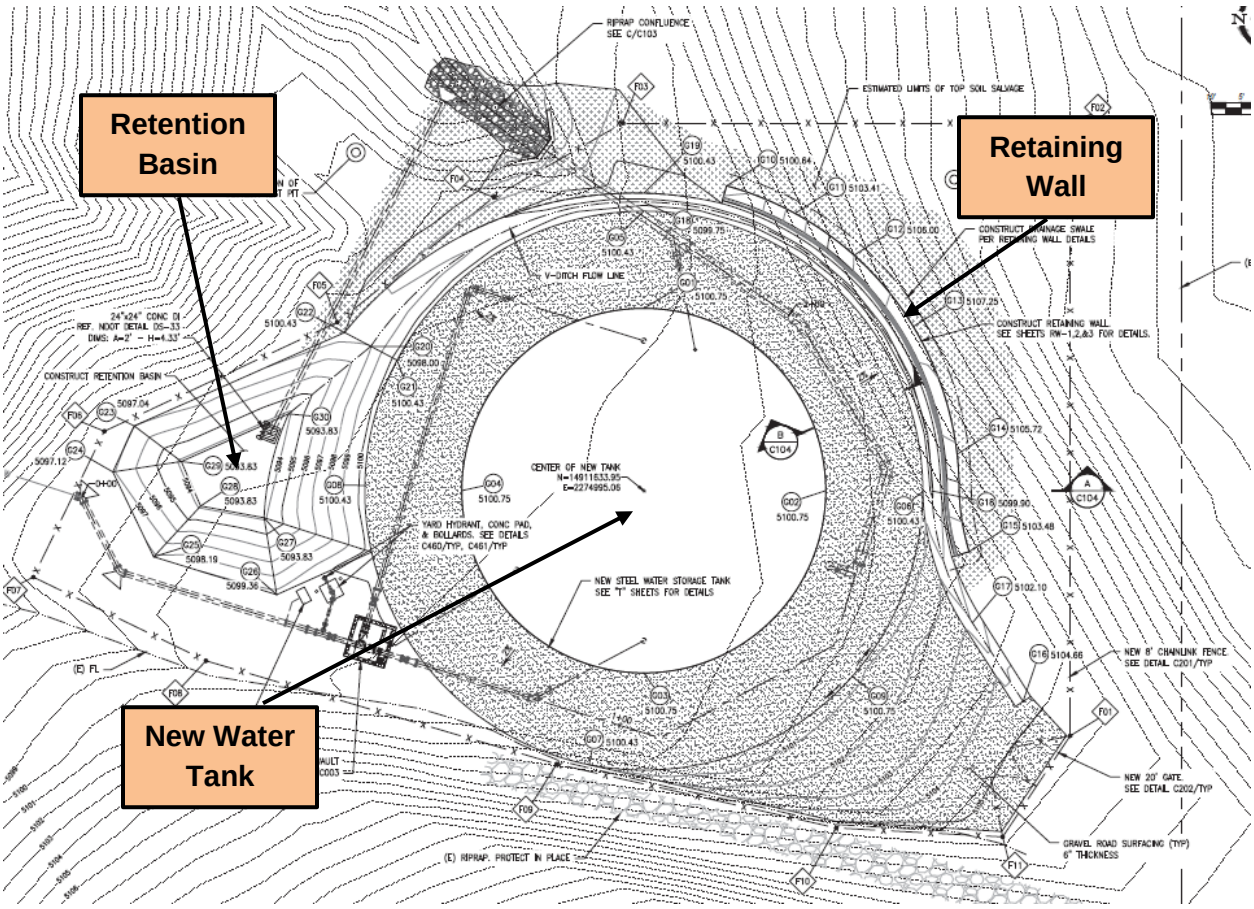
The proposed project is located on a ±1.0-acre parcel in the North Valleys planning area. The applicant, Truckee Meadows Water Authority (TMWA), is requesting approval to replace an existing 440,000-gallon water tank with a new 500,000-gallon water tank for continued service to TMWA customers in the Lemmon Valley area. The existing tank was constructed in the 1970s and is owned and maintained by TMWA. TMWA has determined that the existing tank is at the end of its useful life. The proposal includes demolishing the existing tank and constructing a new tank in the same location. The height of the existing tank is 25.9 feet, and the height of the proposed tank is 28.7 feet. The diameter of the existing tank is 56 feet, and the diameter of the proposed tank is 60 feet. The new tank will connect to existing underground water utilities. The applicant stated that the new tank has been designed to meet the Nevada Administrative Code (NAC) and American Water Works Association (AWWA) standards for welded carbon steel tanks for water storage (D100).

Photos (provided by applicant) **of Existing 440,000-Gallon Water Tank & Access Road**

The proposed project will be accessed via an existing unpaved utility road off Estates Road. The access road was improved by TMWA years ago and is not anticipated to require additional improvements during construction of the new tank. The access road is located through a 60-foot roadway easement located on 1200 Estates Road (APN: 080-730-36) and 1400 Estates Road (APN: 080-730-37).



The project requires additional grading to accommodate the larger footprint of the new tank, a service road around the entire tank, a detention pond for capturing on-site flows that will be created from the project, and new fencing. The existing tank and fence will be deconstructed and removed. Grading for the new tank and detention pond will include the installation of a retaining wall northeast of the new tank to help minimize the required grading area. The amount of grading for the site improvements does not exceed the major grading thresholds found in WCC Section 110.438.35. A portion of the grading plan is shown in the image below. The full image is included with the preliminary construction plans in the application (Exhibit D).



Portion of Grading Plan from Applicant's Preliminary Construction Plans

The new tank will be painted with a non-reflective neutral paint color similar to the existing tank to help it blend with the natural surroundings. The applicant anticipates that the new tank will not be much more visible than the existing tank due to the retaining wall, which will allow the new tank to sit further back into the hillside. The applicant is proposing to secure the perimeter of the development area of the new tank with an 8-foot-tall chain-link fence, topped with one (1) foot of barbed wire (total of nine (9) feet). The Washoe County Development Code includes standards for screening when a civic use adjoins a residential use:

WCC Section 110.412.40(d)

Screening Adjoining Residential Uses. When a civic or commercial use adjoins a residential use, a solid decorative wall or fence shall be erected along the entire length of the common property line. This wall or fence shall be at least six (6) feet but not more than seven (7) feet in height. The wall or fence shall be constructed of durable materials, such as stone, concrete, metal, synthetic or vinyl. Wooden fences are not acceptable.

The applicant is requesting to vary these standards by building the above-described chain-link and barbed wire fence at a maximum of nine feet in height to meet Department of Homeland Security regulations for water tank safety. The applicant is also requesting to forgo a solid fence along the entire length of the property line and to instead build a chain-link fence around only the developed area of the site to surround the new water tank. The 1-acre project parcel sits in the middle of a larger 40-acre parcel (APN: 080-730-36) owned by a different property owner. This 40-acre property has one existing residence. Per the applicant, the residence is located approximately 470-feet from the project site and is not visible from the dwelling unit. The water tank is located at an elevation of 5,100 feet, and the residence sits at 5,024 feet, for a difference of 76 feet. The applicant is proposing that a chain-link fence surrounding the water tank development area will have a less significant visual impact on the surrounding property owners and the community than a solid fence along the entire property line. The applicant provided renderings of potential fencing locations and potential fence material (chain link vs. solid) to demonstrate potential visual impact. *See* images below.

Applicant Renderings – Property Line (yellow) & Proposed Fence (blue) Around Water Tank

Applicant Renderings – Chain-link Fence & Solid Fence – Visual Impact

Staff is in agreement that the chain-link fence and the limited fencing (around water tank rather than property line) will create a less significant visual impact for surrounding properties.

The applicant is also requesting to modify parking surface standards:

WCC Section 110.410.25(e)

Surfacing. All parking spaces, driveways and maneuvering areas shall be paved and permanently maintained with asphalt or cement. Bumper guards shall be provided when necessary to protect adjacent structures or properties as determined by the Director of Community Development.

The applicant is requesting to use 6-inch compact gravel as an alternative surface to asphalt or cement for driveways and maneuvering areas. This request includes the access road and the 16-foot-wide ring road around the water tank. These roads and maneuvering areas will be used by service and maintenance vehicles during monthly visits to service the water tank. Parking spaces are not required, because long-term parking is not required. Vehicles will only be parked temporarily during maintenance visits. The applicant stated that monthly maintenance visits will not generate significant traffic to justify a nonporous surface. The applicant also stated that the proposed surface will minimize runoff during precipitation, compared to asphalt or concrete, and will support the need to minimize flows to Swan Lake in the North Valleys area.

The applicant's final request is to vary landscaping standards:

WCC Section 110.412.40

(a) Coverage. A minimum twenty (20) percent of the total developed land area shall be landscaped. Any disturbance to undeveloped portions of a site shall be mitigated.

(c) Landscaped Buffers Adjoining Residential Uses. When a civic or commercial use adjoins a residential use, a landscaped buffer is required as follows:

(1) The buffer shall be the width of the required front, side or rear yard for the entire length of the adjoining common property line; and

(2) The buffer shall include at least one (1) tree every twenty (20) linear feet of property frontage, or fraction thereof, planted in off-set rows or groupings to achieve maximum screening.

Per WCC Section 110.412.05(b)(1), for expanded development, if the expansion is less than fifty (50) percent, then Article 412, *Landscaping*, applies only to the developable lot area associated with the proposed expansion. For the proposed project, the area of the existing developed lot is ±10,000 square feet, and the new improvements will expand the developed area to ±13,700 square feet. Twenty percent of the expanded development, in accord with WCC Section 110.412.40(a), is ±740 square feet. The applicant is requesting to waive the formal landscaping required in WCC, including waiving the landscape buffers/trees in WCC Section 110.412.40(c), and instead provide revegetation on the disturbed areas. The project site is in a rural area surrounded by lowland vegetation and sagebrush. The applicant has stated that formal landscaping including ground cover, non-native plants, shrubs, and trees will make the site more visible to surrounding residents. At the completion of grading and construction, the applicant proposes to revegetate disturbed areas with a native seed mix to conform with the surrounding vegetation and provide slope stabilization. The applicant is proposing to revegetate an area of ±1,500 square feet, which is more than twice the required area of ±740 square feet.

Neighborhood Meeting

The applicant hosted a neighborhood meeting on Monday, August 14, 2023, from 5:30 – 6:30 p.m. via Zoom. The applicant presented an overview of the project including preliminary site plans, site photos, maps, and project details. One member of the public attended the meeting and did not express concerns about the proposed project.

Area Plan Evaluation

The subject parcel is located within the North Valleys Area Plan in the Lemmon Valley Suburban Character Management Area (SCMA). The following are the pertinent policies from the Area Plan:

Relevant Area Plan Policies Reviewed

Policy	Brief Policy Description	Complies	Condition of Approval
NV.2.3	Site development plans in the North Valleys planning area must submit a plan for the control of noxious weeds. The plan should be developed through consultation with the Washoe County District Health Department, the University of Nevada Cooperative Extension, the State Department of Agriculture, and/or the Washoe-Storey Conservation District. The control plan will be implemented on a voluntary compliance basis.	Yes	Washoe County Planning staff has included a condition in Exhibit A requiring the applicant to submit a plan for the control of noxious weeds.
NV.2.6	Prior to the approval of…non-residential development in the North Valleys planning area, the Reno-Tahoe Airport Authority (RTAA) will be contacted to determine if height limitations and an avigation easement are required…	Yes	The project application was sent to the Reno-Tahoe Airport Authority (RTAA) for review, and no comments or conditions were received.
NV.9.1	With the exception of temporary infrastructure for construction projects, Washoe County will require the underground placement of utility distribution infrastructure within the North Valleys Management Area. Utility transmission facilities will be subject to a special use permit…	Yes	The proposed water tank will be connected to existing underground water utilities.
NV.9.2	The Washoe County Departments of Community Development and Public Works will establish and oversee compliance with design standards for grading that minimize the visual impact of all residential and non-residential hillside development.	Yes	The project application has been reviewed by Washoe County Planning staff and by Washoe County Engineering staff. Conditions to ensure compliance with grading standards have been included in Exhibit A.
NV.9.3	The grading design standards referred to in Policy NV.8.2 will, at a minimum, ensure that disturbed areas shall be finished, and fill slopes will not exceed a 3:1 slope, and that hillside grading will establish an undulating naturalistic appearance by creating varying curvilinear contours.		The project application has been reviewed by Washoe County Planning staff and by Washoe County Engineering staff. Conditions to ensure compliance with grading standards have been included in Exhibit A. The applicant will be required to adhere to the grading standards in WCC Article 438.

NV.10.1	Prior to the approval of…public-initiated capital improvements in the North Valleys planning area, the Nevada Department of Conservation and Natural Resources will be contacted and, if the department requests, an appropriate archaeological investigation will be conducted.	Yes	The project application was sent to the Nevada State Historic Preservation Office (SHPO) for review, and no comments or conditions were received.
NV.12.2	Development in the North Valleys area will comply with all local, state and federal standards regarding air quality.	Yes	The project application was sent to Northern Nevada Public Health, Air Quality, for review, and no comments or conditions were received.
NV.12.3	The granting of special use permits in the North Valleys must be accompanied by a finding that no significant degradation of air quality will occur as a result of the permit. As necessary, conditions may be placed on special use permits to ensure no significant degradation of air quality will occur. The Department of Community Development will seek the advice and input of the Air Quality Division of the Department of Health in the implementation of this policy.	Yes	A finding is included in this report and in the potential motion that no significant degradation of air quality will occur as a result of the special use permit. The project application was sent to Northern Nevada Public Health, Air Quality, for review, and no comments or conditions were received.
NV.13.1	Development proposals, with the exception of single-family homes and uses accessory to single family homes, within the North Valleys planning area will include detailed soils and geo-technical studies sufficient to: a. Ensure structural integrity of roads and buildings. b. Provide adequate setbacks from potentially active faults or other hazards. c. Minimize erosion potential.	Yes	The applicant submitted a geotechnical investigation report dated April 3, 2023, which was completed by Construction Materials Engineers Inc. (CME). Also, the project application was reviewed by Washoe County Engineering (Engineering). Engineering submitted a condition (included in Exhibit A) which requires grading plans and detailed plans for erosion control and slope stabilization.
NV.14.1	Prior to the approval of…special use permits, or public initiated capital improvements in the North Valleys planning area, the Nevada Department of Wildlife will be contacted and given an opportunity to provide conservation, preservation, or other wildlife and habitat management input to the project.	Yes	The project application was sent to the Nevada Department of Wildlife (NDOW) for review. NDOW staff stated they had no comments.

Reviewing Agencies

The following agencies/individuals received a copy of the project application for review and evaluation.

Agencies	Sent to Review	Responded	Provided Conditions	Contact
NDOW (Wildlife)	X	X		Katie Andrle, kmandrle@ndow.org
NV Water Resources	X	X	X	Steve Shell, sshell@water.nv.gov
Washoe County Building & Safety	X			
Washoe County Operations Division Director	X			
Washoe County Parks & Open Space	X	X		Faye-Marie Pekar, fpekar@washoecounty.gov
Washoe County Sewer	X	X	X	Alex Mayorga, amayorga@washoecounty.gov
Washoe County Traffic	X	X		Mitch Fink, mfink@washoecounty.gov
Washoe County Water Rights Manager (All Apps)	X	X		Timber Weiss, tweiss@washoecounty.gov
WCSO Law Enforcement	X	X		Brandon Zirkle, BZirkle@washoecounty.gov
Washoe County Engineering (Land Development) (All Apps)	X	X	X	Rob Wimer, rwimer@washoecounty.gov; Janelle Thomas, jkthomas@washoecounty.gov
NNPH Air Quality	X			
NNPH EMS	X	X		Sabrina Brasuell, sbrasuell@washoecounty.gov
NNPH Environmental Health	X	X	X	James English, jenglish@washoecounty.gov
TMFPD	X	X	X	Dale Way, dway@tmfpd.us; Brittany Lemon, BLemon@tmfpd.us
Airport Authority	X			
Nevada State Historic Preservation	X			
NV Energy	X			
Truckee Meadows Water Authority	X			

All conditions required by the contacted agencies can be found in Exhibit A, Conditions of Approval.

Staff Comment on Required Findings

WCC Section 110.810.30, Article 810, *Special Use Permits*, requires that all of the following findings be made to the satisfaction of the Washoe County Board of Adjustment before granting approval of the request. Staff has completed an analysis of the special use permit application and has determined that the proposal is in compliance with the required findings as follows.

(a) Consistency. That the proposed use is consistent with the action programs, policies, standards and maps of the Master Plan and the North Valleys Area Plan.

Staff Comment: The proposed use is consistent with the action programs, policies, standards and maps of the Master Plan and the North Valleys Area Plan. The water tank (utility services use type) is permitted in the GR regulatory zone with an

approved special use permit. The project conforms to the policies and findings found in the North Valleys Area Plan.

(b) Improvements. That adequate utilities, roadway improvements, sanitation, water supply, drainage, and other necessary facilities have been provided, the proposed improvements are properly related to existing and proposed roadways, and an adequate public facilities determination has been made in accordance with Division Seven.

Staff Comment: The utility road to the existing water tank is accessed off Estates Road and was previously improved by TMWA. This existing utility road is anticipated to be adequate for construction and for future access to the proposed water tank when construction is complete. The new water tank will connect to existing underground water utilities. The grading and drainage improvements necessary for the new water tank have been included in the project application and were reviewed by Washoe County Engineering. Conditions to ensure appropriate grading and drainage are included in Exhibit A.

In addition, during the demolition of the existing water tank and construction of the new water tank, water service to the surrounding neighborhood is not anticipated to be disrupted. TMWA is constructing a Pressure Reducing Station (PRS) under Lemmon Drive (PWP# WA-2023-408). This new main will provide water to the surrounding neighborhoods while the water tank project is being completed. After construction of the new tank, the PRS will be used as a back-up during low-pressure or fire events and will improve service to existing TMWA customers in the Lemmon Valley Area.

(c) Site Suitability. That the site is physically suitable for a 500,000-gallon water tank and for the intensity of such a development.

Staff Comment: The site is currently developed with a water tank that has been in use for decades. The new tank will be slightly larger than the existing tank but will be placed in the same location and will utilize the same access road. The new tank will connect to existing underground water utilities.

(d) Issuance Not Detrimental. That issuance of the permit will not be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area.

Staff Comment: Issuance of the permit is not anticipated to be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area. Water service to existing TMWA customers will not be disrupted during the demolition and construction process. Upon completion of the new water tank, service to existing customers will be improved.

(e) Effect on a Military Installation. Issuance of the permit will not have a detrimental effect on the location, purpose or mission of the military installation.

Staff Comment: There are no military installations located in the proposed site area. This finding is not applicable to the proposed project.

North Valleys Area Plan Finding – Policy NV.12.3

(f) NV.12.3 The granting of special use permits in the North Valleys must be accompanied by a finding that no significant degradation of air quality will occur as a result of the permit.

Staff Comment: The proposed special use permit project application was sent to Northern Nevada Public Health, Air Quality, for review. Neither comments nor denial was received. No degradation of air quality is anticipated. The applicant will be required to obtain air quality permits if necessary.

Recommendation

After a thorough analysis and review, Special Use Permit Case Number WSUP23-0030 is being recommended for approval with conditions. Staff offers the following motion for the Board's consideration.

Motion

I move that, after giving reasoned consideration to the information contained in the staff report and information received during the public hearing, the Washoe County Board of Adjustment approve with conditions Special Use Permit Case Number WSUP23-0030 for Truckee Meadows Water Authority (TMWA), including a larger water tank (utility services use type), the use of 6-inch compact gravel for driveways and maneuvering areas, the use of a revegetation seed mix rather than formal landscaping, and the allowance for an 8-foot chain link fence with one foot of barbed wire (total of 9 feet in height) surrounding the developed water tank area rather than a solid fence along the property line, with the conditions included as Exhibit A to this matter, having made all five findings in accordance with Washoe County Code Section 110.810.30 and an additional finding in accordance with North Valleys Area Plan Policy NV.12.3:

(a) Consistency. That the proposed use is consistent with the action programs, policies, standards and maps of the Master Plan and the North Valleys Area Plan;

(b) Improvements. That adequate utilities, roadway improvements, sanitation, water supply, drainage, and other necessary facilities have been provided, the proposed improvements are properly related to existing and proposed roadways, and an adequate public facilities determination has been made in accordance with Division Seven;

(c) Site Suitability. That the site is physically suitable for a 500,000-gallon water tank and for the intensity of such a development;

(d) Issuance Not Detrimental. That issuance of the permit will not be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area;

(e) Effect on a Military Installation. Issuance of the permit will not have a detrimental effect on the location, purpose or mission of the military installation.

North Valleys Area Plan Finding – Policy NV.12.3

(f) NV.12.3 The granting of special use permits in the North Valleys must be accompanied by a finding that no significant degradation of air quality will occur as a result of the permit.

Appeal Process

Board of Adjustment action will be effective 10 calendar days after the written decision is filed with the Secretary to the Board of Adjustment and mailed to the applicant, unless the action is appealed to the Washoe County Board of County Commissioners, in which case the outcome of the appeal shall be determined by the Washoe County Board of County Commissioners. Any appeal must be filed in writing with the Planning and Building Division within 10 calendar days

from the date the written decision is filed with the Secretary to the Board of Adjustment and mailed to the applicant.

Applicant/Owner:	TMWA, Attn: Thomas Speer, TSpeer@tmwa.com
Consultants:	Wood Rodgers, Inc., Attn: Eric Hasty & Stacie Huggins, ehasty@woodrodgers.com & shuggins@woodrodgers.com

Conditions of Approval

Special Use Permit Case Number WSUP23-0030

The project approved under Special Use Permit Case Number WSUP23-0030 shall be carried out in accordance with the conditions of approval granted by the Board of Adjustment on November 2, 2023. Conditions of approval are requirements placed on a permit or development by each reviewing agency. These conditions of approval may require submittal of documents, applications, fees, inspections, amendments to plans, and more. These conditions do not relieve the applicant of the obligation to obtain any other approvals and licenses from relevant authorities required under any other act.

Unless otherwise specified, all conditions related to the approval of this special use permit shall be met or financial assurance must be provided to satisfy the conditions of approval prior to issuance of a grading or building permit. The agency responsible for determining compliance with a specific condition shall determine whether the condition must be fully completed or whether the applicant shall be offered the option of providing financial assurance. All agreements, easements, or other documentation required by these conditions shall have a copy filed with the County Engineer and the Planning and Building Division.

Compliance with the conditions of approval related to this special use permit is the responsibility of the applicant, his/her successor in interest, and all owners, assignees, and occupants of the property and their successors in interest. Failure to comply with any of the conditions imposed in the approval of the special use permit may result in the institution of revocation procedures.

Washoe County reserves the right to review and revise the conditions of approval related to this Special Use Permit should it be determined that a subsequent license or permit issued by Washoe County violates the intent of this approval.

For the purpose of conditions imposed by Washoe County, “may” is permissive and “shall” or “must” is mandatory.

Conditions of approval are usually complied with at different stages of the proposed project. Those stages are typically:

- Prior to permit issuance (i.e., grading permits, building permits, etc.).
- Prior to obtaining a final inspection and/or a certificate of occupancy.
- Prior to the issuance of a business license or other permits/licenses.
- Some “ conditions of approval” are referred to as “operational conditions.” These conditions must be continually complied with for the life of the project or business.

The Washoe County Commission oversees many of the reviewing agencies/departments with the exception of the following agencies.

- **The DISTRICT BOARD OF HEALTH, through Northern Nevada Public Health (NNPH), has jurisdiction over all public health matters in NNPH. Any conditions set by NNPH must be appealed to the District Board of Health.**

FOLLOWING ARE CONDITIONS OF APPROVAL REQUIRED BY THE REVIEWING AGENCIES. EACH CONDITION MUST BE MET TO THE SATISFACTION OF THE ISSUING AGENCY.

Washoe County Planning and Building Division

1. The following conditions are requirements of Planning and Building, which shall be responsible for determining compliance with these conditions.

   Contact Name – Katy Stark, Planner, 775.328.3618, krstark@washoecounty.gov

   a. The applicant shall attach a copy of the action order approving this project to all permits and applications (including building permits) applied for as part of this special use permit.

   b. The applicant shall include a condition response memorandum with each subsequent permit application. That memorandum shall list each condition of approval, shall provide a narrative describing how each condition has been complied with, and the location of the information showing compliance with each condition within the improvement plan set that has been submitted.

   c. The applicant shall demonstrate substantial conformance to the plans approved as part of this special use permit.

   d. The applicant shall submit construction plans, with all information necessary for comprehensive review by Washoe County, and initial building permits shall be issued within two years from the date of approval by Washoe County. The applicant shall complete construction within the time specified by the building permits.

   e. A note shall be placed on all construction drawings and grading plans stating:

      NOTE

      Should any cairn or grave of a Native American be discovered during site development, work shall temporarily be halted at the specific site and the Sheriff's Office as well as the State Historic Preservation Office of the Department of Conservation and Natural Resources shall be immediately notified per NRS 383.170.

   f. The business license will be obtained to for the new use.

   g. Construction activities shall be limited to the hours between 7am to 7pm, Monday through Saturday only. Any construction machinery activity or any noise associated with the construction activity are also limited to these hours.

   h. The applicant shall submit a plan for the control of noxious weeds to be used during the revegetation process. The plan shall be developed through consultation with the Washoe County District Health Department, the University of Nevada Cooperative Extension, the State Department of Agriculture, and/or the Washoe-Storey Conservation District.

   i. The following **Operational Conditions** shall be required for the life of the business:

      i. This special use permit shall remain in effect until or unless it is revoked or is inactive for one year.

      ii. Failure to comply with any of the conditions of approval shall render this approval out of conformance and subject to revocation.

      iii. The applicant and any successors shall direct any potential purchaser/operator of the site and/or the administrative permit to meet with Planning and Building to review conditions of approval prior to the final sale of the site and/or the administrative permit. Any subsequent purchaser/operator of the site and/or the

administrative permit shall notify Planning and Building of the name, address, telephone number, and contact person of the new purchaser/operator within 30 days of the final sale.

iv. This special use permit shall remain in effect as long as the business is in operation and maintains a valid business license.

Washoe County Engineering and Capital Projects

2. The following conditions are requirements of the Engineering Division, which shall be responsible for determining compliance with these conditions.

Contact Name –

Janelle K. Thomas, P.E., C.F.M., 775.328.3603, jkthomas@washoecounty.gov and Robert Wimer, P.E., 775.328.2059, rwimer@washoecounty.gov

a. A complete set of construction improvement drawings, including an on-site grading plan, shall be submitted when applying for a building/grading permit. Grading shall comply with best management practices (BMP's) and shall include detailed plans for grading, site drainage, erosion control (including BMP locations and installation details), slope stabilization, and mosquito abatement. Placement or removal of any excavated materials shall be indicated on the grading plan. Silts shall be controlled on-site and not allowed onto adjacent property.

DRAINAGE (COUNTY CODE 110.416, 110.420, and 110.421)

Contact Name – Robert Wimer, P.E., 775.328.2059, rwimer@washoecounty.gov

b. The following note shall be added to the construction drawings; "All properties, regardless of if they are located within or outside of a FEMA designated flood zone, may be subject to flooding. The property owner is required to maintain all drainage easements and natural drainages and not perform or allow unpermitted and unapproved modifications to the property that may have detrimental impacts to surrounding properties."

UTILITIES (County Code 422 & Sewer Ordinance)

Contact Name – Alexander Mayorga, P.E., 775.328.2313, amayorga@washoecounty.gov

c. The applicant shall conform to all conditions imposed by intergovernmental agreements required to provide sewer service to the subject project, and, if required, be a party to any such agreements.

Truckee Meadows Fire Protection District

3. The following condition is a requirement of the Truckee Meadows Fire Protection District, which shall be responsible for determining compliance with this condition.

Contact Name – Brittany Lemon, Fire Captain – Fire Prevention, 775.326.6079, blemon@tmfpd.us

a. This project shall meet and comply with all requirements of currently adopted TMFPD fire codes, ordinances, and standards at the time of construction to include infrastructure for fire apparatus access roads and water supply. https://tmfpd.us/fire-code/

Northern Nevada Public Health (NNPH), Environmental Health Division (EHS)

4. The following conditions are requirements of Northern Nevada Public Health (NNPH), Environmental Health Division (EHS), which shall be responsible for determining compliance with these conditions.

   Contact Name – James English, REHS, CP-FS, EHS Supervisor, 775.900.7239, jenglish@washoecounty.gov

   a. If the application is approved, the future building plans and permits must be reviewed and approved by EHS. Prior to EHS building permit approval, the construction and design of the tank must be approved through the Nevada Division of Environmental Protection (NDEP) as water project under NAC 445A.

Nevada Division of Water Resources

5. The following condition is a requirement of the Nevada Division of Water Resources, which shall be responsible for determining compliance with this condition.

   Contact Name – Steve Shell, Water Rights Specialist II, 775.684.2836, sshell@water.nv.gov

   a. Any water used on the described lands should be provided by an established utility or under permit issued by the State Engineer's Office.

*** End of Conditions ***

NORTHERN NEVADA Public Health | Environmental Health

September 25, 2023

Washoe County Community Services
Planning and Development Division

RE: TMWA Lemmon Valley Tank 1 Rebuild; 080-730-12
Special Use Permit; WSUP23-0030

Dear Washoe County Staff:

The following conditions are requirements of Northern Nevada Public Health (NNPH), Environmental Health Division, (EHS) which shall be responsible for determining compliance with these conditions.

Contact Name – James English - jenglish@washoecounty.us

a) Condition #1: EHS has reviewed the referenced application and notes the parcel has no water or sewer disposal services.

b) Condition #2: EHS has no concerns related to the approval of this application as submitted for construction and operation of a new water utility storage tank, or the varying of landscaping standards for the site.

c) Condition #3: If the application is approved, the future building plans and permits must be reviewed and approved by EHS. Prior to EHS building permit approval, the construction and design of the tank must be approved through the Nevada Division of Environmental Protection (NDEP) as water project under NAC 445A.

If you have any questions or would like clarification regarding the foregoing, please contact James English, EHS Supervisor at jenglish@washoecounty.us regarding all NNPH comments.

Sincerely,

James English, REHS, CP-FS
EHS Supervisor
Environmental Health Services
Northern Nevada Public Health

From: Program, EMS
To: Stark, Katherine
Cc: Program, EMS
Subject: FW: September Agency Review Memo II
Date: Monday, September 25, 2023 12:09:29 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
September Agency Review Memo II.pdf
image006.png
image007.png
image008.png
image009.png
image010.png
image011.png

Hello,

The EMS Program has reviewed the September Agency Review Memo II - Special Use Permit Case Number WSUP23-0030 (TMWA Lemmon Valley Tank 1 Rebuild) - and has no concerns or questions at this time based on the information provided.

Thank you,

Sabrina.

NORTHERN NEVADA Public Health

Sabrina Brasuell
EMS Coordinator
Epidemiology and Public Health Preparedness

O: 775-326-6043
1001 E Ninth St. Bldg. B Reno, NV 89512

emsprogram@nnph.org

NNPH.org

Click here to take our customer satisfaction survey

PLEASE NOTE: My last day in the role of EMS Coordinator is October 10th, 2023. **After October 10th, 2023,** please send non-urgent emails to Program Manager, Andrea Esp at AEsp@nnph.org Please send non-urgent emails to

Date: September 25, 2023

To: Katy Stark, Planner

From: Janelle K. Thomas, P.E., C.F.M., Senior Licensed Engineer
Robert Wimer, P.E., Licensed Engineer

Re: Special Use Permit for ***TMWA Lemmon Valley Tank 1 Rebuild WSUP23-0030***
0 Lemmon Drive
APN 080-730-08

GENERAL PROJECT DISCUSSION

Washoe County Engineering staff has reviewed the above referenced application. The Special Use Permit is for the construction of a replacement 500,000-gallon water tank and is located on approximately 1.0 acres off Lemmon Drive, approximately 700 feet southeast of the intersection of Lemmon Drive and Deodar Way. The Engineering and Capital Projects Division recommends approval with the following comments and conditions of approval which supplement applicable County Code and are based upon our review of the site and the application prepared by Wood Rodgers, Inc. The County Engineer shall determine compliance with the following conditions of approval.

For questions related to sections below, please see the contact's name provided.

GENERAL CONDITIONS
Contact Information: Robert Wimer, P.E. (775) 328-2059

1. A complete set of construction improvement drawings, including an on-site grading plan, shall be submitted when applying for a building/grading permit. Grading shall comply with best management practices (BMP's) and shall include detailed plans for grading, site drainage, erosion control (including BMP locations and installation details), slope stabilization, and mosquito abatement. Placement or removal of any excavated materials shall be indicated on the grading plan. Silts shall be controlled on-site and not allowed onto adjacent property.

DRAINAGE (COUNTY CODE 110.416, 110.420, and 110.421)
Contact Information: Robert Wimer, P.E. (775) 328-2059

Conditions:

1. The following note shall be added to the construction drawings; "All properties, regardless of if they are located within or outside of a FEMA designated flood zone, may be subject to flooding. The property owner is required to maintain all drainage easements and natural drainages and not perform or allow unpermitted and unapproved modifications to the property that may have detrimental impacts to surrounding properties."

TRAFFIC AND ROADWAY (COUNTY CODE 110.436)

Contact Information: Mitchell Fink, P.E. (775) 328-2050

Discussion: No traffic or roadway comments.

UTILITIES (County Code 422 & Sewer Ordinance)
Contact Information: Alexander Mayorga, P.E. (775) 328-2313

Conditions:

1. The applicant shall conform to all conditions imposed by intergovernmental agreements required to provide sewer service to the subject project, and, if required, be a party to any such agreements.

From: Katie Andrle <kmandrle@ndow.org>
Sent: Wednesday, September 20, 2023 2:39 PM
To: Albarran, Adriana <AAlbarran@washoecounty.gov>
Subject: RE: September Agency Review Memo II

[**NOTICE:** This message originated outside of Washoe County -- **DO NOT CLICK** on **links** or open **attachments** unless you are sure the content is safe.]

Hi Adriana,

I don't have any comments. Thanks!

From: Pekar, Faye-Marie L.
To: Stark, Katherine
Subject: WSUP23-0030 (TMWA Lemmon Valley Tank 1 Rebuild)
Date: Tuesday, September 26, 2023 12:06:11 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png

Hi Katy,

I have reviewed WSUP23-0030 (TMWA Lemmon Valley Tank 1 Rebuild) on behalf of parks and do not have any comments.

Thank you,

Faye-Marie L. Pekar, MPA
Park Planner, Planning & Building Division | Community Services Department
fpekar@washoecounty.gov |

Visit us first online: www.washoecounty.gov/csd
Planning Division: 775.328.6100 | Planning@washoecounty.gov
CSD Office Hours: Monday-Friday 8:00am to 4:00pm
1001 East Ninth Street, Reno, NV 89512

Have some kudos to share about a Community Services Department employee or experience? Submit a nomination for a Washoe Star by clicking this link: **WASHOE STAR**

From: Steve Shell
To: Stark, Katherine
Subject: WSUP23-0030
Date: Tuesday, September 19, 2023 3:35:05 PM
Attachments: image001.png
image002.png
image003.png
image006.png
image008.png

[**NOTICE:** This message originated outside of Washoe County -- **DO NOT CLICK** on **links** or open **attachments** unless you are sure the content is safe.]

here are no active water rights appurtenant to the described lands in this proposed project.
The lands of the proposed project lie within the Truckee Meadows Water Authority service area.
Any water used on the described lands should be provided by an established utility or under permit issued by the State Engineer's Office.

As of June 1, 2021, the Office of the State Engineer is open to the public. Please call 684-2800 upon arrival and a representative will come down to escort you to our office.

Steve Shell
Water Rights Specialist II
Department of Conservation and Natural Resources
Nevada Division of Water Resources
901 S. Stewart St., Suite 2002
Carson City, NV 89701
sshell@water.nv.gov
(O) 775-684-2836 | (F) 775-684-2811

From: Lemon, Brittany
To: Stark, Katherine
Cc: Way, Dale
Subject: WSUP23-0030 (TMWA Lemmon Valley Tank 1 Rebuild) Conditions of Approval
Date: Tuesday, September 19, 2023 10:45:50 AM
Attachments: image001.png

Hi Katy,

"This project shall meet and comply with all requirements of currently adopted TMFPD fire codes, ordinances, and standards at the time of construction to include infrastructure for fire apparatus access roads and water supply."
https://tmfpd.us/fire-code/.

Thank you!

Brittany Lemon
Fire Captain - Fire Prevention | Truckee Meadows Fire & Rescue
blemon@tmfpd.us | Office: 775.326.6079 | Cell: 775.379.0584
3663 Barron Way, Reno, NV 89511

"Committed to excellence, service, and the protection of life and property in our community"

Date: September 26, 2023

To: Katy Stark, Planner

From: Timber Weiss, P.E., Licensed Engineer

Re: Special Use Permit Case Number WSUP23-0030 (TMWA Lemmon Valley Tank 1 Rebuild)
APN 080-730-08

GENERAL PROJECT DISCUSSION

For hearing, discussion, and possible action to approve a special use permit for the construction and operation of a new water tank (Utility Services Use Type). An existing 440,000-gallon water tank is proposed to be replaced with a new 500,000-gallon water tank. The project will include demolition of the existing tank, connection to an existing underground water line, site grading, a retaining wall, a detention pond, new fencing, and revegetation of undeveloped surfaces. As part of this project, the applicant is also requesting to vary landscaping standards found in WCC Section 110.412.40 by providing revegetation rather than landscaping.

The Community Services Department (CSD) recommends approval of this project with the following Water Rights conditions:

No water rights conditions for this permit.

From:	Zirkle, Brandon
To:	Stark, Katherine; Bronczyk, Christopher
Subject:	FW: September Agency Review Memo II
Date:	Thursday, September 21, 2023 11:14:21 AM
Attachments:	image001.png image002.png image003.png image004.png image005.png September Agency Review Memo II.pdf

The Sheriff's Office has no objections to 8, 9, 11, 12.

Thank you,

Captain Brandon Zirkle
Washoe County Sheriff's Office
Valley Patrol Command
Office (775) 328-3354
Cell (775) 232-9477

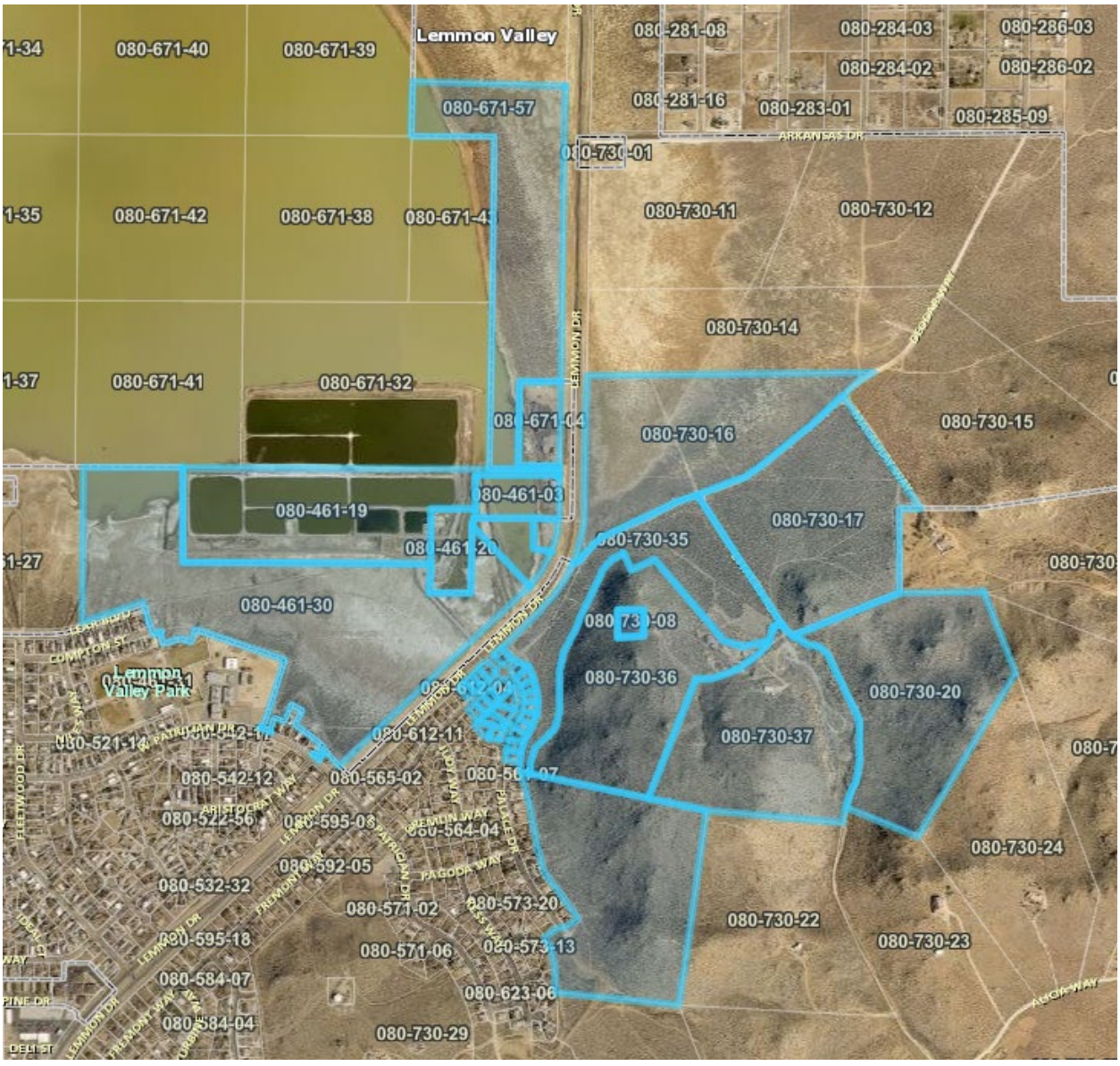
From: Beard, Blaine <BBeard@washoecounty.gov>
Sent: Tuesday, September 19, 2023 11:03 AM
To: Zirkle, Brandon <BZirkle@washoecounty.gov>
Subject: FW: September Agency Review Memo II

These are all four (4) Valley Review memos.

Blaine Beard, Captain
Patrol Division – Incline Village
625 Mount Rose Highway, Incline Village, NV 89451
Desk: 775-832-4114
Personal Cell: 775-722-5580
Email: bbeard@washoecounty.gov
Web: www.WashoeSheriff.com

Public Notice

Washoe County Code requires that public notification for a special use permit must be mailed to a minimum of 30 separate property owners within a minimum 500-foot radius of the subject property a minimum of 10 days prior to the public hearing date. A notice setting forth the time, place, purpose of hearing, a description of the request and the land involved was sent within a 1,250-foot radius of the subject property. A total of 34 separate property owners were noticed a minimum of 10 days prior to the public hearing date.



Public Notice Map

Special Use Permit Case Number WSUP23-0030 (TMWA Lemmon Valley Tank 1 Rebuild)

Special Use Permit
TMWA Lemmon Valley Tank 1 Rebuild

Submitted to Washoe County
September 8, 2023

Prepared for

Truckee Meadows Water Authority
1355 Capital Blvd
Reno, NV 89520

Prepared by

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Blvd • Reno, NV 89502 • Tel: 775.823.4068 • www.woodrodgers.com

WSUP23-0030
EXHIBIT D

Table of Contents

Section 1

Washoe County Development Application

Your entire application is a public record. If you have a concern about releasing personal information, please contact Planning and Building staff at 775.328.6100.

Project Information	**Staff Assigned Case No.:** _____
Project Name: TMWA Lemmon Valley Tank 1 Rebuild	
Project Description: A Special Use Permit to allow a utility service (water tank) in the GR zoning district and to modify the landscape standards per Washoe County Development Code Section 110.412.40. The existing water tank is proposed to be replaced with a new water tank to serve existing customers.	
Project Address: 0 Lemmon Drive	
Project Area (acres or square feet): ±13,700 square feet	
Project Location (with point of reference to major cross streets **AND** area locator): The project site is located off Lemmon Drive approximately 700-feet southeast of the intersection of Lemmon Drive and Deodar Way.	

Assessor's Parcel No.(s):	Parcel Acreage:	Assessor's Parcel No.(s):	Parcel Acreage:
080-730-08	±1.0 acre		

Indicate any previous Washoe County approvals associated with this application:
Case No.(s).

Applicant Information (attach additional sheets if necessary)

Property Owner:		**Professional Consultant:**	
Name: Truckee Meadows Water Authority		Name: Wood Rodgers, Inc	
Address: 1355 Capital Blvd		Address: 1361 Corporate Blvd	
Reno, NV	Zip: 89502	Reno, NV	Zip: 89502
Phone:	Fax:	Phone: 775-823-9770	Fax:
Email:		Email: ehasty@woodrodgers.com	
Cell:	Other:	Cell:	Other:
Contact Person:		Contact Person: Eric Hasty	
Applicant/Developer:		**Other Persons to be Contacted:**	
Name: Truckee Meadows Water Authority		Name: Wood Rodgers, Inc	
Address: 1355 Capital Blvd		Address:	
Reno, NV	Zip: 89502		Zip:
Phone: 775-834-8164	Fax:	Phone: 775-823-5258	Fax:
Email: TSpeer@tmwa.com		Email: shuggins@woodrodgers.com	
Cell: 775-870-0636	Other:	Cell:	Other:
Contact Person: Thomas Speer		Contact Person: Stacie Huggins	

For Office Use Only

Date Received:	Initial:	Planning Area:	
County Commission District:		Master Plan Designation(s):	
CAB(s):		Regulatory Zoning(s):	

Special Use Permit Application
Supplemental Information

(All required information may be separately attached)

1. What is the project being requested?

The existing water tank is proposed to be replaced with a new water tank to serve existing customers. Proposed improvements include demolition of the existing tanks, site grading, detention pond, and new fencing. Specific details are outlined in the project description attached to this application.

2. Provide a site plan with all existing and proposed structures (e.g. new structures, roadway improvements, utilities, sanitation, water supply, drainage, parking, signs, etc.)

A site plan has been provided with this request. The site plan shows the new 500,000 gallon tank will generally be within the footprint of the existing tank. Additional site improvements include connection to existing underground water line, a retaining wall, detention basin, a new fence, and revegetation of undeveloped surfaces.

3. What is the intended phasing schedule for the construction and completion of the project?

The project will be done in one phase and includes demolition of the exiting tank, grading, and construction of the proposed tank.

4. What physical characteristics of your location and/or premises are especially suited to deal with the impacts and the intensity of your proposed use?

There is an existing tank on site. The site will continue to be accessed from the existing service road off of Estates Road and will continue to be maintained by TMWA once the project is complete.

5. What are the anticipated beneficial aspects or affects your project will have on adjacent properties and the community?

The project will continue to provide water service to the surrounding neighborhoods and the Lemmon Valley community. The existing tank has been determined to be at the end of its useful life and the new tank will improve service to existing customers.

6. What are the anticipated negative impacts or affect your project will have on adjacent properties? How will you mitigate these impacts?

Since there is an existing tank there are no anticipated negative affects to the adjacent properties. TMWA is currently constructing a Pressure Reducing Station that will temporarily provide water service during decommission of the old tank and construction of the proposed tank. Further details can be found in the attached project description.

7. Provide specific information on landscaping, parking, type of signs and lighting, and all other code requirements pertinent to the type of use being purposed. Show and indicate these requirements on submitted drawings with the application.

A project description has been submitted with this application and provides greater detail on the project and how it meets all applicable code requirements.

8. Are there any restrictive covenants, recorded conditions, or deed restrictions (CC&Rs) that apply to the area subject to the special use permit request? (If so, please attach a copy.)

❑ Yes	■ No

9. Utilities:

a. Sewer Service	NA
b. Electrical Service	NA
c. Telephone Service	NA
d. LPG or Natural Gas Service	NA
e. Solid Waste Disposal Service	NA
f. Cable Television Service	NA
g. Water Service	TMWA

For most uses, Washoe County Code, Chapter 110, Article 422, Water and Sewer Resource Requirements, requires the dedication of water rights to Washoe County. Please indicate the type and quantity of water rights you have available should dedication be required.

h. Permit #		acre-feet per year	
i. Certificate #		acre-feet per year	
j. Surface Claim #		acre-feet per year	
k. Other #		acre-feet per year	

Title of those rights (as filed with the State Engineer in the Division of Water Resources of the Department of Conservation and Natural Resources).

10. Community Services (provided and nearest facility):

a. Fire Station	NA
b. Health Care Facility	NA
c. Elementary School	NA
d. Middle School	NA
e. High School	NA
f. Parks	NA
g. Library	NA
h. Citifare Bus Stop	NA

Section 2

Project Description

Executive Summary

District #:	5 – Jeanne Herman
Applicant:	Truckee Meadows Water Authority
APN Number:	080-730-08
Request:	A Special Use Permit to allow a utility service (water tank) in the GR zoning district and to modify the landscape standards per Washoe County Development Code Section 110.412.40
Location:	The project site is located off Lemmon Drive approximately ±700-feet southeast of the intersection of Lemmon Drive and Deodar Way.

Background

The proposed project is located on a ±1.0-acre parcel, APN 080-730-08, which has an existing water tank. The property is currently zoned General Rural (GR), has a master plan designation of Rural (R) and is located within the North Valleys Area Plan. The existing water tank was constructed in the 1970's and is owned and maintained by the Truckee Meadows Water Authority (TMWA). The tank is currently accessed via an unpaved utility road off Estates Road. The access road, which was improved by TMWA years ago, is located through an easement on the properties located at 1200 and 1400 Estates Road.

Neighborhood Meeting

As required the applicant hosted a Neighborhood Meeting to discuss the project prior to this application. Post cards were mailed to forty-four (44) property owners within 1,300 feet of the project site. The virtual

meeting was held on Monday August 14, 2023 from 5:30-6:30 pm via Zoom. An overview of the project including preliminary site plans, site photos, and maps of the project and project details were presented. One member of the public attended and expressed no concerns or had any questions regarding the project. The pre-application meeting materials including a recording of the presentation was uploaded to the Washoe County HUB website.

Project Request

TMWA plans to replace the existing water tank, which has been determined to be at the end of its useful life, with a new tank in the same location. The new tank will connect to existing underground water utilities and will continue to provide service to the existing TMWA customers in the Lemmon Valley area. The new tank will be slightly larger, 500,000 gallons compared to the existing 440,000-gallon tank but is proposed to be in the same location. The new tank has been designed to meet the Nevada Administrative Code (NAC) and American Water Works Association (AWWA) standards for welded carbon steel tanks for water storage (D100). The project requires additional grading to accommodate the larger footprint of the new tank, a service road around the entire tank, and a detention pond for capturing on-site flows that will be created from the project.

The existing tank and fence will be deconstructed and removed as part of this process. Grading for the new tank and detention pond will also include the installation of a retaining wall located northeast of the proposed tank and will help to minimize the required grading area. The development area of the new tank will be secured with an 8-foot tall chain-link and barbed wire fence around the perimeter, in accordance with the Department of Homeland Security. The amount of grading for the site improvements does not exceed the threshold that triggers an SUP.

The tank is proposed to be painted with a non-reflective neutral paint color similar to the existing tank that will help it blend with the natural surroundings. Although the new tank is slightly larger in diameter and height, it is anticipated that the new tank will not be much more visible than the existing tank as the retaining wall will allow the tank to sit further back into the hillside.

Tank Dimensions Comparison Table		
	Existing Tank	**Proposed Tank**
Capacity (Gallons)	**440,000**	**500,000**
Diameter (feet)	**56**	**60**
Height (feet)	**25.9**	**28.7**

Water service to the surrounding neighborhood is not anticipated to be disrupted during this process. TMWA is currently constructing a Pressure Reducing Station (PRS) near Lemmon Drive (PWP# WA-2023-408). This new main will provide water to the surrounding neighborhoods while the existing tank is decommissioned and rebuilt. After construction of the new tank, the PRS will be used as a back-up during low-pressure or fire events and improve service to the existing TMWA customers in the Lemmon Valley Area.

TMWA will maintain all facilities within the tank site, including the tank, pavement, fencing, and drainage basin. This will also include the re-establishment of the revegetated areas to be in conformance with WCDC Section 110.412.40.

Requested Modification of Landscape Standards

Since this is an expanded development, landscape standards should only apply to the developable lot area associated with the proposed expansion, in accordance with Washoe County Development Code (WCDC) Section 110.412.05. The area of existing developed lot is ±10,000 square feet, the new improvements will expand this area to ±13,700 of developed lot. Since the development of the property is considered a civic use, 20 percent of the expanded developed area will be required to be landscaped (WCMC Section 110.412.40). This requires ±740 square feet of formal landscape, an area which is very minimal. Furthermore, the site is in a rural/low-density area surrounded by lowland vegetation and sagebrush. Formal landscaping including ground cover, non-native plants, shrubs, and trees will make the site more visible to the surrounding residents. Therefore, as part of this request, the applicant is requesting to waive all formal landscape requirements in lieu of providing revegetation on the disturbed areas. Once grading and construction is complete the disturbed areas that are not developed will be revegetated with a native seed mix to conform with the surrounding vegetation and provide slope stabilization. The total area proposed to be revegetated is ±1,500 square feet, or 41 percent of the expanded development area. This is more than two times the minimum ±740 square feet of formal landscape required by code and complies with WCDC Section 110.412.40(a)(1).

The proposed revegetation, along with the neutral paint color of the new tank, will help the tank blend with the surrounding hillside and provide a much more cohesive aesthetic that is in-line with the goals and policies of the Lemmon Valley Suburban Character Management Area.

Findings

Special Use Permit Findings

(a) Consistency. The proposed use is consistent with the action programs, policies, standards and maps of the Master Plan and the applicable area plan;

Response: The proposed project is in conformance with Washoe County Master Plan and the North Valleys Area Plan, specifically the Lemmon Valley Suburban Character Management Area. There are no programs, policies, or standards of the Master Plan or North Valleys Area Plan that prohibit approval of utility services. Therefore, the proposed project is consistent with the General Rural designation on the property.

(b) Improvements. Adequate utilities, roadway improvements, sanitation, water supply, drainage, and other necessary facilities have been provided, the proposed improvements are properly related to existing and proposed roadways, and an adequate public facilities determination has been made in accordance with Division Seven;

Response: Water service to the surrounding neighborhood is not anticipated to be disrupted during this process. TMWA is currently constructing a Pressure Reducing Station (PRS) under Lemmon Drive (PWP# WA-2023-408). This new main will provide water to the surrounding neighborhoods while the existing tank is decommissioned and rebuilt. After construction of the new tank, the PRS will be used as a back-up during low-pressure or fire events and improve service to the existing TMWA customers in the Lemmon Valley Area.

(c) Site Suitability. The site is physically suitable for the type of development and for the intensity of development;

Response: The project site is already developed with a water tank. TMWA plans to replace the existing water tank, which has been determined to be at the end of its useful life, with a new tank in the same location. The new tank will connect to existing underground water utilities and will continue to provide service to the existing TMWA customers in the Lemmon Valley area. The new tank will be slightly larger, 500,000 gallons compared to the existing 440,000-gallon tank but is proposed to be in the same location and utilize the same access road.

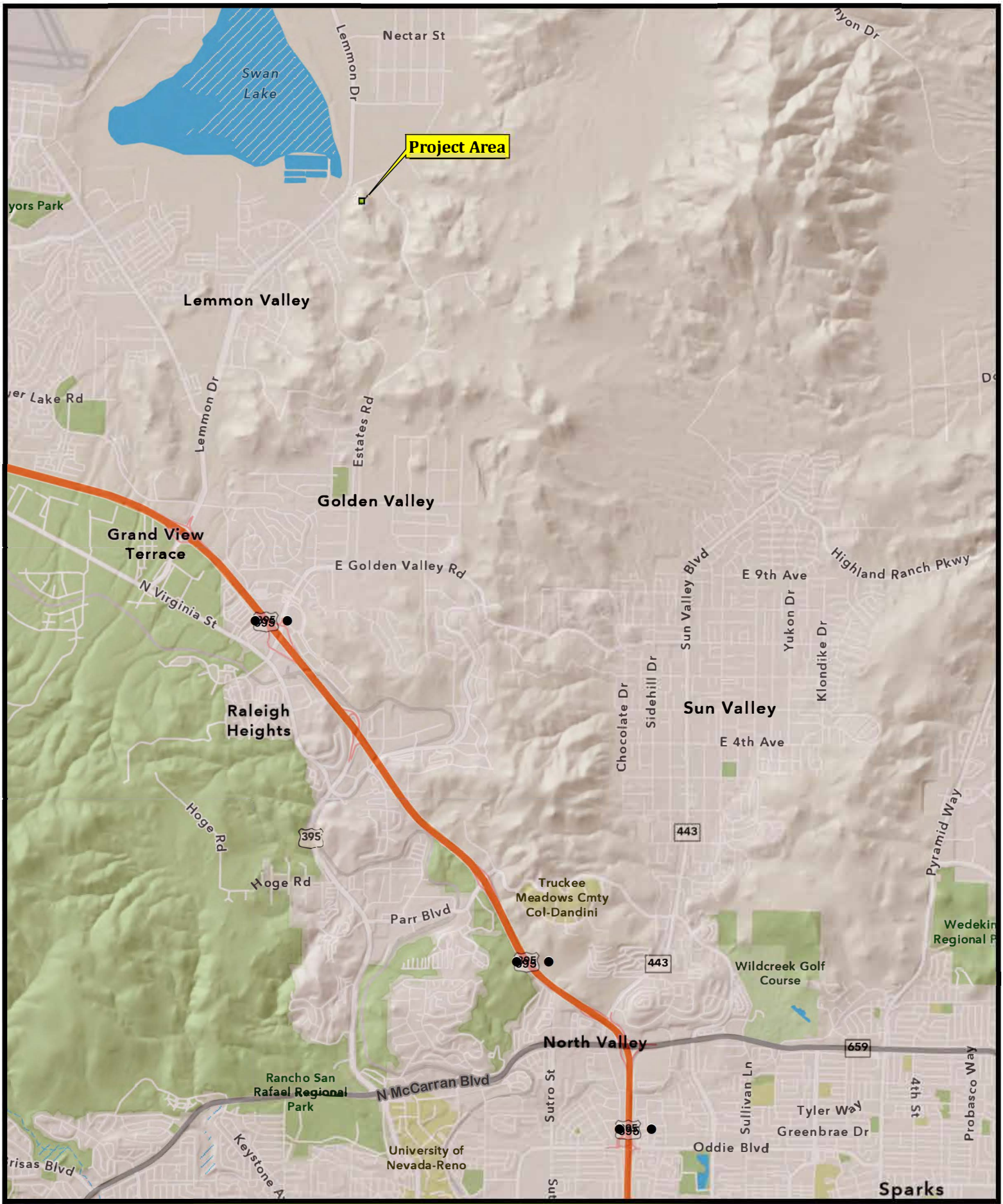
(d) Issuance Not Detrimental. Issuance of the permit will not be significantly detrimental to the public health, safety or welfare; injurious to the property or improvements of adjacent properties; or detrimental to the character of the surrounding area; and

Response: Issuance of the permit will not be detrimental to the public health, safety, or welfare of the surrounding area. Service will not be disrupted to existing customers during this process and service to existing customers will be improved upon completion. Consideration has been given to the neighboring properties through the overall site design, including placement of the building, fencing, and access.

(e) ***Effect on a Military Installation. Issuance of the permit will not have a detrimental effect on the location, purpose or mission of the military installation.***

Response: Not applicable as there are no military installations within the project area.

Section 3



Vicinity Map

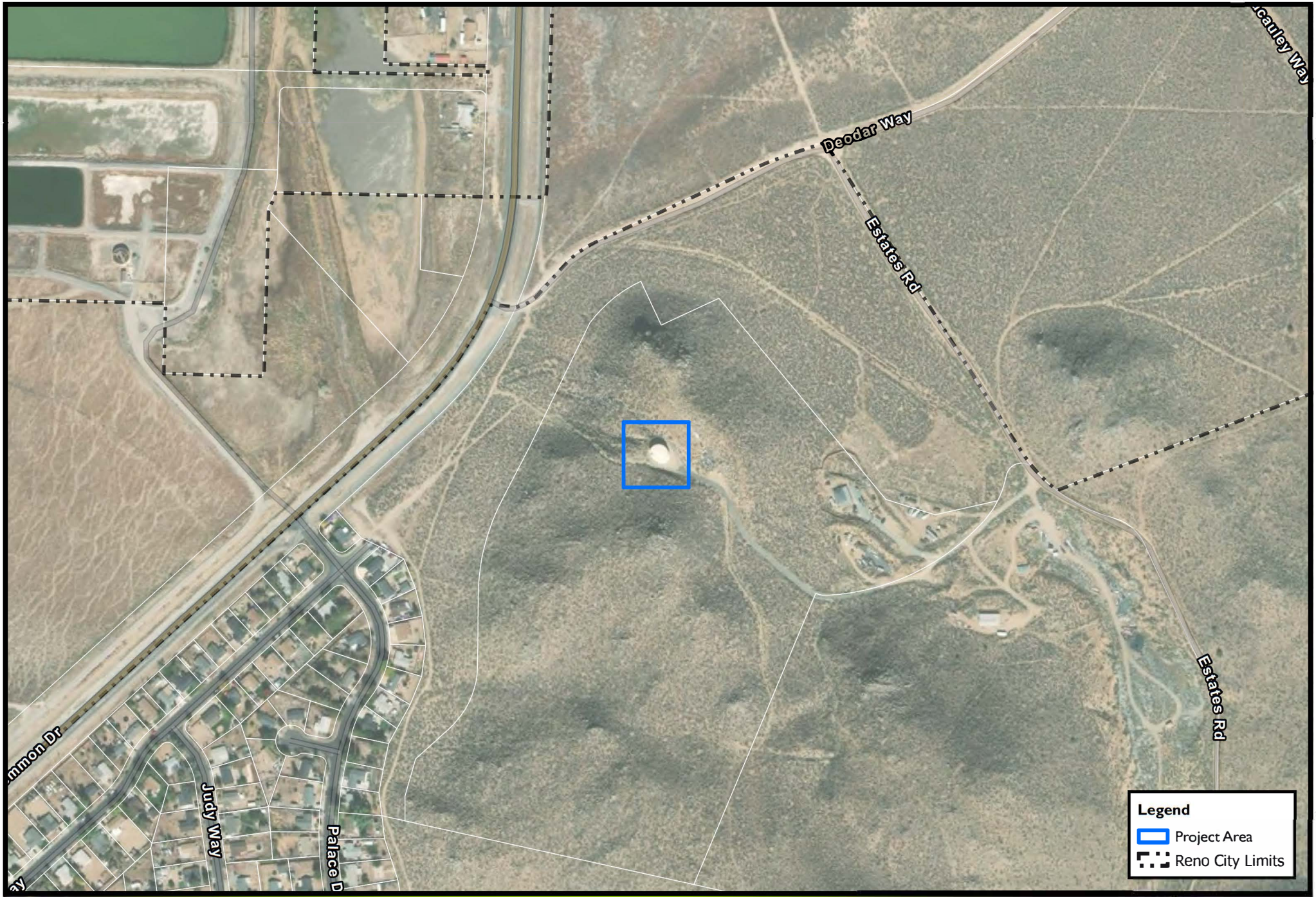
TMWA Lemmon Valley Water Tank Replacement SUP

July 2023

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel. 775.823.4068
Fax. 775.823.4066

EXHIBIT D

J:\Jobs\8040_TMWA_OA\056_Water_Tank_Lemmon\GIS\ArcGIS_Pro\Exhibits.aprx 7/31/2023 10:09 AM kjmoses



Aerial Map

TMWA Lemmon Valley Water Tank Replacement SUP

August 2023

0 235 470
FEET

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
1361 Corporate Boulevard
Reno, NV 89502
Tel: 775.823.4068
Fax: 775.823.4066

WSUP23-0030
EXHIBIT D

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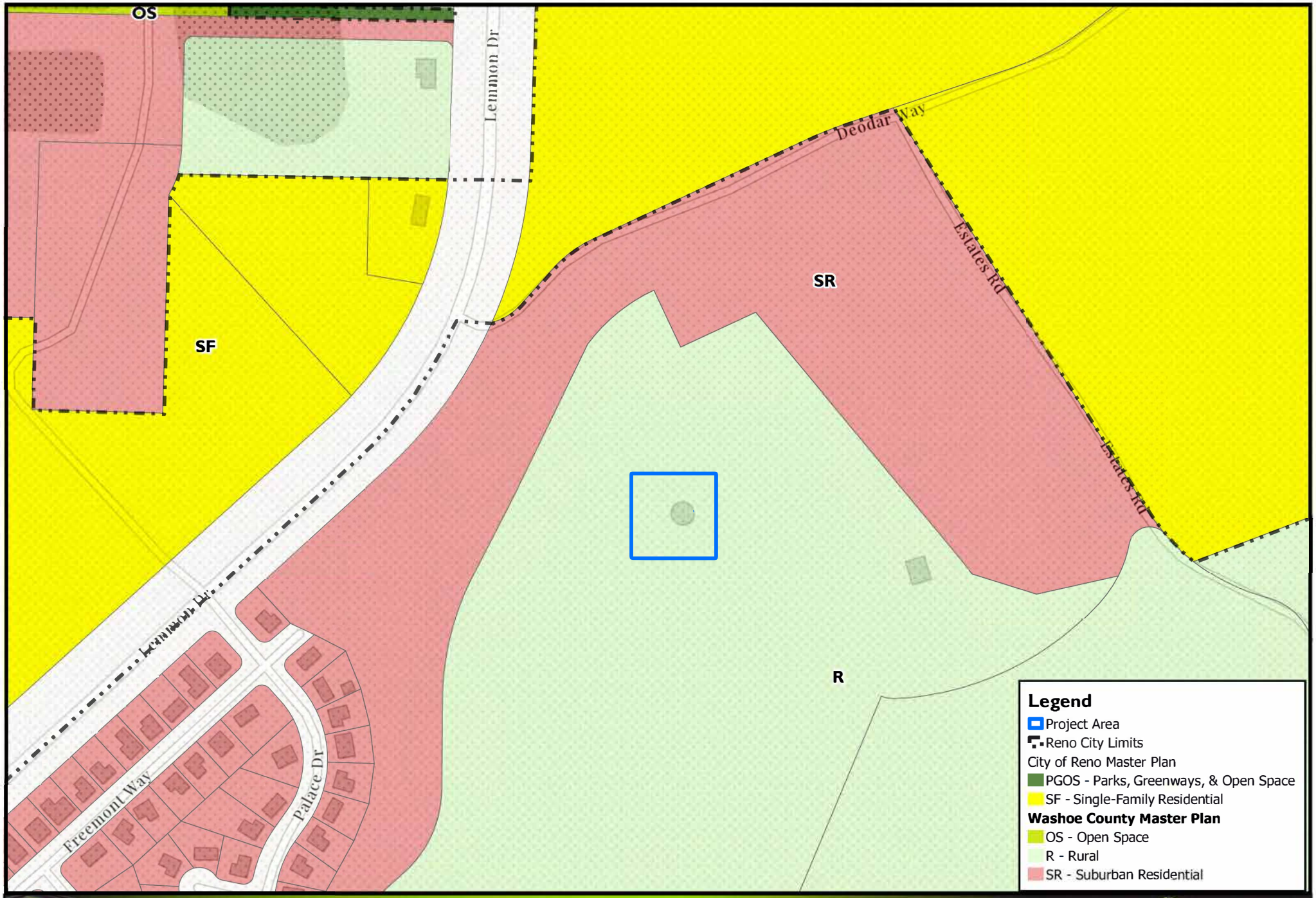

Master Plan

TMWA Lemmon Valley Water Tank Replacement SUP

August 2023

0 215 430
Feet

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Reno, NV 89502
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Fax: 775.823.4066

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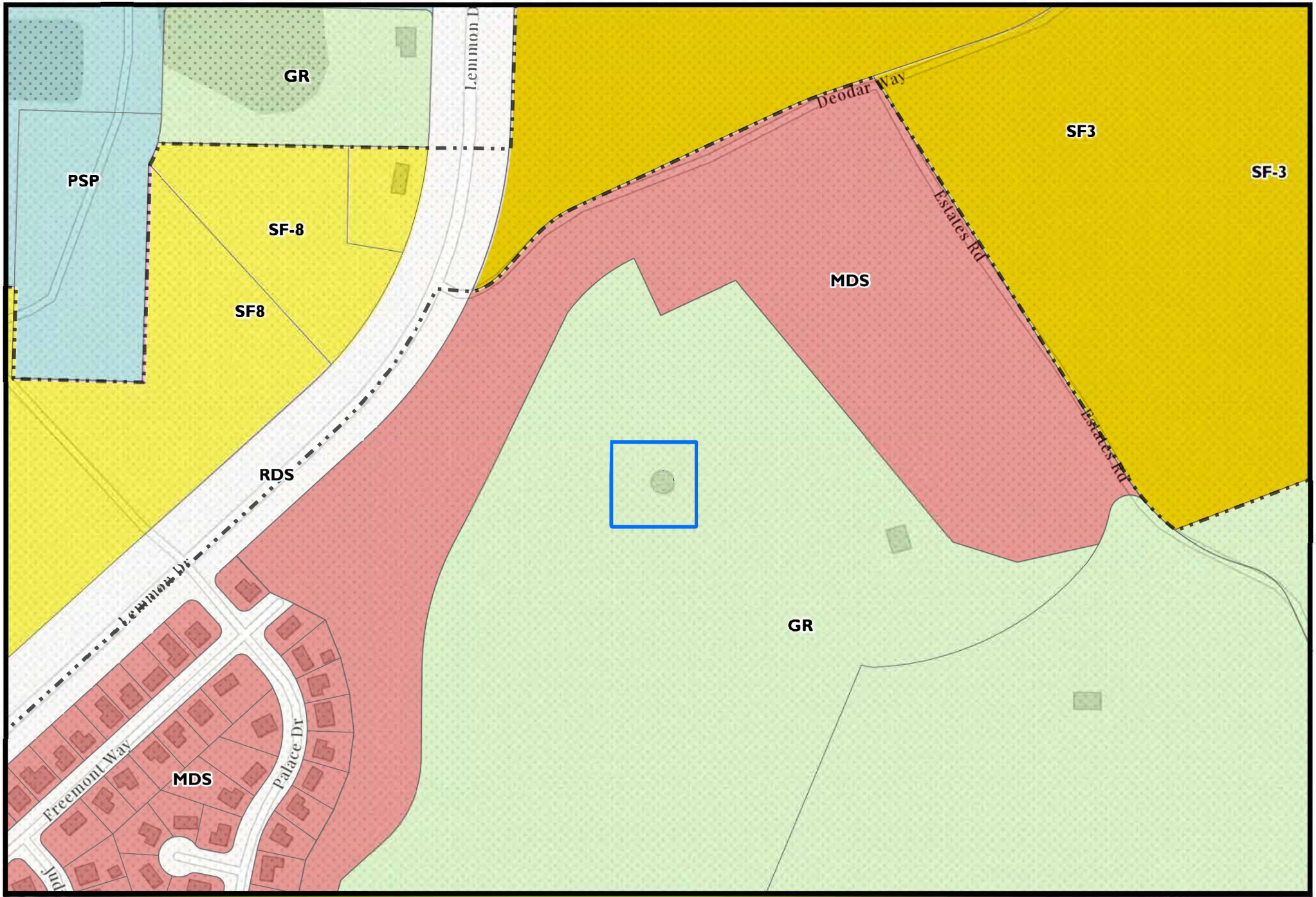

Zoning

TMWA Lemmon Valley Water Tank Replacement SUP

August 2023

0 212½ 425 FEET

WOOD RODGERS
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1361 Corporate Boulevard
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Tel: 775.823.4068
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WSUP23-0030
EXHIBIT B

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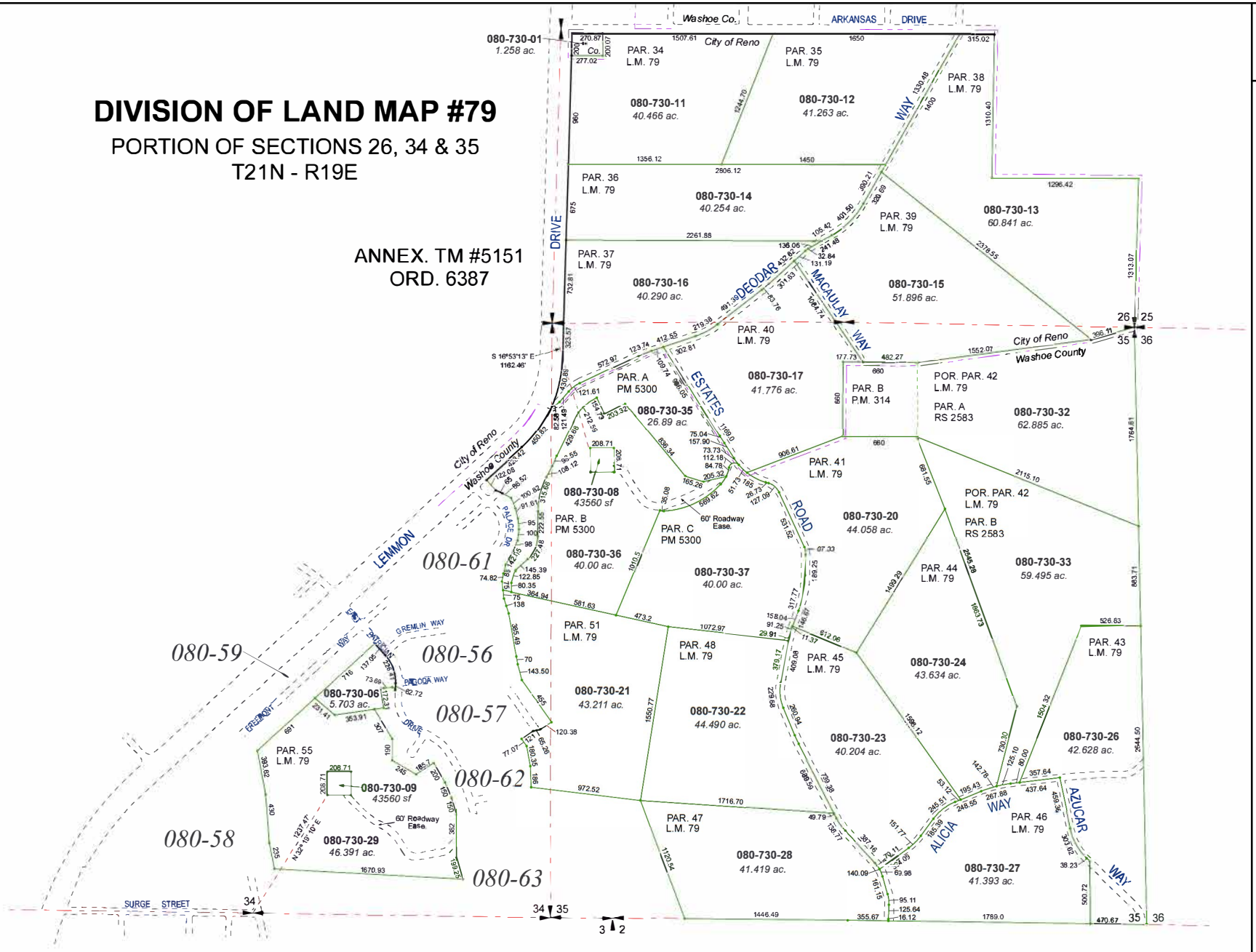
DIVISION OF LAND MAP #79

PORTION OF SECTIONS 26, 34 & 35
T21N - R19E

ANNEX. TM #5151
ORD. 6387



Assessor's Map Number

080-73

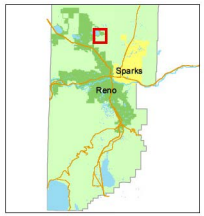
STATE OF NEVADA

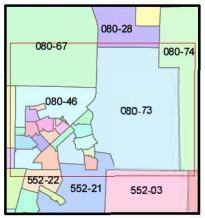
WASHOE COUNTY
ASSESSOR'S OFFICE
Michael E. Clark, Assessor

1001 East Ninth Street
Building D
Reno, Nevada 89512
(775) 328-2231

Feet
0 200 400 600 800

1 inch = 800 feet





created by: TWT 9/28/2009

last updated: KSB 4/15/16 JMO 8/1/17

area previously shown on map(s)

080-67

NOTE: This map was prepared for the use of the Washoe County Assessor for assessment and illustrative purposes only. It does not represent a survey of the premises. No liability is assumed as to the sufficiency or accuracy of the data delineated hereon.

WSUP23-0030
EXHIBIT D

Section 4

GEOTECHNICAL INVESTIGATION
TMWA LEMMON VALLEY WATER TANK REPLACEMENT
LEMMON VALLEY, NEVADA

CME CONSTRUCTION MATERIALS ENGINEERS, INC.

PREPARED FOR:

TRUCKEE MEADOWS WATER AUTHORITY

APRIL 2023
FILE:3152

WSUP23-0030
EXHIBIT D

CME CONSTRUCTION MATERIALS ENGINEERS, INC.
300 Sierra Manor Drive, Suite 1
Reno, NV 89511

April 3, 2023
File: 3152

Thomas Speer, PE
Design Engineer
Truckee Meadows Water Authority
1355 Capital Blvd. Reno, NV 89502
TSpeer@tmwa.com I www.tmwa.com

RE: Geotechnical Investigation
TMWA Lemmon Valley Water Tank Replacement
Lemmon Valley, Washoe County, Nevada

Dear Mr. Speer:

Construction Materials Engineers Inc. (CME) is pleased to submit our geotechnical investigation report for the proposed TMWA Lemmon Valley Water Tank replacement project to be constructed on Washoe County Assessor Parcel Number (APN) 080-730-08, in Lemmon Valley, Washoe County, Nevada.

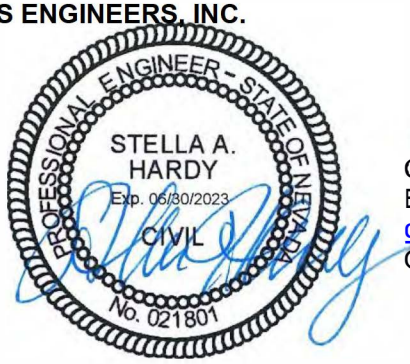
The following report includes the results of our subsurface investigation, laboratory testing, and presents our recommendations for the design and construction of the project. We wish to thank you for the opportunity to provide our services and look forward to working on future endeavors together.

Please feel free to call us should you have any questions or require additional information.

Sincerely,

CONSTRUCTION MATERIALS ENGINEERS, INC.

Stella A. Hardy, PE
Geotechnical Project Manager
RE. Number: 21801
Expires:6/30/2023
shardy@cmenv.com
Direct: 775-737-7569



Carolyn Jones, EI
Engineering Intern
cjones@cmenv.com
Office: 775-851-8205

Dated Signed: 04/03/2023

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GEOTECHNICAL INVESTIGATION
TMWA Lemmon Valley Water Tank Replacement
Lemmon Valley, Washoe County, Nevada

1.0 INTRODUCTION

This report presents results of our literature review, field reconnaissance, subsurface exploration, laboratory testing, and recommendations for design and construction of the proposed TMWA Lemmon Valley Water Tank Replacement, in Lemmon Valley, Washoe County, Nevada. The general project vicinity is shown on Figure 1.

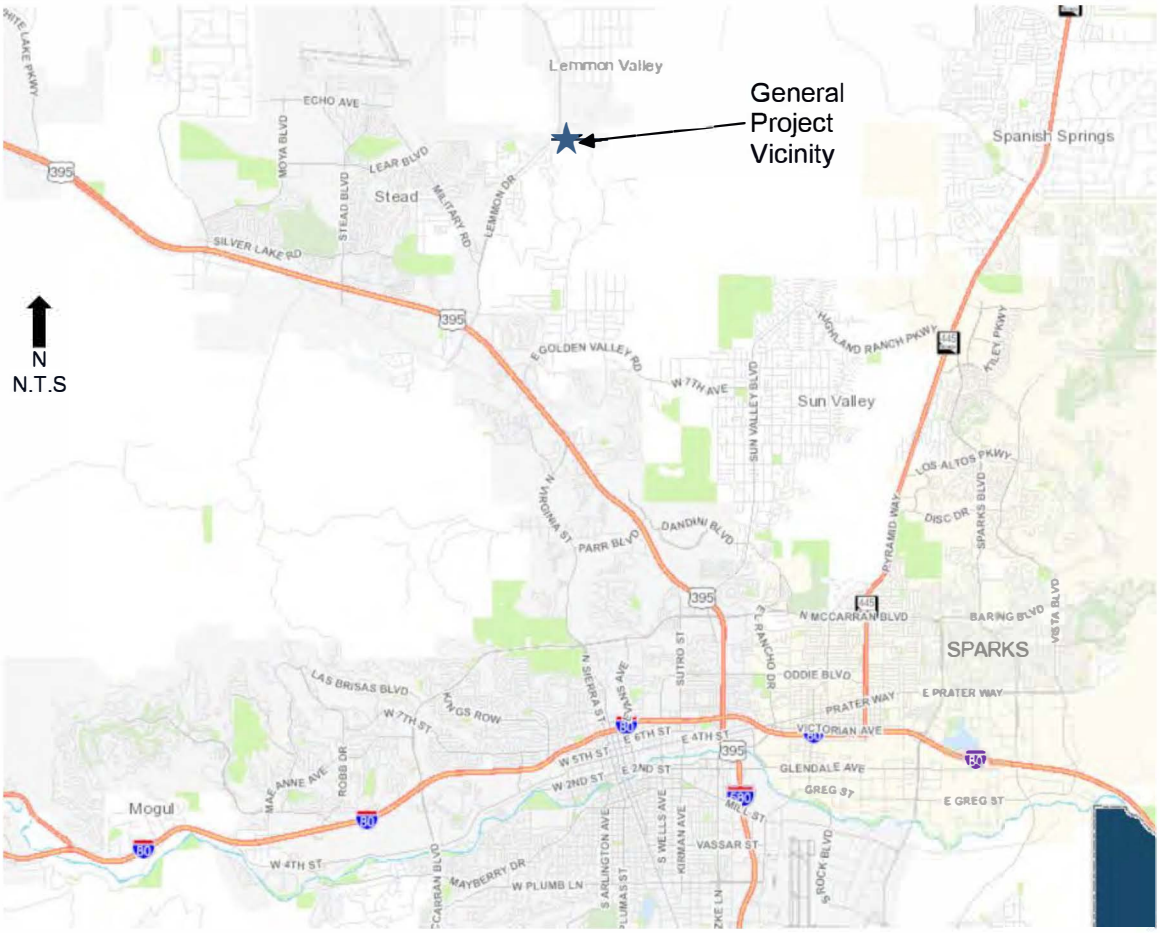


Figure 1: General project Vicinity
(Reference Base Map: Washoe County GIS)

Results from our office and field studies, form the basis for all conclusions and recommendations contained herein.

2.0 SITE CONDITIONS AND PROJECT DESCRIPTION

2.1 SITE CONDITIONS

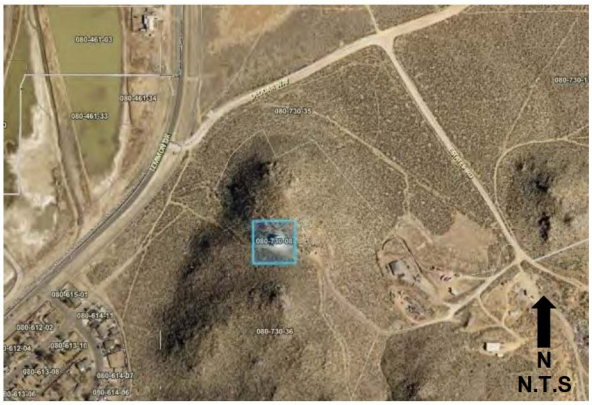


Figure 2: Limits of Subject Site

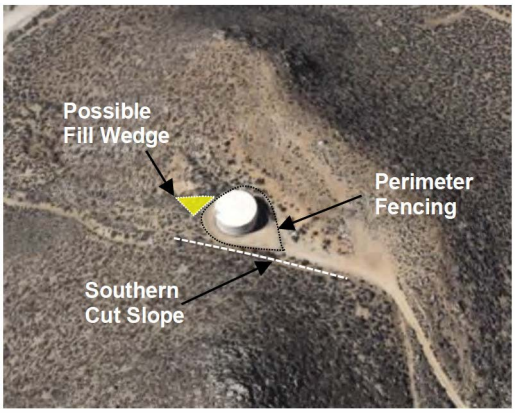


Figure 3: Oblique View Showing Suspected Fill Wedge Location

The existing Lemmon Valley Water Tank sits atop a granitic bedrock knob located southwest of Lemmon Drive on Washoe County APN 080-730-08 as shown on Figure 2. The existing water tank is located within a fenced perimeter centrally located on the 1-acre TMWA owned parcel.

Site access is via a narrow unpaved dirt road which is accessed from a private driveway west of Estates Road. The subject site is bounded in all directions by privately owned land (APN 080-730-36).

The existing tank was constructed circa 1970. Based on a review of historical aerial imagery, the tank is bottomed completely on a cut pad. During grading of the pad, a small wedge of fill was pushed along the western extents of the graded pad as shown on Figure 3.

Two cut slopes are visible at the site: one to the northeast and one on the south. The southern cut slope is 12±ft in height and on the order of 1H:1V, with moderately to slightly weathered bedrock exposed at the face of the cut. The northeastern 14±ft tall cut slope consists of intensely to moderately weathered bedrock which is cut back at a 2.5H:1V or flatter slope.

Currently the site is drained via sheet flow to swales which discharge on the western extents of the site and down the slope.

Vegetation at the site is generally sparse within the proposed improvement area and consists of desert brush and seasonal weeds. Photographs of the site are presented below:

Photograph 1: Southern Cut Slope

Photograph 2: Top of the Northern Cut Slope

2.2 PROJECT DESCRIPTION

The following is a list of our understanding for the project:

- Construction of a new 500,000-gallon steel water tank. The proposed water tank will be 60 to 65 feet in diameter, 25 feet tall, and constructed adjacent to or within the footprint of the existing Lemmon Valley tank (refer to Figure 4).
- The tank will be supported using either concrete ring-wall foundations with granular infill or concrete slab;
- Structural loads are anticipated to be on the order of 3.0 and 4.0 kips per square foot;
- The northeastern cut slope may be modified and the use of a segmented retaining wall with total exposed heights on the order of 4 to 7 feet will be required. The back slope will be 2.5H:1V or flatter. The proposed retaining wall may be constructed using either Redi Rock or Geowall (formally Keystone block). Due to the property line constraints, the wall type used will be determined based on the ability to be constructed using gravity methods (i.e., no geogrid) to limit encroachment into the hillside.
- Cuts and fills are anticipated to be on the order of 5 feet or less.
- A shallow detention basin is proposed on the west side of the existing TMWA property outside the limits of the fenced perimeter.

The preliminary site layout provided by TMWA is presented below:

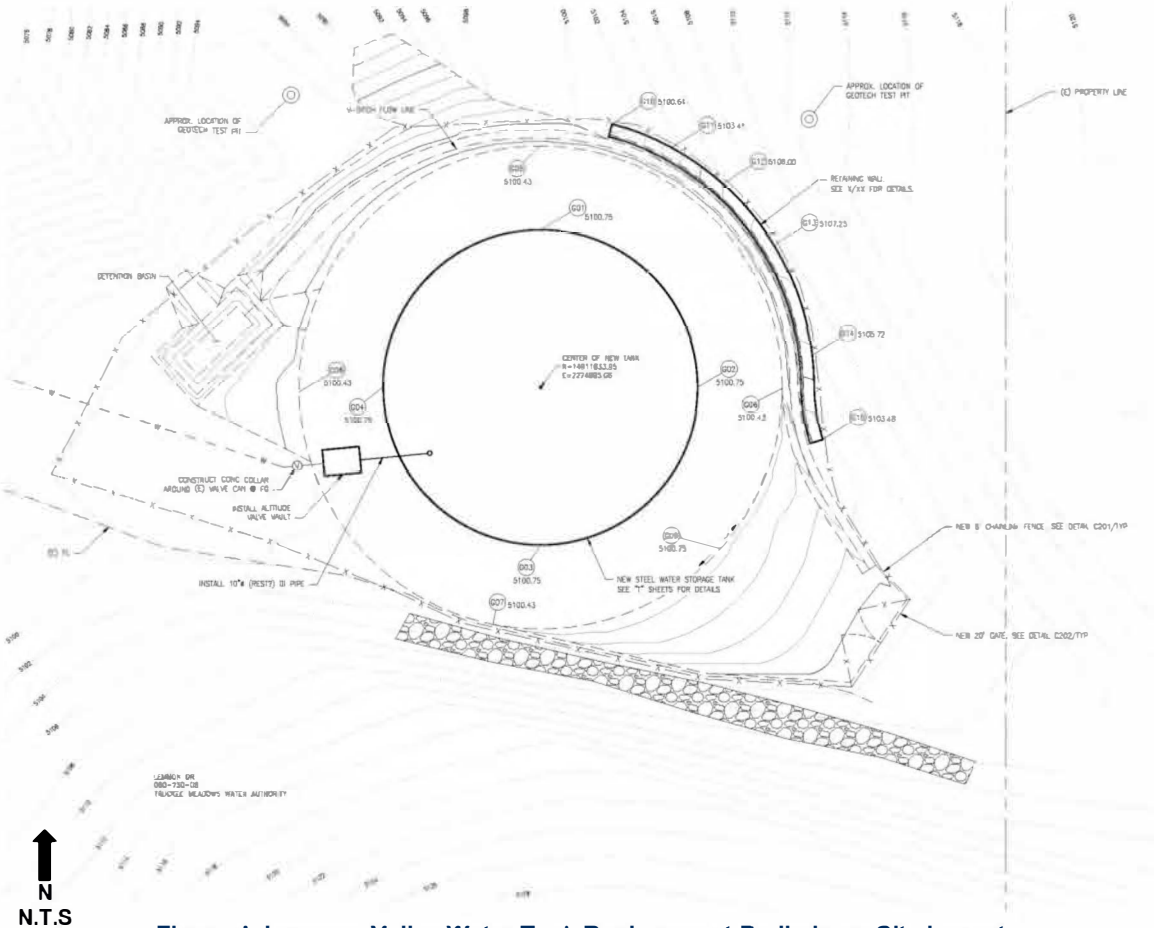


Figure 4: Lemmon Valley Water Tank Replacement Preliminary Site Layout

3.0 SUBSURFACE EXPLORATION

3.1 TEST PIT EXCAVATION

Photograph 3: Test Pit TP-1

CME performed subsurface exploration utilizing test pit excavations on December 8th, 2022. A total of two (2) test pit excavations were performed using a track mounted CAT 325 Excavator equipment with a 24-inch wide, 3-tooth bucket. Excavation refusal was encountered at a depth of 6 feet on weathered bedrock at the top of cut slope on the northside of the existing tank pad. Test Pit TP-2 was performed within the fill wedge (encountered to be approximately 9-feet thick) on the west side of the tank and reached a refusal depth of 11 feet.

Soil samples were visually examined and classified during exploration in general accordance with ASTM D2488. Test pits were backfilled with the equipment available and were not compacted to the standards required for structural fill. During the time of construction, the test pit backfill located within structural areas shall be removed and replaced to the requirements of structural fill as noted in this report.

Exploration locations (Plate A-1), test pit logs (Plate A-2), and soil and rock classification charts are included as Plates A-3 and A-4, attached as Appendix A.

3.2 GEOPHYSICAL TESTING

3.2.1 REFRACTION MICROTREMOR (REMI) SHEAR WAVE VELOCITY

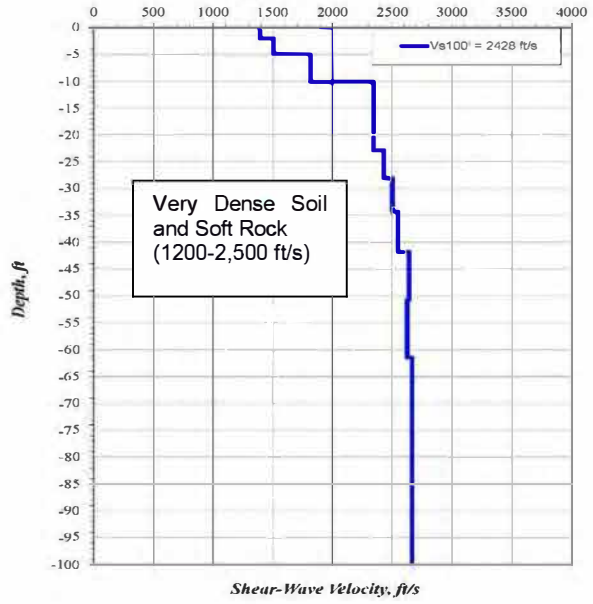


Figure 5: Shear Wave Velocity Profile

One shear wave velocity measurement was performed using Refraction Microtremor (ReMi). The DAQlink 4 24-bit acquisition system (Seismic Source/Optim) utilizing a multichannel geophone cable with twelve (12) geophones, placed at an approximate spacings of 10 feet, was used to obtain surface wave data.

Vertical geophones with resonant frequencies of 10 Hz measure surface wave energy from broad band ambient site noise across the geophone array (i.e., ReMi setup location) for multiple 30-second iterations.

The resulting 1-dimensional shear wave velocity model for each site is included as Figure 5 (Shear Wave Velocity Profile).

The $V_{S,100'}$ represents the average shear wave velocity profile based on travel time from the ground surface to a depth of 100 feet at the tested location. Based on the ReMi, the $V_{S,100'}$ for the site is 2,428 feet per second (ft/s).

The approximate ReMi line location is presented on Plate A-1 (Exploration Location Map).

Shear-wave velocity profiles are generally classified by the ASCE 7-16 as stiff soil (600 to 1,200 ft/sec), very dense soil and soft rock (1,200 to 2,500 ft/sec), and rock (>2,500 ft/sec). Based on the shear wave velocity profile the site generally complies with a designation of very dense soil and soft rock.

3.2.2 REFRACTION COMPRESSIONAL WAVE (P-WAVE)

One refraction array was performed at the location presented on Plate A-1. The measurements were performed using a 12 channel, 10 Hz geophone array, with 10 foot spacing. Measurements using the refraction compressional wave (P-wave) technique were performed in general accordance with ASTM D5777. Seismic compressional wave methods provide general shallow subsurface profile characterization. The two-dimensional profile is included as Figure 6 (Two-Dimensional P-wave Velocity Profile (N.T.S)).

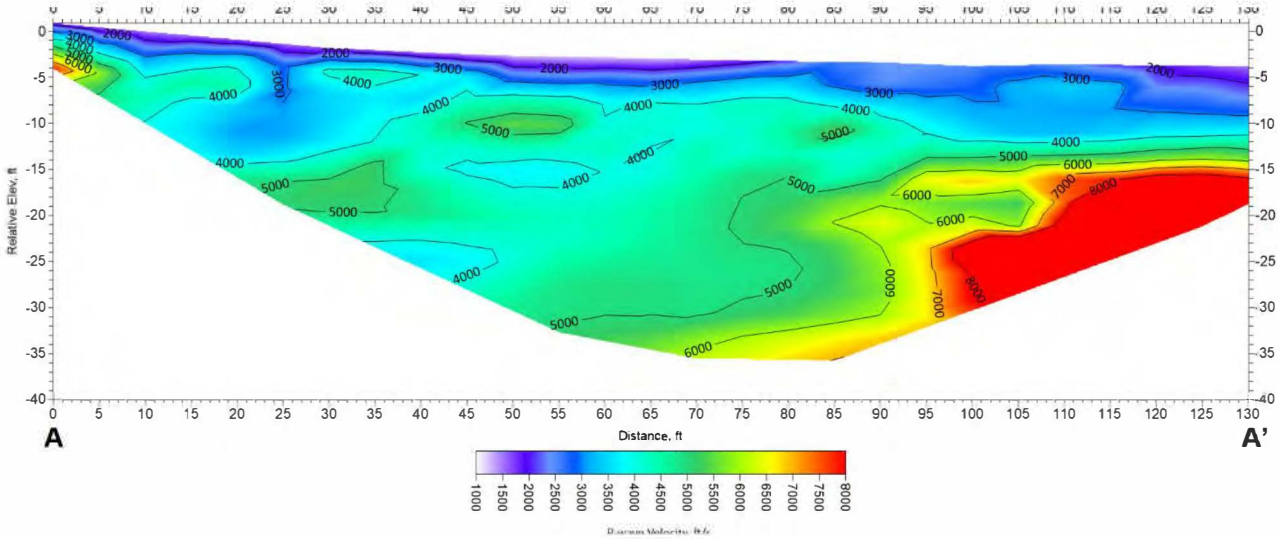


Figure 6: Refraction Line Two-Dimensional P-wave Velocity Profile (N.T.S)

P-wave velocities below 3,000 ft/sec are generally consistent with a soil to soft rock subsurface profile. Based on the profile above, a thin veneer soil on the order of 1 to 4 feet overly the granitic bedrock.

A majority of the bedrock within the upper 10 feet of the geologic profile exhibited velocities on the order of 3,000 ft/sec to 4,000 ft/sec. Based on a review of the 12th Edition of the Handbook of Ripping (Caterpillar, February 2000), granitic bedrock with velocities between 3,000 ft/sec and 4,000 ft/sec are rippable using a D8R Ripper of equivalent.

4.0 LABORATORY TESTING

Soils testing performed in CME's laboratory was conducted in general accordance with ASTM standards and methodologies. Representative soil types were selected and analyzed to determine index properties and engineering properties. The following laboratory tests were completed as part of this investigation:

- In situ moisture content (ASTM D2216);
- Grain size distribution (ASTM D6913); and
- Atterberg Limits (ASTM D4318);

In addition, our firm contracted with an outside laboratory to complete the following analytical testing for the corrosion potential of the site soils:

- Resistivity (EPA 120.1)
- Paste pH (SM-846 9045D)
- Soluble Sulfates (ASTM C1580)
- Redox Potential (SM 2580B)
- Chloride (EPA 9056)
- Sulfide (AWWA C105)

5.0 EXISTING CONDITIONS

5.1 GEOLOGY

Based on a review of the *Reno NE Quadrangle, Geologic Map, Nevada Bureau of Mines and Geology, Urban Map 4Cg, 1:24,000* (Cordy, G.E. and Mansour, A., 1985), the project site is underlain by granodiorite which is described as light to dark-gray, fine to coarse-grained, highly fractured and faulted.

5.2 GENERAL SUBSURFACE PROFILE

The subsurface conditions encountered are generally consistent with the mapped geology. However, as previously noted, the western most test pit was excavated into an existing fill wedge overlying weathered bedrock. A summary of the subsurface profile encountered is included as Table 1.

Table 1: Generalized Soil Profile

Exploration Pit ID	Profile Depth (ft)	Generalized Soil Profile	USCS Soil Classification	Reuse Classification	Total Depth of Exploration (ft)	Depth Groundwater Encountered (ft)
TP-1	0.0-6.0	G_r	Excavates similar to a silty clay sand with gravel and cobbles (SC-SM)	Structural Fill?	Refusal at 6.0	N.E.
TP-2	0.0-9.0	UF	Silty, clayey sand with gravel and cobbles (SC-SM)	Structural Fill	Terminated at 11.0	
	9.0-11.0	G_r	Excavates similar to a Silty clay sand with cobbles (SC-SM)	Structural Fill?		

Soil Profile Key:

UF – Undocumented Fill
G_r – Granodiorite Bedrock

Reuse Classification Definition:

Limited: May be reused in non-structural areas.
Structural Fill: Meets the requirements of a granular soil and may be reused as structural fill provided it is screened to remove debris and oversized material. Queried (?) where additional evaluation is warranted during construction.

NOTES:
1. N.E. Not Encountered or observed.
2. Refer to Plate A-2 for additional details.

5.3 GROUNDWATER AND SOIL MOISTURE

Groundwater was not encountered during the current exploration to the maximum depth explored. Based on the anticipated depth of excavation required for the project, groundwater is not expected to impact construction.

However, seasonal seepage and/or runoff may be encountered depending on the season of construction and cumulative precipitation in the area. Temporary dewatering of open cut excavations affected by seasonal runoff may be required and shall be performed by the contractor. Construction planning shall include the assumption that groundwater fluctuations may occur due to precipitation, temperature, runoff, adjacent irrigation, or where conduits, such as utility trenches, are present. Regardless of the conditions encountered during the current exploration, CME recommends the contractor is prepared for dewatering during construction.

6.0 SEISMICITY

6.1 FAULTING

To determine the location of mapped earthquake faulting trending through or near the project site, a review of the following published information was completed:

1) USGS Website: *Earthquake Hazards Program Quaternary Faults in Google Earth*;
2) The USGS Interactive Fault Map U.S. Quaternary Faults (arcgis.com);and
3) University of Nevada Reno Interactive Quaternary Fault Map included as Figure 7 (Excerpt from the UNR Quaternary Interactive Fault Map). (http://gisweb.unr.edu/QuaternaryFaults/)

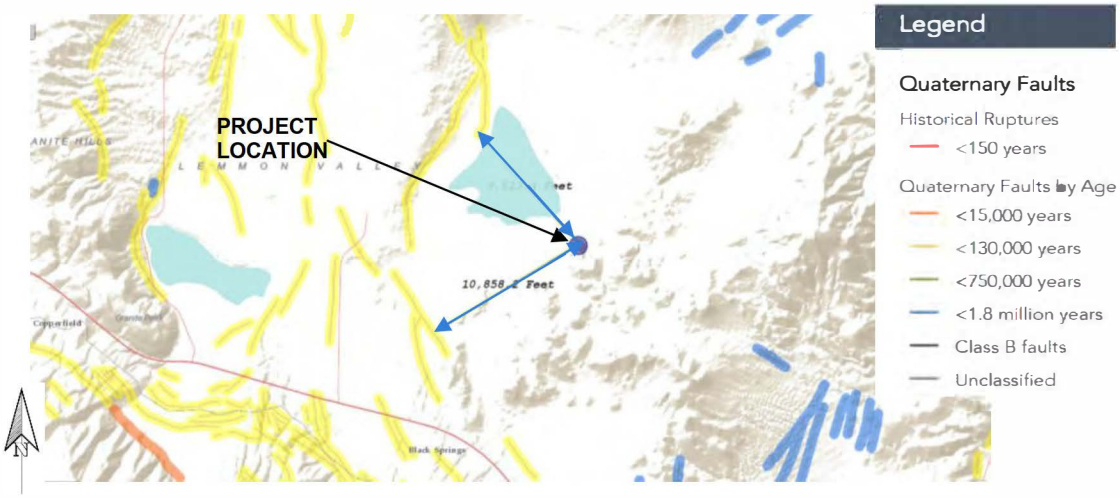


Figure 7: Excerpt from the UNR Quaternary Interactive Fault Map

10 ka	130 ka	750 ka	<1.8Ma
Holocene Active	Late Quaternary Active	Quaternary Active	Quaternary

ka = 1,000 years in the past; Ma = 1,000,000 years in the past

Quaternary earthquake fault evaluation criterion has been formulated by a professional committee for the State of Nevada Seismic Safety Council, 2006, as outlined above. Faults that have shown movement more recently (e.g., Holocene Active) pose a more significant potential for surface rupture hazard.

No mapped faults are located traversing through the project site. The closest faults to the site are located nearly 2 miles southwest and northwest of the project location. This group of Quaternary Active faults are associated with the Freds Mountain fault zone.

7.0 DISCUSSION

7.1 GENERAL INFORMATION

Geotechnical recommendations for design and construction of the project are included as Sections 8.0 (Design Recommendations) and 9.0 (Construction Recommendations). The following definitions are applicable for recommendations in this report related to design and construction of the proposed project:

	Table 2: General Definitions for Report Recommendations
Fine Grained Soil	Soil with more than 40 percent by weight passing the number 200 sieve, plasticity index less than 15 (PI<15) or expansion index less than 20 (EI<20).
Clay Soil	For the purposes of this report, clay soil may be defined as any soil having more than 15 percent by weight passing the number 200 sieve and a plasticity index greater than or equal to 15 (PI≥15).
Granular Soil	Existing onsite soil not meeting the requirement for a fine-grained or clay soil with: • A maximum particle size of 4-inches or less, • Less than 30 percent retained on the ¾ inch sieve; • Less than 35 percent passing the No. 200 sieve; and • Plasticity index less than 15 (PI<15) or expansion index less than 20 (EI<20).
Structural Fill	• Soil generated from onsite grading may be reused as structural fill provided it meets the requirements of a granular soil and is free of organics or deleterious materials (refer to Section 9.2.2 Structural Fill). • Structural fill is the supporting soil placed in densified lifts below foundations, concrete slabs-on-grade, pavements, or any structural element that derives support from the underlying sub-soils material.
Structural Areas	Includes all areas that will be used for the support of concrete slabs, flatwork, foundations, pavements, or other structures deriving support from the underlying soil.
Undocumented Fill	Soil/material placed and/or compacted but not observed, monitored, tested, or documented by a licensed materials test engineering firm. This material may be suitable for re-use pending further verification with the use of laboratory testing.
Subgrade	• The elevation directly below the aggregate base layer for both concrete slabs-on-grade and pavements; • Bottom of excavation for foundations bottomed on native soil materials and structural fill. • The surface elevation below structural fill.
Relative Compaction	The dry density of soil in the field expressed as a percentage of the density of the soil after densification during placement. Relative compaction shall be in accordance with ASTM D1557.
Standard Specifications	Work shall be performed in general conformance to the Orange Book Standard Specifications for Public Works Construction, 2012, Revision 8 (SSPWC); and/or Truckee Meadow Water Authority Standard Details and Specifications.

7.2 CONSTRUCTION CONSIDERATIONS

Based on the results of our field and laboratory studies, the project as described in this report may be constructed as currently proposed. Table 3 (General Geotechnical Considerations and Overview Summary) provides a general summary of the construction and design considerations as they pertain to the project. Geotechnical recommendations for design and construction of the project are included as Sections 8.0 (Design Recommendations) and 9.0 (Construction Recommendations).

Table 3: General Geotechnical Considerations and Overview Summary

Subject	Geotechnical Consideration
Groundwater/ Seasonal Runoff	Groundwater was not encountered or observed during the current and previous subsurface exploration.
Earthwork/ Excavations	• Based on the geophysical results (refer to Section 3.2) and the bedrock conditions encountered within Test Pit TP-1, trimming of the northern slope to accommodate the future tank may be performed using a large (45 tons) sized excavator and bucket equipped with twin tiger teeth or other suitable attachment designed for maximum rock penetration. Zones of resistant bedrock may require use of pneumatic hammer to loosen larger unfractured bedrock fragments. • Resistant zones of bedrock similar to the material exposed on the southern cut slope may make confined excavations difficult and slow. • Weathered bedrock spoils may be suitable for reuse as structural fill for unpaved roadway improvements or retained backfill provided the friable fragments of bedrock have been completely broken down and oversized rock fragments have been removed. The use of bedrock spoils below the tank footprint are prohibited.
Undocumented Fill	A wedge of undocumented fill was encountered near the western extents of the development area as noted on Figure 3 (Oblique View Showing Suspected Fill Wedge Location). Based on our understanding of the proposed improvements, the future tank will be located all on cut outside of the limits of the undocumented fill wedge.
Detention Basin Stormwater	A shallow basin on the order of 1 to 2 feet deep is proposed on the southwest side of the site. The basin will be used as an energy dissipater to slow down storm runoff and permit sediments to settle out prior to discharge down the slope. The basin will be excavated into the weathered bedrock. From a geotechnical perspective, this basin may be constructed as proposed, provided it is not designed for infiltration and appropriate erosion control such as rip rap is installed, regularly inspected, and maintained. The weathered granodiorite is susceptible to erosion due to the granular characteristics; where drainage paths are permitted overland, erosion prevention will need to be considered.
General Information	This report shall be reviewed by the design team and contractor in its entirety.

8.0 DESIGN RECOMMENDATIONS

8.1 SEISMIC DESIGN PARAMETERS

Seismic design parameters are based on the provisions listed under the 2018 IBC. Based on mapped geology, and our understanding of the subsurface conditions at the site, a Site Class C can be used for the project design. Table 4 (Seismic Design Parameters (2018 IBC)) provides a summary of seismic design parameters for a Site Classification of C. A copy of the Seismic Hazards Report is provided in Appendix C.

Table 4: Seismic Design Parameters (2018 IBC)

Approximate Latitude of Site		39.6472°
Approximate Longitude of Site		-119.8269°
Site Class Selected for this Site		C
Risk Category		IV
Type	**Description**	**Value**
S_S	Spectral Response Acceleration at Short Period (0.2 sec.)	1.456
S_1	Spectral Response Acceleration at 1-second Period	0.495
F_a	Site amplification factor at Short Period (0.2 sec.)	1.200
F_v	Site amplification factor at 1-second Period	1.500
S_{DS}	Design Spectral Response Acceleration at Short Period (0.2 sec.)	1.165
S_{D1}	Design Spectral Response Acceleration at 1-second Period	0.495
S_{MS}	Site-modified spectral acceleration value at Short Period (0.2 sec.)	1.747
S_{M1}	Site-modified spectral acceleration value at 1-second Period	0.742
T_L	Long-period transition period in seconds	6
PGA	MCE_G peak ground acceleration	0.619
PGA_M	Site modified peak ground acceleration	0.743

NOTES:
1. Per ASCE 7-16 Section 11.4.4, F_a shall not be less than 1.2.
2. See requirements for Site Specific Ground Motions in Section 11.4.8 of ASCE 7.
3. Reference https://seismicmaps.org/

8.2 FOUNDATION DESIGN

The proposed water tank will be supported using a concrete ring wall foundation with granular infill. Based on the assumed structural loading, proposed structure type, and soil conditions encountered during the subsurface exploration, foundation design parameters presented in Table 5 (Allowable Bearing Pressure) are recommended for project design.

Table 5: Allowable Bearing Pressure	
Allowable Bearing Pressures (psf)	
Footings bottomed at least 2 feet [3] below the proposed finished grade elevation on weathered granitic bedrock	4,500
Allowable Friction Coefficient:	
For foundations bottomed on weathered granitic bedrock	0.48
Allowable Passive Soil Pressure (psf/ft)	
Backfill soils consisting of compacted structural fill	300

NOTES:

1. (psf)-Pounds per square foot
2. The allowable bearing pressure may be increased by one-third for total loading conditions including wind and seismic forces (2018 IBC). The allowable bearing pressure is a net value; therefore, the weight of the foundation which extends below grade and backfill may be neglected when computing dead loads. The allowable bearing pressure includes a minimum FOS of 3.0 against bearing failure.
3. Based on a minimum foundation width of 1½ feet.
4. For frost protection, footings shall be bottomed at least 2 feet below adjacent exterior grade.
5. The passive earth pressure shall be used as a triangular distribution. The frictional resistance and passive earth pressure provided in the table are "allowable" and may be used in combination without reduction as a factor of safety of 1.5 is included.
6. Assumes stem-wall backfill is compacted to at least 90 percent relative compaction (ASTM D1557).
7. The material within the frost zone should be neglected when designing for passive pressure. Where sloping backfill will be used near foundations, the design engineer shall contact the geotechnical engineer for additional recommendations.
8. The bottom of all foundation excavations shall be free of ponded or standing water, frost, and loose or sloughing materials.

8.2.1 SETTLEMENT

Based on the subsurface conditions encountered during the subsurface exploration, an immediate (short term) settlement response is expected. The following estimated settlement is based on the assumption the tank structure foundations are founded on cut.

Immediate Settlement Response	Immediate total settlement is estimated to be on the order of 1-inch or less is anticipated to occur during construction after total structural loading has been applied.
Differential Settlement	Provided recommendations in this report are followed, differential settlement for foundations with similar loads is anticipated to be about ½ of the total settlement provided the foundations are all bottomed on similar material (e.g., all on suitable native material or properly compacted structural fill).

8.3 RETAINING WALL LATERAL EARTH PRESSURES

Static lateral earth pressures on retaining walls are dependent on the relative rigidity, allowable movement of the retaining structure, strength properties of the backfill soil, and drainage conditions behind the retaining wall. The lateral earth pressure is strongly dependent on the lateral deformations which occur in the soil.

A restrained retaining wall (i.e., displacement not permitted) will experience higher lateral earth pressures than a retaining wall that is free to move (cantilever conditions). The restrained retaining wall lateral earth pressure is based on the at-rest soil coefficient (K_o), and lateral earth pressure values for the retaining wall that is free to rotate with the ability to deflect at the top (wall movement greater than 0.001H for cohesionless soils and greater than 0.01H for cohesive soils) are based on active soil coefficient (K_a).

The proposed northern retaining wall will be used to retain a bedrock slope (i.e., cut slope). The bedrock material is generally consistent with a moderately to strongly cemented granular soil. Based on our understanding the proposed wall types, an active earth pressure condition will be applicable for design and construction for this project. Lateral active earth pressure values for both cut and fill slopes are presented in Table 6 (Lateral Earth Pressures).

Table 6: Lateral Earth Pressures

Earth Pressure Condition		Backfill Slope	Active Earth Pressure Coefficient (K_a)	Equivalent Fluid Density (psf/ft)
Cut Slope	Active (P_a)	Level	0.23	32
		2.5H:1V	0.27	38
Fill Slope and Stem-wall	Active (P_a)	Level	0.28	35
		3H:1V	0.33	41

NOTES:

1. Pounds per square foot per foot of depth
2. Assumes free-draining conditions above the groundwater table.
3. Does not include surcharge loading.
4. Assumes no dynamic loading.
5. For active earth pressure, wall must rotate about base away from the retained soil to mobilize. Lateral movements of about 0.001 H, where H is wall height will be required for design of active earth pressure condition.
6. Cut Slopes: Assuming maximum unit weight of 140 pcf and a soil friction angle of at least 39 degrees. Retained backfill will consist of a thin wedge of back-of-wall drainage and densified structural fill with a thickness of less than the retained height abutted against weathered bedrock. The value provided does not include cohesion.
7. Fill Slopes or Stem-wall Design: Assuming maximum unit weight of 125 pcf and a soil friction angle of at least 34 degrees. Retained backfill shall consist of densified structural fill extending laterally a distance equal to the height of the retaining wall.

Subterranean structures and short retaining walls, including foundations, shall be designed to resist the lateral earth pressure exerted by the retained soil plus any additional lateral force that will be applied to the wall due to surcharge loads placed at or near the wall.

8.4 PERMANENT SLOPES

In general, the site grading modifications are anticipated to consist of partial trimming of the existing cut slope with no modification to the existing fill slopes. The following provides general guidance for new slope construction.

Permanent Cut Slopes	The existing permanent cut slope northeastern of the existing water tank is on the order of 2.5H:1V. It is understood that the proposed site grading will include a small area of trimming. The base of the new graded area of the cut slope will be retained by a segmented retaining wall. The top of slope will generally be left in place and untouched. At the time of our subsurface investigation, no visible erosional concerns were noted. Care should be taken during grading to limit the potential for concentrated flows from undercutting the base or eroding the top of slope. Establishment of vegetation for erosion control purposes along the bedrock surface may be difficult, CME recommends an erosion control specialist be consulted where revegetation is proposed. Maintenance planning shall include considerations should include annual or semiannual inspections to address erosion concerns over the lifetime of the project.
Permanent Fill Slopes	In general, permanent fill slopes less than 20 feet total height will be stable at a 2H:1V or flatter. For planning purposes, permanent fill slopes on the order of 3H:1V or flatter are better suited for applications where the use of vegetation is the proposed method of erosion control and for maintenance purposes.
Erosion Prevention	To prevent erosion of the slope face, site grading shall be performed such that water collected from the tank pad is not permitted to drain directly over the slope face. Vegetation or hydroseeding applications may be suitable for cut and fill slopes with permanent slope angles on the order of 3H:1V or flatter. Riprap or other mechanical means may be required for 2.5H:1V slopes. For slopes steeper than 2H:1V, an erosion control specialist should be consulted.

9.0 CONSTRUCTION RECOMMENDATIONS

9.1 SITE PREPARATION

9.1.1 CLEARING AND GRUBBING

The ground surface is generally devoid of vegetation in the proposed improvement area. If present, surface vegetation, duff, and topsoil shall be stripped and grubbed prior to initiating fill placement or construction activities. Surface vegetation shall be disposed of outside the construction limits of the site.

9.1.2 SUBGRADE PREPARATION

Subgrade material is anticipated to consist of decomposed bedrock complying with the designation of a granular soil, or moderately to slightly weathered bedrock[1]. Clay and/or fine-grained soil is not anticipated to be encountered during construction.

All areas to receive structural fill, aggregate base, or structural loading shall be prepared in general accordance with the following recommendations:

Weathered Bedrock	Scarification of moderately to slightly weathered bedrock (i.e., non-soil conforming material) is not required. Excavations in weathered bedrock may result in an irregular surface. It is recommended that the contractor attempt to remove these undulations, where possible, to create a flat surface.
Residual Soil and Decomposed Bedrock	Residual soils and decomposed bedrock shall be scarified, moisture conditioned, and densified to at least 90 percent relative compaction (ASTM D1557). Moisture conditioning and scarification depth will be dependent on the soil type: • Granular soils shall be scarified to a minimum depth of 6 inches and moisture conditioned, if required, prior to densification. It is recommended that these soils have moisture contents of plus or minus 2 percent of optimum moisture (ASTM D1557) prior to densification. Moisture contents above 3 percent of optimum moisture will be acceptable if the soil horizon maintains its stability when subjected to construction equipment loads and density can be achieved in subsequent structural fill lifts. Densification of the soil will be dependent on soil type: • Granular soils are not considered cohesive and the particles generally require shaking or vibratory action (i.e., smooth drum roller) for densification. • To determine if oversaturated subgrade materials have a potential for pumping, proof-rolling with heavy rubber-tired construction equipment such as a fully loaded water truck is recommended. Pumping or soft areas shall be over excavated and replaced with densified structural fill.

9.1.3 WATER TANK FOUNDATION GRADE PREPARATION

Foundation grade preparation shall be performed in accordance with Section 9.1.2. The water tank foundations will be bottomed on bedrock and may be poured neat. If bedrock protrusions are present, protrusion shall be overcut and the resulting void filled with concrete.

[1] Bedrock material which is generally solid and tightly bound, moderately hard, not friable, with little to no residual soil development.

9.2 MASS GRADING

9.2.1 REUSE OF EXISTING SITE SOILS

In general, a majority of the soil and weathered bedrock encountered will meet the definition of a granular soil provided bedrock fragments are broken down sufficiently (i.e., no friable or decomposing chunks permitted) and oversized (>4-inches) fragments are removed. Material not meeting the requirements of a granular soil may be placed as nonstructural fill. Guideline requirements for reuse of existing onsite material are summarized below:

Nonstructural Fill Oversized particles (i.e., >4-inches nominal diameter) and friable/decomposing bedrock fragments which may break down over time	Materials not meeting the requirements of a granular soil shall not be reused in structural areas (refer to 7.1 General Information). Nonstructural fill may be stockpiled onsite and reused in landscape or non-structural areas. Alternatively, this material may be hauled off site and disposed of in an approved location. Care shall be taken not to mix non-structural fill with the onsite granular fill material. Nonstructural fill shall be free of construction debris and/or hazardous materials; and shall not be incorporated into structural fill, or permitted to be located within the 1H:1V (horizontal: vertical) zone influence of structural areas.
Structural Fill Granular soil or imported structural fill	Soil meeting the requirements of a granular soil (refer to Section 7.1 General Information) free of deleterious and oversized materials, shall be stockpiled onsite for reuse in structural areas.

Stockpile areas shall be protected from erosion and runoff. Temporary erosion control measures shall be implemented during project construction.

9.2.2 STRUCTURAL FILL

Material generated onsite that is proposed for reuse as structural fill shall meet the requirements of a granular soil as defined in Section 7.1 (General Information). Structural fill shall be free of vegetation, organic matter, and other deleterious material. Imported structural fill, if required, shall comply with the specifications presented in Table 7 (Guideline Specification for Imported Structural Fill).

Table 7: Guideline Specification for Imported Structural Fill

Sieve Size		Percent by Dry Weight Passing
4-inches		100
¾ inch		70 – 100
No. 40		15 – 65
Percent Passing No. 200	**Maximum Liquid Limit**	**Maximum Plastic Index**
5 – 15	45	14
16 – 35	40	10
R-Value (Traffic Areas Only)	**Water Soluble Sulfate (SO_4) in Soil (%) by Mass**	**Organic Content (ASTM D2974) (%)**
30	<0.2	<3%

NOTES:

1. R-Value is required for materials placed in roadways or areas to receive vehicular traffic only. Not required for building foundations or ancillary improvements outside of traffic areas.
2. Water Soluble Sulfate required where structural fill will be located adjacent to, above, or in direct contact with concrete elements. Please contact the project geotechnical engineer for additional guidance.

Structural fill shall be placed in maximum 8-inch thick (loose) level lifts or layers and densified to at least 90 percent relative compaction. The required moisture content of the soils, prior to densification, shall range between plus or minus 2 percent of optimum moisture, as determined by moisture-density relationship test results (ASTM D1557). Moisture contents greater than 2 percent of optimum moisture are acceptable if the soil lift is stable and required relative compaction can be attained in the soil lift and succeeding soil lifts. Grading should not be performed with frozen soils or on frozen soils.

9.3 EXCAVATIONS

9.3.1 EXCAVATION DIFFICULTY

It is anticipated that a majority of the trenching and confined excavations will have a depth on the order of 5 feet or less and may be performed using conventional excavation equipment such as a large trackhoe (45 tons). The excavation contractor shall consider the use of twin tiger ripper teeth or other ripper teeth attachments. In addition, pneumatic hammer maybe required to remove resistant zones of bedrock as described in this report.

Based on the anticipated depth of installation, smaller equipment such as a backhoe or mini excavator are not recommended or advised for use as refusal may be encountered at depths less than the proposed depth of installation. It is the contractor's responsibility to provide properly sized equipment to accommodate excavations within weathered bedrock.

9.3.2 TRENCH STABILITY

Excavations performed in weathered bedrock are expected to stand near vertical; if excavations extending into the existing fill wedge are proposed, caving or sloughing should be expected.

In areas where temporary confined excavations may be unstable, trench boxes or trench shields may be used to provide safe ingress and egress for construction personnel. It should be noted that trench shields are not designed to prevent lateral movement of the trench sidewall and are used for protection of field personnel from cave-ins. Alternative methods for shoring may be required if trench excavations intercept the theoretical loading path for structural elements (i.e., 1H: 1V (horizontal: vertical)) such as foundations, retaining walls, tanks, or other structures exerting load on the underlying soils.

Regulations amended in OSHA Part 1926, Volume 54, Number 209 of the Federal Register (Table B-1, October 31, 1989) requires that the temporary sidewall slopes be no greater than those presented in Table 8 (Maximum Allowable Temporary Slopes).

Table 8: Maximum Allowable Temporary Slopes

Soil or Rock Type	Maximum Allowable Slopes[1] for Excavations (< 20 Feet)[2]	
Stable Rock	Vertical	90º
Type A	3H:4V	53º
Type B	1H:1V	45º
Type C	3H:2V	34º

NOTES:

1. Angles are expressed in degrees from the horizontal and have been rounded off.
2. Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.
3. For detailed description of the soil types outlined above visit the US Department of Labor Safety and Health Topics website at: https://www.osha.gov/SLTC/trenchingexcavation/construction.html

All excavations regardless of depth shall be evaluated to check the stability prior to occupation by construction personnel. Trenching and confined excavations within the bedrock are anticipated to comply with Stable Rock or Type A conditions and will be dependent on the depth and weathering patterns of the bedrock encountered. Excavations extending into the fill wedge may comply with Type C conditions.

Trench excavations shall be protected from surface water/runoff. Temporary drainage swales may be excavated to divert surface flows into a collection area away from the open excavation. Bank stability will remain the responsibility of the contractor present at the site, who is able to observe changes in ground conditions, and has control over the means and method of construction.

9.4 SITE DRAINAGE

The project site will be subjected to seasonal runoff. Adequate surface drainage shall be constructed and maintained to convey the water away from proposed structures. The permanent finished slope grade away from the structure shall be at least 2 percent for a minimum distance of 10 feet away from the structure. It is recommended that all runoff is collected within permanent drainage paths away from the structure and existing slope faces.

To limit the potential for moisture migration into the backfill adjacent to foundation stem walls, CME recommends that stem wall and foundation backfill is compacted to at least 90 percent relative compaction.

9.5 CORROSION CONSIDERATIONS

9.5.1 CONCRETE

Many external sources can affect the potential for sulfate attack against concrete ranging from soil type, marine/wetland environments, to deicing and industrial conditions. The American Concrete Institute (ACI) Committee 201 and ACI 318-14 have established guidelines for determining the potential for sulfate attack from external sources. Table 9 (General Guideline Requirements for Concrete Subject to Sulfate Exposure) has been developed to provide the design engineer with guideline recommendations for cement type based on the severity of potential sulfate exposure associated with the tested soils encountered during the current exploration.

Table 9: General Guideline Requirements for Concrete Subject to Sulfate Exposure

Severity of Potential Exposure	Water Soluble Sulfate (SO_4) in soil (%) by mass	Sulfate (SO_4) in water (ppm)	Maximum Water Cementitious Materials Ratio	Cementitious Material Requirements
S0 (negligible)	$SO_4 < 0.10$	$SO_4 < 150$	No Requirement	No Requirement
S1 (Moderate)	$0.10 < SO_4 < 0.20$	$150 < SO_4 < 1,500$	0.50	ASTM C150 Type II Cement
S2 (Severe)	$0.2 < SO_4 < 2.0$	$1,500 < SO_4 < 10,000$	0.45	ASTM C150 Type V Type I Cement with 20% Class N Pozzolan Type I Cement with 20% Class F Fly Ash
S3 (Very Severe)	$SO_4 > 2.0$	$SO_4 > 10,000$	0.40	Refer to ACI 201.2R.16 and ACI 318-14

NOTES:
1. Table reference: ACI 201.2R.16, publication Table 6.1.4.1a and 6.1.4.1b and ACI 318-14, Table 19.3.1.1

The soil tested has a sulfate content of less than 0.10 percent and comply with a severity of potential exposure classification of S0 (negligible). No special requirements are listed under this category; and Type II Cement may be used for project design.

9.6 DIPRA CORROSION POTENTIAL SUMMARY FOR BURIED DUCTILE IRON PIPES

Table 10 (DIPRA Design Decision Matrix (DDM) (2018)) summarizes general corrosion coating recommendations for ferrous pipe based on the ductile iron pipe research association (DIPRA) Design Decision Matrix.

Table 10: DIPRA Design Decision Matrix (DDM) (2018)

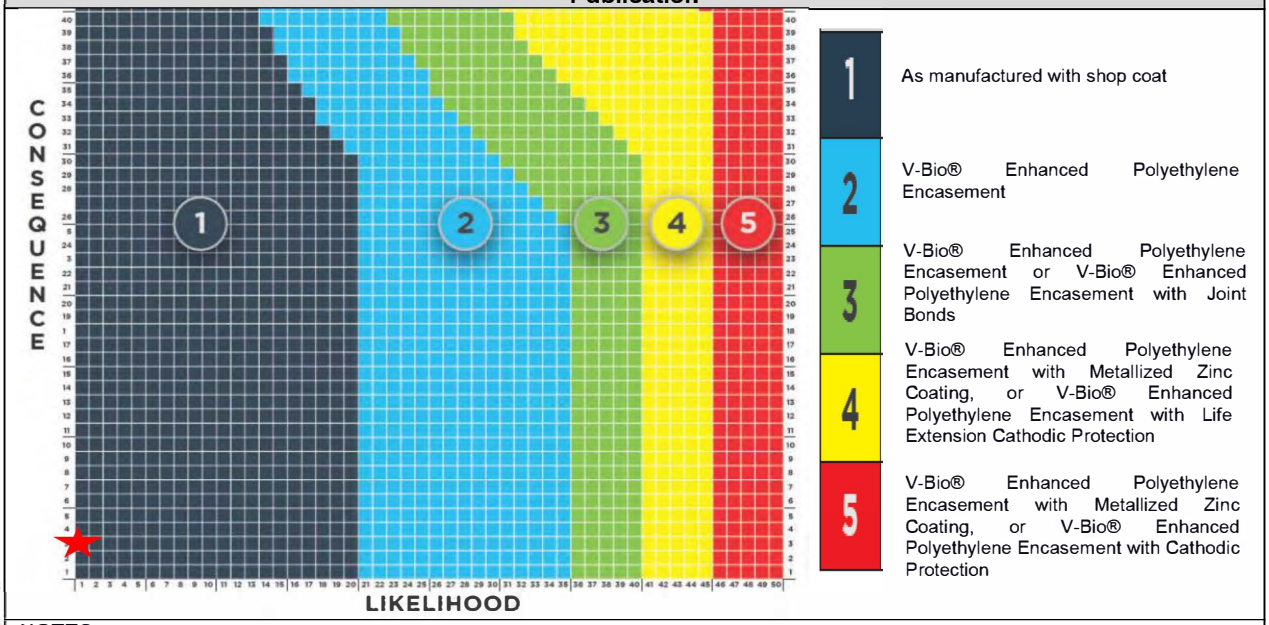
Likelihood Score

Sample ID	Resistivity	Chlorides	Moisture Content	Groundwater	pH	Sulfide Ions	Redox Potential	Bi-Metallic Considerations[2]	Total Score
TP-2, 2A, 3.0'-5.0'	8,500	<50	2.5%	No	7.15	Negative	148	No	0

Consequence Score

Sample ID	Pipe Service	Location	Depth of Cover Considerations	Alternate Water Supply Available?	Total Score
TP-2, 2A, 3.0'-5.0'	3"-12"	Routine	3 to 8 feet	No?	3

Excerpt of Figure 1: DDM Two-Dimensional Matrix Diagram from the DIPRA Design Decision Matrix Publication



NOTES:

1. A corrosion specialist should be consulted to confirm general recommendations contained in this section.
2. Assumes conservative approach such that the pipeline is connected to a noble metal (e.g. copper).
3. The reference publication should be reviewed by the design engineer for further explanation and clarification (https://www.dipra.org/phocadownload/new/CorrosionControl-DesignDecisionModel.pdf)

Based on the DDM, if ductile iron pipe is considered, as manufactured with shop coat is recommended. A corrosion specialist should be consulted to confirm general recommendations contained in this section.

10.0 GENERAL CONSTRUCTION OBSERVATION, TESTING, AND DOCUMENTATION

10.1 RELATIVE DENSITY REQUIREMENTS

The contractor is responsible for reading the site preparation and grading requirements in its entirety. This section is for general reference only and does not cover recommendations for placement and/or site remediation where required.

The following table provides a summary of the minimum relative compaction required for earthwork and site preparation:

Table 11: Minimum Relative Density for Site Grading

Material Type	Minimum Relative Density (ASTM D1557)[1]	Geotechnical Report Section Reference
Subgrade Preparation	90%	Section 9.1.2 Subgrade Preparation
Structural Fill	90%	Section 9.2.2 Structural Fill
Retained Backfill	90%	Section 9.2.2 Structural Fill and 8.3 Retaining Wall Lateral Earth Pressures
Foundation Grade Preparation	90%	Section 9.1.3 Water Tank Foundation Grade Preparation

NOTES:

1. Relative compaction refers to the ratio percentage of the in-place density of a soil divided by the same soil's maximum dry density as determined by the ASTM D1557 laboratory test procedure. Optimum moisture content is the corresponding moisture content of the same soil at its maximum dry density

All materials testing completed during construction should be in accordance with local governing standards.

10.2 TESTING AND DOCUMENTATION

The recommendations presented in this report are based on the assumption that the owner/project manager provides sufficient field testing and construction review during all phases of construction. These construction observations and testing services should include but not be limited to:

- Site preparation and grading;
- Foundation grade soil preparation and observation;
- Reinforced concrete inspection and placement; and
- Structural observation and testing services.

CME employs a large staff of certified inspectors and testers to provide these services. Prior to construction, the owner/project manager should schedule a preconstruction conference to include, but not be limited to: owner/project manager, project engineer, general contractor, earthwork and materials subcontractors, and geotechnical engineer. It is the owner's/project manager's responsibility to set-up this meeting and contact all responsible parties. The conference will allow parties to review the project plans, specifications, and recommendations presented in this report, and discuss applicable material quality and mix design requirements. All quality control reports should be submitted to the owner/project manager for review and distributed to the appropriate parties.

Additionally, all plans and specifications should be reviewed by the engineer responsible for this geotechnical report to determine if they have been completed in accordance with the recommendations contained herein. It is the owner's/project manager's responsibility to provide the plans and specifications to the geotechnical engineer

11.0 LIMITATIONS

Exploration Location and Geologic Variations	• This report has been prepared in accordance with generally accepted local geotechnical practices. The conclusions and recommendations of this report are provided for the design and construction of the proposed project as described in this report. The analyses and recommendations contained herein are based upon field exploration locations included on Plate A-1. • Exploration locations included as part of this report should be considered accurate only to the degree implied by the methods used. This report does not reflect soil, rock, or groundwater variations that may become evident during the construction period, at which time re-evaluation of the recommendations may be necessary.
General Intent and Information Distribution	• The intent of this report is to provide geotechnical information related to construction and design of the project. The owner/project manager is responsible for distribution of this report to all designers and contractors whose work is affected by geotechnical recommendations provided. In the event of changes in the design, location, or ownership of the project prior to construction, our recommendations should be reviewed by our geotechnical representative. • If our engineer is not accorded the privilege of making this recommended review, the CME can assume no responsibility for misinterpretation or misapplication of his recommendations or their validity in the event changes have been made in the original design concept without our prior review.
Warranties	• CME makes no other warranties, either expressed or implied, as to the professional advice provided under the terms of this agreement and included in this report. Any use, reliance on, or decisions, which a third party makes based upon the information contained in this report, are the sole responsibility of such third parties. CME accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.
Clay Soil	• Clay soils may be present in discontinuous areas below the proposed improvements. Clay soils may potentially shrink or swell (volume changes) in response to changes in the moisture content of the soil. Moisture changes in these soils can occur as a result of seasonal variations in precipitation, poor site drainage, landscape irrigation, leaking underground pipes, capillary action, or from other sources. Volume changes in clay soils can cause differential movements in structural elements constructed in the sphere of influence or bearing on the clay soil. The project geotechnical engineer shall be notified where questionable soils are encountered.
Standard Owner Maintenance and Monitoring Responsibility	• All structures are subjected to deterioration from environmental and manmade exposures. As a result, all structures require frequent monitoring and regular maintenance to prevent damage and/or deterioration. Such monitoring and maintenance are the sole responsibility of the Owner. CME, Inc. shall have no responsibility for such issues or resulting damages.
Environmental Hazards Evaluation	• Any evaluation of the site for the presence of surface or subsurface hazardous substances is beyond the scope of this study. When suspected hazardous substances are encountered during routine geotechnical investigations, they are noted in the exploration logs and reported to the client.

12.0 REFERENCES

American Concrete Institute (ACI) 318, *Building Code Requirements for Structural Concrete.*

American Society for Testing and Materials (ASTM), 2014, *Soil and Rock; Dimension Stone; Geosynthetics,* Volume 4.08.

Bowles, J. E., 1996, Foundation Analysis and Design, McGraw Hill.

Robert Baboian, et. al., Corrosion Tests and Standards, Application and Interpretation, 2nd edition, 2006

ASCE. 2016. Minimum Design Loads for Buildings and Other Structures. ASCE/SEI Standard 7-16

Google Earth aerial photos, Accessed December 2022

International Building Code, 2018

NRCS Web Soil Survey, accessed December 2022

AASHTO LRFD Bridge Design Specifications. Washington, D.C.: American Association of State Highway and Transportation Officials, 2017.

US Army Corps of Engineers, *Engineer Manual 1110-1-1904, Engineering and Design Settlement Analysis*, dated September 30, 1990

AWWA Standard D100-21, Welded Carbon Steel Tanks for Water Storage, Effective Date, November 1, 2021

APPENDIX A

VICINITY MAP
N.T.S

EXPLORATION LOCATION MAP
SCALE 1"=30'

SCALE 1"~30 '
30 15 0 15 30

V:\Active\3152\autocad\3152.dwg

CME CONSTRUCTION MATERIALS ENGINEERS INC.
300 Sierra Manor Drive, Suite 1
Reno, NV 89511

TRUCKEE MEADOWS WATER AUTHORITY
LEMMON VALLEY WATER TANK REPLACEMENT
EXPLORATION LOCATION MAP
WASHOE COUNTY APN 080-730-08
PROJECT NO.: 3152 DATE:12/22/2022

LEGEND
APPROXIMATE TEST PIT LOCATION
APPROXIMATE REMI LINE LOCATION

PLATE
A-1

WSUP23-0030
EXHIBIT D

LOG OF TEST PIT TP-1

PROJECT NO: 3152	**EXCAVATION CONTRACTOR:** Q&D CONSTRUCTION	**BEGIN DATE:** 12/8/2022	
PROJECT: LEMMON VALLEY WATER TANK		**COMPLETION DATE:** 12/8/2022	
LOCATION: 39.64721, -119.82652	**EXCAVATION EQUIPMENT:** CAT 325 EXCAVATOR	**SURFACE ELEVATION:** 5116 (ft) (County GIS)	
	BUCKET SIZE AND TYPE: 2 FEET, 3-TEETH	**BACKFILL METHOD:** TAMPED CUTTINGS	
CLIENT: TMWA	**TEST PIT WIDTH:**	**WATER DEPTH:** NOT ENCOUNTERED	
LOGGED BY: CJJ	**TEST PIT LENGTH:**	**READING TAKEN:** 12/8/2022	

FIELD						DESCRIPTION	Δ DCP CORRELATED SPT N VALUE Δ 10 20 30 40 PL MC LL 0 20 40 60 80100 ☐ FINES CONTENT (%) ☐ 20 40 60 80	LABORATORY					REMARKS
ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	POCKET PEN. (TSF)	GRAPHIC LOG			LIQUID LIMIT	PLASTICITY INDEX	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	
5116	0												
	1					**IGNEOUS ROCK (GRANITE)**, gray and orange, moderately weathered, moderately hard, intensely to moderately fractured.							Hard digging, bucket scraping at 1.0 feet.
5114	2					EXCAVATES AS:. **SILTY, CLAYEY SAND with GRAVEL and COBBLES (SC-SM)**; about 10% angular to subangular COBBLES, up to 6.0 in. nominal diameter; about 25% coarse to fine, angular to subangular GRAVEL, up to 3.0 in. nominal diameter; about 55% coarse to fine, angular to subangular SAND; about 10% low plasticity fines.							
	3		1A					22	17	2.5		12.6	Samples 1A and 2B were combined for testing.
5112	4												
	5												
5110	6					Terminated at 6.0 ft bgs							
						PRACTICAL REFUSAL AT 6.0 FEET ON RESISTANT BEDROCK. NO FREE WATER ENCOUNTERED OR OBSERVED.							
	7												
5108	8												
	9												
5106	10												
	11												
5104	12												

CME CONSTRUCTION MATERIALS ENGINEERS, INC.

Construction Materials Engineers, Inc.
300 Sierra Manor Drive, Suite 1
Reno, Nevada 89511
(775) 851-8205

PROJECT NUMBER: 3152
PROJECT: LEMMON VALLEY WATER TANK
EXPLORATION: TP-1
ENTRY BY: CJJ **PLATE:** A-2
CHECKED BY: SAH

WSUP23-0030
EXHIBIT D

LOG OF TEST PIT TP-2

PROJECT NO: 3152	**EXCAVATION CONTRACTOR:** Q&D CONSTRUCTION	**BEGIN DATE:** 12/8/2022	
PROJECT: LEMMON VALLEY WATER TANK		**COMPLETION DATE:** 12/8/2022	
LOCATION: 39.64723, -119.82690	**EXCAVATION EQUIPMENT:** CAT 325 EXCAVATOR	**SURFACE ELEVATION:** 5098 (ft) (County GIS)	
	BUCKET SIZE AND TYPE: 2 FEET, 3-TEETH	**BACKFILL METHOD:** TAMPED CUTTINGS	
CLIENT: TMWA	**TEST PIT WIDTH:**	**WATER DEPTH:** NOT ENCOUNTERED	
LOGGED BY: CJJ	**TEST PIT LENGTH:**	**READING TAKEN:** 12/8/2022	

FIELD						LABORATORY					
ELEVATION (ft)	DEPTH (ft)	SAMPLE	SAMPLE NO	POCKET PEN. (TSF)	GRAPHIC LOG	DESCRIPTION	Δ DCP CORRELATED SPT N VALUE Δ 10 20 30 40; PL MC LL; 0 20 40 60 80 100; ☐ FINES CONTENT (%) ☐ 20 40 60 80	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE (%)	D. DENSITY (PCF)	% PASSING 200 SIEVE	REMARKS
						SILTY, CLAYEY SAND with GRAVEL and COBBLES (SC-SM); light orangish brown; dry to moist; about 5% subangular COBBLES, up to 5.0 in. nominal diameter; about 15% coarse to fine, subangular GRAVEL, up to 3.0 in. nominal diameter; about 65% coarse to fine, subangular SAND; about 15% low plasticity fines [UNDOCUMENTED FILL?].							Rootlets within upper 1.0 foot.
5096	2												
	3												Cobbles increasing with depth.
5094	4		2A					22	17	3.8		16.3	
	5												
5092	6												
	7												
5090	8												
	9					9.0							
						IGNEOUS ROCK (GRANITE), tan and orange, moderately weathered, moderately hard, intensely to moderately fractured.							Hard digging starting at 9.0 feet. Bucket scraping.
5088	10		2B			EXCAVATES AS: **SILTY, CLAYEY SAND with GRAVEL and COBBLES (SC-SM)**; about 10% angular to subangular COBBLES, up to 7.0 in. nominal diameter; about 25% coarse to fine, angular to subangular GRAVEL, up to 3.0 in. nominal diameter; about 55% coarse to fine, angular to subangular SAND; about 10% low plasticity fines.		22	17	2.5		12.6	Samples 1A and 2B were combined for testing.
	11					Terminated at 11.0 ft bgs							
5086	12					PRATICAL REFUSAL AT 11.0 FEET ON RESISTANT BEDROCK. NO FREE WATER ENCOUNTERED OR OBSERVED.							

CME CONSTRUCTION MATERIALS ENGINEERS, INC.

Construction Materials Engineers, Inc.
300 Sierra Manor Drive, Suite 1
Reno, Nevada 89511
(775) 851-8205

PROJECT NUMBER: 3152
PROJECT: LEMMON VALLEY WATER TANK
EXPLORATION: TP-2
ENTRY BY: CJJ **PLATE:** A-2
CHECKED BY: SAH

WSUP23-0030
EXHIBIT D

CME CONSTRUCTION MATERIALS ENGINEERS, INC.

SOIL CLASSIFICATION CHART

PLATE A-3

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL CLASSIFICATION NAMES
Course grained soils (More than 50% of the material is larger than No. 200 sieve size)	Gravel and gravelly soils	Clean gravels		GW	Well-graded gravels, gravel-sand mixtures, few or no fines
				GP	Poorly-graded gravels, gravel-sand mixtures, few or no fines
		Gravels with fines		GM	Silty gravels, gravel-sand-silt mixtures
				GC	Clayey gravels, gravel-sand-clay mixtures
	Sand and sandy soils	Clean sands		SW	Well-graded sands, gravelly sands, few or no fines
				SP	Poorly-graded sands, gravelly sands, few or no fines
		Sands with fines		SM	Silty sands, sand-silt mixtures
				SC	Clayey sands, sand-clay mixtures
Fine grained soils (More than 50% of the material is smaller than No. 200 sieve size)	Silts and clays	Liquid Limit less than 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
				OL	Organic silts and organic silt-clays of low plasticity
		Liquid Limit greater than 50		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
				CH	Inorganic clays of medium to high plasticity
				OH	Organic clays of medium to high plasticity
				PT	Peat or other highly organic soils

NOTES:
1. Dual classifications may occur (e.g. SP-SM, CL-ML, GP-GC)

PARTICLE ANGULARITY

Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular	Particles are similar to angular, but have rounded edges
Subrounded	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded	Particles have smoothly curved sides and no edges

PARTICLE SHAPE

Flat	Particles with width/thickness >3
Elongated	Particles with length/width >3
Flat and Elongated	Particles meet criteria for both flat and elongated

MOISTURE

Dry	No discernable moisture
Moist	Moisture present, but no free water
Wet	Visible free water

CEMENTATION

Weak	Crumbles or breaks with handling or light finger pressure.
Moderate	Crumbles or breaks with considerable finger pressure.
Strong	Will not crumble or break with finger pressure.

PARTICLE SIZE, Ps

Boulders		Ps > 12"
Cobbles		3" < Ps ≤ 12"
Gravel	coarse	$\frac{3}{4}$" < Ps ≤ 3"
	fine	$\frac{1}{5}$" < Ps ≤ $\frac{3}{4}$"
Sand	coarse	$\frac{1}{16}$" < Ps ≤ $\frac{1}{5}$"
	medium	$\frac{1}{64}$" < Ps ≤ $\frac{1}{16}$"
	fine	$\frac{1}{300}$" < Ps ≤ $\frac{1}{64}$"
Fines		Ps ≤ $\frac{1}{300}$"

PERCENT OF SOIL, Pp

Trace	Pp < 5%
Few	5 ≤ Pp ≤ 15%
Little	15 ≤ Pp ≤ 30%
Some	30 ≤ Pp ≤ 50%
Mostly	50 ≤ Pp ≤ 100%

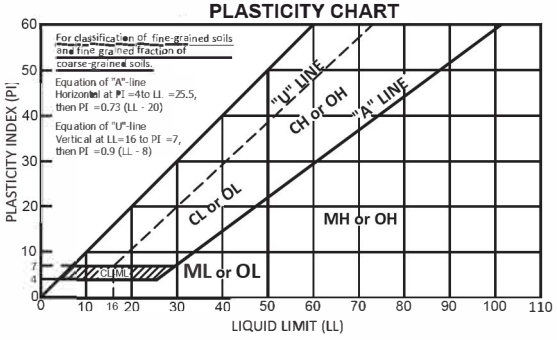
SOIL SAMPLE TYPES

- Bulk Sample
- Standard Penetration Test (2.0" OD, 1.42" ID)
- California Modified Sampler (3.0" OD, 2.42" ID)
- Thin walled Shelby Tube (3.0" OD)
- Rock Core

GROUNDWATER SYMBOLS

- Water level during drilling
- Water level after drilling

PLASTICITY CHART



APPARENT DENSITY OF COHESIONLESS SOIL

	SPT (1.4" ID) N_{60}
Very Loose	< 5
Loose	5 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

Based on 60% energy ratio (ER_i). $N_{60} = N_{measured} * (ER_i/60)$

California Modified Sampler can be corrected to SPT by multiplying by 0.62

CONSISTENCY OF COHESIVE SOIL

	SPT (1.4"ID) N_{60}	Unconfined Compressive Strength (psf)	Pocket Penetrometer (tsf)
Very Soft	0 - 1	< 500	< 0.25
Soft	2 - 4	500 - 1,000	0.25 - 0.5
Medium Stiff	5 - 8	1,000 - 2,000	0.5 - 1.0
Stiff	9 - 15	2,000 - 4,000	1.0 - 2.0
Very Stiff	16 - 30	4,000 - 8,000	2.0 - 4.0
Hard	31 - 60	8,000 - 16,000	> 4.0
Very Hard	> 60	> 16,000	

WSUP23-0030
EXHIBIT D

CME CONSTRUCTION MATERIALS ENGINEERS, INC.

ROCK CLASSIFICATION CHART

PLATE A-4

BEDDING SPACING, Sb	
Massive	10' < Sb
Very Thickly Bedded	3' < Sb ≤ 10'
Thickly Bedded	1' < Sb ≤ 3'
Moderately Bedded	4" < Sb ≤ 1'
Thinly Bedded	1" < Sb ≤ 4"
Very Thinly Bedded	$\frac{1}{4}$" < Sb ≤ 1"
Laminated	Sb ≤ $\frac{1}{4}$"

ROCK HARDNESS	
Extremely Hard	Cannot be scratched with a pocketknife or sharp pick. Can only be chipped with repeated heavy hammer blows.
Very Hard	Cannot be scratched with a pocketknife or sharp pick. Breaks with repeated heavy hammer blows.
Hard	Can be scratched with a pocketknife or sharp pick with difficulty (heavy pressure). Breaks with heavy hammer blows.
Moderately Hard	Can be scratched with a pocketknife or sharp pick with light or moderate pressure. Breaks with moderate hammer blows.
Moderately Soft	Can be grooved 1/16 in. deep with a pocketknife or sharp pick with moderate or heavy pressure. Breaks with light hammer blow or heavy manual pressure.
Soft	Can be grooved or gouged easily with a pocketknife or sharp pick with light pressure, can be scratched with fingernail. Breaks with light to moderate manual pressure.
Very Soft	Can be readily indented, grooved or gouged with fingernail, or carved with a pocketknife. Breaks with light manual pressure.

WEATHERING FOR INTACT ROCK

Description	Diagnostic Features					General Characteristics
	Chemical weathering-discoloration and/or oxidation		Mechanical weathering-grain boundary conditions	Texture and leaching		
	Body of rock	Fracture surfaces		Texture	Leaching	
Fresh	No discoleration, not oxidized.	No discoloration or oxidation.	No separation, intact (tight).	No change	No leaching	Hammer rings when crystalline rocks are struck.
Slightly Weathered	Discoloration or oxidation is limited to surface of, or short distance from, fractures; some feldspar crystals are dull.	Minor to complete discoloration or oxidation of most surfaces.	No visible separation, intact (tight).	Preserved	Preserved	Hammer rings when crystalline rocks are stuck. Body of rock not weakened.
Moderately Weathered	Discoloration or oxidation extends from fractures usually throughout; Fe-Mg minerals are "rusty" feldspar crystals are "cloudy".	All fracture surfaces are discolored or oxidized.	Partial separation of boundaries visible.	Generally preserved	Generally preserved	Hammer does not ring when rock is struck. Body of rock is slightly weakened.
Intensely Weather	Discoloration or oxidation throughout; all feldspars and Fe-Mg minerals are altered to clay to some extent; or chemical alteration produces in situ disaggregation, see grain boundary conditions.	All fracture surfaces are discolored or oxidized, surfaces friable.	Partial separation, rock is friable; in semiarid conditions granitics are disaggregated.	Texture altered by chemical disintegration (hydration, argillation).	Leaching of soluble minerals may be complete.	Dull sound when struck with hammer, usually can be broken with moderate to heavy manual pressure or by light hammer blow without reference to planes of weakness such as incipient or hairline fractures, or veinlets.
Decomposed	Discolored or oxidized throughout, but resistant minerals such as quartz may be unaltered; all feldspars and Fe-Mg minerals are completely altered to clay.		Complete separation of grain boundaries (disaggregated).	Resembles a soil, partial or complete remnant rock structure may be preserved; leaching of soluble minerals usually complete.		Can be granulated by hand. Resistant minerals such as quartz may be present as "stringers" or "dikes."

CORE RECOVERY
The core recovery value (REC) provides an indication of the success of the coring operation in recovering the cored rock. Diminished core recovery can be attributed to voids within the rock mass or loss of rock mass due to drilling fluids.
$REC = \frac{\Sigma(\text{Length of recovered core pieces})(100\%)}{\text{Total length of the core run}}$

ROCK QUALITY DESIGNATION
Rock Quality Designation is a measure of the fracturing in a rock mass as observed in a core specimen. A high value of RQD indicates few or widely spaced fractures. RQD is valid for core diameters from 1.4 to 3.335 inches. RQD is based on ASTM D6032.
$REC = \frac{\Sigma(\text{Length of intact core pieces} \geq 4 \text{ inches})(100\%)}{\text{Total length of the core run}}$

FRACTURE DENSITY	
Unfractured	No fractures.
Very Slightly Fractured	Core lengths greater than 3 ft.
Slightly Fractured	Core lengths mostly from 1 to 3 ft.
Moderately Fractured	Core lengths mostly from 4 in. to 1 ft.
Intensely Fractures	Core lengths mostly from 1 to 4 in.
Very Intensely Fractured	Mostly chips and fragments.
Note: exclude mechanical breaks	

FRACTURE FILLING, FF	
Clean	No visible separation
Very Thin	FF < $\frac{1}{32}$"
Moderately Thin	$\frac{1}{32}$" ≤ FF < $\frac{1}{8}$"
Thin	$\frac{1}{8}$" ≤ FF < $\frac{3}{8}$"
Moderately Thick	$\frac{3}{8}$" ≤ FF < 1"
Thick	1" ≤ FW

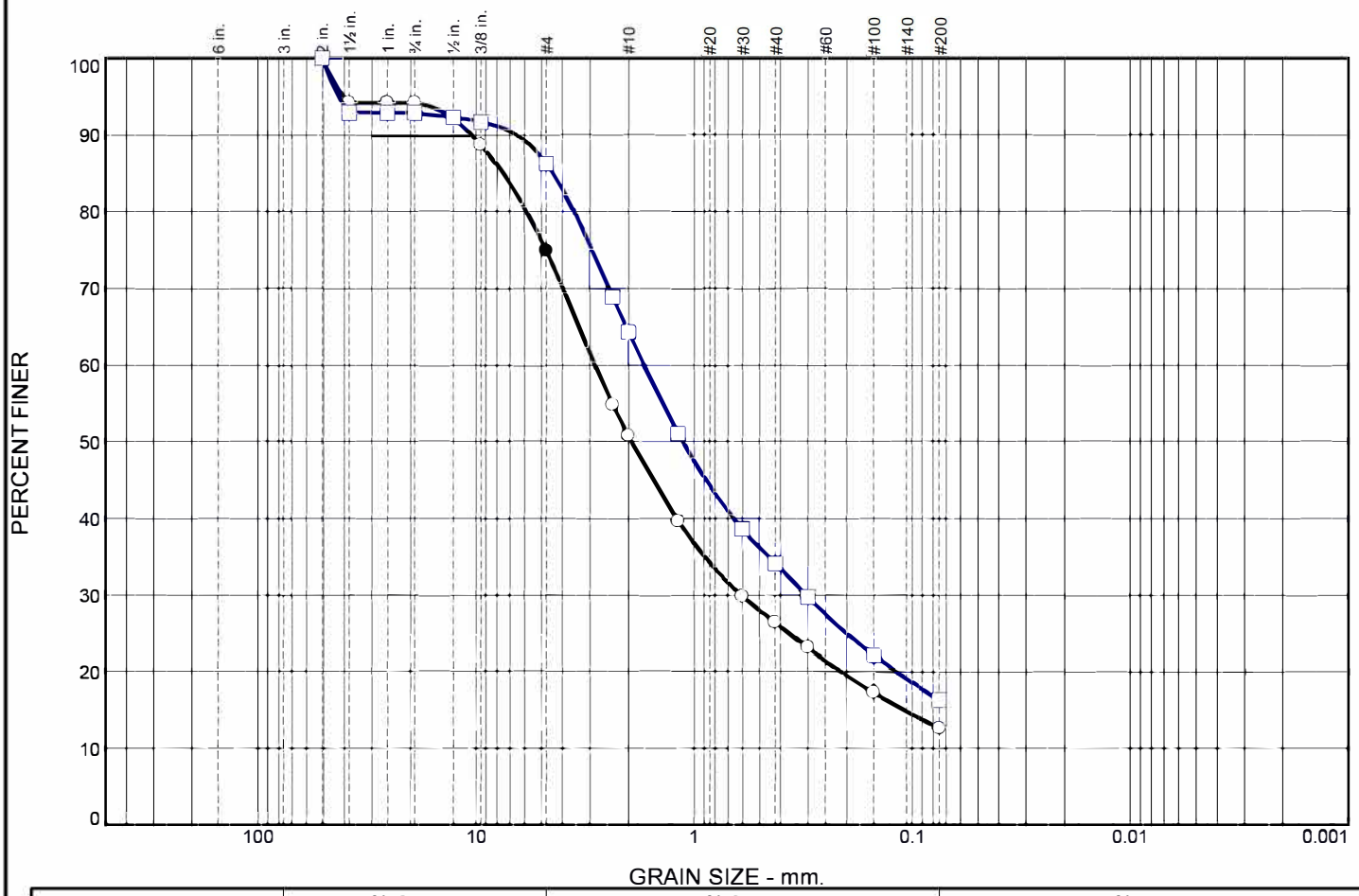
FRACTURE HEALING	
Totally Healed	Fracture is completely healed or recemented to a degree at least as hard as surrounding rock.
Moderately Healed	Greater than 50 percent of fracture is healed or recemented.
Partly Healed	Less than 50 percent of fractured material, filling, or fracture surface is healed or recemented
Not Healed	Fracture surface filling is not healed or recemented.

FRACTURE ROUGHNESS	
Stepped	Near-normal steps and ridges occur on the fracture surface.
Rough	Large, angular asperities can be seen.
Moderately Rough	Asperities are clearly visible and fracture surface feels abrasive.
Slightly Rough	Small asperities on the fracture surface are visible and can be felt.
Smooth	No asperities, smooth to the touch.

ROCK STRENGTH	
Plastic	Plastic or very low strength
Friable	Crumbles easily by rubbing with fingers
Weak	An unfractured specimen will crumble under light hammer blows
Moderately Strong	Specimen will withstand a few heavy hammer blows before breaking
Strong	Specimen will withstand a few heavy ringing hammer blows and will yield with difficulty only dust and small flying pieces
Very Srong	Specimen will resist heavy ringing hammer blows and will yield with difficulty dust and small flying fragments

APPENDIX B

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	5.8	19.3	24.1	24.3	13.9	12.6	
□	0.0	7.1	6.6	21.9	30.2	17.9	16.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	22	17	7.5490	2.8460	1.9338	0.6081	0.1080			
□	22	17	4.4274	1.6978	1.1251	0.3071				

	MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○	silty, clayey sand with gravel	12/14/2022	SC-SM	2.5
□	silty, clayey sand	12/14/20221	SC-SM	3.8

Project No. 3152 **Client:** TRUCKEE MEADOWS WATER AUTHORITY

Project: LEMMON VALLEY WATER TANK GEOTECHNICAL INVESTIGATION

○ **Location:** TP-1 1A (3-5') TP-2 2B (10-11') **Sample Number:** 37206

□ **Location:** TP-2 2A **Depth:** 3-5'

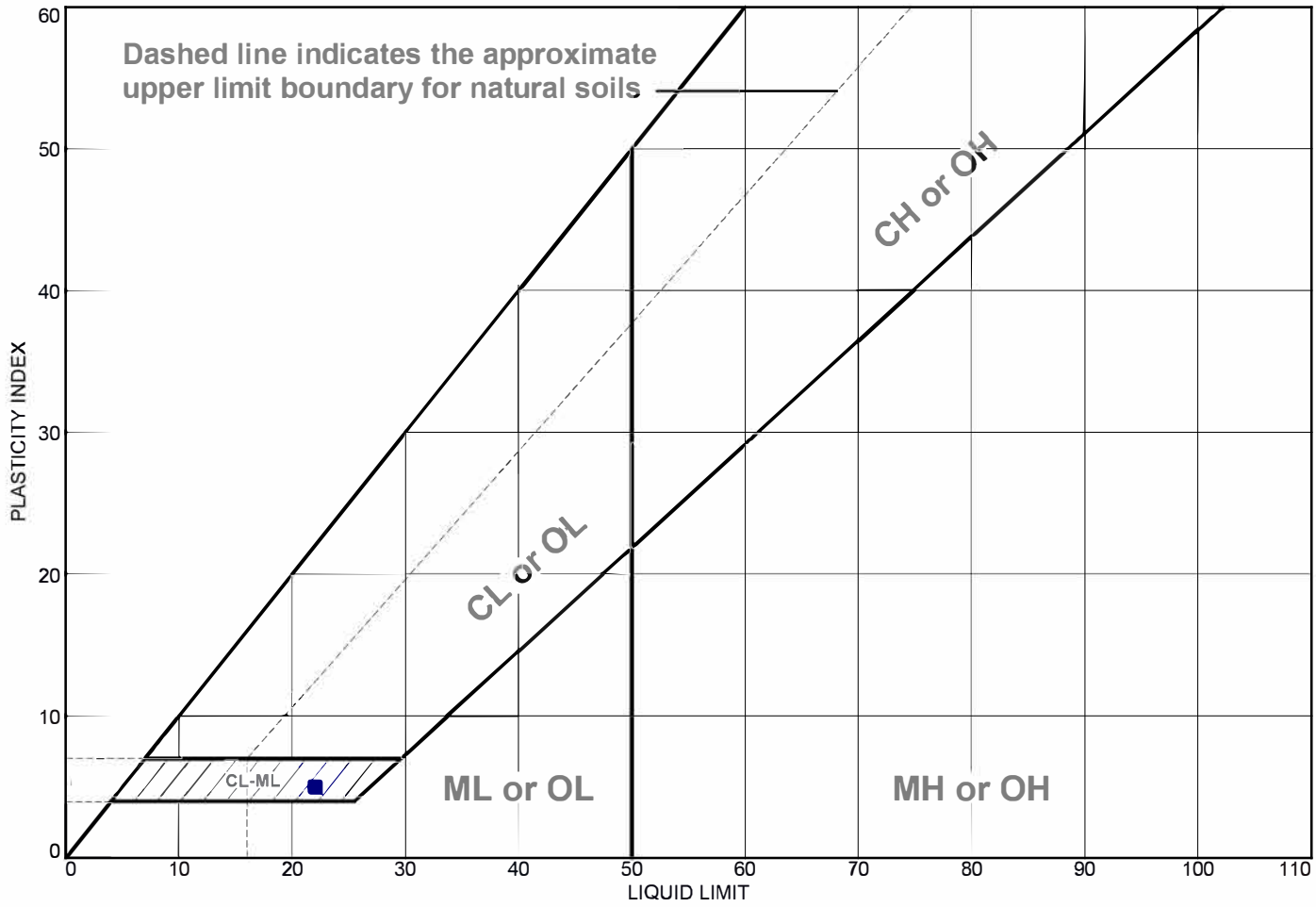
Remarks:

CME CONSTRUCTION MATERIALS ENGINEERS, INC.

PLATE B-1

Tested By: RV **Checked By:** HB

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	silty, clayey sand with gravel	22	17	5	26.5	12.6	SC-SM
■	silty, clayey sand	22	17	5	34.2	16.3	SC-SM

Project No. 3152 **Client:** TRUCKEE MEADOWS WATER AUTHORITY

Project: LEMMON VALLEY WATER TANK GEOTECHNICAL INVESTIGATION

●**Location:** TP-1 1A (3-5') TP-2 2B (10-11') **Sample Number:** 37206

■**Location:** TP-2 2A **Depth:** 3-5'

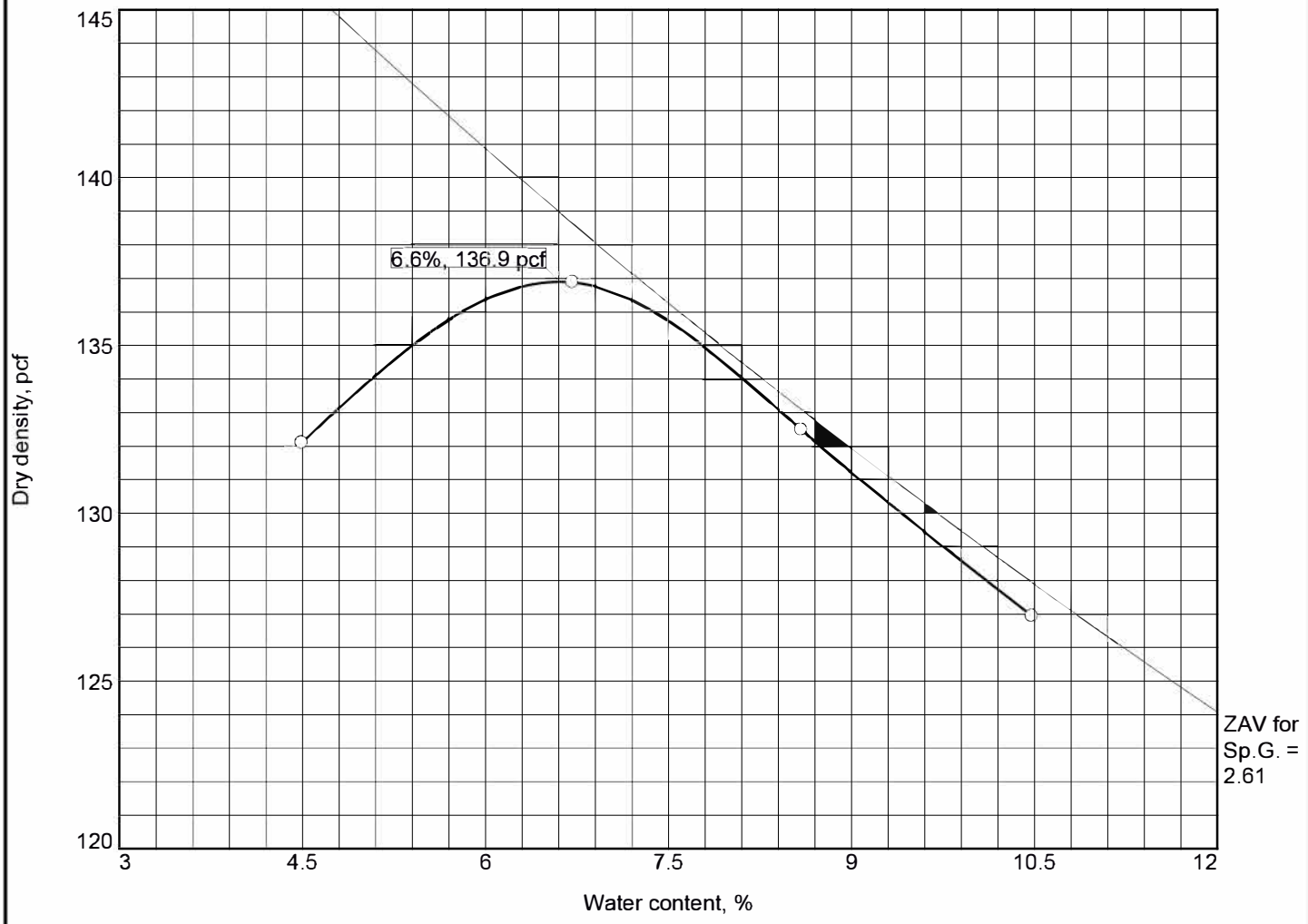
Remarks:

CME CONSTRUCTION MATERIALS ENGINEERS, INC.

PLATE B-2

Tested By: JH **Checked By:** HB

MOISTURE DENSITY CURVE



Test specification: ASTM D 1557-12 Method C Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
	SC-SM	A-1-b	2.5		22	5	5.8	12.6

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 136.9 pcf Optimum moisture = 6.6 %	silty, clayey sand with gravel

Project No. 3152 **Client:** TRUCKEE MEADOWS WATER AUTHORITY
Project: LEMMON VALLEY WATER TANK GEOTECHNICAL INVESTIGATION

○**Location:** TP-1 1A (3-5') TP-2 2B (10-11') **Sample Number:** 37206

CME CONSTRUCTION MATERIALS ENGINEERS, INC.

Remarks:
RECEIVED ON 12/13/2022

PLATE

Tested By: G. POTTER **Checked By:** S. SCHWEITZER

SGS Silver State Labs-Reno
1135 Financial Blvd
Reno, NV 89502
(775) 857-2400 FAX: (888) 398-7002
www.ssalabs.com

Analytical Report

Workorder#: **22120686**
Date Reported: **12/29/2022**

Client: CME-Construction Materials Engineers, Inc
Project Name: 3152/Lemmon Valley Tank/TP-2 2A 3'-5'
PO #: 3152

Sampled By: Client

Laboratory Accreditation Number: NV015/CA2990

Laboratory ID	Client Sample ID	Date/Time Sampled	Date Received
22120686-01	TP-2 2A 3' - 5'	12/08/2022 12:00	12/13/2022

Parameter	Method	Result	Units	PQL	Analyst	Date/Time Analyzed	Data Flag
Chloride	EPA 9056	<50	mg/Kg	50	SR	12/28/2022 22:24	
Oxidation-Reduction Potential	SM 2580B	148	mV		AC	12/20/2022 9:14	
pH	SW-846 9045D	7.15	pH Units		AC	12/28/2022 9:16	
pH Temperature	SW-846 9045D	20.0	°C		AC	12/28/2022 9:16	
Resistivity	EPA 120.1	8500	Ohms-cm		AC	12/27/2022 14:15	
Sulfate	ASTM 1580C	< 0.02	%	0.02	AC	12/28/2022 9:18	
Sulfide	AWWA C105	Negative	POS/NEG		AC	12/27/2022 16:08	

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Sierra Environmental Monitoring
SGS Silver State Labs-Reno
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Reno, NV 89502
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Quality Control Report

WO#: 22120686
12/29/2022

Analysis: Oxidation-Reduction Potential, Soil
Method: SM 2580B **Batch ID:** R74003

Duplicate

RunID: 74003 SeqNo 1896019 Units: mV
Analysis Date: 12/20/2022 9:14:00 AM Analyst: AC

Analyte	Result	Rep Limit	Rep Qual	RPD	Sample Value
Oxidation-Reduction Potential	146			0.0468227	153

Laboratory Control Sample (LCS)

RunID: 74003 SeqNo 1896017 Units: mV
Analysis Date: 12/20/2022 9:14:00 AM Analyst: AC

Analyte	LCS Spike Added	LCS Result	LCS % Recovery	LCSD Spike Added	LCSD Result	LCSD % Recovery	RPD	RPD Limit	Low Limit	High Limit	Qual
Oxidation-Reduction Potential	439.0	445	101								

Analysis: PASTE pH
Method: SW-846 9045D **Batch ID:** R74228

Duplicate

RunID: 74228 SeqNo 1902256 Units: pH Units
Analysis Date: 12/28/2022 9:16:00 AM Analyst: AC

Analyte	Result	Rep Limit	Rep Qual	RPD	Sample Value
pH	7.18			0.0041870	7.15
pH Temperature	20.0			0	20

Laboratory Control Sample (LCS)

RunID: 74228 SeqNo 1902254 Units: pH Units
Analysis Date: 12/28/2022 9:16:00 AM Analyst: AC

Analyte	LCS Spike Added	LCS Result	LCS % Recovery	LCSD Spike Added	LCSD Result	LCSD % Recovery	RPD	RPD Limit	Low Limit	High Limit	Qual
pH	7.020	7.02	100								

Analysis: Water Soluble Sulfate-ASTM (SO4)
Method: ASTM 1580C **Batch ID:** R74229

Laboratory Control Sample (LCS)

RunID: 74229 SeqNo 1902251 Units: mg/L
Analysis Date: 12/28/2022 9:18:00 AM Analyst: AC

Analyte	LCS Spike Added	LCS Result	LCS % Recovery	LCSD Spike Added	LCSD Result	LCSD % Recovery	RPD	RPD Limit	Low Limit	High Limit	Qual
Sulfate	25.00	27.1	108								

Original

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Reno, NV 89502
(775) 857-2400 FAX: (888) 398-7002
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Quality Control Report

WO#: 22120686
12/29/2022

Analysis: Anions 300.0 Solid
Method: EPA 9056 **Batch ID:** R74302

Method Blank

RunID: 74302 SeqNo 1904349 Units: mg/Kg
Analysis Date: 12/3/2021 8:08:07 PM Analyst: SR

Analyte	Result	Rep Limit	Rep Qual
Chloride	< 0.50	0.50	

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 22120940-01A
RunID: 74302 SeqNo 1904432 Units: mg/Kg
Analysis Date: 12/29/2022 12:44:38 AM Analyst: SR

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit	Qual
Chloride	0	1000	990	99.4	1000	1000	100	0.806	20	90	110	

Matrix Spike (MS) / Matrix Spike Duplicate (MSD)

Sample Spiked: 22120940-01A
RunID: 74302 SeqNo 1904433 Units: mg/Kg
Analysis Date: 12/29/2022 1:12:43 AM Analyst: SR

Analyte	Sample Result	MS Spike Added	MS Result	MS % Recovery	MSD Spike Added	MSD Result	MSD % Recovery	RPD	RPD Limit	Low Limit	High Limit	Qual
Chloride	0	1000	1000	100								

Original

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Reno, NV 89502
(775) 857-2400 FAX: (888) 398-7002
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Definitions & Qualifiers

WO#: **22120686**
Date: **12/29/2022**

Definitions:

LCS: Laboratory Control Sample; prepared by adding a known mass of target analytes to a specified amount of de-ionized water and prepared with the batch of samples, used to calculate Accuracy (%REC).

LCSD: LCS Duplicate; used to calculate both Accuracy (%REC) and Precision (%RPD)

MBLK: Method Blank; a sample of similar matrix that is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedure, and in which no target analytes
or interferences are present at concentrations that impact the analytical results for sample analyses.

MS: Matrix Spike; prepared by adding a known mass of target analytes to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available, used to calculate Accuracy (%REC)

MSD: Matrix Spike Duplicate; used to calculate both Accuracy (%REC) and Precision (%RPD)

RPD: Relative Percent Difference; comparison between sample and duplicate and/or MS and MSD.

PQL: Practical Quantitation Limit; the limit to which data is quantitated for reporting.

MDL: Method Detection Limit; the limit to which the instrument can reliably detect.

MCL: Maximum Contaminant Level; value set according to EPA guidelines.

Qualifiers:

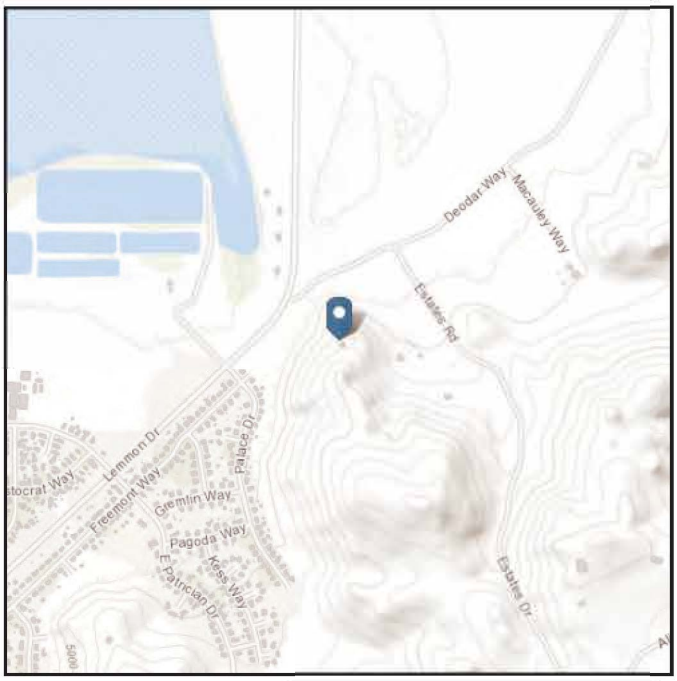
* - Analyte exceeds Safe Drinking Water Act MCL, does not meet drinking water standards.
C - Analyte value below Safe Drinking Water Act MCL, does not meet drinking water standards.
B - Analyte found above the PQL in associated method blank.
G - Calibration blank analyte detected above PQL.
H - Sample analyzed beyond holding time for this parameter.
J - Estimated Value; Analyte found between MDL and PQL limits.
L - Sample concentration is at least 5 times greater than spike contribution. Spike recovery criteria do not apply.
R - RPD between sample and duplicate sample outside the RPD acceptance limits.
S - Batch MS and/or MSD were outside acceptance limits, batch LCS was acceptable.
W - Sample temperature when recieved was out of limit as specified by method.
Z - Batch LCS and/or LCSD were outside acceptance limits.

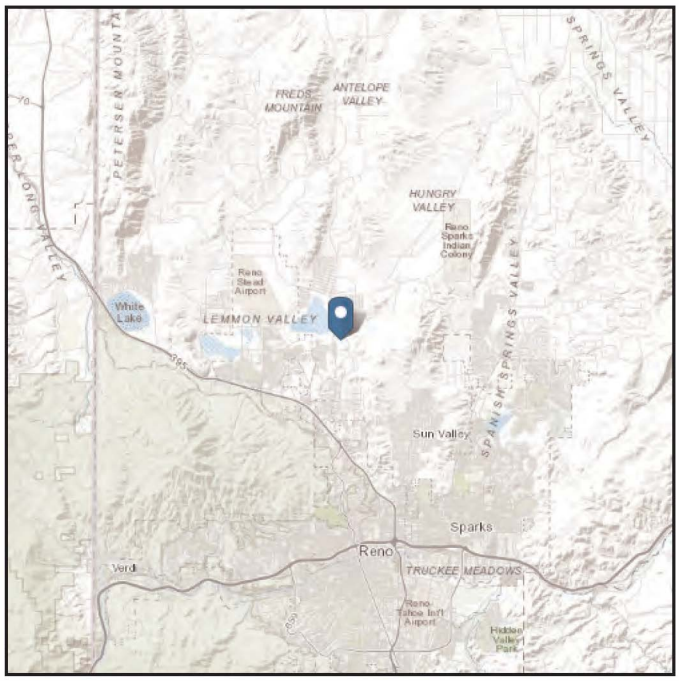
APPENDIX C

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	39.64723
Risk Category:	IV	**Longitude:**	-119.8269
Soil Class:	C - Very Dense Soil and Soft Rock	**Elevation:**	5102.17 ft (NAVD 88)





WSUP23-0030
EXHIBIT D

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

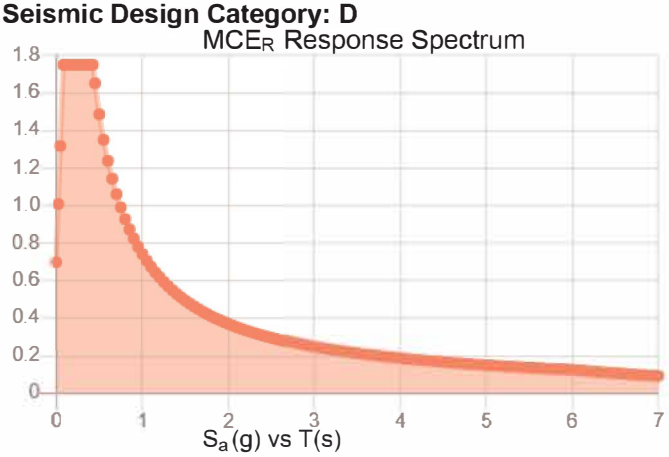
C - Very Dense Soil and Soft Rock

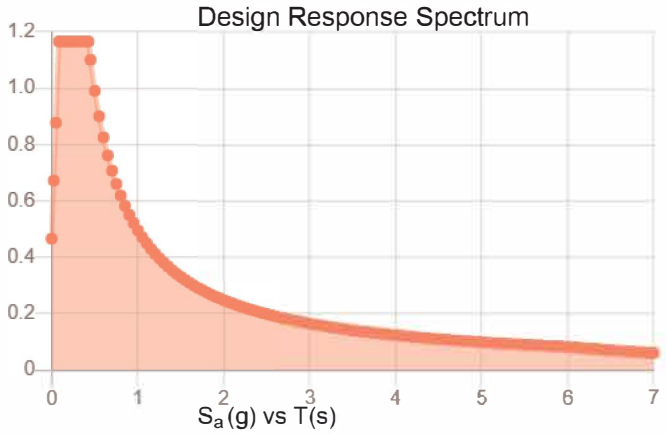
Site Soil Class:

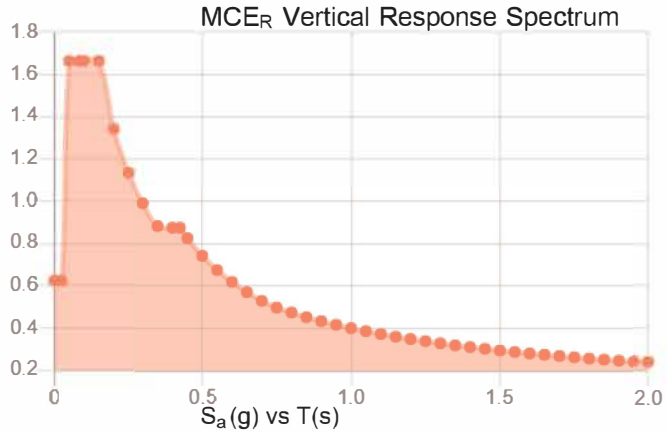
Results:

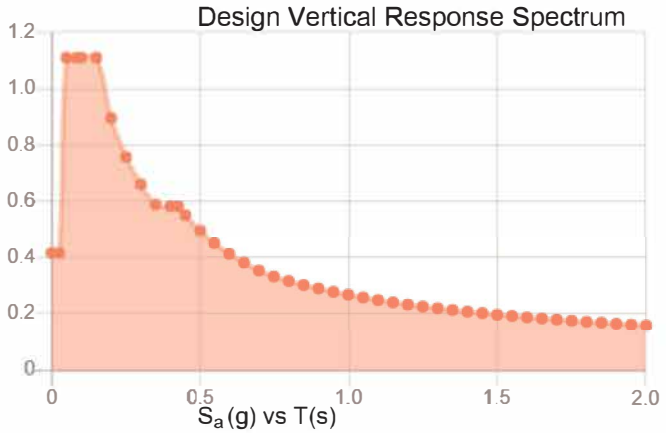
S_S :	1.456	S_{D1} :	0.495
S_1 :	0.495	T_L :	6
F_a :	1.2	PGA :	0.619
F_v :	1.5	PGA_M :	0.743
S_{MS} :	1.747	F_{PGA} :	1.2
S_{M1} :	0.742	I_e :	1.5
S_{DS} :	1.165	C_v :	1.191

Seismic Design Category: D









Data Accessed: **Wed Feb 01 2023**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

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66

OWNER'S CERTIFICATE

This is to certify that the undersigned LEMMON VALLEY LAND COMPANY, INC. is the owner of the tract of land represented on this plat and has consented to the preparation and recordation of this plat and that the same is executed in compliance with and subject to the provisions of N.R.S. Chapter 278.

1. The access, public utility and cable television easements as shown hereon are hereby granted and set apart forever.
2. All streets as identified hereon including all appurtenances thereto are hereby dedicated to Washoe County and to be public thoroughfares forever.

LEMMON VALLEY LAND COMPANY, INC.

GEORGE F. PEEK, VICE PRESIDENT — DATE 9-9-85

STATE OF NEVADA
SS
COUNTY OF WASHOE

On this 9th day of September, 1985, personally appeared before me, a Notary Public, in the County of Washoe, GEORGE F. PEEK who acknowledged to me that he executed the above instrument. In witness whereof, I hereunto set my hand and affix my official seal on the date and year first above written

NOTARY PUBLIC

SURVEYOR'S CERTIFICATE

I, HARRY R. ERICSON, a Registered Land Surveyor in the State of Nevada, certify that:

1. This is a true and accurate representation of the lands surveyed under my supervision at the instance of LEMMON VALLEY LAND COMPANY, INC.
2. The lands surveyed lie within a portion of Sections 3 and 4, T.20N., R.19E., M.D.M., and portions of Sections 11, 14, 15, 22, 23, 26, 27, 34 and 35, T.21N., R.19E., M.D.M., and the survey was completed on September 23, 1985.
3. This plat complies with the applicable state statutes and any local ordinances.
4. The monuments are of the character shown and occupy the positions indicated and are sufficient to enable the survey to be retraced.
5. The perimeter contains the areas shown hereon.

HARRY R. ERICSON
REGISTERED LAND SURVEYOR
NEVADA CERTIFICATE NO. 1797

DATE 9-12-85

PLANNING COMMISSION APPROVAL

The Tentative Map was reviewed and found in compliance with N.R.S. Chapter 278 on November 7, 1984 by the Washoe County Planning Commission.

PLANNING DIRECTOR — DATE 9/12/85

COUNTY COMMISSION CERTIFICATE

This Final Map was approved and accepted by the Board of County Commissioners of Washoe County, Nevada on the 12th day of September, 1985. The offer of dedication of all streets shown hereon, with the exception of Chickadee Drive and Lemmon Drive, is rejected at this time, with the offer to remain open in accordance with the provisions of N.R.S. Chapter 278.4725. The access easement to Parcel B of Parcel Map No. 314 is hereby relocated to a more suitable location as shown hereon.

COUNTY CLERK

UTILITY EASEMENT ACCEPTANCE

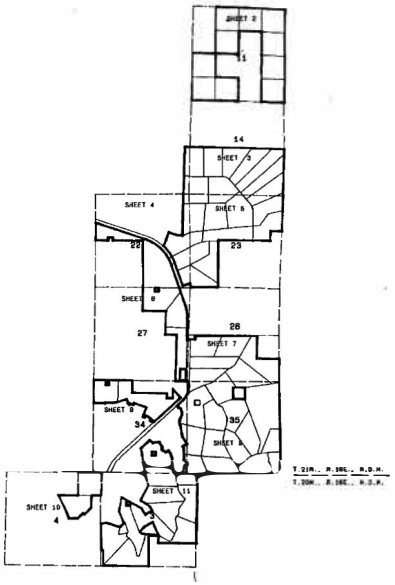
The utility easements shown on this plat have been checked, accepted and approved by the undersigned utility companies and Group W Cable, Incorporated.

SIERRA PACIFIC POWER COMPANY — DATE 9/24/85

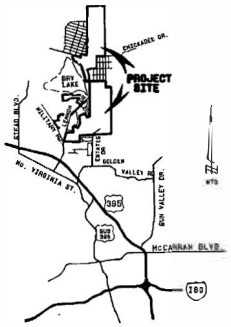
NEVADA BELL — DATE 9/12/85

VALLEY WATER COMPANY — DATE 9-9-85

GROUP W CABLE, INCORPORATED — DATE 9-12-85



KEY MAP



VICINITY MAP

1023013

NOTES

1. Portions of this area may be subject to high water inundation and the drinking water from private wells may not be suitable.
2. Access to portions of this property is by roadways and/or easements which are not maintained by Washoe County. The maintenance is the responsibility of the user. Roadway access may be seasonal.
3. A public utility easement is hereby granted within each parcel for the exclusive purpose of installing and maintaining utility service facilities to that parcel at locations mutually agreed upon by the owner of record and the utility company.
4. All parcel acreages shown include roadway and utility easements.
5. This map is not a subdivision as all parcels contain 40 acres or more, or are 1/16th of a section.
6. The natural drainage will not be impeded during the improvement or development of these parcels.
7. A schematic representation of future lots and roads, which does not necessarily represent the ultimate development of the properties addressed through this map, is available for review at the offices of the Washoe County Department of Comprehensive Planning. (See Lemmon Valley Land Company, Inc., Division of Land into Large Parcels File.)
8. All side and rear parcel lines shall have a public utility and cable television easement ten feet in width centered about the parcel line. In addition, the boundary shown on this map, indicated by a heavy line, shall have a public utility and cable television easement ten feet in width adjacent to the boundary, except where otherwise noted.

TOTAL AREA = 3047.130 Ac.±

TOTAL LOTS = 88

BASIS OF BEARINGS

NEVADA COORDINATE SYSTEM,
WEST ZONE

LEGEND

✚	FOUND G.L.O. BRASS CAP (UNLESS OTHERWISE NOTED)
⊢	FOUND G.L.O. BRASS CAP (UNLESS OTHERWISE NOTED)
●	SET 5/8" REBAR CAPPED RLS 1797
PUE & CATV	PUBLIC UTILITY AND CABLE TELEVISION EASEMENT
⊕ T5	EXISTING POINT AS INDICATED
●	RECORD POINT
×—×—×	FENCE

MAP OF DIVISION INTO LARGE PARCELS
FOR
LEMMON VALLEY LAND COMPANY, INC.
PORT. SEC. 3 & 4, T.20N., R.19E., M.D.M.
PORT. SEC. 11, 14, 15, 22, 23, 26, 27, 34, 35, T.21N., R.19E., M.D.M.
WASHOE COUNTY, NEVADA

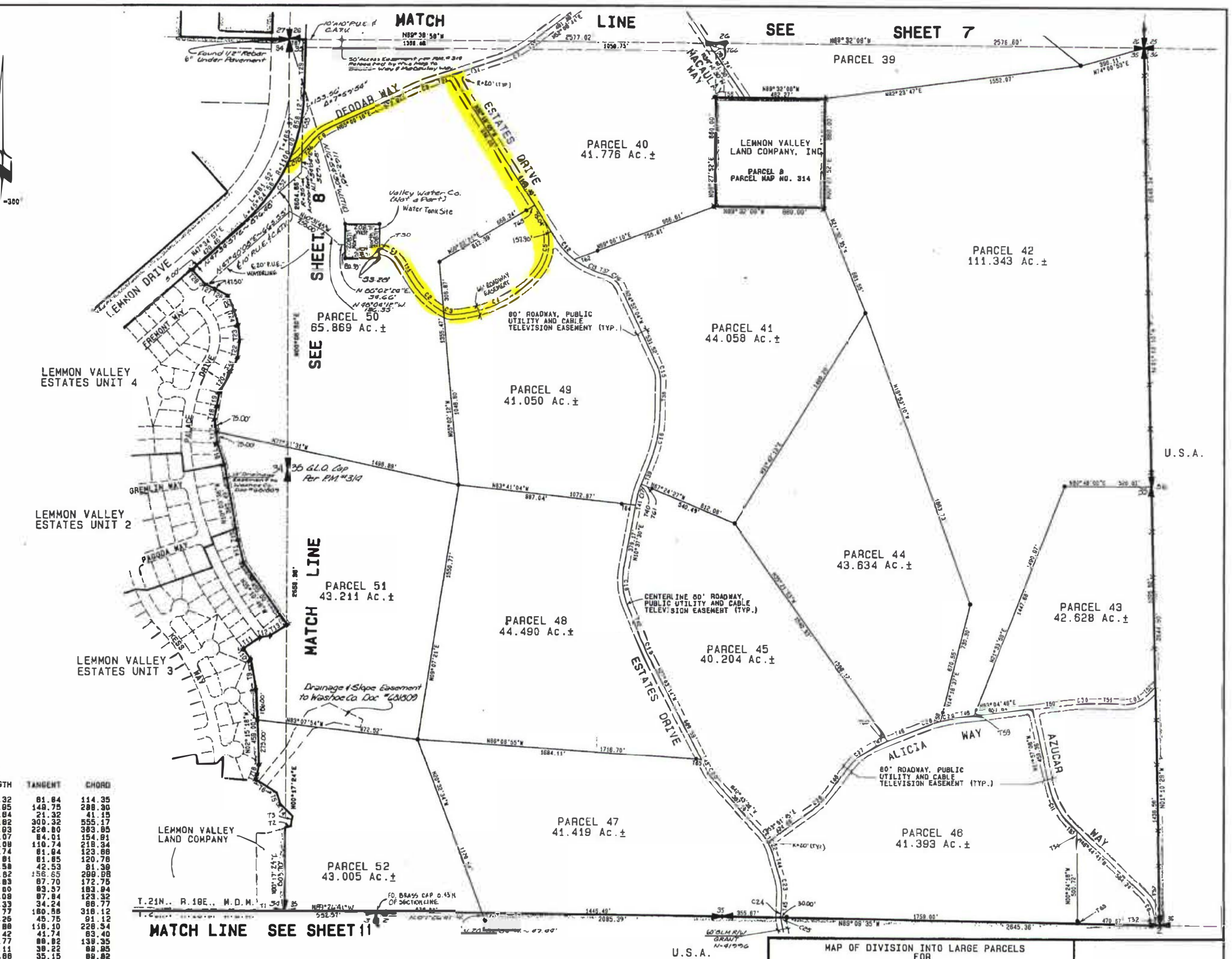
SEA — ENGINEERS/PLANNERS
SPARKS, NEVADA
LAS VEGAS, NEVADA
SEATTLE, WASHINGTON

JOB NO 206-014-842
DESIGNED K.L.H.
DRAWN MP 1080A
COMP
CHECKED CAMP 9/26/85
DATE AUGUST 1985
SHEET 1 OF 11 SHEETS

FILE NO. 1023013
FEE: $125.00
FILED FOR RECORD AT THE REQUEST OF SEA Corp
ON THIS 27 DAY OF Sept.
1985, AT 4:24 MINUTES PAST 1
O'CLOCK P.M., OFFICIAL
RECORDS OF WASHOE COUNTY,
NEVADA.
COUNTY RECORDER
BY: DEPUTY

79

LAND MAP 79



NUMBERED COURSES

REF. NO.	BEARING	DISTANCE
T 1	N89°13'45"W	172.55
T 2	N73°10'23"E	32.78
T 3	N10°15'57"E	80.00
T 4	N45°10'34"W	105.00
T 5	N18°51'51"W	71.72
T 6	N57°51'15"W	150.82
T 7	N22°58'28"E	28.58
T 8	N11°48'52"E	82.00
T 9	N10°31' 5"W	180.35
T 10	N35°10'48"W	77.07
T 11	N54°49'12"E	121.00
T 12	N78°14'18"E	85.20
T 13	N57°10'28"E	120.38
T 14	N14°37'18"W	143.50
T 15	N10° 3'38"W	70.00
T 16	N17°41'23"W	138.00
T 17	N 7°35'48"W	150.00
T 18	N10°37'47"E	74.82
T 19	N11°38'47"E	85.00
T 20	N29° 2'41"E	142.05
T 21	N21°52'43"E	88.00
T 22	N 7°30'17"E	100.00
T 23	N 8°39' 2"W	85.00
T 24	N13°50'42"W	91.81
T 25	N21°53'58"W	100.82
T 26	N62°41'20"W	88.52
T 27	N85° 2'14"W	65.00
T 28	N42°25' 3"W	120.00
T 29	N 1°40' 0"E	323.57
T 30	N75°54'27"W	27.56
T 31	N31° 5'42"W	138.38
T 32	N 1°10'20"W	33.77
T 33	N52° 8'44"E	7.88
T 34	N71°28'58"E	302.81
T 35	N71°28'58"E	108.74
T 36	N41°46'42"E	121.49
T 37	N73°24'48"W	28.73
T 38	N 0°51' 8"E	189.25
T 39	N21° 4'54"E	148.87
T 40	N21° 4'54"E	11.37
T 41	N10°37'30"E	29.81
T 42	N22°16'28"W	280.84
T 43	N27° 3'14"W	49.79
T 44	N15°56'14"W	181.15
T 45	N 2°11'38"E	125.64
T 46	N38°28'16"E	185.39
T 47	N87°43'50"E	53.12
T 48	N87°43'50"E	185.43
T 49	N83° 4'48"E	80.00
T 50	N83° 4'48"E	244.03
T 51	N88°48'21"W	168.09
T 52	N44°30'14"E	65.80
T 53	N 0°24'18"W	3.58
T 54	N 0°24'18"W	50.75
T 55	N48°44'41"W	38.23
T 56	N89°32' 8"W	177.73
T 57	N89° 9'35"W	38.02
T 58	N14°18'37"E	59.75
T 59	N21°33'58"E	43.28
T 60	N35°21'53"W	57.18
T 61	N87°24'27"W	71.57
T 62	N88° 8'10"E	151.00
T 63	N58°22'21"E	55.85
T 64	N83°41' 4"W	85.83
T 65	N88° 6'55"W	32.59
T 66	N88°38'58"W	00.78
T 67	N88°38'58"W	100.03

CURVE DATA

CURVE NO.	DELTA	RADIUS	LENGTH	TANGENT	CHORD
C 1	44°48'45"	150.00	117.32	61.84	114.35
C 2	31°26'44"	531.95	291.95	149.75	288.30
C 3	30°14'30"	78.88	41.64	21.32	41.15
C 4	44°52'28"	727.28	569.62	300.32	555.17
C 5	74°38'43"	300.00	390.83	228.80	363.85
C 6	45°34'12"	200.00	159.07	84.01	154.91
C 7	19°20'15"	650.00	219.08	110.74	218.34
C 8	6°28'43"	1100.00	123.74	61.94	123.68
C 9	23°13'34"	300.00	121.61	61.65	120.78
C 10	33°47'50"	140.00	82.58	42.53	81.39
C 11	34°47'33"	500.00	303.62	156.65	298.98
C 12	19°53'48"	500.00	173.63	87.70	172.75
C 13	21°11'38"	500.00	185.00	93.57	183.94
C 14	48°32'42"	150.00	127.08	67.64	123.32
C 15	25°43'10"	150.00	67.33	34.24	66.77
C 16	20°13'46"	900.00	317.77	160.56	316.12
C 17	10°27'24"	500.00	91.26	45.75	91.12
C 18	32°53'56"	400.00	229.68	118.10	226.54
C 19	4°46'47"	1000.00	83.42	41.74	83.40
C 20	15°40'22"	500.00	136.77	68.82	136.35
C 21	13°23'28"	300.00	70.11	35.22	69.95
C 22	13°21'58"	300.00	69.96	35.15	69.82
C 23	16° 8'50"	300.00	80.11	47.85	84.71
C 24	6° 6'39"	150.00	16.12	8.07	16.12
C 25	6°33'30"	150.00	17.17	8.59	17.16
C 26	17°23'20"	500.00	151.77	76.47	151.19
C 27	31°15'34"	400.00	245.51	125.80	242.48
C 28	8°10'51"	1000.00	142.78	71.51	142.66
C 29	7°10' 5"	1000.00	125.10	62.63	125.02
C 30	8° 6'53"	1000.00	141.63	70.93	141.51
C 31	46°41'25"	200.00	162.98	86.32	158.51
C 32	23°28'55"	1100.00	450.82	228.62	447.67
C 33	22°28' 2"	1100.00	430.89	218.14	427.05

SECTION 35
T.21N., R.19E.

A DIVISION OF POR. PARCEL A, PARCEL MAP NO. 314

MAP OF DIVISION INTO LARGE PARCELS FOR
LEMMON VALLEY LAND COMPANY, INC.
POR. SEC. 3 & 4, T.20N., R.19E., M.D.M.
POR. SEC. 11, 14, 15, 22, 23, 26, 27, 34, 35, T.21N., R.19E., M.D.M.
WASHOE COUNTY NEVADA

sea ENGINEERS/PLANNERS
SPARKS, NEVADA
LAS VEGAS, NEVADA
SEATTLE, WASHINGTON

JOB NO. 200-014-842
DESIGNED J.W.McG.
DRAWN HP 1000A
CHECKED
DATE AUGUST 1985
SHEET NO. 9 OF 11 SHEETS

1025013

LAND MAP 79-11

WSUP23-0030
EXHIBIT D

IMPROVEMENT PLANS

for

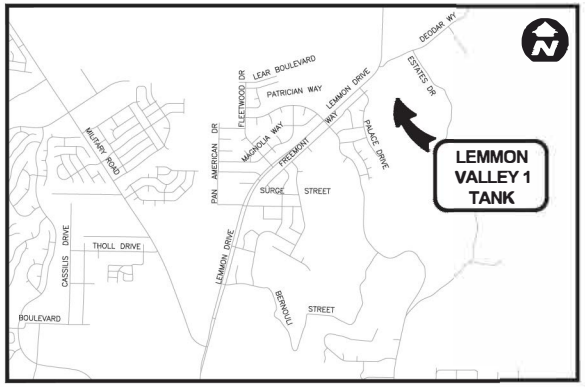
LEMMON VALLEY 1 TANK REBUILD

RENO - WASHOE COUNTY - NEVADA

TMWA PROJECT NO: 14-0035

PWP# WA-2023-XXX

SHEET INDEX



LOCATION MAPS
NTS

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

JOHN ZIMMERMAN
GENERAL MANAGER

KAREN MEYER
PROJECT REPRESENTATIVE
Office Phone: 775-834-8012
Cell Phone: 775-544-3886

THOMAS SPEER
PROJECT ENGINEER
Office Phone: 775-834-8164
email: tspeer@tmwa.com

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Expr: 06/30/24
CIVIL
No. 26995
8/25/23

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

811 Know what's below. Call before you dig.

G000
SHEET 1 OF 36

PROJECT # 14-0035

K:\D_Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2 Design\1 CAD\14-0035 G000-G002.dwg
Aug 25, 2023 - 12:53pm

GENERAL NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND TMWA SAFETY REGULATIONS AND SHALL MAINTAIN THE WORK AREA IN A SAFE CONDITION 24 HOURS PER DAY UNTIL THE PROJECT IS COMPLETE. WORKER AND PUBLIC SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR NOT TMWA.

2. THE CONTRACTOR SHALL BE REQUIRED TO PREPARE, SUBMIT FOR APPROVAL AND ABIDE BY ALL TRAFFIC CONTROL PLANS AS REQUIRED BY THE CITY OF RENO. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND THE CONDITIONS OF THE PERMITS PRIOR TO HIS/HER BID.

3. AT LEAST 4 WORKING DAYS BEFORE STARTING CONSTRUCTION, THE CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT AT 811 AND REQUEST UTILITY MARKING. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIRING EXISTING FACILITIES (PUBLIC OR PRIVATE) THAT ARE DAMAGED BY HIS OPERATIONS.

4. DEPTH AND HORIZONTAL LOCATION OF EXISTING UTILITIES DEPICTED ON THESE PLANS ARE APPROXIMATE BASED ON INFORMATION PROVIDED BY THIRD PARTIES. TMWA MAKES NO REPRESENTATION AS TO THE COMPLETENESS OR ACCURACY OF SUCH DATA, AND IT IS NOT INTENDED TO AND SHALL NOT BE RELIED UPON AS A SUBSTITUTE FOR THE INDEPENDENT INVESTIGATION BY CONTRACTOR. CONTRACTOR SHALL IDENTIFY & VERIFY THE DEPTH & LOCATION OF ALL EXISTING UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. ANY CONFLICT SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE TMWA REPRESENTATIVE. ALL EXISTING UTILITIES ARE NOT SHOWN, AND FACILITIES SHOWN MAY BE IN A LOCATION DIFFERENT FROM THAT DEPICTED.

5. SYMBOLS ARE NOT TO SCALE AND DO NOT NECESSARILY REPRESENT ACTUAL LOCATIONS OF FACILITIES.

6. CONTRACTOR IS RESPONSIBLE FOR LOCATING AND COORDINATING WORK AROUND ALL EXISTING UTILITIES.

7. CONTRACTOR SHALL VERIFY CONSTRUCTION METHODS AND OVERALL JOB APPROACH WITH TMWA AND ENGINEER PRIOR TO CONSTRUCTION.

8. CONTRACTOR SHALL PROVIDE ALL STAKING AND SURVEYING NECESSARY TO CONSTRUCT THE PROJECT. SURVEYING SHALL BE CONDUCTED BY A LICENSED SURVEYOR IN THE STATE OF NEVADA.

9. THE MATERIALS AND METHODS OF CONSTRUCTION HEREIN SPECIFIED SHALL BE FURNISHED IN ACCORDANCE WITH NAC 445A.65505 TO 445A.6723 INCLUSIVE AND THE STANDARDS OF THE TMWA CONSTRUCTION STANDARDS, STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("STANDARD SPECIFICATIONS" OR "ORANGE BOOK"), AMERICAN WATER WORKS ASSOCIATION (AWWA), AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), AMERICAN CONCRETE INSTITUTE (ACI), THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM), THE AMERICAN WELDING SOCIETY (AWS), AND MANUFACTURER STANDARDS. CONFLICTS OR QUESTIONS REGARDING THE SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE TMWA REPRESENTATIVE FOR RESOLUTION.

10. SOILS RETENTION MAY BE REQUIRED AROUND WATER METER BOXES, FIRE HYDRANTS, AND OTHER FACILITIES IF SLOPES EXCEED 15%.

11. CONTRACTOR SHALL CONTROL DUST IN ACCORDANCE WITH WASHOE COUNTY DISTRICT HEALTH DISTRICT AIR QUALITY REGULATIONS.

12. THE CONTRACTOR REALIZES THAT INCLEMENT (WINTER WEATHER) MAY OCCUR DURING THE PROPOSED WORK. NO ADDITIONAL PAYMENTS SHALL BE GRANTED FOR PROTECTING THE WORK IN PROGRESS AND DELAYS DUE TO INCLEMENT WEATHER CONDITIONS.

13. THE CONTRACTOR SHALL MAINTAIN A NEAT AND LEGIBLE DRAWING SET DENOTING ANY FIELD CHANGES THAT DEVIATE FROM THE APPROVED DESIGN ON A DAILY BASIS. PRIOR TO TMWA'S ACCEPTANCE OF THE IMPROVEMENTS AND FINAL PAYMENT THE CONTRACTOR IS TO PRESENT THIS DRAWING SET, WHICH REFLECTS ALL FIELD CHANGES TO TMWA'S PROJECT REPRESENTATIVE.

14. SEE SPECIFICATIONS FOR SEQUENCE OF CONSTRUCTION REQUIREMENTS.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL MATERIAL SPILLED OR TRACKED ONTO EXISTING ROADWAYS ON A DAILY BASIS.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES WITHIN THE LIMITS OF CONSTRUCTION, WHETHER OR NOT SAID UTILITIES ARE SHOWN ON THE PLANS. THIS RESPONSIBILITY INCLUDES CONTACTING UTILITY COMPANIES FOR LOCATIONS AND POTHOLING PRIOR TO CONSTRUCTION. REPAIR OF ANY DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR.

BASIS OF BEARING AND ELEVATION

BASIS OF BEARINGS: NORTH AMERICAN DATUM OF 1983 AS BASED ON FEDERAL BASE NETWORK/COOPERATIVE BASE NETWORK OBSERVATIONS IN 1994 (AKA NAD83/94), NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE AND HOLDING THE WASHOE COUNTY PUBLISHED LATITUDE AND LONGITUDE OF 39°32'16.44843" NORTH AND 119° 53' 08.87676" WEST FOR REGIONAL GPS CORS "RNO1" (WASHOE COUNTY IDENTIFIER N745M01028). A COMBINED GRID-TO-GROUND SCALE FACTOR OF 1.000197939 IS USED TO SCALE THE STATE PLANE GRID COORDINATES TO GROUND.

BASIS OF ELEVATIONS: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND HOLDING THE WASHOE COUNTY PUBLISHED ELLIPSOID HEIGHT OF 1531.277 METERS (5023.865 FEET) FOR REGIONAL GPS CORS "RNO1" AND USING GEOID 99 TO DERIVE THE ORTHOMETRIC ELEVATION ABOVE MEAN SEA LEVEL.

WATER GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT THE INTEGRITY OF EXISTING WATER LINES DURING CONSTRUCTION.

2. CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS PIPE, FITTINGS AND APPURTENANCES AS REQUIRED TO COMPLETE THE UTILITY WORK AS SHOWN.

3. TMWA DOES NOT GUARANTEE EXISTING VALVES WILL PROVIDE A COMPLETE SHUTDOWN. THE REMOVAL OF NUISANCE WATER TO CONDUCT THE WORK SHALL BE INCIDENTAL TO THE MOST APPROPRIATE BID ITEM. EXCESSIVE AMOUNTS OF WATER SHALL BE EVALUATED BY THE TMWA INSPECTOR FOR THE MOST APPROPRIATE ACTION TO PURSUE.

4. ALL WATER MAINS SHALL BE TESTED FOR PRESSURE AND LEAKAGE PER AWWA C600 & C605. TEST PRESSURE SHALL BE AS INDICATED IN CONTRACT DOCUMENTS AND NO LESS THAN 150 PSI ON MAINS NOT SPECIFICALLY CALLED OUT. DUCTILE IRON PIPELINES MUST BE PRESSURE TESTED ACCORDING TO AWWA STANDARD C600 AND PVC PIPELINES MUST BE PRESSURE TESTED ACCORDING TO AWWA STANDARD C605 PER NAC 445A.67145 (7). FOR OTHER MATERIALS, THE PIPELINES MUST BE PRESSURE TESTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PER NAC 445A.67145 (7)(c).

5. BACTERIOLOGICAL TESTING, DISINFECTION, AND FLUSHING, FOR POTABLE WATER LINE CONSTRUCTION, SHALL BE PERFORMED PER AWWA C651. TMWA SHALL BE RESPONSIBLE FOR PERFORMING AND FUNDING UP TO TWO BACTERIOLOGICAL TESTS PER RUN OF PIPE CONSTRUCTED. IF MORE THAN TWO TESTS ARE REQUIRED, THE COST SHALL BE PLACED UPON THE CONTRACTOR. TWO (2) BACTERIOLOGICAL TESTS SHALL BE CONDUCTED PER TEST SEGMENT. BACTERIOLOGICAL TEST SAMPLES WILL NOT BE COLLECTED ON FRIDAYS, WEEKENDS, TMWA OBSERVED HOLIDAYS, OR THE DAY BEFORE A TMWA OBSERVED HOLIDAY, UNLESS AUTHORIZED BY THE TMWA INSPECTOR. BACTERIOLOGICAL TESTING OF MAIN/APPURTENANCES SHALL BE CONDUCTED BY A NEVADA CERTIFIED LABORATORY. TMWA CAN PROVIDE TESTING AT NO COST TO THE CONTRACTOR WITH A 2 WORKING DAY PRIOR NOTICE. UNLESS SPECIAL ARRANGEMENTS ARE AGREED UPON IN ADVANCE BY THE TMWA INSPECTOR SAMPLING BY TMWA LABORATORY STAFF SHALL BE LIMITED TO NORMAL WORKING HOURS MONDAY THROUGH THURSDAY.

6. PER NAC 445A.67145(6),
WATER MAIN MUST NOT BE PLACED INTO SERVICE AFTER ITS INITIAL CONSTRUCTION UNTIL:
   6.1. THE WATER MAIN HAS BEEN DISINFECTED AND FLUSHED IN ACCORDANCE WITH AWWA STANDARD C651.
   6.2. THE DISPOSAL OF ANY SPENT CHLORINE SOLUTIONS MUST BE COORDINATED WITH NDEP'S BUREAU OF WATER POLLUTION CONTROL (BWPC).
   6.3. ANALYSES OF THE WATER MAIN WHICH INDICATE THAT THE WATER MEETS PRIMARY DRINKING WATER STANDARDS FOR COLIFORM BACTERIA (ABSENT FOR COLIFORM BACTERIA) HAVE BEEN OBTAINED AND REPORTED TO THE WCHD. PER AWWA STANDARD C651, TWO SETS OF CONSECUTIVE SAMPLES MUST BE TAKEN AT LEAST 24 HOURS APART FROM EVERY 1200 FEET OF MAIN, AT THE END OF THE LINE, AND FROM EACH BRANCH.

7. PRIOR TO BEING PUT INTO SERVICE, TMWA WILL DISINFECT THE TANK AND ENSURE THAT TWO COLIFORM SAMPLES PASS PRIMARY DRINKING WATER STANDARDS IN ACCORDANCE WITH AWWA C652 AND NAC 445A.67085.3.

8. AFTER THE TANKS HAVE BEEN DRAINED, TMWA WILL INSPECT SILT STOPS AND OVERFLOW PIPING FOR COMPLIANCE WITH NAC445A AND AWWA D100. ANY DEFICIENCIES INCLUDING MISSING OR NON-FUNCTIONING COMPONENTS WILL BE CORRECTED PRIOR TO COMPLETION OF THE WORK.

9. AFTER THE TANK INTERIOR IS CURED FOR THE APPROPRIATE TIME, THE TANK WILL BE FILLED WITH WATER BY TMWA AND THE WATER WILL BE HELD IN THE TANK FOR FIVE (5) DAYS. ON THE SIXTH DAY, THE WATER RETAINED IN THE TANK WILL BE TESTED ON THE SIXTH DAY BY A PROPERLY CERTIFIED LABORATORY HIRED BY TMWA FOR THE PRESENCE OF VOLATILE ORGANIC CHEMICALS, AND THE RESULTS SUBMITTED TO WASHOE COUNTY HEALTH DISTRICT FOR APPROVAL.

10. THE TANK WILL NOT BE PLACED INTO SERVICE UNTIL ALL REQUIREMENTS OF NAC 445A ARE MET.

CONTROL OF POLLUTION, NOISE, AND WATER

A. DUST SHALL BE CONTROLLED AT ALL TIMES IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASHOE COUNTY DISTRICT HEALTH DEPARTMENT.

B. THE CONTRACTOR SHALL NOT DISCHARGE OR ALLOW THE SPILLAGE OF PAINT, SOLVENT, THINNER, ENGINE OIL, FUEL, HYDRAULIC FLUID, OTHER PETROLEUM PRODUCTS, OR ANY HAZARDOUS MATERIAL. EQUIPMENT SHALL BE MAINTAINED AT ALL TIMES IN A MANNER TO PREVENT LEAKAGE AND SPILLAGE OF PETROLEUM PRODUCTS.
   1. AT A MINIMUM, TO PREVENT SOIL CONTAMINATION FROM ACCIDENTAL SPILLS, 3M POWERSORB FABRIC, OR EQUAL, SHALL BE USED UNDER ENGINES AND ENGINE DRIVEN EQUIPMENT, UNDER FUEL STORAGE AREAS, UNDER EQUIPMENT SERVICING AREAS, AND UNDER ANY OTHER AREAS WHERE PETROLEUM PRODUCTS OR HAZARDOUS MATERIALS ARE STORED OR USED.
   2. FABRIC SHALL BE PROTECTED FROM MECHANICAL DAMAGE AND ANCHORED AGAINST WIND DISPLACEMENT. AREAS WHERE PETROLEUM PRODUCTS OR HAZARDOUS MATERIALS ARE STORED SHALL BE SURROUNDED BY A BERM DESIGNED TO CONTAIN ANY SPILL THAT MAY OCCUR.
   3. THE CONTRACTOR SHALL HAVE A SPILL CLEANUP KIT CAPABLE OF CLEANING UP A SPILL OF AT LEAST 10 GALLONS OF PETROLEUM PRODUCT AT THE WORK SITE AT ALL TIMES. THE KIT SHALL BE A COMMERCIALLY AVAILABLE KIT CONTAINING OIL ABSORBING PADS OR GRANULAR ABSORBENT MATERIAL. CONTAINMENT BOOMS, AND A DISPOSAL CONTAINER. WORKERS SHALL BE INSTRUCTED IN USE OF THE KIT AND SHALL BE ADEQUATELY TRAINED AND EQUIPPED TO DEAL WITH THE ACCIDENTAL SPILL OF ANY HAZARDOUS MATERIAL USED.
   4. IN THE EVENT OF AN ACCIDENTAL SPILL OF PETROLEUM PRODUCTS OR HAZARDOUS MATERIALS THE CONTRACTOR SHALL IMMEDIATELY CONTAIN THE SPILL AND ARRANGE FOR THE MATERIAL TO BE CLEANED UP AND DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS. THE COSTS OF ALL CLEANUP AND DISPOSAL WORK SHALL BE BORNE BY THE CONTRACTOR. IF A HAZARDOUS CONDITION EXISTS THE CONTRACTOR SHALL TAKE WHATEVER ACTIONS ARE NECESSARY TO PROTECT THE PUBLIC AND WORKERS FROM INJURY, AND ADJACENT PROPERTIES FROM DAMAGE. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE TMWA REPRESENTATIVE OF THE SPILL.

C. THE CONTRACTOR SHALL EMPLOY ALL APPLICABLE BEST MANAGEMENT PRACTICES (BMPS) FOR CONTROL OF SEDIMENT AND EROSION FROM CONSTRUCTION SITES PER RECOMMENDATIONS OF THE TRUCKEE MEADOWS CONSTRUCTION SITE BMPS HANDBOOK. THE ESTIMATED AREA OF SITE DISTURBANCE FOR THIS PROJECT IS LESS THAN ONE ACRE.

D. THE CONTRACTOR SHALL CONTROL NOISE FROM HIS OPERATIONS TO LEVELS THAT ARE NOT A NUISANCE AND THAT MEET ALL LOCAL NOISE CONTROL REGULATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE NOISE LEVELS ALLOWED BY THE JURISDICTION WHERE THE WORK IS LOCATED AND TO COMPLY WITH THOSE REGULATIONS.

E. WATER DEVELOPED AS A RESULT OF THE WORK SHALL BE DISPOSED OF BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

F. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE FOR LEGAL DISPOSAL OF WATER WITHOUT DAMAGE TO ADJACENT PROPERTIES.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP.	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

GENERAL NOTES

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Exp: 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
G001
2 OF 36

WSUP23-0030
EXHIBIT D

LINETYPE LEGEND

- NEW WATER MAIN/SERVICE LINE
- EXISTING WATER MAIN
- EXISTING WATER SERVICE LINE
- PREVIOUSLY ABANDONED WATER SERVICE LINE
- 18"SD — EXISTING STORM DRAIN MAIN/LATERAL WITH SIZE
- 12"SS — EXISTING SANITARY SEWER MAIN WITH SIZE
- RW — EXISTING RECLAIMED WATER
- EXISTING WATER TANK DRAIN LINE WITH SIZE
- G — EXISTING NATURAL GAS MAIN/LATERAL
- T — EXISTING UNDERGROUND TELECOMMUNICATIONS FACILITY
- CATV — EXISTING UNDERGROUND CABLE TV
- FOC — EXISTING FIBER OPTIC CABLE – CHARTER COMMUNICATIONS
- UGE — EXISTING UNDERGROUND ELECTRIC FACILITY
- TS — EXISTING UNDERGROUND TRAFFIC SIGNAL FACILITY
- EXISTING ROADWAY CENTERLINE (APPROXIMATE)
- EXISTING PROPERTY LINE
- EXISTING PIPE TO BE REMOVED AND DISPOSED OF BY OTHERS
- EXISTING PIPE TO ABANDON. CONC CAP AT ENDS
- EXISTING FLOWLINE
- EXISTING FENCE LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- NEW MAJOR CONTOUR
- NEW MINOR CONTOUR
- EXISTING CONCRETE
- CONSTRUCTED BY DEVELOPER (FUTURE)

SYMBOLS

- A / M101 — SECTION IDENTIFICATION LETTER; SHEET OR DRAWING NUMBER WHERE SECTION APPEARS
- MATERIAL/GRADING TAG
- 1 — NOTE TAG
- D / S201 — SECTION/DETAIL IDENTIFICATION LETTER; SHEET OR DRAWING NUMBER WHERE SECTION/DETAIL IS TAKEN OR APPEARS
- CXXX TYP — TYPICAL DETAIL CALLOUT FOUND ON TYPICAL DETAIL SHEETS
- FME 3021 — EXISTING EQUIPMENT TAG
- MTR 1211 — NEW EQUIPMENT TAG

HATCHING LEGEND

- CONCRETE (PLAN & SECTION)
- AC PAVING (SECTION)
- GRATING
- NEW AGGREGATE BASE OR DRAIN ROCK (SECTION)
- EXISTING AC PAVING (PLAN)
- EXISTING GRADE & FILL (SECTION)
- NEW AC PAVING (PLAN)
- ROCK SLOPE PROTECTION (PLAN & SECTION)
- REMOVE & WASTE (R&W), DEMOLISH OR ABANDON (ABND)
- CONCRETE CURB, GUTTER AND DRIVEWAY REMOVAL & REPLACEMENT
- GRAVEL ROAD SURFACING

NOTE: NOT ALL LINETYPES, SYMBOLS, HATCHES OR ABBREVIATIONS ARE REPRESENTED IN THIS PLANSET.

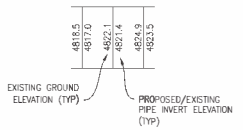
ABBREVIATIONS

±	PLUS OR MINUS	GA	GAUGE	R&W	REMOVE AND WASTE
⌀	DIAMETER	GAL	GALLONS	RAD	RADIUS
		GALV	GALVANIZED	RBP	REMOVABLE BARRIER POST
AB	AGGREGATE BASE	GB	GRADE BREAK	RCP	REINFORCED CONCRETE PIPE
AC	ASPHALT CONCRETE	GPM	GALLONS PER MINUTE	RD	ROAD
ACP	ASPHALT CONCRETE PAVEMENT	GSP	GALVANIZED STEEL PIPE	REF	REFERENCE
AGG	AGGREGATE	GV	GATE VALVE, GAS VALVE	REQD	REQUIRED
ALUM	ALUMINUM			REV	REVISION
APP	APPROVED	H	HEIGHT	RFA	RESTRAINED FLANGE ADAPTER
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	HDPE	HIGH DENSITY POLYETHYLENE	RFCA	RESTRAINED FLANGED COUPLING ADAPTER
APN	ASSESSOR PARCEL NUMBER	HEX	HEXAGONAL	RJ	RESTRAINED-JOINT
APPROX.	APPROXIMATE(LY)	HOA	HOMEOWNERS ASSOCIATION	RMJ	RESTRAINED MECHANICAL JOINT
ARV	AIR RELEASE VALVE	HORIZ	HORIZONTAL	ROW	RIGHT OF WAY
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	HP	HORSEPOWER	RS	RESILIENT SEATED
AWWA	AMERICAN WATER WORKS ASSOCIATION	HR	HOUR	RT	RIGHT
				RTC	REGIONAL TRANSPORTATION COMMISSION
BC	BEGINNING OF CURVE	IE	INVERT ELEVATION	RTU	REMOTE TELEMETRY UNIT
BGS	BELOW GRADE SURFACE	IN	INCH	RW	RESILIENT WEDGE, RECLAIMED WATER, REDWOOD
BOT	BOTTOM	INC	INCORPORATED		
BP	BARRIER POST	INV	INVERT	S	SLOPE, SOUTH
BPS	BOOSTER PUMP STATION	IP	IRON PIPE	SCH	SCHEDULE
BV	BALL VALVE, BUTTERFLY VALVE			SD	STORM DRAIN
		L	LENGTH	SDMH	STORM DRAIN MANHOLE
C	CONCRETE SPOT ELEVATION	LB(S)	POUND(S)	SDR	STANDARD DIMENSION RATIO
C/C	CENTER-TO-CENTER	LF	LINEAR FEET	SF	SQUARE FEET
C&G	CURB AND GUTTER	LIP	LIP OF GUTTER	SQ	SQUARE
CATV	CABLE TELEVISION	LLC	LIMITED LIABILITY CORPORATION	SS, SSWR	SANITARY SEWER
CAV	COMBINATION AIR VALVE	LN	LANE	SST, SS	STAINLESS STEEL
CF	CORRECTION FACTOR	LP	LIGHT POLE	SSMH	SANITARY SEWER MANHOLE
CI	CAST IRON	LT	LEFT	SSPWC	STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
CIP	CAST IRON PIPE				
CL	CLASS, CENTER LINE	MAG	MAGNETIC	ST	STREET
CLF	CHAINLINK FENCE	MAX	MAXIMUM	STA	STATION
CLR	CLEAR	MDD	MAXIMUM DAY DEMAND, MAXIMUM DRY DENSITY	STD	STANDARD
CMU	CEMENT MASONRY UNIT	MFR	MANUFACTURER	STL	STEEL
COMP	COMPACTED	MH	MANHOLE	STMFD	SOUTH TRUCKEE MEADOWS FIRE DEPARTMENT
CONC	CONCRETE	MIN	MINIMUM	STMGID	SOUTH TRUCKEE MEADOWS GENERAL IMPROVEMENT DISTRICT
CORP	CORPORATION	MIP	MALE IRON PIPE		
CP	CONTROL POINT	MJ	MECHANICAL JOINT	SWR	SEWER
CU	COPPER, CUBIC	MLS	MORTAR LINED STEEL		
CV	CHECK VALVE, CONTROL VALVE	MPH	MILES PER HOUR	TBC	TOP BACK OF CURB
				TBD	TOP BACK OF ASPHALT DIKE
DET	DETAIL	N	NORTH	TEL	TELEPHONE
DG	DECOMPOSED GRANITE	(N)	NEW	TEMP	TEMPORARY
DI	DUCTILE IRON, DRAINAGE INLET, DROP INLET	NAC	NEVADA ADMINISTRATIVE CODE	TMH	TELEPHONE MANHOLE
DIP	DUCTILE IRON PIPE	NAVD	NORTH AMERICAN VERTICAL DATUM	TMWA	TRUCKEE MEADOWS WATER AUTHORITY
DR	DRAIN	NO	NUMBER	TR	TRANSITE (AC) PIPE, TRAFFIC
DWG	DRAWING	NPT	NATIONAL PIPE THREAD	TRW	TOP OF RETAINING WALL
		NTS	NOT TO SCALE	TW	TOP OF WALL
E	EAST			TYP	TYPICAL
EC	END OF CURVE	OAE	OR APPROVED EQUAL		
EDC	EDGE OF CONCRETE	OC	ON CENTER	UGE	UNDERGROUND ELECTRIC
EF	EACH FACE	OD	OUTSIDE DIAMETER	U.N.O.	UNLESS NOTED OTHERWISE
EG	EXISTING GRADE	OHP	OVERHEAD POWER	UV	UTILITY VAULT
EGR	EDGE OF GRAVEL ROAD	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION		
ELEV	ELEVATION			VB	VALVE BOX
EOP	EDGE OF PAVEMENT	PCC	PORTLAND CEMENT CONCRETE	VERT	VERTICAL
EP	EDGE OF PAVEMENT	PE	PLAIN END, POLYETHYLENE	VFD	VARIABLE FREQUENCY DRIVE
EPDM	ETHYLENE PROPYLENE DIENE MONOMER	PL	PROPERTY LINE	VG	VALLEY GUTTER
EX, (E)	EXISTING	PO	PUSH-ON, POST OFFICE		
		POC	POINT OF CONNECTION	W	WITH, WATER, WIDTH, WEST
FC	FLEX COUPLING	PP	POWER POLE	WM	WATER METER
FCA	FLANGED COUPLING ADAPTER	PRS	PRESSURE REDUCING/REGULATING STATION	WV	WATER VALVE
FDC	FIRE DEPARTMENT CONNECTION	PRV	PRESSURE RELEASE VALVE		
FEL&C	FUSION EPOXY LINED AND COATED	PSF	POUNDS PER SQUARE FOOT	YD	YARD
FG	FINISHED GRADE	PSI	POUNDS PER SQUARE INCH		
FH	FIRE HYDRANT	PT	PRESSURE TRANSDUCER, POINT		
FIP	FEMALE IRON PIPE	PV	PLUG VALVE		
FL	FLOWLINE, FENCELINE	PVC	POLYVINYL CHLORIDE		
FLA	FLANGE	PWP	PUBLIC WORKS PROJECT		
FLG	FLANGE				
FOC	FIBER OPTIC CABLE	R&R	REMOVE AND REINSTALL		
FT	FEET	R&S	REMOVE AND SALVAGE		
FX	FAX	R	RADIUS		

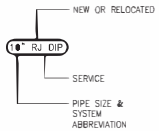
PLAN AND PROFILE SYMBOL LEGEND

- PROPOSED TEE / TAPPING SLEEVE
- PROPOSED 90° ELBOW
- PROPOSED 45° ELBOW
- PROPOSED 11.25° ELBOW
- PROPOSED VERTICAL ELBOW
- EXISTING VERTICAL ELBOW
- PROPOSED THRUST BLOCK
- PROPOSED REDUCER
- PROPOSED GATE VALVE (PLAN)
- PROPOSED GATE VALVE (PROFILE)
- PROPOSED GATE VALVE – NORMALLY CLOSED
- EXISTING ISOLATION VALVE
- EXISTING ISOLATION VALVE – NORMALLY CLOSED
- PROPOSED COUPLING
- PROPOSED CAP / FCA WITH BLIND FLANGE
- EXISTING CAP
- PROPOSED NEW WATER METER BOX AND COVER
- EXISTING WATER METER FACILITY
- PROPOSED FLUSH ASSEMBLY
- EXISTING FLUSH ASSEMBLY
- PROPOSED SSMH BY OTHERS
- EXISTING SSMH TO BE DEMO BY OTHERS
- EXISTING SINGLE CHECK VALVE
- FH — EXISTING FIRE HYDRANT
- WV — EXISTING WATER VALVE
- EXISTING STORM DRAIN MANHOLE (SDMH)
- EXISTING SANITARY SEWER MANHOLE (SSMH)
- EXISTING STORM DRAIN CATCH BASIN TYPE 1
- EXISTING STORM DRAIN CATCH BASIN TYPE 4–R
- EXISTING ROUND STORM DRAIN CATCH BASIN WITH GRATE
- EXISTING NATURAL GAS VALVE
- EXISTING NATURAL GAS CAP
- EXISTING NATURAL GAS REDUCER
- EXISTING UTILITY POLE
- EXISTING UNDERGROUND ELECTRIC VAULT WITH MANHOLE ACCESS
- EB — EXISTING ELECTRIC BOX / VAULT (SIZES VARY)
- ET — EXISTING ELECTRIC TRANSFORMER
- TEL — EXISTING TELECOMMUNICATIONS BOX / VAULT (SIZES VARY)
- EXISTING TELECOMMUNICATIONS VAULT WITH MANHOLE ACCESS
- TV — EXISTING CHARTER COMMUNICATIONS CABLE TV/FIBER OPTIC BOX (SIZES VARY)
- TS — EXISTING TRAFFIC SIGNAL BOX (SIZES VARY)
- TSI — EXISTING TRAFFIC SIGNAL CABLE MANHOLE ACCESS BOX
- EXISTING TRAFFIC SIGNAL – MULTIPLE LIGHTS WITH ARM
- EXISTING TRAFFIC SIGNAL – SINGLE LIGHT
- EXISTING STREET LIGHT
- EXISTING (FOUND) MONUMENT
- SURVEY CONTROL POINT
- MSP — EXISTING METAL SIGN POST
- EXISTING TREE
- FLOW ARROW
- BARRIER POST
- REMOVABLE BARRIER POST

PROFILE ELEVATION INDICATORS



PIPING IDENTIFICATION SYSTEM



PIPING IDENTIFICATION SYSTEM NOTE:

SEE PIPING ABBREVIATIONS THIS SHEET. SEE SPECIFICATION FOR PIPE MATERIAL NOT SPECIFICALLY CALLED OUT ON THE DRAWINGS.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY. RETURN UPON COMPLETION OF PROJECT (Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

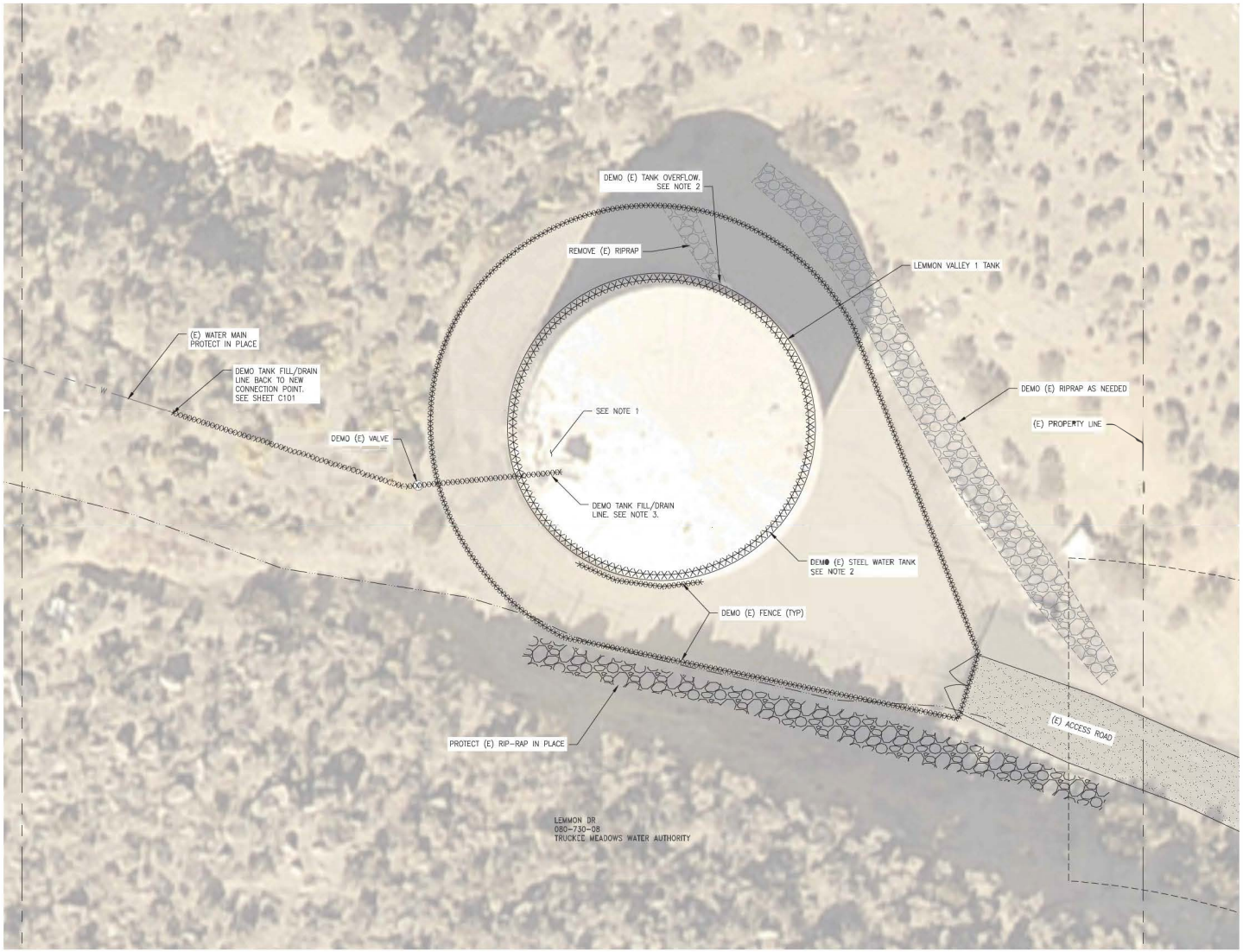
LEGENDS, AND ABBREVIATIONS

PROFESSIONAL ENGINEER – STATE OF NEVADA
THOMAS SPEER
Exp: 06/30/24
CIVIL
No. 26995

SHEET NUMBER
G002
3 OF 36

K:\O_Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2 Design\1 CAD\14-0035 G000-G002.dwg
Aug 25, 2023 - 8:53am

WSUP23-0030
EXHIBIT D



NORTH

10' 5' 0 10'
SCALE
1" = 10'

NOTES:

1. ROOF MOUNTED APPURTENANCES TO BE REMOVED BY TMWA PRIOR TO DEMO.
2. DEMO (E) WATER TANK, RETAINING RING, AND APPURTENANCES.
3. CUT AND CAP (E) TANK FILL/DRAIN PIPE AT A PROPER LOCATION THAT WILL ALLOW CONNECTION FOR NEW.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

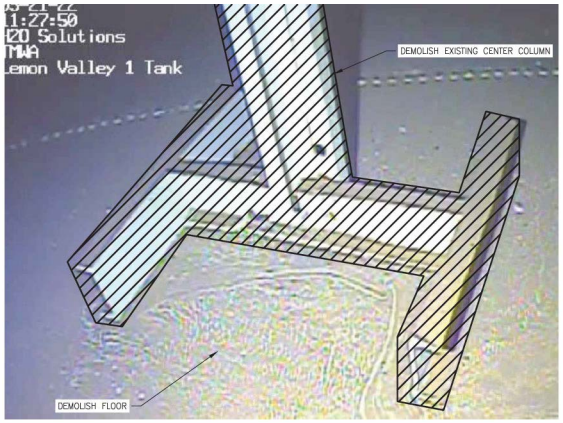
DEMOLITION PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Exp: 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
D100
4 OF 36

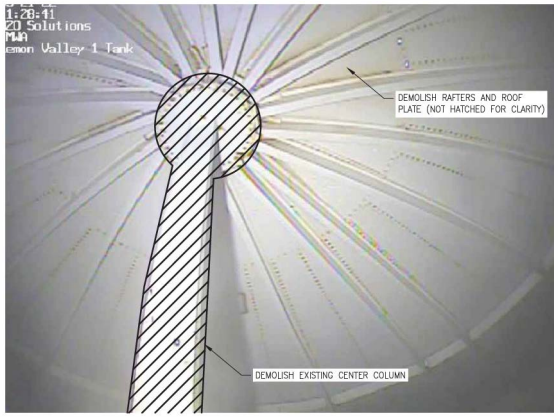
K:\C_Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2 Design\1 CAD\14-0035 D100 DEMO.dwg
Aug 25, 2023 - 8:54am

WSUP23-0030
EXHIBIT D



CENTER COLUMN - BASE

CENTER COLUMN - MIDDLE



CENTER COLUMN - TOP

NOTES:

1. THESE DETAILS ARE INTENDED TO PROVIDE THE CONTRACTOR WITH INFORMATION AS TO THE CONSTRUCTION OF THE TANK FROM THE INSIDE. NOT ALL ITEMS HAVE BEEN CALLED OUT OR HATCHED FOR CLARITY.
2. THE ENTIRE TANK IS TO BE DEMOLISHED.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN K. GONZALEZ
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY. RETURN UPON COMPLETION OF PROJECT (Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

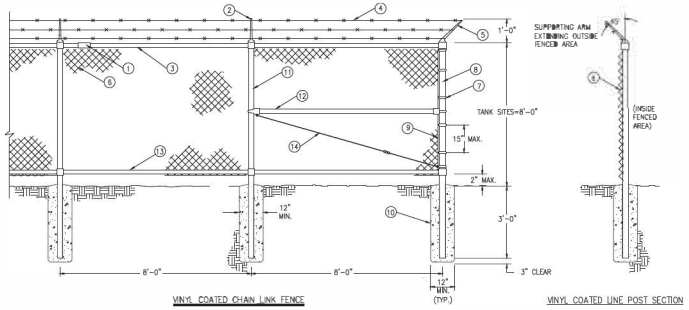
INTERIOR DEMO DETAILS

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Expr: 06/30/24
CIVIL
No. 28995
8/25/23

SHEET NUMBER
D200
5 OF 36

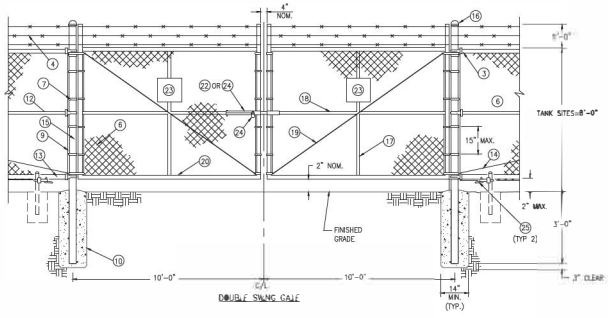
K:\D_Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2 Design\1 CAD\14-0035 D200 DEMO.dwg
Aug 25, 2023 - 8:54am

WSUP23-0030
EXHIBIT D



VINYL COATED CHAIN LINK FENCE

VINYL COATED LINE POST SECTION

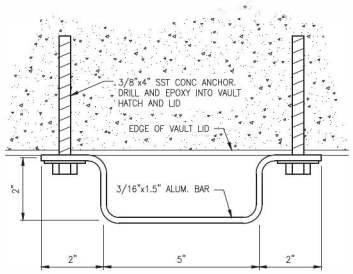


DOUBLE SWING GATE

VINYL COATED CHAIN LINK FENCE & DOUBLE SWING GATE MATERIAL LIST AND SPECIFICATIONS

1. RAIL COUPLING, OUTSIDE SLEEVE TYPE, MINIMUM 6" LONG
2. LINE POST BARBED WIRE SUPPORTING ARM.
3. TOP RAIL: 1 1/4" NOMINAL SIZE (0.140" WALL; 2.27 LB/FT)
4. BARBED WIRE: 3 STRANDS OF 12.5 CA/WIRE W/ 14 GA. 4 POINT BARBS.
5. CORNER POST BARBED WIRE SUPPORTING ARM AT 45° ANGLE (FACING OUT).
6. 9 GA. 2" VINYL COATED CHAIN LINK FABRIC. COLOR SHALL BE PER TMWA.
7. BRACE BAND OR TENSION BAND.
8. CORNER POST, 2 1/2" NOMINAL SIZE (0.203" WALL; 5.79 LB/FT)
9. TENSION BAR SECURED TO POST WITH BRACE OR TENSION BANDS.
10. CONCRETE FOOTING. TOP TO BE TROWELED TO A DENSE SMOOTH FINISH AND SLOPED TO DRAIN AWAY FROM POST. 3000 PSI MIN.
11. LINE POST: 2" NOMINAL SIZE (0.154 WALL; 3.65 LB/FT).
12. POST BRACE: 1 1/4" NOMINAL SIZE (0.140" WALL; 2.27 LB/FT).
13. BOTTOM RAIL: 1 1/4" NOMINAL SIZE (0.140" WALL; 2.27 LB/FT). NO MORE THAN 2" ABOVE GR ADE.
14. TRUSS ROD, MINIMUM 3/8" DIAMETER WITH A TURNBUCKLE.
15. GATE POST, 3 1/2" NOMINAL SIZE (0.226" WALL; 9.11 LB/FT).
16. FIRST CAP.
17. GATE LEAF VERTICAL INTERMEDIATE BRACE SPACED SO THAT NO VERTICAL MEMBERS ARE MORE THAN 7' APART; 1 1/2" NOMINAL SIZE (0.145" WALL; 2.72 LB/FT).
18. GATE LEAF HORIZONTAL INTERMEDIATE BRACE 2" NOMINAL SIZE (0.154" WALL; 3.65 LB/FT).
19. DIAGONAL TRUSS ROD OF MINIMUM 3/8" NOMINAL DIAMETER, REQUIRED IF GATE LEAF IS 6' OR WIDER.
20. GATE FRAME, 2" NOMINAL (0.154" WALL; 3.65 LB/FT).
21. ALL HARDWARE, POSTS, WIRE, EXTENSION ARMS, RODS, ETC. COLOR SHALL BE PER TMWA.
22. INSTALL FABRICATED LATCH (SEE DETAIL) OR #24 PER TMWA REQUEST.
23. WARNING SIGN SUPPLIED BY TMWA.
24. STRONG ARM LATCH FOR ROUND FRAME WHERE REQUESTED BY TMWA (LOCKS PROVIDED BY TMWA)
25. INSTALL GATE KEEPING TO SECURE GATE IN OPEN POSITION. INSTALL 2"Ø x 12' LONG POST WITH CONC FOOTING.

VINYL COATED CHAIN LINK FENCE DETAILS W/ 20' DOUBLE GATE — C201 TYP — N.T.S.



TOP VIEW

NOTES:

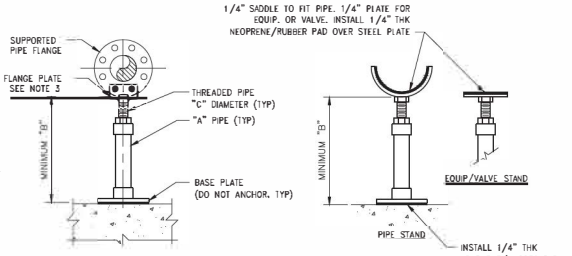
1. 2 MOUNTING BRACKETS SHALL BE INSTALLED 16" O.C. AT EACH LADDER LOCATION, TO BE LOCATED IN FIELD. COORDINATE W/ TMWA REPRESENTATIVE.

LADDER MOUNTING BRACKET — C299 TYP — SCALE: NTS

ADJUSTABLE PIPE SUPPORT SCHEDULE				
SIZE OF SUPPORTED PIPE	EXTENSION PIPE SIZE "A" SCH 40	BASE PLATE SIZE	MIN. MUM DIST. FROM FLANGE TO FLOOR "B"	THREADED PIPE "C" DIAMETER
2	2"	4"x6"x 1/4"	7"	1"
2 1/2	2.5"	4"x6"x 1/4"	7"	1.5"
3	2.5"	4"x6"x 1/4"	7"	1.5"
4	3"	4"x6"x 1/4"	7"	2.5"
6	3"	4"x6"x 1/4"	7"	2.5"
8	3"	4"x6"x 1/4"	7"	2.5"
10	3"	4"x6"x 1/4"	7"	2.5"
12	3"	4"x6"x 1/4"	7"	2.5"
14	4"	8"x8"x 1/2"	9 1/2"	3"
16	4"	8"x8"x 1/2"	9 1/2"	3"

NOTES:

1. MATERIAL OF FABRICATION ASTM A35 & A53 STEEL WITH ELECTRO-GALVANIZED FINISH OR AS SPECIFIED ON THE DRAWING.
2. STANDON MODEL S89 FLANGE SUPPORT OR EQUAL. SUPPORT DOES NOT SERVE AS SEISMIC OR THRUST SUPPORT.
3. TWO BOLTS UP TO 10". 45° THEREAFTER

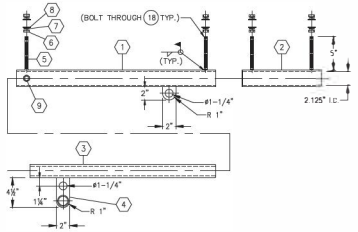


ADJUSTABLE PIPE SUPPORT DETAIL — C500 TYP — N.T.S.

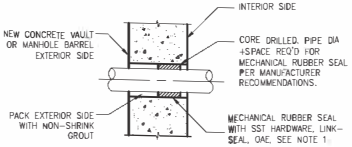
FABRICATED LATCH MATERIAL LIST		
NO.	QTY.	DESCRIPTION
1	30"	LATCH GUIDE CYLINDER – 2-1/2" X 3/16" SQUARE TUBING
2	12"	LATCH GUIDE CYLINDER – 4-1/2" X 2-1/2" X 3/16" SQUARE TUBING
3	28"	LATCH BOLT – 2" X 1/4" SQUARE TUBING
4	2	PADLOCK HASPS – 1/4" STEEL PLATE
5	4	MOUNTING STUDS – 1/2" X 5" ALL-THREAD
6	8	1/2" HEX NUTS
7	9	1/2" SPLIT LOCK WASHERS
8	9	1/2" FLAT WASHERS
9	1	LATCH BOLT STOP – 1/2" X 4" MACHINE BOLT
10	1	LATCH BOLT HANDLE – 1 1/4" X 4" SCH 40 STEEL PIPE

GENERAL NOTES

1. ALL HARDWARE AND COMPONENTS TO BE HOT-DIP GALVANIZED AFTER FABRICA TION.DO NOT TIGHTEN HARDWARE MORE THAN NECESSARY.
2. OVERTIGHTENING MAY DEFORM LATCH OR GATE COMPONENTS.



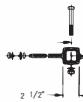
TOP VIEW



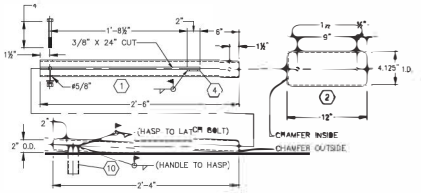
NOTES:

1. DO NOT USE LINK-SEAL ON SDR 35 PVC PIPE.

WALL PENETRATION DETAIL — C520 TYP — N.T.S.



END VIEW



FRONT VIEW

FABRICATED GATE LATCH — C202 TYP — N.T.S.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 20 23
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY, RETURN UPON COMPLETION OF PROJECT (Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

DETAILS

PROFESSIONAL ENGINEER - STATE OF NEVADA — THOMAS SPEER — Expr. 06/30/24 — CIVIL — No. 28995 — 8/25/23

SHEET NUMBER
C001
6 OF 36

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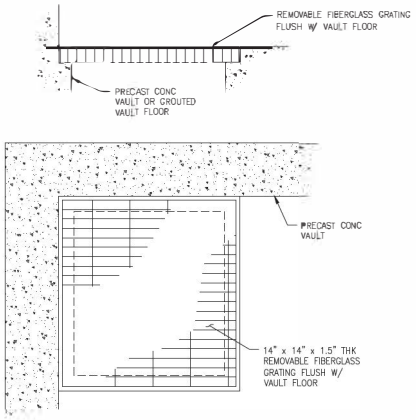
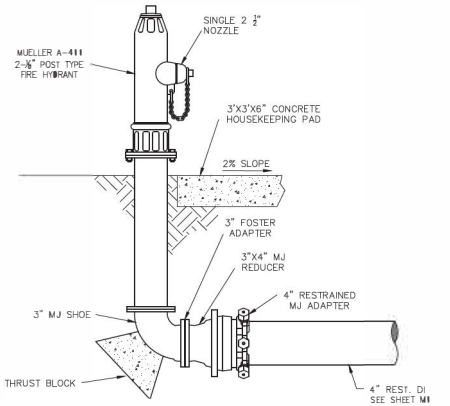
Aug 25, 2023 - 18:54am

WSUP23-0030
EXHIBIT D

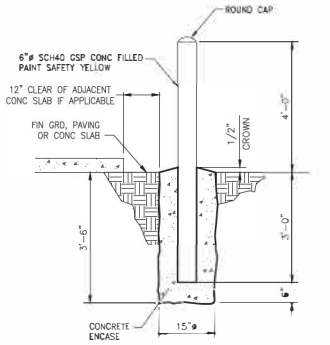


NOTES:
1. DUE TO HIGH GROUND WATER, NO DRAIN HOLE WILL BE IN THE VAULT FLOOR.
2. GRATE SHALL BE PEDESTRIAN FRIENDLY.

SUMP GRATING — N.T.S. — C521 TYP



POST HYDRANT — N.T.S. — C460 TYP

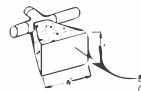


BOLLARD DETAIL — N.T.S. — C461 TYP

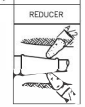
TYPE OF FITTING	90° BEND	45° BEND	11.25° OR 22.5° BEND	TEE OR DEAD END	CROSS W/PLUG	TEE W/PLUG	ALL PLUGS (DEAD END)
TYPICAL INSTALLATION							

THRUST BLOCK BEARING AREA (SQ. FT.)

SIZE OF PIPE	90° BEND	45° BEND	11.25° OR 22.5° BEND	TEE OR DEAD END	TEE W/PLUG	CROSS W/PLUG
4"	2	1	1	3	3	3
6"	5	3	2	4	4	4
8"	7	4	3	5	8	8
10"	12	6	3	9	12	12
12"	16	8	5	12	16	16
14"	22	12	8	16	24	24
16"	30	16	8	20	30	30
18"	36	20	10	28	40	40
24"	55	35	18	40	55	55

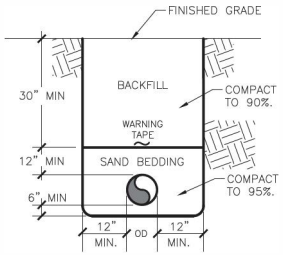


EXAMPLE OF THRUST BLOCK ON 12" TEE



NOTES:
1. BEARING AREAS IN TABLE ARE BASED ON THE FOLLOWING:
   SOIL BEARING CAPACITY=1,500 LB./SQ. FT.
   FACTOR OF SAFETY=1.5
   TEST PRESSURE IS 100 P.S.I.
2. FOR OTHER TEST PRESSURES: REQUIRED BEARING AREA = $\frac{\text{TEST PRESSURE (P.S.I.)}}{100\ \text{P.S.I.}}$ X AREA IN TABLE ABOVE
3. THRUST BLOCKS TO BE CONSTRUCTED OF 2000 P.S.I. CONCRETE.
4. BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL.
5. JOINTS, BOLTS, AND FACE PLUGS TO BE KEPT CLEAR OF CONCRETE BY USE OF PLASTIC WRAP. SIDES SHALL BE WOOD FORMED UNLESS APPROVED BY ENGINEER.
6. REDUCERS SHALL REQUIRE THRUST BLOCKS EQUIVALENT TO THOSE CALLED FOR 45 DEGREE FITTINGS. REQUIRED BEARING AREAS SHALL BE GOVERNED BY THE LARGEST DIAMETER OF THE REDUCER.

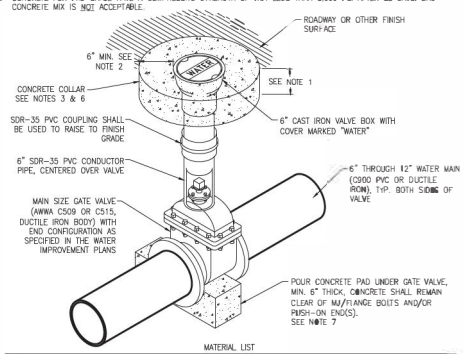
THRUST BLOCK DETAILS — N.T.S. — C462 TYP



NOTES:
1. ALL TRENCHES MUST CONFORM TO APPLICABLE TMWA, CITY, STATE, COUNTY, AND OSHA SPECIFICATIONS AND REQUIREMENTS.

TRENCH DETAIL (TYP) — N.T.S. — C463 TYP

NOTES:
1. CONCRETE COLLAR SHALL BE MINIMUM 6-INCHES THICK OR MATCH PAVEMENT THICKNESS, WHICHEVER IS GREATER UNLESS OTHERWISE SPECIFIED BY THE JURISDICTIONAL AGENCY RESPONSIBLE FOR THE ROADWAY.
2. FOR MULTIPLE VALVE/RISER BOXES IN CLOSE PROXIMITY, A MONOLITHIC CONCRETE COLLAR MAY BE POURED.
3. CONTRACTOR AND/OR DESIGN ENGINEER SHALL CONSULT WITH THE JURISDICTIONAL AGENCY RESPONSIBLE FOR THE ROADWAY FOR REQUIREMENTS THAT MAY VARY FROM THIS STANDARD PRIOR TO CONSTRUCTION.
4. ALL BOLTS AND EXPOSED METAL SHALL BE COATED WITH BRUSHED-ON MASTIC.
5. GATE VALVE, DUCTILE IRON PIPE, AND OTHER METAL PARTS SHALL BE ENCASED WITH POLYETHYLENE WRAP PER AWWA C105.
6. UNLESS OTHERWISE SPECIFIED BY THE JURISDICTIONAL AGENCY RESPONSIBLE FOR THE ROADWAY, PORTLAND CEMENT CONCRETE (P.C.C.) FOR CONCRETE COLLAR SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4,000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS, MINIMUM 6 SACKS OF CEMENT PER CUBIC YARD WITH A MAXIMUM WATER/CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6% ±1.5%, SLUMP AT 1 TO 4 INCHES. BAG CONCRETE MIX IS NOT ACCEPTABLE.
7. CONCRETE FOR PAD SHALL HAVE A COMPRESSIVE STRENGTH OF NOT LESS THAN 3,000 PSI AFTER 28 DAYS. BAG CONCRETE MIX IS NOT ACCEPTABLE.



MATERIAL LIST

QTY	DESCRIPTION
1	MAIN SIZE GATE VALVE (AWWA C509 OR C515, DUCTILE IRON BODY) WITH END CONFIGURATION AS SPECIFIED IN THE WATER IMPROVEMENT PLANS
1	MASTIC (1 GALLON CAN – BRUSH ON)
1	6" ø SDR-35 PVC CONDUCTOR PIPE SECTION
1	6" ø CAST IRON VALVE BOX WITH COVER MARKED "WATER"
1	FULL FACE GASKET
1	CONCRETE BULK – PAD AND COLLAR

IN-LINE GATE VALVE W/ CONC COLLAR — SCALE: NTS — 10J-2 TYP

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

DETAILS

PROFESSIONAL ENGINEER - STATE OF NEVADA — THOMAS SPEER — Expr: 06/30/24 — CIVIL — No. 25995 — 8/25/23

SHEET NUMBER
C002
7 OF 36

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Aug 25, 2023 - 10:54am

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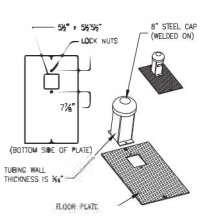
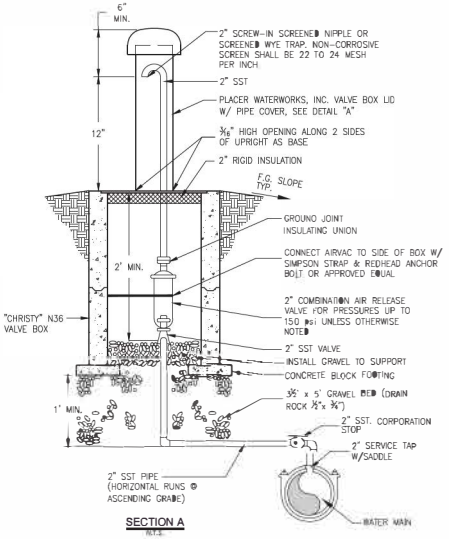


PLACER WATER WORKS, INC.
9522 ANTELOPE OAKS COURT
ROSEVILLE, CA 95747
(916) 773-2959

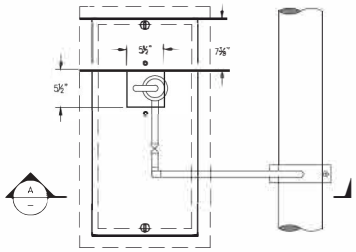
1. ALL METAL CLEANED WITH DEV PREP 88 BY DEVOE CAT. #74870R00.
2. DEVRAN 224HS CATALYZED POLYAMIDE EPOXY PRIMER (HUNTER GREEN) APPLIED 2 TO 3 MILLS THICK. (SOLIDS BY VOLUME 75%)
3. DEVTHANE 379 CATALYZED ALIPHATIC URETHANE FINISH TWO COAT. (HUNTER GREEN) APPLIED 2 TO 3 MILLS THICK. (63% SOLIDS BY VOLUME).
4. LOCK NUTS WELDED TO THE UNDER SIDE OF COVER.
5. VENT TUBE IS INDIVIDUALLY BENDED AND COMES COMPLETE WITH FASTENING BOLTS AND WASHERS.
6. STEEL CORNER IS INDIVIDUALLY PACKAGED COMPLETE WITH BOLT DOWN FASTENERS.

CAT # PWAE11BM	18 1/8" x 27" x 3/4"
CAT # PWAE21BM	20 3/4" x 33 1/4" x 7/8"

COVER DETAIL
NTS

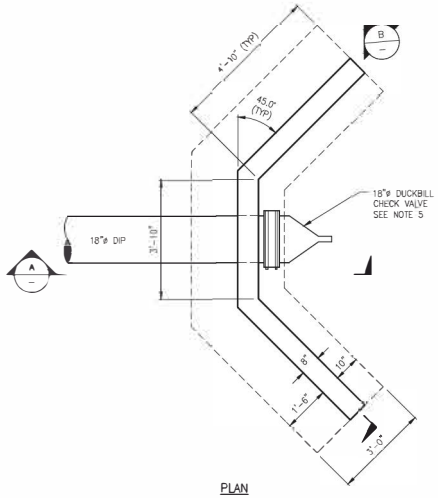


SECTION A
NTS

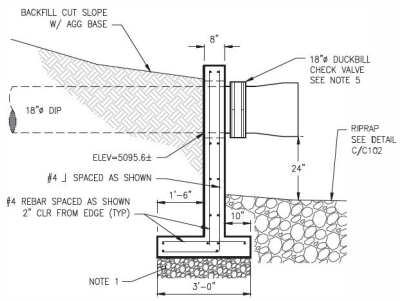


PLAN
NTS

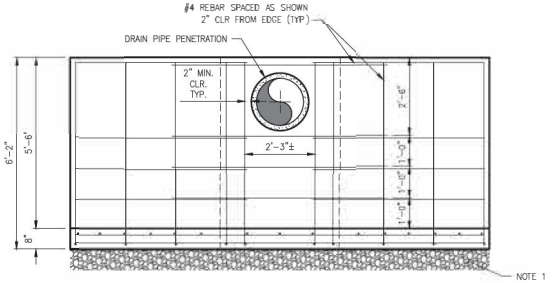
ARV DETAIL — SCALE: NTS — C700 TYP



PLAN



SECTION A



SECTION B

NOTES:

1. 8" THICK TYPE 2 AGG BASE COMPACTED TO 95% M.D.D. IF SUBGRADE IS UNSUITABLE, CONTACT ENGINEER.
2. CHAMFER EXPOSED EDGES OF HEADWALL: 1/2"
3. HEADWALL CONCRETE:
   - 3.1. MAX WATER CEMENT RATIO: 0.45
   - 3.2. MIN COMPRESSIVE STRENGTH: 4000 PSI – 28 DAY BREAK
   - 3.3. SLUMP: 1–4 INCHES
   - 3.4. 4–7% ENTRAINED AIR
   - 3.5. ALL OTHER INFO: SEE SECTION 03 00 05 CONCRETE OF THE SPECIFICATIONS
4. REINFORCING STEEL:
   - 4.1. MIN BENDING DIAMETER IS 3" ON #4 BARS
   - 4.2. ALL BARS SHALL REMAIN UNMOVED DURING POURING OF CONCRETE
   - 4.3. MAY BE BENT OR CUT ONSITE
5. DUCKBILL SLEEVE MUST BE EPDM. ALL HARDWARE MUST BE STAINLESS STEEL. A MAX OF 2" OF UPSTREAM HYDROSTATIC HEAD REQUIRED FOR OPENING. MUST BE RESISTANT TO FREEZING OPEN OR CLOSED. MUST DISPLAY MFR. NAME, VALVE MODEL, SIZE, AND SERIAL NO. OUTSIDE OF THE PRODUCT. ACCEPTABLE PRODUCTS INCLUDE:
   - 5.1. RED VALVE. TIDEFLEX SERIES, TF–1 SLIDE–ON TYPE
   - 5.2. PROCO PRODUCTS, SERIES 700 PROFLEX RUBBER CHECK VALVE
   - 5.3. ONYX VALVE CO., SERIES DBF

DRAIN OUTLET DETAIL — SCALE: 1/2" = 1'-0" — C800 TYP

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
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TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

DETAILS

PROFESSIONAL ENGINEER – STATE OF NEVADA
THOMAS SPEER
Expr: 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
C003
8 OF 36

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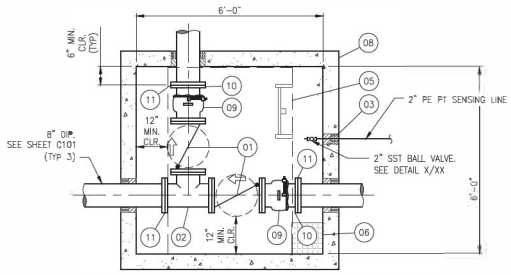
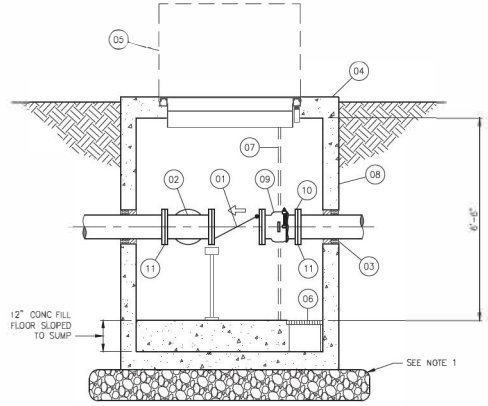


PLAN



SECTION

CHECK VALVE VAULT DETAIL

SCALE: 1/2" = 1'-0"

A / C004

EQUIPMENT/MATERIAL SCHEDULE

TAG	DESCRIPTION	DETAIL	SPEC
01	8"ø SWING-FLEX CHECK VALVE, W/ BACKFLOW ACTUATOR, DI BODY AND COVER WITH EPDM COVERED DISC, SST BOLTS, NUTS, AND WASHERS, O.A.E.		—
02	8"ø SCH40 STL FELAC FLG TEE		40 05 24
03	PIPE PENETRATION (TYP)	C520/TYP	
04	CONCRETE LID. THICKNESS OF CONCRETE, STEEL REINFORCEMENT SIZING, STEEL PLACEMENT, AND HATCH PLACEMENT SHALL BE STAMPED BY A NEVADA LICENSED ENG.		03 00 05
05	ALUMINUM ACCESS HATCH; INCIDENTAL H20 LOADING; DOUBLE LEAF WITH 72" X 48" CLEAR OPENING; SS TYPE 316 HARDWARE; SPRING ASSIST; SLAMLOCK; RECESSED PADLOCK AND LIFT HANDLE; 2" INSULATION WITHIN LID; HINGES ON SHORT SIDE; USF FABRICATION TDH, OR EQUAL., SHALL BE CASTED INTO THE CONCRETE LID (NOTE BUBBLE 14). LID DRAIN TO BE DIRECTED OUTSIDE OF VAULT TO DAYLIGHT. FIELD FIT AS NEEDED.		03 00 05
06	12" X 12" X 12" SUMP BLOCKOUT W/ REMOVABLE GRATE	C521/TYP	
07	16" WIDE ALUMINUM LADDER WITH RAIL SAFETY EXTENSIONS, CONSTRUCT AND MOUNT TO MEET OSHA STANDARDS. LADDER DESIGN TO BE STAMPED BY A NEVADA LICENSED ENG.	C29 9/TYP	03 00 05
08	PRECAST CONCRETE VAULT – INTERNAL DIMENSIONS L: 6' – W: 8' – D: 7.5' VAULT SHALL BE DESIGNED AND STAMPED BY A NEVADA LICENSED ENG.		03 00 05
09	8"ø RPCA ROMAC ALPHA D.A.E.		—
10	8"ø SCH40 STL FELAC FLG/PE SPOOL		40 05 24
11	8"ø DIELECTRIC ISOLATION KIT		—

NOTES:

1. PROVIDE 24" THICK LAYER OF TYPE 2 AB COMPACTED TO 95%, EXTEND 12" BEYOND VAULT WALLS IN ALL DIRECTIONS, WRAPPED IN FILTER FABRIC.
2. FINISHED GRADE SURFACE TO MATCH ADJACENT LANDSCAPING, BACKFILL PER SPEC SECTION 31 23 00. SLOPE FINISHED GRADE AWAY FROM VAULT.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-00 5
DESIGNED TES
DRAWN JRH
DATE AUG. 20 3
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RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

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LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

DETAILS

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Expr: 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
C004
9 OF 36

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Aug 25, 2023 - 8:54am

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NOTES:

1. ACCESS TO SITE SHALL BE PROVIDED ON (E) ACCESS EASEMENT AS SHOWN. MAX GRADE IS AROUND 20%.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

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DESIGNED TES
DRAWN JRH
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TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA #9520-3013 PHONE: 775-834-8080

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LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

OVERALL SITE PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Exp: 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
C100
10 OF 36

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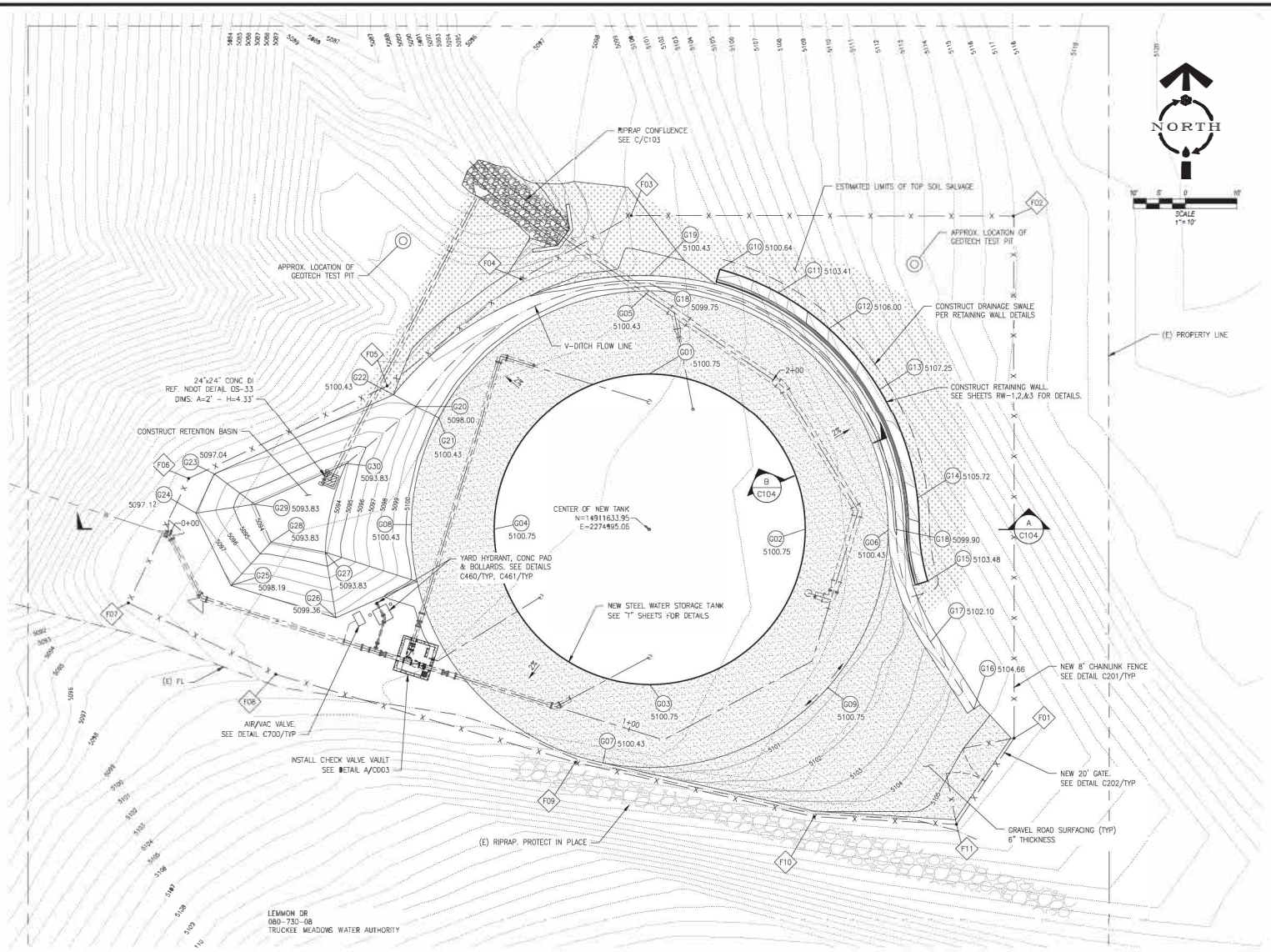


GRADING TAG TABLE

TAG	NORTHING	EASTING	ELEV	DESCRIPTION
G01	14911663.95	2274995.06	5100.75	TANK PAD
G02	14911633.95	2275025.06	5100.75	TANK PAD
G03	14911603.95	2274995.06	5100.75	TANK PAD
G04	14911633.95	2274965.06	5100.75	TANK PAD
G05	14911679.95	2274995.06	5100.43	FG
G06	14911633.78	2275041.06	5100.43	FG
G07	14911588.84	2274986.05	5100.43	FG
G08	14911634.80	2274949.07	5100.43	FG
G09	14911603.37	2275029.43	5100.75	FG
G10	14911684.12	2275008.72	5100.64	TOP BACK OF WALL
G11	14911679.58	2275019.99	5103.41	TOP BACK OF WALL
G12	14911672.70	2275029.74	5106.00	TOP BACK OF WALL
G13	14911660.95	2275039.50	5107.25	TOP BACK OF WALL
G14	14911639.94	2275046.72	5105.72	TOP BACK OF WALL
G15	14911623.92	2275048.71	5103.48	TOP BACK OF WALL
G16	14911599.25	2275057.60	5104.66	SWALE FL
G17	14911612.20	2275049.26	5102.10	SWALE FL
G18	14911681.45	2274995.06	5099.75	SWALE FL
G18	14911633.91	2275042.56	5099.90	SWALE FL
G19	14911682.91	2274995.10	5100.43	FG
G20	14911657.70	2274950.07	5098.00	SWALE FL
G21	14911655.42	2274954.38	5100.43	FG
G22	14911659.98	2274945.75	5100.43	FG
G23	14911644.61	2274911.05	5097.04	FG
G24	14911637.04	2274907.53	5097.12	FG
G25	14911623.06	2274914.26	5098.19	FG
G26	14911616.84	2274934.55	5099.36	FG
G27	14911629.49	2274932.46	5093.83	FG
G28	14911631.43	2274922.00	5093.83	FG
G29	14911638.75	2274918.81	5093.83	FG
G30	14911646.59	2274936.50	5093.83	FG

FENCE TAG TABLE

TAG	NORTHING	EASTING	DESCRIPTION
F01	14911593.59	2275065.37	FENCE ANGLE
F02	14911694.45	2275065.37	FENCE ANGLE
F03	14911694.45	2274991.59	FENCE ANGLE
F04	14911682.24	2274970.32	FENCE ANGLE
F05	14911661.66	2274944.53	FENCE ANGLE
F06	14911643.73	2274906.12	FENCE ANGLE
F07	14911619.73	2274894.41	FENCE ANGLE
F08	14911605.95	2274922.88	FENCE ANGLE
F09	14911588.95	2274980.71	FENCE ANGLE
F10	14911578.44	2275026.81	FENCE ANGLE
F11	14911576.97	2275054.25	FENCE ANGLE

NOTES:

1. ESTIMATED VOLUMES/AREAS
   - 1.1. ESTIMATED TOTAL CUT VOLUME: 566 CY
   - 1.2. ESTIMATED GRAVEL ROAD SURFACING VOLUME: 95 CY
   - 1.3. ESTIMATED TOP SOIL SALVAGE: 1,500 SF
2. CONTRACTOR SHALL CONTROL DUST AND NOISE AND IMPLEMENT BEST MANAGEMENT PRACTICES FOR WATER (FROM STORM OR CONSTRUCTION) WHILE MOBILIZED ON THE SITE. SEE SHEET G001 FOR MORE INFORMATION

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

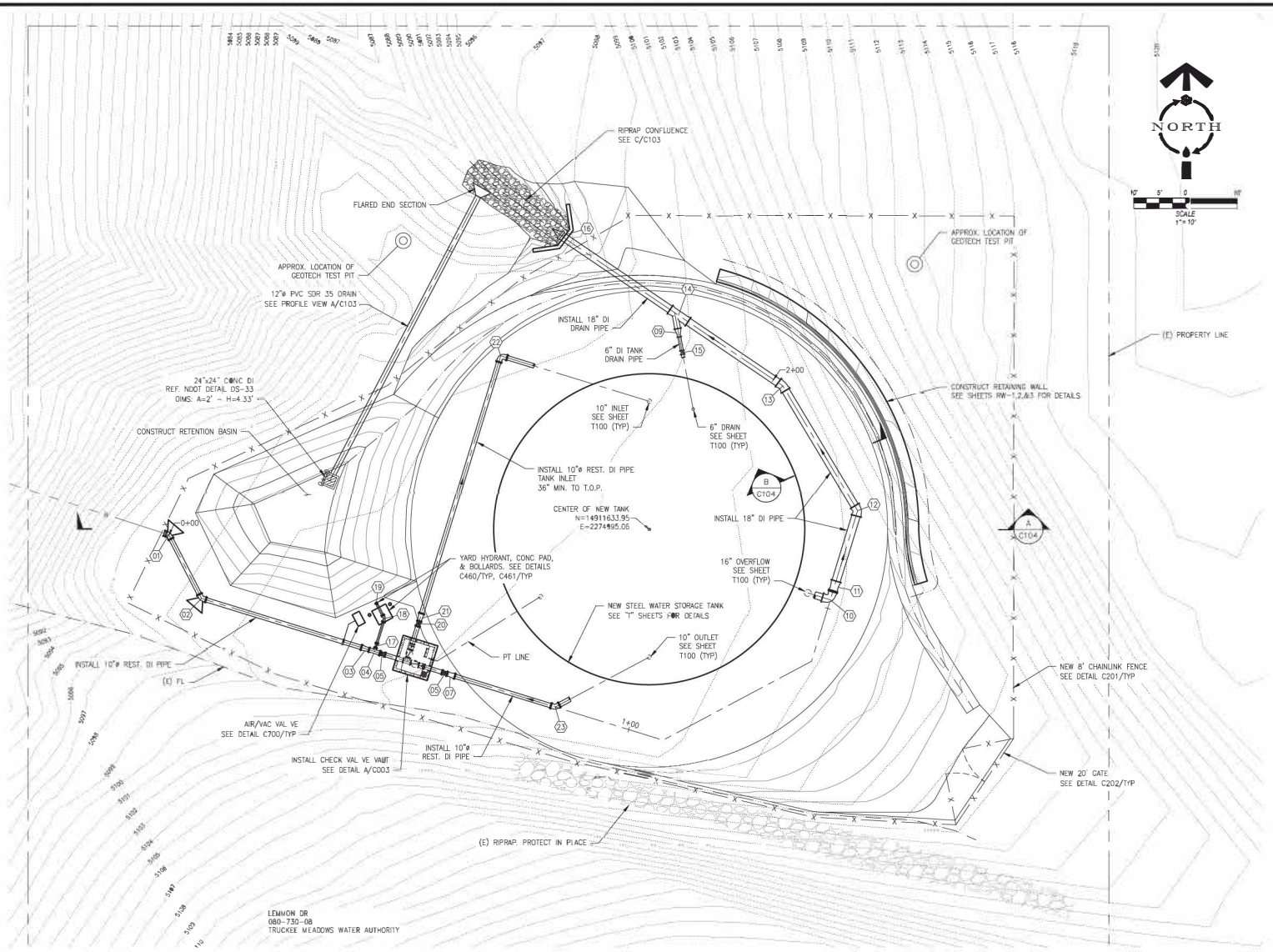
GRADING PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Expr: 06/30/24
CIVIL
No. 28995
8/25/23

SHEET NUMBER
C101
11 OF 36

K:\O_Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2 Design\C_CAD\14-0035 C101 SITE PIPING PLAN.dwg
Aug 25, 2023 - 10:55am

WSUP23-0030
EXHIBIT D



(#) PIPING TAG TABLE

TAG	DESCRIPTION
01	10"ø FLGMJ DI 45° BEND W/ REST. GLAND, FCA, AND THRUST BLOCK
02	10"ø DI MJ 45° BEND W/ RES. GLANDS, AND THRUST BLOCK
03	10"x8" MJ LEB REDUCER
04	8"x8"x4" MJ DI TEE
05	8"ø MJ RSGV
06	NA
07	10"x8" MJ LEB RED.
08	NA
09	12"x6" SEB DI RED.
10	16"ø DI MJ 90° BEND W/ MJ ADAPTER
11	16"x18" DI MJ RED
12	18"ø DI MJ 45° BEND
13	18"ø DI MJ 22.5° BEND
14	18"x12" DI MJ WYE
15	6"ø MJ RSGV
16	DRAIN OUTLET, SEE DETAIL C800/TYP
17	4" MJ RSGV
18	4"ø REST. MJ 45° BEND
19	4"ø YARD HYDRANT
20	8"ø REST. MJ RSGV
21	10"x8" MJ LEB RED.
22	10"ø DI MJ 90° BEND W/ REST. GLANDS
23	10"ø DI MJ 45° BEND W/ RES. GLANDS

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY, RETURN UPON COMPLETION OF PROJECT (Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

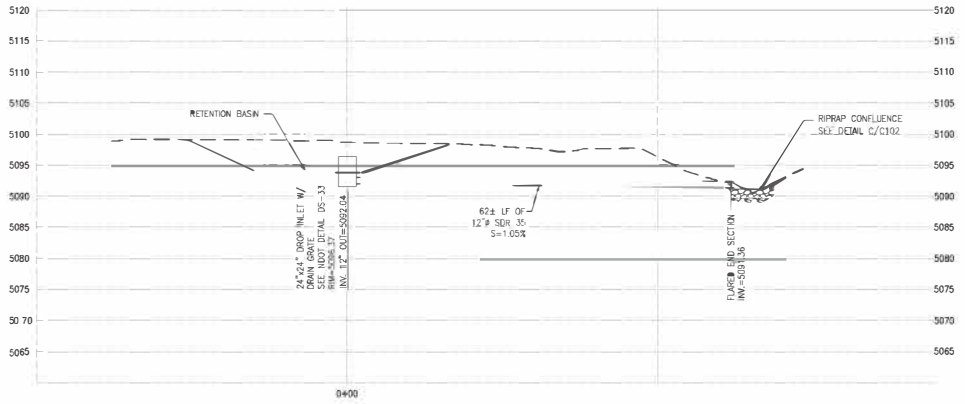
YARD PIPING PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Expr: 06/30/24
CIVIL
No. 26955
8/25/23

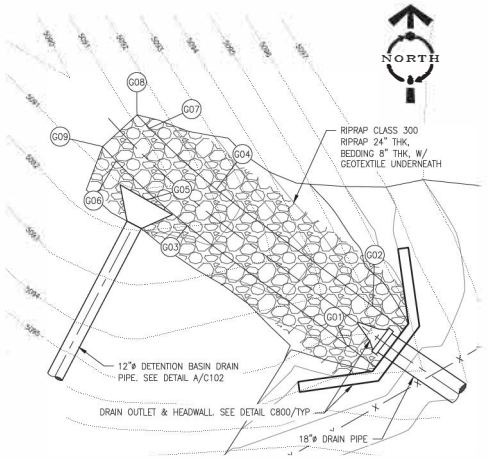
SHEET NUMBER
C102
12 OF 36

K:\O_Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2 Design\1 CAD\14-0035 C101 SITE PIPING PLAN.dwg
Aug 25, 2023 - 18:55pm

WSUP23-0030
EXHIBIT D



PROFILE VIEW — SCALE: 1" = 10' — A / C101



RIPRAP CONFLUENCE PLAN — SCALE: 1/4" = 1'-0" — C / C101

GRADING TAG TABLE

TAG	NORTHING	EASTING	DESCRIPTION
G01	14911690.44	2274975.67	24" BELOW GRAIN OUTLET
G02	14911692.90	2274977.38	24" BELOW GRAIN OUTLET
G03	14911698.06	2274985.45	5091.66
G04	14911700.39	2274987.34	5091.66
G05	14911699.73	2274962.85	5091.37 FLARED END SECTION
G06	14911702.23	2274980.98	5091.18
G07	14911704.32	2274963.05	5091.18
G08	14911705.18	2274962.24	5091.13
G09	14911703.15	2274980.03	5091.13

PROFILE VIEW — SCALE: 1" = 10' — B / C101

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
PROFILE VIEWS & CONFLUENCE PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Exp: 06/30/24
CIVIL
No. 28999
8/25/23

SHEET NUMBER
C103
13 OF 36

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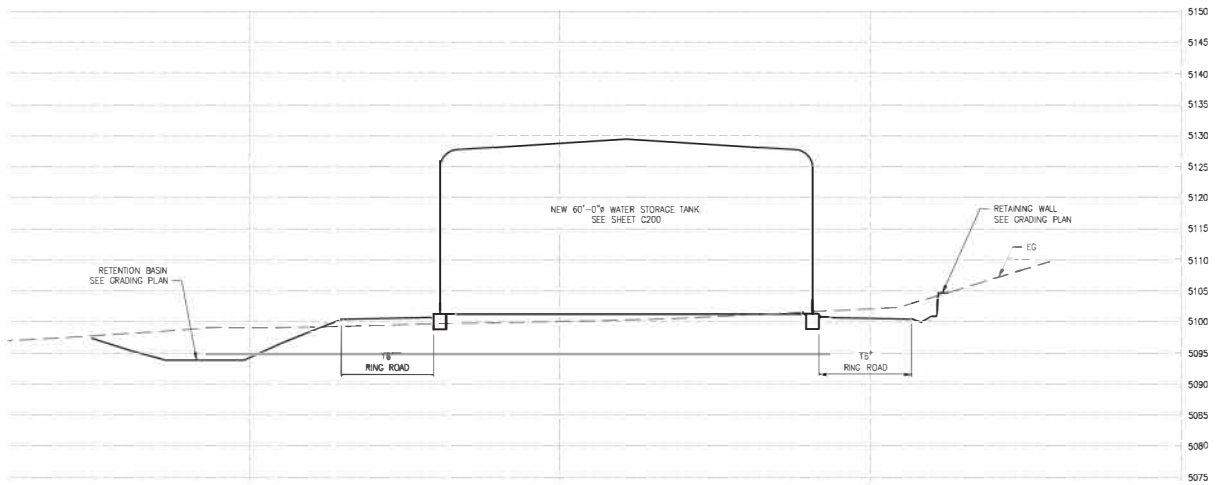
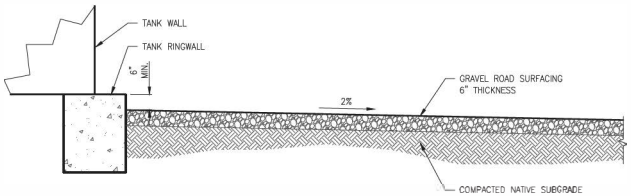
Aug 25, 2023 - 10:55am

WSUP23-0030
EXHIBIT D



SECTION VIEW — SCALE: 1" = 10' — A / C101



RING ROAD SURFACING — SCALE: 1/2" = 1'-0" — B / C101

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

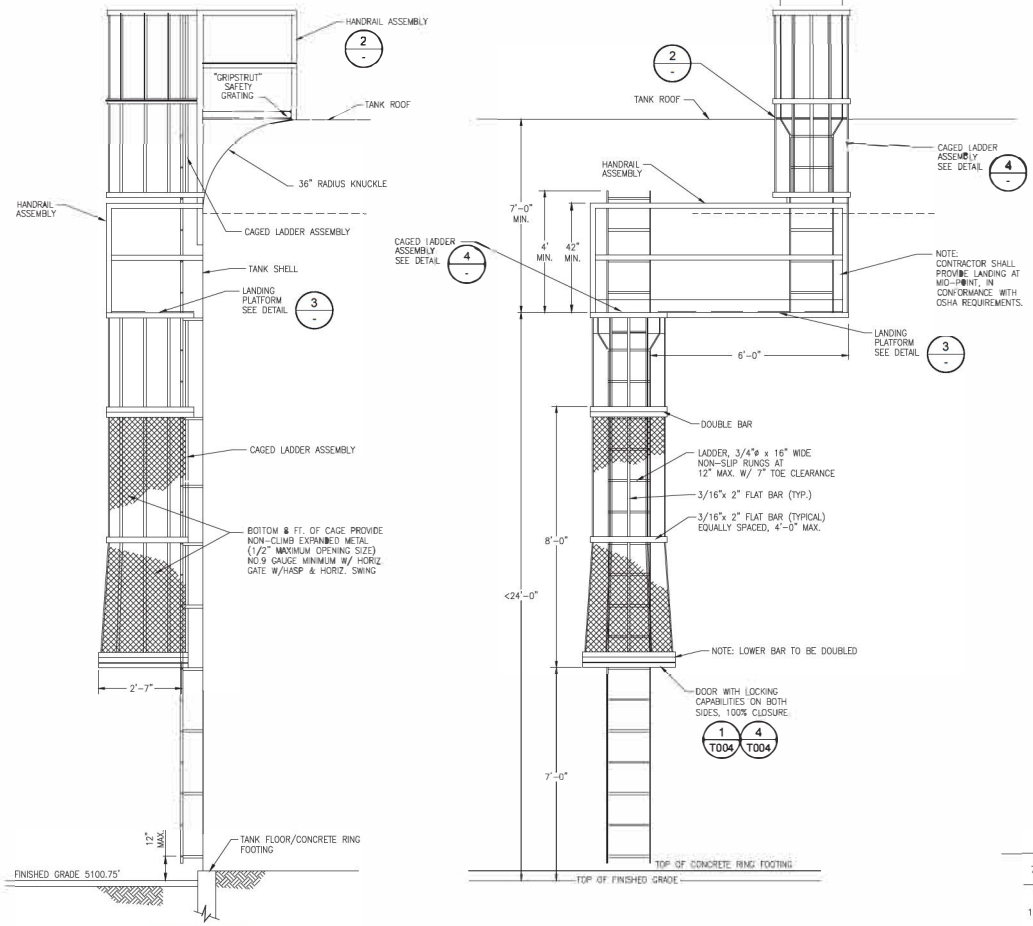
SECTIONS

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Exp: 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
C104
14 OF 36

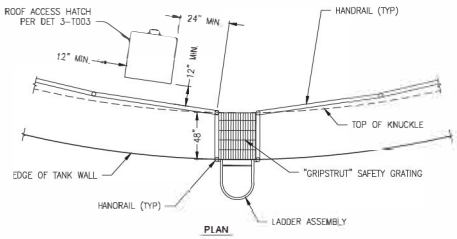
K:\C_Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2_Design\1_CAD\14-0035 C101 SITE PIPING PLAN.dwg
Aug 25, 2023 - 8:35am

WSUP23-0030
EXHIBIT D



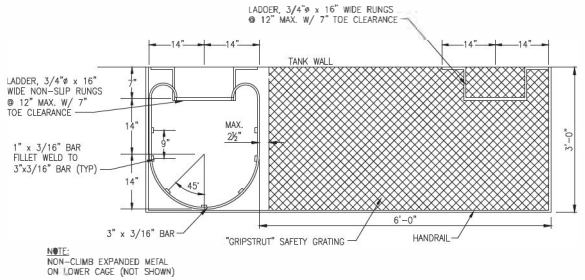
NOTES:
1. PERMANENT EXTERIOR LADDER AND LANDING SHALL BE CONSTRUCTED TO COMPLY WITH THE REQUIREMENTS OF SECTION 304.2.1.2 OF THE 2021 UNIFORM MECHANICAL CODE.
2. DETAIL SHOWN IS CONCEPTUAL IN NATURE. CONTRACTOR IS RESPONSIBLE TO DESIGN THE EXTERIOR LADDERS, LANDINGS, AND CAGES. PROVIDE ADDITIONAL SUPPORTS AS NEEDED TO RESIST WIND AND SEISMIC LOADS. CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS STAMPED BY A NEVADA LICENSED P.E.

EXTERIOR LADDER DETAIL 1 N.T.S.



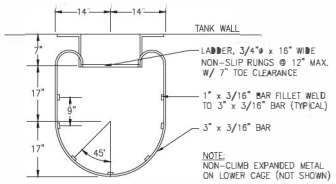
NOTES:
1. FABRICATE HANDRAILS IN ACCORDANCE WITH SEC. 05 52 05.
2. PLAN "B" APPLIES TO ROOFS WITH KNUCKLES ONLY.

ROOF LANDING AND HANDRAIL DETAILS 2 N.T.S.



NOTE:
NON-CLIMB EXPANDED METAL ON LOWER CAGE (NOT SHOWN)

LANDING PLATFORM 3 N.T.S.



LADDER CAGE PLAN 4 N.T.S.

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR Engineering, Inc.
9605 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED J. BELLIN
DRAWN K. GONZALEZ
DATE AUGUST 21, 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

TANK DETAILS - 1

SHEET NUMBER
T001
15 OF 36

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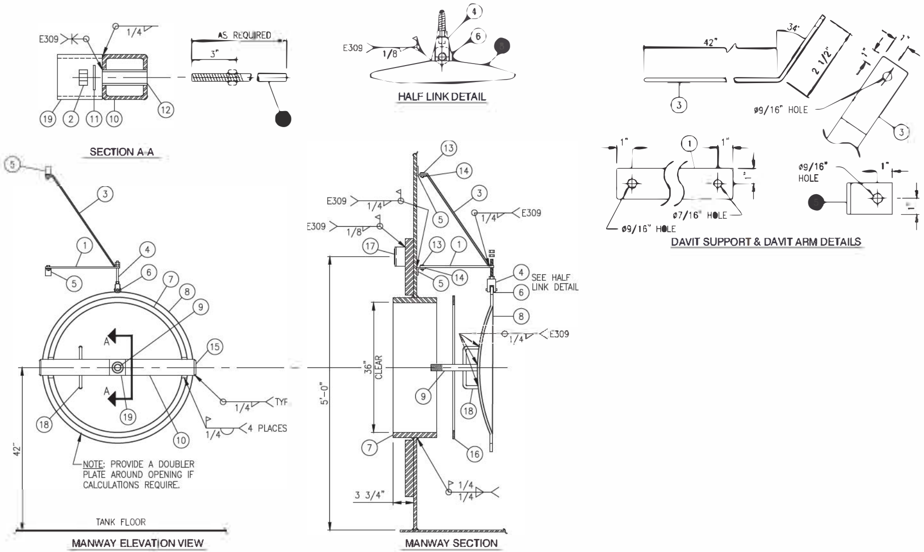
Aug 21, 2023 - 3:09pm

WSUP23-0030
EXHIBIT D


SECTION A-A
HALF LINK DETAIL
DAVIT SUPPORT & DAVIT ARM DETAILS
MANWAY ELEVATION VIEW
MANWAY SECTION
NOTE: PROVIDE A DOUBLER PLATE AROUND OPENING IF CALCULATIONS REQUIRE.
TANK FLOOR
SEE HALF LINK DETAIL
AS REQUIRED
4 PLACES
36" CLEAR
5'-0"
42"
3 3/4"
ø9/16" HOLE
ø7/16" HOLE

NOTES:

1. DETAIL SHOWN IS CONCEPTUAL IN NATURE. CONTRACTOR IS RESPONSIBLE TO DESIGN THE MANWAYS AND SUPPORTS. CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS STAMPED BY A NEVADA LICENSED P.E

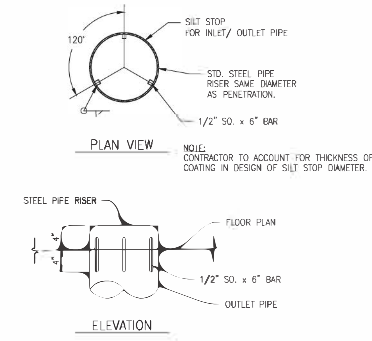
36" DIAMETER MANWAY

N.T.S. 1 -

PROPOSED MATERIAL LIST

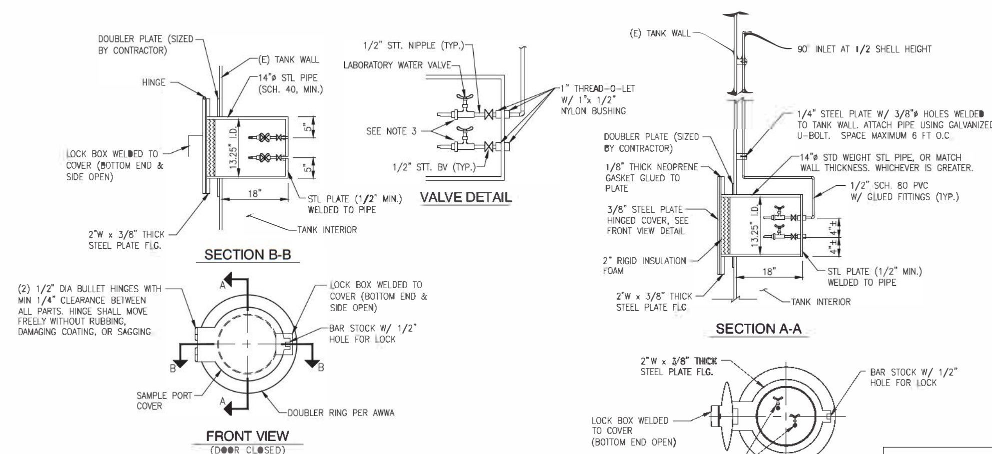
NO	DESCRIPTION	TOTAL QTY.	SPECIFICATIONS
1	FLAT BAR, 3/8" x 2" x 28" LG.	1	SS304
2	HEX NUT, 3/4" HEAVY	1	A307
3	FLAT BAR, 1/4" x 2" x 44 1/2" LG.	1	SS304
4	CLEVIS ROD END w/ THREADED ROD 3/8" x 12" w/(3) NUTS	1	SS304
5	ANGLE, 3 x 3" x 3/8" x 2" LG	2	A36
6	HALF RING, 5/16" x 2 1/4"	1	SS18-8
7	PLATE, 1" x 8 1/2" x 9'-8 1/4" LG. ROLLED TO 36" I.D	1	A573-70
8	40 x 32 FLARED & DISHED HEAD, 3/8" x 32" DISH RAD, 4" FLANGE	1	A36
9	ROUND BAR, 3/4" DIA. LENGTH AS REQUIRED w/ 3" NC T.O.E.	1	SS304
10	SQUARE TUBE SUPPORT, 3" x 3" x 1/4" x 42" LG	1	A500
11	3/4" HEAVY FLAT WASHER	1	A307
12	PIPE, 1" x STD. WT.x 3" LG.	1	SS304
13	BOLT,1/2"-13 NC x 1 1/2" LG. w/ NYLOCK NUT & WASHER	2	SS304
14	NYLON ISOLATING KIT	2	NYLON
15	FLAT BAR END CAP, 2 1/2" x 1/4" x 2 1/2" LG.	2	A36
16	RING GASKET x 1/4" 60 DUROMETER-HARDNESS	1	NSF-61 EPDM
17	STD. AWWA TANK NAMEPLATE (ONE PER TANK) RIVET TO MOUNTING PLATE	1	SS304
18	MANWAYDOOR HANDLE, ø1/2" ROD x 6" x 4"	1	SS304
19	NUTSECURITY COVER, HHS 3 x 3 x 1/4" x 3" LG.	1	SS304

NUMBER REQUIRED IS PER MANWAY (EXCLUDING ITEM 17, WHICH IS PER TANK)
NUMBER OF MANWAYS REQUIRED: 2


120°
SILT STOP FOR INLET/ OUTLET PIPE
STD. STEEL PIPE RISER SAME DIAMETER AS PENETRATION.
1/2" SQ. x 6" BAR
PLAN VIEW
NOTE: CONTRACTOR TO ACCOUNT FOR THICKNESS OF COATING IN DESIGN OF SILT STOP DIAMETER.
STEEL PIPE RISER
FLOOR PLAN
1/2" SQ. x 6" BAR
OUTLET PIPE
ELEVATION

SILT TRAP DETAIL

N.T.S. 2 -


DOUBLER PLATE (SIZED BY CONTRACTOR)
(E) TANK WALL
HINGE
14"ø STL PIPE (SCH. 40, MIN.)
LOCK BOX WELDED TO COVER (BOTTOM END & SIDE OPEN)
STL PLATE (1/2" MIN.) WELDED TO PIPE
2"W x 3/8" THICK STEEL PLATE FLG.
TANK INTERIOR
SECTION B-B
1/2" STT. NIPPLE (TYP.)
LABORATORY WATER VALVE
1" THREAD-O-LET W/ 1"x 1/2" NYLON BUSHING
SEE NOTE 3
1/2" STT. BV (TYP.)
VALVE DETAIL
(2) 1/2" DIA BULLET HINGES WITH MIN 1/4" CLEARANCE BETWEEN ALL PARTS. HINGE SHALL MOVE FREELY WITHOUT RUBBING, DAMAGING COATING, OR SAGGING
LOCK BOX WELDED TO COVER (BOTTOM END & SIDE OPEN)
BAR STOCK W/ 1/2" HOLE FOR LOCK
SAMPLE PORT COVER
DOUBLER RING PER AWWA
FRONT VIEW
(DOOR CLOSED)
(E) TANK WALL
90° INLET AT 1/2 SHELL HEIGHT
1/4" STEEL PLATE W/ 3/8"ø HOLES WELDED TO TANK WALL. ATTACH PIPE USING GALVANIZED U-BOLT. SPACE MAXIMUM 6 FT O.C.
DOUBLER PLATE (SIZED BY CONTRACTOR)
14"ø STD WEIGHT STL PIPE, OR MATCH WALL THICKNESS. WHICHEVER IS GREATER.
1/8" THICK NEOPRENE GASKET GLUED TO PLATE
1/2" SCH. 80 PVC W/ GLUED FITTINGS (TYP.)
3/8" STEEL PLATE HINGED COVER, SEE FRONT VIEW DETAIL
2" RIGID INSULATION FOAM
2"W x 3/8" THICK STEEL PLATE FLG
STL PLATE (1/2" MIN.) WELDED TO PIPE
TANK INTERIOR
SECTION A-A
2"W x 3/8" THICK STEEL PLATE FLG.
BAR STOCK W/ 1/2" HOLE FOR LOCK
LOCK BOX WELDED TO COVER (BOTTOM END OPEN)
LABORATORY WATER VALVE
FRONT VIEW
(DOOR OPEN)

SAMPLE TAP NOTES:

1. INSTALL TAP 54" FROM FINISHED GRADE TO CENTERLINE.
2. LABORATORY WATER VALVE TO BE CHICAGO FAUCETS MODEL 937-CP WITH 204 HANDLE OR APPROVED EQUAL.
3. PROVIDE IDENTIFICATION TAGS FOR SAMPLE VALVES PER SPEC SEC 10 14 00. TAGS TO READ "LOWER" AND "UPPER @ XX FT". WHERE XX IS HEIGHT OF 90° INLET ABOVE TANK FLOOR.

TMWA DOUBLE SAMPLE TAP DETAIL

N.T.S. 3 -

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED J. BELLIN
DRAWN K. GONZALEZ
DATE AUGUST 21, 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

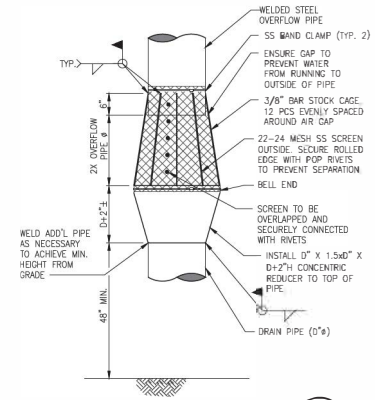
LEMMON VALLEY 1 TANK REBUILD

RENO, NEVADA

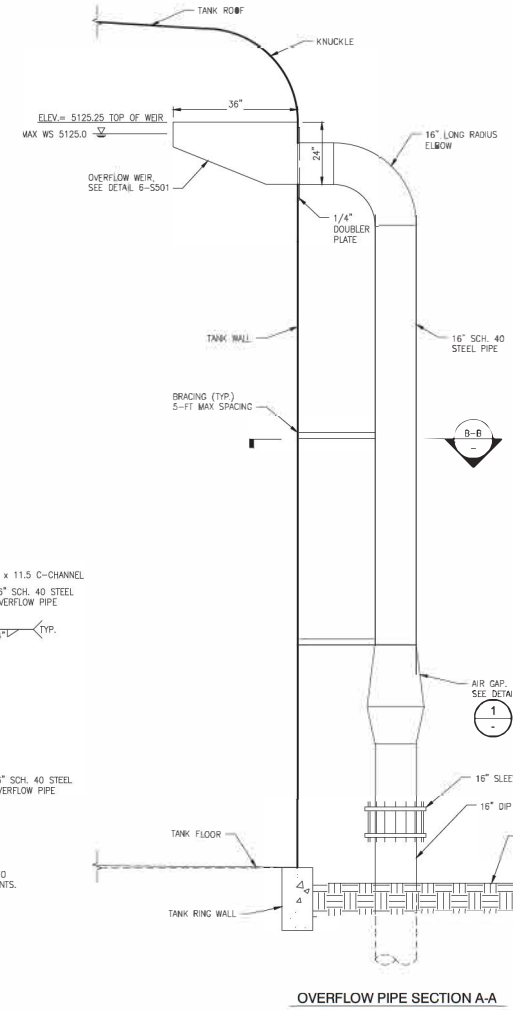
TANK DETAILS - 2

SHEET NUMBER
T002
16 OF 36

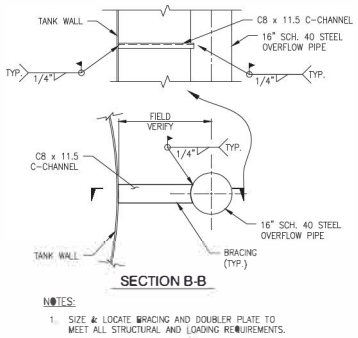
WSUP23-0030
EXHIBIT D



OVERFLOW AIR GAP DETAIL — 1 — N.T.S.



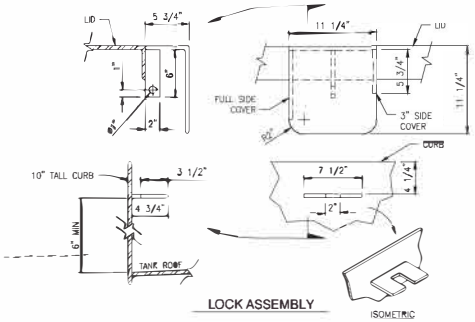
OVERFLOW PIPE SECTION A-A



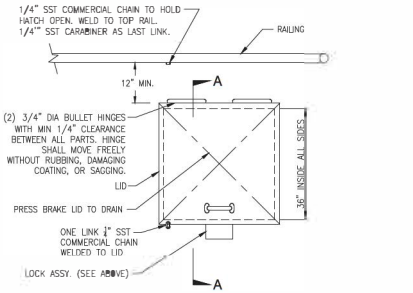
SECTION B-B

NOTES:
1. SIZE & LOCATE BRACING AND DOUBLER PLATE TO MEET ALL STRUCTURAL AND LOADING REQUIREMENTS.

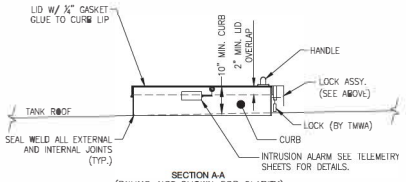
OVERFLOW PIPE DETAIL — 2 — SCALE: 1"=2'-0"



LOCK ASSEMBLY



TOP VIEW



SECTION A-A
(RAILING NOT SHOWN FOR CLARITY)

NOTES:
1. ALL HATCH COMPONENTS TO BE WELDED. NO BOLTS, SCREWS, OR OTHER FASTENERS.
2. LOCKED HATCH SHALL HAVE NO MORE THAN 0.5" PLAY.
3. LID SHALL CLOSE AND LOCK SMOOTHLY WITH COATINGS AND GASKETS IN PLACE, WITHOUT ADDITIONAL FORCE REQUIRED.

36" SQUARE AWWA ROOF HATCH — 3 — N.T.S.

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR Engineering, Inc.
9605 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED J. BELLIN
DRAWN K. GONZALEZ
DATE AUGUST 21, 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

TANK DETAILS - 3

SHEET NUMBER
T003
17 OF 36

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Aug 21, 2023 - 3:58pm

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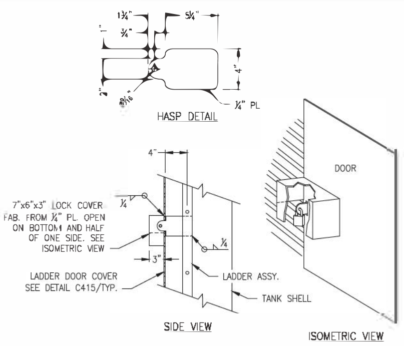
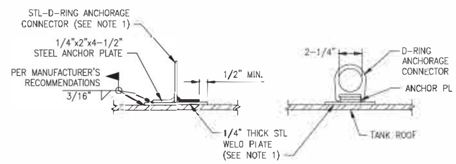
EXHIBIT D



LADDER LOCK DETAIL 1 N.T.S



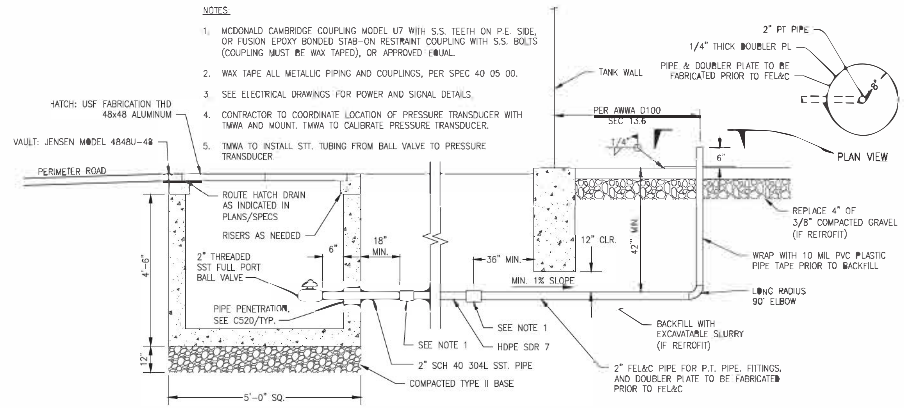
NOTE

1. STEEL D-RING AND PLATE SHALL BE MODEL NO. 2101634 AS MANUFACTURED BY DBI SALA, OR APPROVED EQUAL. THE D-RING AND PLATE SHALL BE COATED AFTER THE PLATE IS WELDED TO THE TANK. THE D-RING SHALL ROTATE FREELY AND SHALL NOT BE WELDED TO THE TANK OR PLATE. COATING SHALL CONFORM TO SPECIFICATIONS.
2. TYPICAL PLACEMENT 3-FT CLEAR OF ADJACENT STRUCTURES, COORDINATE W/ TMWA PROJECT REPRESENTATIVE.

FALL PROTECTION ANCHOR POINT DETAIL 2 N.T.S

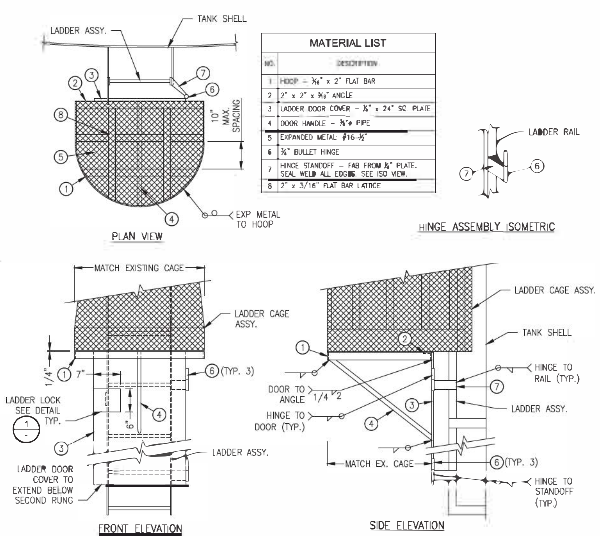
NOTES:

1. MCDONALD CAMBRIDGE COUPLING MODEL U7 WITH S.S. TEETH ON P.E. SIDE, OR FUSION EPOXY BONDED STAB-ON RESTRAINT COUPLING WITH S.S. BOLTS (COUPLING MUST BE WAX TAPED), OR APPROVED EQUAL.
2. WAX TAPE ALL METALLIC PIPING AND COUPLINGS, PER SPEC 40 05 00.
3. SEE ELECTRICAL DRAWINGS FOR POWER AND SIGNAL DETAILS.
4. CONTRACTOR TO COORDINATE LOCATION OF PRESSURE TRANSDUCER WITH TMWA AND MOUNT. TMWA TO CALIBRATE PRESSURE TRANSDUCER.
5. TMWA TO INSTALL STT. TUBING FROM BALL VALVE TO PRESSURE TRANSDUCER



HATCH: USF FABRICATION THD 48x48 ALUMINUM
VAULT: JENSEN MODEL 4848U-48
PERIMETER ROAD
ROUTE HATCH DRAIN AS INDICATED IN PLANS/SPECS
RISERS AS NEEDED
2" THREADED SST FULL PORT BALL VALVE
PIPE PENETRATION, SEE C520/TYP.
4'-6"
12"
5'-0" SQ.
6"
18" MIN.
SEE NOTE 1
2" SCH 40 304L SST. PIPE
COMPACTED TYPE II BASE
TANK WALL
PER AWWA D100 SEC 13.6
1/4"
36" MIN.
MIN. 1% SLOPE
12" CLR.
42" MIN.
SEE NOTE 1
HDPE SDR 7
2" FEL&C PIPE FOR P.T. PIPE, FITTINGS, AND DOUBLER PLATE TO BE FABRICATED PRIOR TO FEL&C
BACKFILL WITH EXCAVATABLE SLURRY (IF RETROFIT)
LONG RADIUS 90° ELBOW
WRAP WITH 10 MIL PVC PLASTIC PIPE TAPE PRIOR TO BACKFILL
REPLACE 4" OF 3/8" COMPACTED GRAVEL (IF RETROFIT)
2" PT PIPE
1/4" THICK DOUBLER PL
PIPE & DOUBLER PLATE TO BE FABRICATED PRIOR TO FEL&C
PLAN VIEW
6"

PRESSURE TRANSDUCER PIPE 3 N.T.S



LADDER ASSY.
TANK SHELL
10" MAX. SPACING
EXP METAL TO HOOP
PLAN VIEW
LADDER RAIL
HINGE ASSEMBLY ISOMETRIC
MATCH EXISTING CAGE
LADDER CAGE ASSY.
1/4"
7"
6 (TYP. 3)
LADDER LOCK SEE DETAIL 1 TYP.
LADDER DOOR COVER TO EXTEND BELOW SECOND RUNG
LADDER ASSY.
FRONT ELEVATION
LADDER CAGE ASSY.
TANK SHELL
DOOR TO ANGLE
HINGE TO DOOR (TYP.)
HINGE TO RAIL (TYP.)
LADDER ASSY.
MATCH EX. CAGE
6 (TYP. 3)
HINGE TO STANDOFF (TYP.)
SIDE ELEVATION

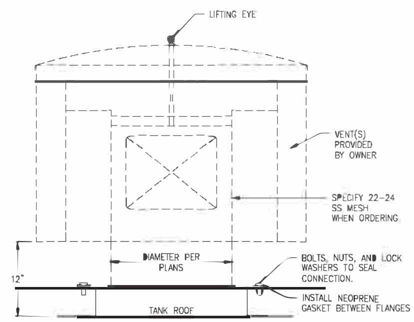
MATERIAL LIST

NO.	DESCRIPTION
1	HOOP - ⅜" x 2" FLAT BAR
2	2" x 2" x ⅜" ANGLE
3	LADDER DOOR COVER - ¼" x 24" SQ. PLATE
4	DOOR HANDLE - ¾"ø PIPE
5	EXPANDED METAL #16-½"
6	⅝" BULLET HINGE
7	HINGE STANDOFF - FAB FROM ¼" PLATE. SEAL WELD ALL EDGES. SEE ISO VIEW.
8	2" x 3/16" FLAT BAR LATTICE

NOTES:

1. ALL GATE COMPONENTS TO BE WELDED. NO BOLTS, SCREWS, OR OTHER FASTENERS.

LADDER SECURITY GATE DETAIL 4 N.T.S



TYPICAL VENT

NOTES:

1. PER NEVADA ADMINISTRATIVE CODE, VENT MESH SHALL BE STAINLESS STEEL WITH 22-24 OPENINGS PER INCH. CONTRACTOR SHALL ENSURE PROPER MESH IS PROVIDED.
2. CONTRACTOR SHALL VERIFY VENT SIZE WITH MANUFACTURER.
3. VENT SHALL BE EQUIPPED WITH A FAIL-SAFE MECHANISM TO ENSURE PROPER OPERATION IN THE EVENT OF A FROZEN OR BLOCKED SCREEN PER AWWA D-100 SECTION 7.5.2.
4. PREP AND PAINT VENT ACCORDING TO SPECIFICATION SECTION 09 96 00.
5. ALLOWABLE VENT IS ALWAYS SAFE TANK VENT BY ADVANCETANK. NO EQUAL.
6. EXISTING FLANGE MAY REQUIRE MODIFICATION TO FIT.
7. VENT FLANGE SHALL BE SEALED TIGHT.

TANK VENT 5 N.T.S.

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AUGUST 21, 2023

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DRAWN K. GONZALEZ
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SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY, RETURN UPON COMPLETION OF PROJECT
(Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

TANK DETAILS - 4

SHEET NUMBER
T004
18 OF 36

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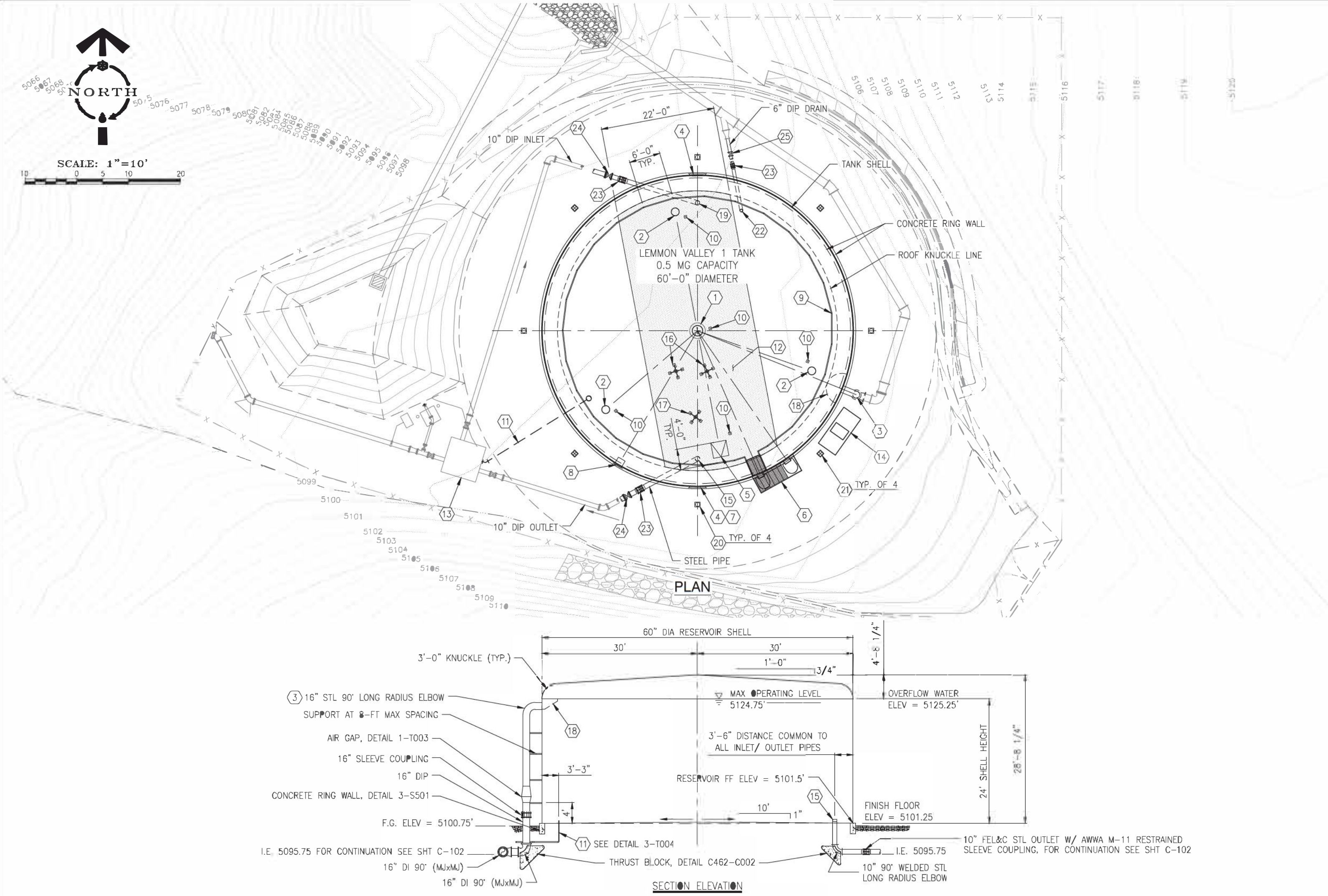
EXHIBIT D



NORTH
SCALE: 1"=10'
10 0 5 10 20
10" DIP INLET
22'-0"
6" DIP DRAIN
6'-0" TYP.
TANK SHELL
CONCRETE RING WALL
ROOF KNUCKLE LINE
LEMMON VALLEY 1 TANK
0.5 MG CAPACITY
60'-0" DIAMETER
4'-0" TYP.
TYP. OF 4
10" DIP OUTLET
TYP. OF 4
STEEL PIPE
PLAN
60" DIA RESERVOIR SHELL
30'
30'
1'-0"
3/4"
4'-8 1/4"
3'-0" KNUCKLE (TYP.)
16" STL 90' LONG RADIUS ELBOW
SUPPORT AT 8-FT MAX SPACING
AIR GAP, DETAIL 1-T003
16" SLEEVE COUPLING
16" DIP
CONCRETE RING WALL, DETAIL 3-S501
F.G. ELEV = 5100.75'
I.E. 5095.75 FOR CONTINUATION SEE SHT C-102
16" DI 90' (MJxMJ)
16" DI 90' (MJxMJ)
MAX OPERATING LEVEL
5124.75'
OVERFLOW WATER
ELEV = 5125.25'
3'-6" DISTANCE COMMON TO
ALL INLET/ OUTLET PIPES
3'-3"
RESERVOIR FF ELEV = 5101.5'
24' SHELL HEIGHT
28'-8 1/4"
10'
1"
FINISH FLOOR
ELEV = 5101.25
SEE DETAIL 3-T004
THRUST BLOCK, DETAIL C462-C002
I.E. 5095.75
10" FEL&C STL OUTLET W/ AWWA M-11 RESTRAINED
SLEEVE COUPLING, FOR CONTINUATION SEE SHT C-102
10" 90' WELDED STL
LONG RADIUS ELBOW
SECTION ELEVATION

TANK PLAN & COMPOSITE ELEVATION (1) SCALE: 1"=10'

KEY NOTES:

1. CENTER VENT PROVIDED BY TMWA, 24-IN DIAMETER, DETAIL 5-T004. CONTRACTOR RESPONSIBLE TO FABRICATE FLANGE TO ACCOMMODATE VENTS. APPLY COATING SYSTEM PER SPEC SECTION 09 96 00.
2. PERIMETER VENT PROVIDED BY TMWA, 18-IN DIAMETER. CONTRACTOR RESPONSIBLE TO FABRICATE FLANGE TO ACCOMMODATE VENTS. DETAIL 5-T004. APPLY COATING SYSTEM SECTION 09 96 00.
3. OVERFLOW AIR GAP, DETAIL 1-T003.
4. INSTALL 36-IN DIA MANWAY, DETAIL 1-T002.
5. 36-IN SQ HINGED ROOF HATCH W/ LOCK BOX FACING TANK CENTER, DETAIL 3-T003
6. EXTERIOR LADDER ASSEMBLY W/ SAFETY CAGE, DETAILS 1&2-T001.
7. INSTALL TANK NAMEPLATE PER DETAIL 1-T002 AND SPEC 10 14 00.
8. SAMPLE TAP, DETAIL 3-T002.
9. GUARDRAIL 162-LF, DETAIL 1-S002.
- FALL PROTECTION ANCHOR POINT, DETAIL 2-T004.
11. 2-IN SENSING PIPE TO PRESSURE TRANSDUCER IN CHECK VALVE VAULT, DETAIL 3-T004
12. AREA SHOWN TO RECEIVE A NON-SLIP COATING. REFER TO SECTION 09 96 00 OF THE SPECIFICATIONS. TAPE EDGE FOR A CLEAN LINE.
13. CHECK VALVE VAULT, DETAIL A-C004.
14. 8'-6"x4'-0" PAD FOR RTU AND BATTERY, DETAILS 6-S002 AND 1-E501
15. 10-IN OUTLET WITH SILT STOP, DETAIL 2-T002
- SOLAR PANEL MAST, DETAIL 3-E500.
17. SCADA ANTENNA MAST, DETAIL 3-E500. COORDINATE LOCATION WITH TMWA.
- OVERFLOW BOX, DETAIL 2-T003.
19. 10-IN FEL&C STEEL INLET.
20. CP MONITORING STATION, SEE SHT CP500
21. CP REFERENCE CELL, SEE SHT CP500
22. 6-IN DRAIN OUTLET.
23. FLEX COUPLING W/ M11 RESTRAINT HARNESS.
24. 10-IN GATE VALVE (MJxMJ).
25. 6-IN GATE VALVE (MJxMJ).

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LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
TANK PLAN AND ELEVATION

SHEET NUMBER
T100
19 OF 36

WSUP23-0030
EXHIBIT D

GENERAL NOTES

1) NO WALL SHALL BE CONSTRUCTED ON AN UNSTABLE SLOPE. IF IT IS DETERMINED IN THE FIELD THAT THE EXISTING SLOPE IS NOT STABLE, THE SLOPE MUST FIRST BE STABILIZED (I.E. MSE, SOIL NAILING OR APPROVED ALTERNATE).THE CONTRACTOR IS RESPONSIBLE FOR STABILITY DURING CONSTRUCTION.

2) PERMANENT BMP'S SHALL BE DESIGNED AND INSTALLED TO CONVEY STORM WATER TO PROPERLY DESIGNED STORM WATER CONTROL SYSTEMS, AND PROVIDE EROSION PROTECTION AT THE TOE OF THE WALL TO PREVENT STORM WATER RUNOFF FROM UNDERCUTTING BASE OF RETAINING WALLS.

3) EROSION CONTROL MEASURES WILL REQUIRE MAINTENANCE OVER THE LIFETIME OF THE DEVELOPMENT AND SHOULD BE CONSIDERED A PRIMARY MAINTENANCE OBJECTIVE.

4) CONSTRUCTION OBSERVATION AND INSPECTIONS:
   a. THE OWNER'S QUALIFIED INSPECTION FIRM SHALL VERIFY THE MATERIALS SUPPLIED BY THE CONTRACTOR MEET ALL THE REQUIREMENTS OF THE SPECIFICATION. THIS INCLUDES ALL SUBMITTALS AND PROPER INSTALLATION OF THE SYSTEM.
   b. THE CONTRACTOR'S FIELD CONSTRUCTION SUPERVISOR SHALL HAVE DEMONSTRATED EXPERIENCE AND BE QUALIFIED TO DIRECT ALL WORK AT THE SITE.

5) GENERAL DEFINITIONS
   c. SEGMENTED RETAINING WALL UNITS: DRY-STACKED COLUMN OF CONCRETE UNITS THAT CREATE THE MASS OF A CONVENTIONAL SEGMENTED RETAINING WALL (SRW). REFER TO DETAIL SHEETS RW-2 AND RW-3.
   d. UNIT DRAINAGE FILL: FREE-DRAINING, COARSE GRAINED AGGREGATES PLACED IN THE CORES AND BETWEEN THE SRW UNITS EXTENDING A MINIMUM LATERAL DISTANCE OF 12-INCHES BEHIND THE TAIL OF THE SRW UNITS . REFER TO TABLE 1 FOR GRADATION REQUIREMENTS). UNIT DRAINAGE FILL SHALL BE FREE OF ORGANIC, CLAY, OR OTHER DELETERIOUS MATERIALS.
   e. REINFORCED SOIL: COMPACTED SOIL (REFER TO TABLE 3) CONFINED BY/BETWEEN GEOGRID REINFORCEMENT APPLICABLE TO REINFORCED SRW SYSTEMS. SRW UNITS AND REINFORCED SOILS ARE TREATED AS A SINGLE HOMOGENOUS ZONE CONTRIBUTING TO THE MASS AND WIDTH OF THE STRUCTURE; THEREFORE, 100% COVERAGE FOR EACH REINFORCED LAYER IS REQUIRED. REFER TO SHEET RW-2 AND RW-3 FOR ADDITIONAL INFORMATION.
   f. EMBEDMENT TRENCH: TRENCH EXCAVATED AT BASE OF RETAINING WALL FOR LEVELING PAD CONSTRUCTION.
   g. LEVELING PAD: LEVEL SURFACE CONSTRUCTED USING COMPACTED TYPE 2, CLASS B AGGREGATE BASE (2012 STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION), USED TO DISTRIBUTE THE WEIGHT OF THE DRY-STACKED COLUMN OF SRW UNITS OVER A WIDER FOUNDATION AREA AND PROVIDE WORKING SURFACE DURING CONSTRUCTION.
   h. FOUNDATION SOIL: SOIL MASS DIRECTLY UNDERLYING THE RETAINING WALL SECTION.
   i. WALL EMBEDMENT : DEPTH OF SRW BELOW THE FINISHED GRADE ELEVATION. THE EMBEDMENT DEPTH SHALL BE A MINIMUM OF 2 FEET FOR FROST PROTECTION.
   j. EXPOSED HEIGHT: PORTION OF SRW ABOVE THE FINISHED GRADE ELEVATION
   k. TOTAL WALL HEIGHT: WALL EMBEDMENT + EXPOSED HEIGHT

CONSTRUCTION NOTES

6) EMBEDMENT TRENCH CONSTRUCTION SHALL INCLUDE:
   a. SUBGRADE SOILS SHALL BE PREPARED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL INVESTIGATION REPORT.
   b. REMEDIAL EARTHWORK (IF REQUIRED) SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL INVESTIGATION REPORT.

8) LEVELING PAD CONSTRUCTION SHALL INCLUDE :
   a. A MINIMUM 6 IN. THICK LAYER OF COMPACTED TYPE 2, CLASS B AGGREGATE BASE (SSPWC) COMPACTED TO AT LEAST 95% RELATIVE COMPACTION. THE RESULTING LEVELING COURSE SHALL BE FIRM, LEVEL BEARING PAD ON WHICH TO PLACE THE FIRST COURSE OF CONCRETE SRW UNITS.
   b. THE LEVELING PAD SHALL EXTEND LATERALLY A MINIMUM OF 6 INCHES IN FRONT OF AND BEHIND THE SRW.

9) SEGMENTED RETAINING WALL (SWR) PLACEMENT
   a. ALL MATERIALS SHALL BE INSTALLED AT THE PROPER ELEVATION AND ORIENTATION AS SHOWN IN THE WALL DETAILS ON THE CONSTRUCTION PLANS. THE SRW UNITS SHALL BE INSTALLED IN GENERAL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE DRAWINGS SHALL GOVERN IN ANY CONFLICT BETWEEN THE TWO REQUIREMENTS. PLACE UNITS ACCORDING TO NCMA'S "SEGMENTAL RETAINING WALL INSTALLATION GUIDE" AND SEGMENTAL RETAINING WALL UNIT MANUFACTURER'S WRITTEN INSTRUCTIONS.
   b. UNITS WITH CHIPPED, DAMAGED, SPALLING, OR STAINED FACES SHALL NOT BE PLACED IN THE RETAINING WALL.
   c. FIRST COURSE OF UNITS SHALL BE PLACED ON THE LEVELING PAD AT THE APPROPRIATE LINE AND GRADE. ALIGNMENT AND LEVEL SHALL BE CHECKED IN ALL DIRECTIONS TO ENSURE THAT ALL UNITS ARE IN FULL CONTACT WITH THE LEVELING COURSE AND PROPERLY SEATED.
   d. TAMP UNITS INTO BASE LEVELING PAD AS NECESSARY TO BRING TOPS OF UNITS INTO A LEVEL PLANE. PLACE UNITS FOR FULL LENGTH OF WALL. PLACE UNITS IN FIRM CONTACT WITH EACH OTHER, PROPERLY ALIGNED AND LEVEL.
   e. FOR SUBSEQUENT UNITS, REMOVE EXCESS FILL AND DEBRIS FROM TOP OF UNITS IN COURSE BELOW. PLACE UNITS IN FIRM CONTACT, PROPERLY ALIGNED AND DIRECTLY ON COURSE BELOW.
   f. PLACE THE FRONT OF THE BLOCKS SIDE-BY-SIDE. DO NOT LEAVE GAPS BETWEEN ADJACENT UNITS. LAYOUT OF CORNERS AND CURVES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
   c. INSTALL SHEAR/CONNECTING DEVICES PER MANUFACTURER'S RECOMMENDATIONS.VERTICAL SETBACK SHALL MEET THE REQUIREMENTS ON THE DETAIL SHEETS.
   d. MAXIMUM HORIZONTAL GAP BETWEEN ERECTED UNITS SHALL BE ≤ 1/2 INCH (13 MM).
   e. PLACE AND COMPACT DRAINAGE FILL WITHIN AND BEHIND WALL UNITS. PLACE AND COMPACT BACKFILL SOIL BEHIND DRAINAGE FILL. FOLLOW WALL ERECTION AND DRAINAGE FILL CLOSELY WITH STRUCTURE BACKFILL.
   f. PRIOR TO PLACEMENT AND COMPACTION OF UNIT DRAINAGE FILL , BACKFILL MAXIMUM STACKED VERTICAL HEIGHT OF SRW UNITS SHALL NOT EXCEED THREE COURSES OR 4 FEET, WHICHEVER IS LESS .

10) SRW UNIT SHEAR CONNECTORS (FIBERGLASS REINFORCEMENT PINS):
   a. PINS SHALL BE CAPABLE OF HOLDING THE GEOGRID IN THE PROPER DESIGN POSITION.
   b. REINFORCEMENT PINS SHALL BE 1/2-INCH (12 MM) DIAMETER THERMOSET ISOPTHALIC POLYESTER RESIN PULTRUDED FIBERGLASS REINFORCEMENT PINS WITH THE FOLLOWING REQUIREMENTS:
   c. FLEXURAL STRENGTH IN ACCORDANCE WITH ASTM D4476: 128,000 PSI (882 MPA) MINIMUM.
   d. SHORT BEAM SHEAR IN ACCORDANCE WITH ASTM D4475: 6,400 PSI (44 MPA) MINIMUM.

11) UNIT DRAINAGE FILL AND BACK-OF-WALL DRAINAGE:
   a. UNIT DRAINAGE FILL SHALL MEET THE REQUIREMENTS OF TABLE 1 AND BE A MINIMUM ONE CUBIC FOOT OF DRAINAGE FILL FOR EACH SQUARE FOOT OF WALL FACE.
   b. BACK-OF-WALL DRAINS (WHERE DETAILED) SHALL CONSIST OF 4" DIAMETER SLOTTED OR PERFORATED PVC DRAIN PIPE OR APPROVED ALTERNATE. THE DRAIN PIPE SHALL BE INSTALLED IN GENERAL ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATIONS AND SLOPED AT LEAST 1% TO DRAIN TO DAYLIGHT SECTION. ALL DRAINAGE PIPES SHALL BE DAYLIGHTED. IN NO CASE SHALL A BACK-DRAIN DEAD-END INTO THE BACK OF WALL.
   c. DAYLIGHTED DRAINAGE LATERALS SHALL BE SPACED AT MAXIMUM 50 FT SPACING ALONG THE WALL FACE. A RODENT GRADE SHALL BE USED ON ALL DAYLIGHTED PIPE ENDS.
   d. A SEPARATION GEOTEXTILE SHALL BE PLACED BETWEEN THE RETAINED BACKFILL AND/OR REINFORCED SOIL AND DRAIN ROCK INTERFACE. THE GEOTEXTILE SHALL BE NON-WOVEN MEETING THE REQUIREMENTS OF TABLE 2 (SEPARATION GEOTEXTILE MINIMUM STRENGTH AND HYDRAULIC PROPERTIES).

12) REINFORCED SOIL BACKFILL SHALL MEET THE SPECIFICATIONS OF TABLE 3, PLACEMENT OF REINFORCED SOIL AND RETAINED BACKFILL SHALL :
   a. BE IN COMPACT LIFTS SUCH THAT DISTURBANCE OF THE SRW ALIGNMENT DOES NOT OCCUR, OVER-COMPACTION OF RETAINED BACKFILL DURING RETAINING WALL CONSTRUCTION SHALL BE AVOIDED. HEAVY CONSTRUCTION EQUIPMENT SHALL NOT BE USED FOR PLACING AND/OR COMPACTING BACKFILL ADJACENT TO THE RETAINING WALL, AND SHOULD BE KEPT A MINIMUM OF THREE FEET OR AT A DISTANCE DETERMINED BY A 1H:1V SLOPE AWAY FROM THE BASE OF THE WALL, WHICHEVER IS GREATER.
   b. REINFORCED SOIL SHALL BE PLACED, SPREAD AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF SLACK IN THE GEOGRID AND INSTALLATION DAMAGE.
   c. REINFORCED SOIL AND RETAINED BACKFILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT TO EXCEED 6 INCHES WHERE HAND COMPACTION IS USED, OR 8 - 10 INCHES WHERE HEAVIER COMPACTION EQUIPMENT IS USED. LIFT THICKNESS SHALL BE FIELD ADJUSTED TO ENSURE DENSIFICATION IS REALIZED THROUGHOUT THE ENTIRE LIFT THICKNESS.ONLY LIGHTWEIGHT HAND-OPERATED EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET FROM THE TAIL THE MODULAR CONCRETE UNITS.
   d. REINFORCED SOIL AND RETAINED BACKFILL SHALL BE COMPACTED TO AT LEAST 90% RELATIVE COMPACTION BASED ON ASTM D1557. MOISTURE CONDITIONING PRIOR TO PLACEMENT IS RECOMMENDED TO ENSURE THE MOISTURE CONTENT OF THE BACKFILL MATERIAL IS UNIFORMLY DISTRIBUTED THROUGHOUT EACH LAYER AT ±2% OF OPTIMUM.
   e. CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY THE GEOGRID REINFORCEMENT. A MINIMUM FILL THICKNESS OF 6 INCHES IS REQUIRED PRIOR TO THE USE OF CONSTRUCTION VEHICLES OVER THE GEOGRID. VEHICLE TURNING SHALL BE KEPT TO A MINIMUM TO PREVENT DISPLACEMENT THE FILL AND DAMAGE TO THE GEOGRID.
   f. AT THE END OF EACH DAY'S OPERATION, THE CONTRACTOR SHALL SLOPE THE LAST LIFT OF REINFORCED SOIL AND RETAINED BACKFILL AWAY FROM THE WALL UNITS TO DIRECT RUNOFF AWAY FROM WALL FACE. THE CONTRACTOR SHALL NOT ALLOW SURFACE RUNOFF FROM ADJACENT AREAS TO ENTER THE WALL CONSTRUCTION SITE.

13) CAP BLOCK PLACEMENT
   a. THE CAP BLOCK AND/OR TOP SRW UNIT SHALL BE BONDED TO THE SRW UNITS BELOW USING AN APPROVED MASONRY CAP ADHESIVE SUCH AS SRW PRODUCTS SUPERIOR STRENGTH SOLVENT (HTTPS://SRWPRODUCTS.COM/PRODUCTS/ADHESIVES/SUPERIOR-STRENGTH-SOLVENT-BASED-ADHESIVE/) OR APPROVED ALTERNATE . THE BLOCK SHALL BE DRY AND SWEPT CLEAN PRIOR TO ADHESIVE PLACEMENT.

14) REFER TO THE PROJECT GEOTECHNICAL INVESTIGATION REPORT (CME, 2023) FOR ADDITIONAL SITE PREPARATION AND FILL PLACEMENT RECOMMENDATIONS.

15) GEOGRID INSTALLATION (REFER TO SHEETS RW-2 AND RW-3 FOR ADDITIONAL DETAILS):
   a. SHALL BE PERFORMED IN GENERAL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. IN ADDITION:
   b. GEOGRID SHALL BE ORIENTED WITH THE HIGHEST STRENGTH AXIS PERPENDICULAR TO THE WALL ALIGNMENT.
   c. GEOGRID REINFORCEMENT SHALL BE PLACED AT THE STRENGTHS, LENGTHS AND ELEVATIONS SHOWN ON THE CONSTRUCTION DESIGN DRAWINGS OR AS DIRECTED BY THE ENGINEER.
   d. THE GEOGRID SHALL BE LAID HORIZONTALLY ON COMPACTED BACKFILL AND ATTACHED TO THE MODULAR WALL UNITS. PLACE THE NEXT COURSE OF MODULAR CONCRETE UNITS OVER THE GEOGRID. THE GEOGRID SHALL BE PULLED TAUT AND ANCHORED PRIOR TO BACKFILL PLACEMENT ON THE GEOGRID.
   e. GEOGRID REINFORCEMENTS SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTHS AND PLACED SIDE-BY-SIDE TO PROVIDE 100% COVERAGE AT EACH LEVEL (UNLESS OTHERWISE NOTED BY MANUFACTURER)
   f. PLACE SOIL REINFORCEMENT IN HORIZONTAL JOINTS OF RETAINING WALL WHERE INDICATED AND ACCORDING TO SOIL-REINFORCEMENT MANUFACTURER'S WRITTEN INSTRUCTIONS.
   g. EMBED REINFORCEMENT WITHIN SRW UNITS PER MANUFACTURER RECOMMENDATIONS AND STRETCH TIGHT OVER COMPACTED BACKFILL. ANCHOR SOIL REINFORCEMENT TO SRW PER BLOCK MANUFACTURERS' RECOMMENDATIONS BEFORE PLACING FILL.
   h. PLACE ADDITIONAL SOIL REINFORCEMENT AT CORNERS AND CURVES OF WALLS TO PROVIDE CONTINUOUS REINFORCEMENT REFER TO DETAILS ON SHEET RW-2. FAILURE TO PROPERLY PLACE GEOGRID IN THESE ZONES MAY RESULT IN UNSATISFACTORY PERFORMANCE OF THE WALL.

16) RECOMMENDED SPECIAL INSPECTION REQUIREMENTS
   h. EMBEDMENT TRENCH AND LEVELING PAD: PERIODIC, INCLUDES FIELD DENSITY TESTING OF BOTH PREPARED SUBGRADE AND LEVELING PAD.
   i. DRAIN INSTALLATION: PERIODIC VISUAL OBSERVATION
   j. GENERAL WALL CONSTRUCTION, DRAINAGE FILL, AND COMPACTION OF BACKFILL: CONTINUOUS FOR GEOGRID REINFORCED WALLS, PERIODIC OBSERVATION FOR GRAVITY WALLS.

17) RELATIVE DENSITY AND MOISTURE CONTENT REQUIREMENTS FOR PLACEMENT OF THE LEVELING PAD AND REINFORCED SOIL AND RETAINED BACKFILL IS INCLUDED IN TABLE 4 ON SHEET RW-1

18) CME'S RETAINING WALL DESIGN INCLUDES A SNOW LOAD OF 31 PSF. DESIGN ASSUMES THAT ALL OTHER SURCHARGE LOADS BEHIND THE WALLS WILL BE A MINIMUM DISTANCE EQUAL TO OR GREATER THAN THE TOTAL WALL HEIGHT. ALTERNATIVELY, IF FOUNDATION LOADS ARE NOT SUFFICIENTLY OFFSET , BUILDING FOUNDATIONS SHALL BE DEEPENED TO REMOVE LOADING FROM THE ZONE OF INFLUENCE OF THE RETAINING WALL. THE "ZONE OF INFLUENCE" SHALL BE APPROXIMATED BY A 1 VERTICAL BY 1 HORIZONTAL (1V:1H) PROJECTION LINE (DOWNWARD AND OUTWARD) FROM THE EXTERIOR EDGE OF THE STRUCTURE FOUNDATION (E.G., "ZONE OF INFLUENCE"). IF THIS ASSUMPTION IS INACCURATE, THE SITE CIVIL DESIGNER SHALL NOTIFY OUR OFFICE IMMEDIATELY TO CONFIRM DESIGN CALCULATIONS.

19) SRW UNIT COLOR AND FINISH SHALL CONFORM TO THE PROJECT SPECIFICATIONS.

20) IF A CONFLICT IN THE PROJECT SPECIFICATIONS AND THE SRW PLAN SET ARE OBSERVED, PLEASE NOTIFY CONSTRUCTION MATERIALS ENGINEERS, INC. TO PROVIDE ADDITIONAL GUIDANCE AND/OR RECOMMENDATIONS.

TABLE 1 : GRADATION REQUIREMENTS FOR UNIT DRAINAGE FILL

SIEVE SIZE	PERCENT PASSING
1 IN	100
3/4 IN	75-100
NO. 4	0-60
NO. 40	0-50
NO. 200	0-5

* SEE GENERAL NOTES 5d, SHEET RW-2 AND RW-3 FOR ADDITIONAL INFORMATION

TABLE 2 : SEPARATION GEOTEXTILE MINIMUM STRENGTH AND HYDRAULIC PROPERTIES

TRAPEZOID TEAR STRENGTH (ASTM D 4533)	80 LBS
PUNCTURE STRENGTH (ASTM D 4833)	80 LBS
GRAB STRENGTH (ASTM D 4632)	200 LBS
BURST STRENGTH (ASTM D 3786)	250 PSI
MINIMUM PERMITTIVITY (ASTM D 4491)	>0.2 SEC
APPARENT OPENING SIZE (ASTM D 4751)	<0.25 MM

TABLE 3: SPECIFICATIONS FOR REINFORCED SOIL BACKFILL

SIEVE SIZE	PERCENT PASSING BY WEIGHT
4-INCH	100
2.5 INCH	100
NO. 40	30-50
NO. 200	15-30

MAXIMUM LIQUID LIMIT	MINIMUM INTERNAL FRICTION ANGLE (ø)	MAXIMUM PLASTIC INDEX
45	34°	25

ASTM TEST METHODS D6913, D4318, D3080

TABLE 4 : MINIMUM RELATIVE DENSITY REQUIREMENTS (ASTM D1557)

MATERIAL TYPE	MATERIAL SPECIFICATION	MINIMUM RELATIVE DENSITY	ACCEPTABLE MOISTURE CONTENTS
LEVELING COURSE	TYPE 2, CLASS B AGGREGATE BASE (SECTION 200.00-1 OF 2012 SSPWC)	95%	±2 % OF OPTIMUM
REINFORCED SOIL	REFER TO TABLE 3 (SHEET RW-1)	90%	±2 % OF OPTIMUM
RETAINED BACKFILL	IN-PLACE NATIVE ONSITE SOIL/BEDROCK	90% (**REQUIRED FOR FILL ONLY**)	±2 % OF OPTIMUM

GENERAL GUIDANCE FOR TEMPORARY CUT SLOPES [OSHA PART 1926, VOLUME 54, NUMBER 209 OF THE FEDERAL REGISTER (TABLE B-1, OCTOBER 31, 1989)]

SOIL OR ROCK TYPE	DESCRIPTION	MAXIMUM ALLOWABLE TEMPOARY SLOPE	
STABLE BEDROCK	NATURAL SOLID MINERAL MATTER THAT CAN BE EXCAVATED WITH VERTICAL SIDES AND REMAIN INTACT WHILE EXPOSED. IT IS USUALLY IDENTIFIED BY A ROCK NAME SUCH AS GRANITE OR SANDSTONE. DETERMINING WHETHER A DEPOSIT IS OF THIS TYPE MAY BE DIFFICULT UNLESS IT IS KNOWN WHETHER CRACKS EXIST AND WHETHER ORNOT THE CRACKS RUN INTO ORAWAY FROM THE EXCAVATION.	Vertical	90°
TYPE A	COHESIVE SOILS WITH AN UNCONFINED COMPRESSIVE STRENGTH OF 1.5 TONS PER SQUARE FOOT (TSF) (144 KPA) OR GREATER. EXAMPLES OF TYPE A COHESIVE SOILS ARE OFTEN CLAY SILTY CLAY, SANDY CLAY, CLAY LOAM AND, IN SOME CASES, SILTY CLAY LOAM AND SANDY CLAY LOAM. (NO SOIL IS TYPE A IF IT IS FISSURED, IS SUBJECT TO VIBRATION OF ANY TYPE, HAS PREVIOUSLY BEEN DISTURBED, IS PART OF A SLOPED, LAYERED SYSTEM WHERE THE LAYERS DIP INTO THE EXCAVATION ON A SLOPE OF 4 HORIZONTAL TO 1 VERTICAL (4H:1V) OR GREATER, OR HAS SEEPING WATER.	3H:4V	53°
TYPE B	COHESIVE SOILS WITH AN UNCONFINED COMPRESSIVE STRENGTH GREATER THAN 0.5 TSF (48 KPA) BUT LESS THAN 1.5 TSF (144 KPA). EXAMPLES OF OTHER TYPE B SOILS ARE: ANGULAR GRAVEL, SILT, SILT LOAM, PREVIOUSLY DISTURBED SOILS UNLESS OTHERWISE CLASSIFIED AS TYPE C, SOILS THAT MEET THE UNCONFINED COMPRESSIVE STRENGTH OR CEMENTATION REQUIREMENTS OF TYPE A SOILS BUT ARE FISSURED OR SUBJECT TO VIBRATION; DRY UNSTABLE ROCK; AND LAYERED SYSTEMS SLOPING INTO THE TRENCH AT A SLOPE LESS THAN 4H:1V (ONLY IF THE MATERIAL WOULD BE CLASSIFIED AS A TYPE B SOIL).	1H:1V	45°
TYPE C	COHESIVE SOILS WITH AN UNCONFINED COMPRESSIVE STRENGTH OF 0.5 TSF (48 KPA) OR LESS. OTHER TYPE C SOILS INCLUDE GRANULAR SOILS SUCH AS GRAVEL, SAND AND LOAMY SAND. SUBMERGED SOIL, SOIL FROM WHICH WATER IS FREELY SEEPING, AND SUBMERGED ROCK THAT IS NOT STABLE. ALSO INCLUDED IN THIS CLASSIFICATION IS MATERIAL IN A SLOPED, LAYERED SYSTEM WHERE THE LAYERS DIP INTO THE EXCAVATION OR HAVE A SLOPE OF FOUR HORIZONTAL TO ONE VERTICAL (4H:1V) OR GREATER. LAYERED GEOLOGICAL STRATA. WHERE SOILS ARE CONFIGURED IN LAYERS, I.E., WHERE A LAYERED GEOLOGIC STRUCTURE EXISTS, THE SOIL MUST BE CLASSIFIED ON THE BASIS OF THE SOIL CLASSIFICATION OF THE WEAKEST SOIL LAYER. EACH LAYER MAY BE CLASSIFIED INDIVIDUALLY IF A MORE STABLE LAYER LIES BELOW A LESS STABLE LAYER. I.E., WHERE A TYPE C SOIL RESTS ON TOP OF STABLE ROCK.	3H:2V	34°

* REFER TO PROJECT GEOTECHNICAL INVESTIGATION REPORT FOR ADDITIONAL INFORMAITON

Stella A. Hardy Digitally signed by Stella A. Hardy Date: 2023.04.03 08:33:33 -07'00'

STELLA A. HARDY CIVIL

REVISION NO. | DATE | COMMENT

CME CONSTRUCTION MATERIALS ENGINEERS INC. 360 SIERRA MANOR DRIVE SUITE 1 RENO, NEVADA 89511

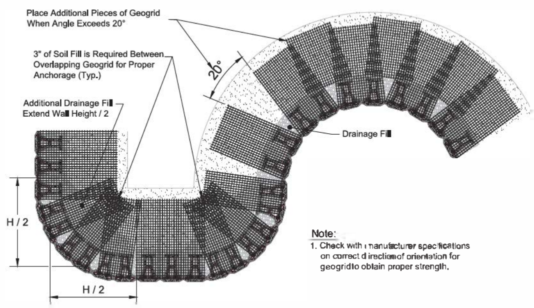
TRUCKEE MEADOWS WATER AUTHORITY
LEMMON VALLEY WATER TANK RETAINING WALL
GENERAL NOTES AND TYPICAL SRW WALL DETAILS
WASHOE COUNTY APN 080-730-18
PROJECT NO. 3152

SHEET
RW-1

WSUP23-0030
EXHIBIT D

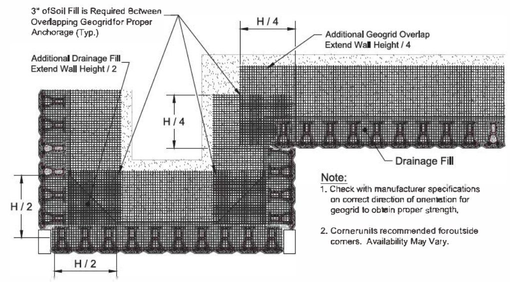
NOTES:

1) REFER TO CIVIL PLANS FOR GENERAL WALL GEOMETRY INCLUDING EXPOSED HEIGHT, TOP OF WALL AND BOTTOM OF WALL ELEVATION, AND BACKSLOPE.
2) SRW REINFORCED BACKFILL GEOGRID DESIGN IS BASED ON MIRAFI MIRAGRID 3XT.
3) RELATIVE DENSITY AND MOISTURE CONTENT REQUIREMENTS FOR PLACEMENT OF THE LEVELING PAD AND REINFORCED SOIL IS INCLUDED ON SHEET RW-1.
4) TYPICAL DETAILS PRESENTED ON RW-2 WERE COMPILED USING BASALITE TYPICAL DETAILS AND GENERAL PRODUCT SPECIFICATIONS. MODIFICATIONS TO THE STANDARD DETAILS WERE COMPLETED BY CONSTRUCTION MATERIALS ENGINEERS, INC. (CME). PLEASE CONTACT OUR OFFICE IF CLARIFICATION OF DETAILS, NOTES, SPECIFICATIONS, OR TABLES PRESENTED HEREIN ARE REQUIRED.
5) REFER TO MANUFACTURER RECOMMENDATIONS FOR INSTALLATION (HTTPS://BASALITE.COM).



Place Additional Pieces of Geogrid When Angle Exceeds 20°
3" of Soil Fill is Required Between Overlapping Geogrid for Proper Anchorage (Typ.)
Additional Drainage Fill Extend Wall Height / 2
20°
Drainage Fill
H / 2
H / 2
Note:
1. Check with manufacturer specifications on correct direction of orientation for geogrid to obtain proper strength.

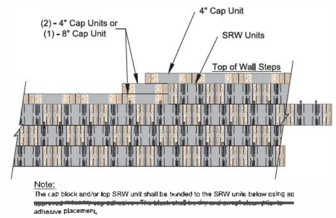
Geogrid Installation on Curves



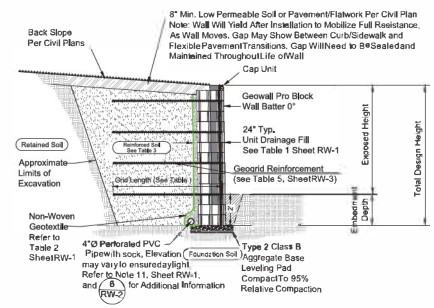
3" of Soil Fill is Required Between Overlapping Geogrid for Proper Anchorage (Typ.)
Additional Drainage Fill Extend Wall Height / 2
H / 4
Additional Geogrid Overlap Extend Wall Height / 4
H / 4
Drainage Fill
H / 2
H / 2
Note:
1. Check with manufacturer specifications on correct direction of orientation for geogrid to obtain proper strength.
2. Corner units recommended for outside corners. Availability May Vary.

Geogrid Installation at Corners

1 RW-2 TYPICAL GEOGRID INSTALLATION AT CORNERS AND CURVES
N.T.S

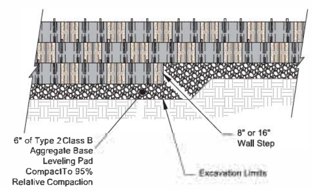


2 RW-2 TYPICAL WALL CAP DETAIL WITH STEPPED CONFIGURATION
N.T.S

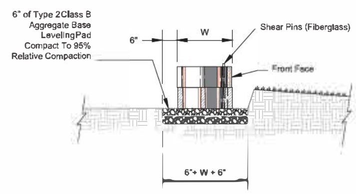


Back Slope Per Civil Plans
8" Min. Low Permeable Soil or Pavement/Flatwork Per Civil Plan
Note: Wall Will Yield After Installation to Mobilize Full Resistance. As Wall Moves, Gap May Show Between Curb/Sidewalk and Flexible Pavement Transitions. Gap Will Need to Be Sealed and Maintained Throughout Life of Wall
Cap Unit
Geowall Pro Block Wall Batter 0°
24" Typ. Unit Drainage Fill See Table 1 Sheet RW-1
Geogrid Reinforcement (see Table 5, Sheet RW-3)
Retained Soil
Reinforced Soil See Table 3
Approximate Limits of Excavation
Grid Length (See Table)
Non-Woven Geotextile Refer to Table 2 Sheet RW-1
4"Ø Perforated PVC Pipe with sock. Elevation may vary to ensure daylight. Refer to Note 11, Sheet RW-1, and 6 RW-2 for Additional Information
Foundation Soil
Type 2 Class B Aggregate Base Leveling Pad Compact To 95% Relative Compaction
Exposed Height
Total Design Height
Embedment Depth

4 RW-2 TYPICAL GEOGRID REINFORCED WALL SECTION AND SCHEDULE
N.T.S

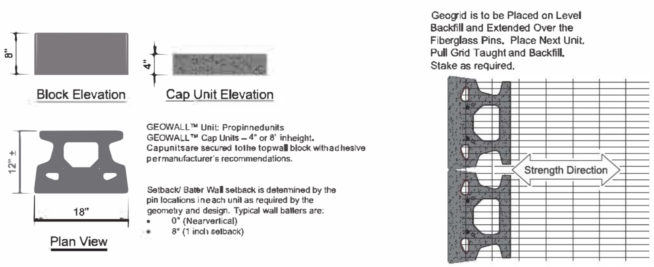


Elevation



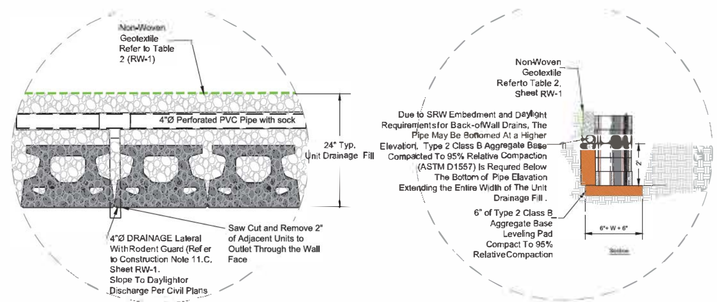
Section

3 RW-2 TYPICAL AGGREGATE BASE LEVELING PAD DETAIL
N.T.S



8"
Block Elevation
4"
Cap Unit Elevation
12" ±
18"
Plan View
GEOWALL™ Unit: Pro pinned units
GEOWALL™ Cap Units – 4" or 8" in height.
Cap units are secured to the top wall block with adhesive per manufacturer's recommendations.
Setback/ Batter: Wall setback is determined by the pin locations in each unit as required by the geometry and design. Typical wall batters are:
• 0" (Near vertical)
• 8" (1 inch setback)
Geogrid is to be Placed on Level Backfill and Extended Over the Fiberglass Pins. Place Next Unit. Pull Grid Taught and Backfill. Stake as required.
Strength Direction

5 RW-2 TYPICAL SRW UNIT DETAIL
N.T.S



Non-Woven Geotextile Refer to Table 2 (RW-1)
4"Ø Perforated PVC Pipe with sock
24" Typ. Unit Drainage Fill
4"Ø DRAINAGE Lateral With Rodent Guard (Refer to Construction Note 11.C, Sheet RW-1. Slope To Daylight or Discharge Per Civil Plans
Saw Cut and Remove 2" of Adjacent Units to Outlet Through the Wall Face
Non-Woven Geotextile Refer to Table 2, Sheet RW-1
Due to SRW Embedment and Daylight Requirements for Back-of-Wall Drains, The Pipe May Be Bottomed At a Higher Elevation. Type 2 Class B Aggregate Base Compacted To 95% Relative Compaction (ASTM D1557) Is Required Below The Bottom of Pipe Elevation Extending the Entire Width of The Unit Drainage Fill.
6" of Type 2 Class B Aggregate Base Leveling Pad Compact To 95% Relative Compaction
6" + W + 6"

6 RW-2 TYPICAL BACK-OF-WALL DRAIN AND DAYLIGHT REQUIREMENTS
N.T.S

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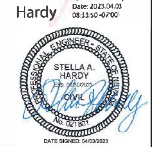


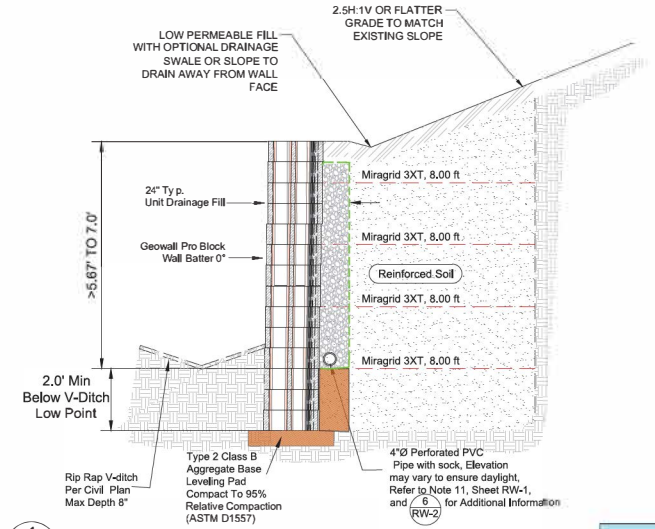
REVISION NO. | DATE | COMMENT

TRUCKEE MEADOWS WATER AUTHORITY
LEMMON VALLEY WATER TANK RETAINING WALL
SRW TYPICAL DETAILS AND NOTES
WASHOE COUNTY 080-730-18
PROJECT NO.: 3182 DATE: 01/03/2023

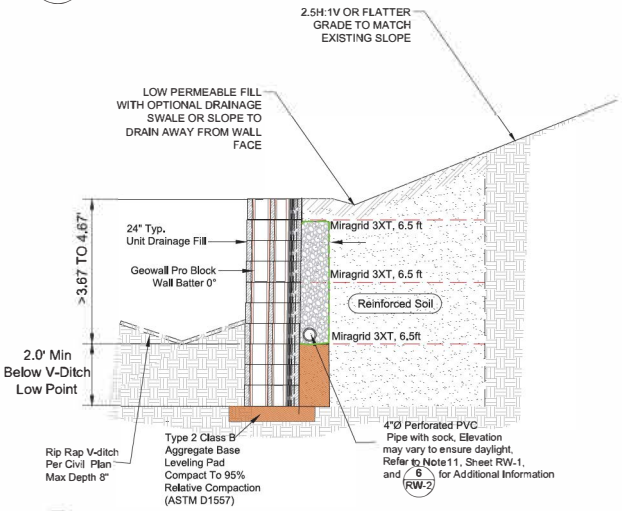
CME CONSTRUCTION MATERIALS ENGINEERS INC.
300 SIERRA MANOR DRIVE, SUITE 1
RENO, NEVADA 89511

SHEET
RW-2

WSUP23-0030
EXHIBIT D



1 RW-3 TYPICAL SRW WALL SECTION EXPOSED HEIGHT >5.67' TO 7.0'
(N.T.S)



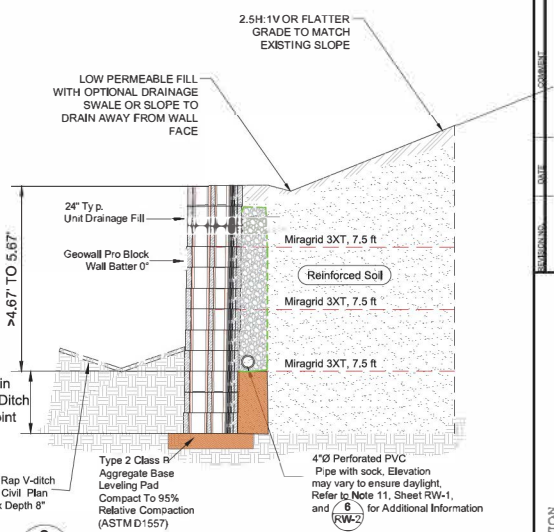
3 RW-3 TYPICAL SRW WALL SECTION EXPOSED HEIGHTS >3.67' TO 4.67"
(N.T.S)

TABLE 5: GEOGRID REINFORCEMENT SCHEDULE

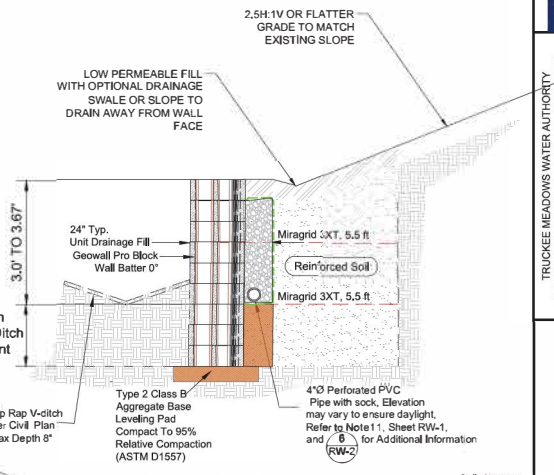
EXPOSED WALL HEIGHT (FT)	TOTAL WALL HEIGHT INCLUDING EMBEDMENT (FT)	BACKSLOPE ANGLE	NUMBER OF GEOGRID LAYERS	GEOGRID LAYER ELEVATIONS FROM TOP OF LEVELING PAD (FT)	MINIMUM GEOGRID EMBEDMENT LENGTH (FT)	GRID TYPE	GEOGRID VERTICAL SPACING (FT)
>5.67' TO 7.0	>8.3 TO 9.67	2.5H:1VOR FLATTER	4	2.0, 4.0, 6.0, 8.0	8.0	MIRAFI 3XT	2.0
>4.67' TO 5.67'	>7.3 TO 8.3	2.5H:1VOR FLATTER	3	2.0, 4.0, 6.0	7.5		
>3.67' TO 4.67'	>6.3 TO 7.3	2.5H:1VOR FLATTER	3	2.0, 4.0, 6.0	6.5		
3.0 TO 3.67	5.67 TO 6.3	2.5H:1VOR FLATTER	2	2.0, 4.0	5.5		
LESS THAN 3.0	LESS THAN 5.67	2.5H:1VOR FLATTER	1	2.0	4.5		

NOTES:

1. TO MAINTAIN 100% LAYER COVERAGE FOR GEOGRID PLACEMENT, 1ST LAYER OF GEOGRID MUST BE PLACE DAT THE TOP INTERFACE OF THE 3RD BLOCK UP FROM THE LEVELING COURSE AND CONTINUE AT 2 FOOT VERTICAL INTERVAL SPACINGS UNTIL THE TOTAL NUMBER OF LAYERS HAVE BEEN INSTALLED.
2. DEPTH OF GEOGRID EMBEDMENT WILL VARY BASED ON TOP OF WALL ELEVATION AND BLOCK SIZE, CALCULATIONS SUPPORT MAXIMUM EXPOSED WALL HEIGHT OF UP TO 7.0 FEET .
3. THE LENGTH OF GEOGRID REINFORCEMENT VARIES BY WALL HEIGHT TO LIMIT THE NEED FOR UNNECESSARY CUT ALONG THE BEDROCK SLOPE. CARE SHOULD BE TAKEN DURING CONSTRUCTION TO ENSURE THE APPROPRIATE LENGTHS OF GEOGRID REINFORCEMENT HAVE BEEN IMPLEMENTED INTO THE DESIGN. IN NO CASE SHALL THE GEOGRID LENGTHS BE LESS THAN THE MINIMUM PRESENTED ON THE PLAN SET.
4. WHERE A V-DITCH OR SWALE WILL BE LOCATED WITHIN 5 FEET LATERALLY OF THE BASE OF THE WALL, THE DEPTH OF WALL EMBEDMENT SHALL BE INCRESED IN DEPTH EQUAL TO THE DEPTH OF THE V-DITCH OR SWALE.



2 RW-3 TYPICAL SRW WALL SECTION EXPOSED HEIGHTS >4.67' TO 5.67'
(N.T.S)



4 RW-3 TYPICAL SRW WALL SECTION EXPOSED HEIGHT 3.0 TO 3.67
(N.T.S)

CONSTRUCTION MATERIALS ENGINEERS INC.
CME
5190 NEIL ROAD, SUITE 111
RENO, NEVADA 89502

TRUCKEE MEADOWS WATER AUTHORITY
LEMMON VALLEY WATER TANK RETAINING WALL
SRW TYPICAL WALL SECTIONS
WASHOE COUNTY 866-30-48
PROJECT NO. 1810

Stella A. Hardy

SHEET
RW-3

WSUP23-0030
EXHIBIT D

GENERAL STRUCTURAL NOTES (GSN)

GENERAL

G1. SCOPE
THE NOTES ON THIS SHEET AND THE STANDARD STRUCTURAL DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT WHETHER SPECIFICALLY CALLED OUT OR NOT, EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY ON THE STRUCTURAL SHEETS. IF THERE ARE QUESTIONS, THEY SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER AND ANSWERED IN WRITING PRIOR TO CONSTRUCTION.

G2. APPLICABLE SPECIFICATIONS AND CODES
A. 2018 INTERNATIONAL BUILDING CODE (IBC 2018) WITH APPLICABLE EDITIONS OF THE CODE REFERENCED STANDARDS AND WITH NORTHERN NEVADA AMENDMENTS.
B. 2016 MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURE (ASCE 7-16)
C. 2014 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-14)
D. 2016 STEEL CONSTRUCTION MANUAL, 15TH ED (AISC 360-16)
E. 2011 WELDED CARBON STEEL TANKS FOR WATER STORAGE (AWWA D100-11)

G3. DESIGN CRITERIA
A. DEAD LOAD: ACTUAL TRIBUTARY STRUCTURE WEIGHT
B. LIVE LOAD:
1. RESERVOIR ROOF (PER AWWA D100): = 15 PSF
C. WIND:
1. ULTIMATE WIND SPEED = 135 MPH
2. ALLOWABLE STRESS WIND SPEED: = 104 MPH
3. EXPOSURE = C
4. IMPORTANCE FACTOR: = 1.15
4. STRUCTURE IS ENCLOSED.
D. SEISMIC
1. WELDED CARBON STEEL WATER STORAGE TANK
a. OCCUPANCY CATEGORY: = IV
b. IMPORTANCE FACTOR: = 1.50
c. SITE CLASS: = C
d. SPECTRAL RESPONSE ACCELERATION: SS = 1.456
e. SPECTRAL RESPONSE ACCELERATION S1 = 0.495
f. SPECTRAL RESPONSE COEFFICIENT: SDS = 1.165
g. SPECTRAL RESPONSE COEFFICIENT: SD1 = 0.495
h. SEISMIC DESIGN CATEGORY = D
i. ANALYSIS PROCEDURE = AWWA D100
E. SNOW LOAD:
1. GROUND SNOW LOAD: = 31 PSF
2. EXPOSURE FACTDR: C_e = 0.9
3. THERMAL FACTOR C_t = 1.0
4. ROOF SLOPE FACTOR: C_s = 1.0
5. IMPORTANCE FACTOR: I_s = 1.2

G4. SAFETY
SAFETY AND STRUCTURE STABILITY DURING CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. STRUCTURES HAVE BEEN DESIGNED TO RESIST CODE FORCES AS A COMPLETED STRUCTURE. THE TANK SHELL SHALL BE SHORED AS REQUIRED TO RESIST CODE FORCES AT ALL TIMES DURING CONSTRUCTION. PROVIDE STIFFENERS AROUND ANY TEMPORARY ACCESS OPENING CUT INTO THE SHELL.

G5. SPECIAL INSPECTIONS
SPECIAL INSPECTIONS ARE REQUIRED IN ACCORDANCE WITH CHAPTER 1 AND CHAPTER 17 OF THE IBC. PAYMENT FOR THESE INSPECTIONS IS NOT THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE FOR FULL ACCESS TO THE WORK BY THE SPECIAL INSPECTOR AND SHALL PROVIDE FOR THESE INSPECTIONS IN THE CONSTRUCTION SCHEDULE IN ACCORDANCE WITH THE CITY OF RENO REQUIREMENTS. A STATEMENT OF RESPONSIBILITY SHALL BE SUBMITTED UNDER SEPARATE COVER WITH THE PERMIT APPLICATION AS REQUIRED UNDER IBC SECTION 1704. SPECIAL INSPECTIONS ARE REQUIRED FOR THE FOLLOWING WORK:
A. TANK COATING SYSTEM
B. STRUCTURAL WELDING
C. CONCRETE

G6. STANDARD STRUCTURAL DETAILS
THE STANDARD STRUCTURAL DETAILS DEPICT TYPICAL DETAILING TO BE USED ON THIS PROJECT. CONDITIONS NOT EXPLICITLY SHOWN ON THE DRAWINGS SHALL BE MADE SIMILAR TO THE STANDARD STRUCTURAL DETAILS SHOWN. OBTAIN APPROVAL OF THE ENGINEER IN WRITING FOR SIMILAR CONDITIONS PRIOR TO CONSTRUCTION.

G7. CONFLICTS
IN CASES WHERE CONFLICTS OCCUR BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE MOST STRINGENT REQUIREMENTS SHALL APPLY FOR BID PURPOSES, UNLESS OTHERWISE RESOLVED IN WRITING DURING THE BID PHASE.

G8. GEOTECHNICAL
THE FOLLOWING NON-CONTRACTUAL GEOTECHNICAL REPORT WAS DEVELOPED FOR THIS PROJECT AND IS THE BASIS OF THE STRUCTURAL DESIGN:
NAME OF GEOTECHNICAL FIRM: CONSTRUCTION MATERIALS ENGINEERS, INC
ADDRESS: 300 SIERRA MANOR DRIVE, SUITE 1, RENO, NEVADA 89511
REPORT NUMBER: 3152
REPORT DATE: FEBRUARY 1, 2023
A. ALLOWABLE NET SOIL BEARING PRESSURE = 4500 PSF (SUSTAINED LOADS)
= 6000 PSF (WIND/SEISMIC LOADS)
B. ACTIVE LATERAL EARTH PRESSURE = 35 PSF
C. PASSIVE LATERAL EARTH PRESSURE = 300 PSF
D. COEFFICIENT OF FRICTION = 0.48

G9. TANK FOUNDATION
SUBGRADE PREPARATION BELOW TANK AND CONCRETE RINGWALL SHALL BE PER THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT REFERENCED ABOVE. BACKFILL BELOW TANK INSIDE OF CONCRETE RINGWALL TO 8 INCHES MINIMUM THICKNESS WITH AB COURSE CONFORMING TO ASTM C33, SIZE #7 AND COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM D698 AND 4 INCHES MINIMUM FINAL THICKNESS OF OILED SAND.

STEEL

S1. DESIGN STRENGTHS
SQUARE OR RECTANGULAR HSS: Fy=46 KSI
PIPE: Fy=35 KSI
ALL OTHER PLATES AND SHAPES: Fy=36 KSI

S2. DIMENSIONS
TO CENTERLINES OF COLUMNS AND BEAMS, TOP SURFACES OF BEAMS AND TUBES AND BACKS OF CHANNELS AND ANGLES UNO

S3. ELEVATIONS
TOP OF STEEL REFERS TO TOP SURFACE OF MEMBER OR FLANGE UNO

S4. WHEN FILLET WELD SIZE IS NOT INDICATED, PROVIDE MAXIMUM WELD SIZE BASED ON MATERIAL THICKNESS IN ACCORDANCE WITH AISC AND AWWA SPECIFICATIONS

S5. CONFORM TO AISC 360, STEEL CONSTRUCTION MANUAL.

CONCRETE

C1. DESIGN STRENGTHS:
$f'c$ = 4,000 PSI
fy = 60,000 PSI

C2. CONCRETE COVER
UNLESS OTHERWISE NOTED OR SHOWN, PROVIDE CONCRETE COVER FOR REINFORCING AS FOLLOWS:
CONCRETE DEPOSITED AGAINST EARTH 3 IN
ALL OTHER: 2 IN
SEE DRAWINGS FOR EXCEPTIONS

C3. ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE ACI MANUAL OF STANDARD PRACTICE. SEE SPECIFICATIONS FOR ADDITIONAL REINFORCING PLACEMENT REQUIREMENTS.

C4. PROVIDE 3/4 IN CHAMFERS AT ALL EXPOSED EDGES. NOT ALL CHAMFERS MAY BE SHOWN ON DRAWINGS.

C5. ABSOLUTELY NO WELDING OF REINFORCING BARS OR USING HEAT TO BEND REINFORCING BARS SHALL BE ALLOWED WITHOUT SPECIFIC APPROVAL FROM THE STRUCTURAL ENGINEER.

GENERAL STRUCTURAL ABBREVIATIONS

A/E	ARCHITECT/ENGINEER
AB	ANCHOR BOLT
ADDL	ADDITIONAL
ADH	ADHESIVE
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
ALUM	ALUMINUM
ANC	ANCHOR
APRX	APPROXIMATE
APVD	APPROVED
ARCH	ARCHITECTURAL
BC	BOTTOM CHORD
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BOL	BOLLARD
BOT	BOTTOM
BP	BASE PLATE
BRG	BEARING
BTB	BACK TO BACK
BTW	BETWEEN
C	CHANNEL SHAPE
CHD	CHORD
CIP	CAST-IN-PLACE
CJ	CONSTRUCTION JOINT
CJP	CONTINUOUS JOINT PENETRATION
CL	CENTERLINE
CLJ	CONTROL JOINT
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CTC	CENTER TO CENTER
CTR	CENTER
CY	CUBIC YARD
D	DEEP
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DEMO	DEMOLITION
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIST	DISTANCE
DL	DEAD LOAD
DT	DOUBLE TEE
DTL	DETAIL
DWG	DRAWING
DWL	DOWEL
E	EAST
EA	EACH
ECC	ECCENTRIC
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
EW	EACH WAY
EWEF	EACH WAY, EACH FACE
EWTB	EACH WAY, TOP AND BOTTOM
EXP	EXPANSION
EXST	EXISTING
FAB	FABRICATOR
FD	FLOOR DRAIN
FDTN	FOUNDATION
FG	FINISHED GRADE
FIG	FIGURE
FIN	FINISH
FLR	FLOOR
FOC	FACE OF CONCRETE, FACE OF CURB
FR	FRAME
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET, FOOT
FTG	FOOTING
FV	FIELD VERIFY

GA	GAGE (METAL THICKNESS)
GALV	GALVANIZED
GEN	GENERAL
GR	GRADE
GRTG	GRATING
H1E	STANDARD ACI HOOK ONE END
H2E	STANDARD ACI HOOK BOTH ENDS
HC	HOLLOW CORE
HDR	HEADER
HK	HOOK
HORIZ	HORIZONTAL
HP	HIGH POINT
HS	HEADED STUD
HSS	HOLLOW STRUCTURAL SHAPE
HT	HEIGHT
ID	INSIDE DIAMETER
IF	INSIDE FACE
IN	INCH
INFO	INFORMATION
INT	INTERIOR, INTERSECTION
INV	INVERT
JF	JOINT FILLER
JST	JOIST
JT	JOINT
K	KIP
KB	KNEE BRACE
KLF	KIPS PER LINEAR FOOT
KSI	KIPS PER SQUARE INCH
L	ANGLE, LENGTH
LAD	LADDER
LB	POUND
LF	LINEAR FOOT
LG	LONG
LIN	LINEAR
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LNG	LONGITUDINAL
LOC	LOCATION
LP	LOW POINT
LWC	LIGHTWEIGHT CONCRETE
MAX	MAXIMUM
MBR	MEMBER
MC	MOMENT CONNECTION
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
ML	MASONRY LINTEL
N	NORTH
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OH	OVERHEAD
OPNG	OPENING
OPP	OPPOSITE
OVHG	OVERHANG
PAR	PARALLEL
PCF	POUNDS PER CUBIC FOOT
PCLJ	PARTIAL CONTROL JOINT
PEN	PENETRATION
PEMB	PRE ENGINEERED METAL BUILDING
PL	PLATE
PLBG	PLUMBING
PLF	POUNDS PER LINEAR FOOT
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PS	PIPE SUPPORT, PUMP STATION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY

RECT	RECTANGULAR
REF	REFERENCE
REINF	REINFORCING
REQD	REQUIRED
REV	REVISION
RO	ROUGH OPENING
RTW	RETAINING WALL
S	SOUTH
SCH	SCHEDULE
SECT	SECTION
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SL	SLOPE
SLTD	SLOTTED
SOG	SLAB ON GRADE
SPA	SPACING
SPEC	SPECIFICATION
SQ	SQUARE
SST	STAINLESS STEEL
STD	STANDARD
STIR	STIRRUP
STL	STEEL
STR	STRUCTURAL, STRAIGHT
SUSP	SUSPENDED
T&B	TOP AND BOTTOM
T/	TOP OF
TD	TRENCH DRAIN
TEMP	TEMPORARY
THK	THICK
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOG	TOP OF GRATING
TOM	TOP OF MASONRY
TOS	TOP OF SLAB, TOP OF STEEL
TOW	TOP OF WALL
TPG	TOPPING, THROUGH PLATE GIRDER
TYP	TYPICAL
ULT	ULTIMATE
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VOL	VOLUME
W	WEST, WIDE, WIDE FLANGE BEAM
W/	WITH
W/O	WITHOUT
WF	WIDE FLANGE
WLD	WELDED
WM	WIRE MESH
WP	WORK POINT
WS	WATERSTOP
WT	WEIGHT
WWF	WELDED WIRE FABRIC

GENERAL NOTES:

1. THESE ABBREVIATIONS APPLY TO THE STRUCTURAL SET OF CONTRACT DRAWINGS.
2. LISTING OF ABBREVIATIONS DOES NOT IMPLY THAT ALL ABBREVIATIONS ARE USED IN THE CONTRACT DRAWINGS.
3. ABBREVIATIONS SHOWN ON THIS SHEET INCLUDE VARIATIONS OF A WORD. FOR EXAMPLE, "MOD" MAY MEAN MODIFY OR MODIFICATION; "INC" MAY MEAN INCLUDED OR INCLUDING AND "REINF" MAY MEAN EITHER REINFORCE OR REINFORCING.

100% SUBMITTAL
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AUGUST 21, 2023

HDR Engineering, Inc.
9605 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

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Aug 21, 2023 - 12:53pm

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED R. WRIGHT
DRAWN R. WRIGHT
DATE AUGUST 21, 2023
CHECKED J. NERVIG
SUBMITTED
RECOMMENDED
APPROVED

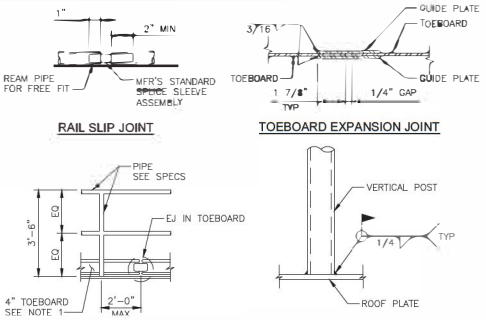
TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
GENERAL STRUCTURAL NOTES AND ABBREVIATIONS

PROFESSIONAL ENGINEER - STATE OF NEVADA
RYAN WRIGHT
Exp: 06/30/24
CIVIL
No. 030882
08/21/23

SHEET NUMBER
S001
23 OF 36

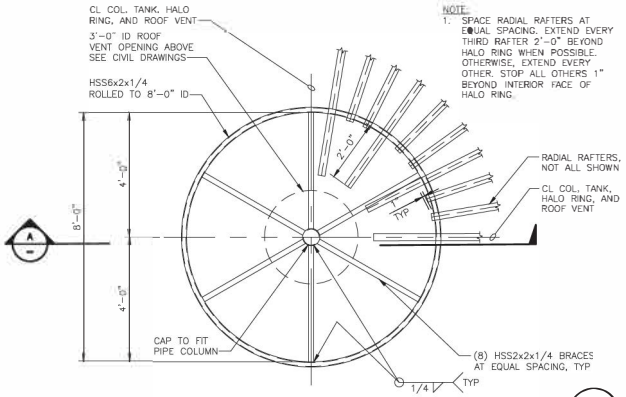
WSUP23-0030
EXHIBIT D



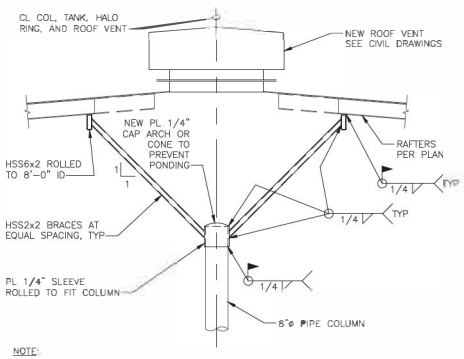
NOTES:

1. TOEBOARDS SHALL BE PLACED 1/4" CLEAR MAX ABOVE WALKING SURFACE.
2. 6'-0" MAXIMUM SPACING BETWEEN POSTS.
3. GUARDRAILS SHALL BE WELDED ASSEMBLIES.
4. REFER TO SPECIFICATION SECTION 05 52 05 FOR ADDITIONAL INFORMATION.

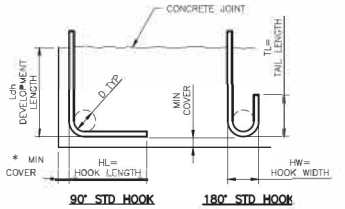
STEEL GUARDRAIL — N.T.S. — 1 / -



HALO SUPPORT — N.T.S. — 2 / -



HALO SECTION — N.T.S. — A / -



HOOK DEVELOPMENT LENGTHS f'c =4.0 ksi fy = 60 ksi					
BAR SIZE	HL	HW	TL	D	Ldh
#3	6"	3"	4"	2 1/4"	6"
#4	8"	4"	4 1/2"	3"	7"
#5	10"	5"	5"	3 3/4"	9"
#6	1'-0"	6"	6"	4 1/2"	10"
#7	1'-2"	7"	7"	5 1/4"	12"
#8	1'-4"	8"	8"	6"	14"
#9	1'-7"	11 3/4"	10 1/2"	9 1/2"	15"
#10	1'-10"	1'-1 1/4"	11 1/2"	10 3/4"	17"
#11	2'-0"	1'-2 3/4"	1'-1"	12"	18"

NOTES:

1. PROVIDE MINIMUM HOOK DEVELOPMENT LENGTHS PER TABLE UNO.
2. ALL HOOKS SHOWN ON THE DRAWINGS SHALL BE STANDARD HOOKS UNO.

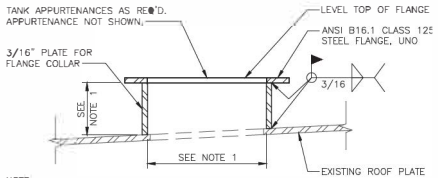
REINFORCING HOOK SCHEDULE — N.T.S. — 3 / -

LAP SPLICE AND EMBEDMENT LENGTHS f'c =4.0 ksi fy = 60 ksi		
BAR SIZE	BARS SPACED GREATER THAN 4"	BARS SPACED LESS THAN OR EQUAL TO 4"
#3	14"	20"
#4	19"	32"
#5	29"	46"
#6	39"	62"
#7	55"	87"
#8	69"	107"
#9	76"	116"
#10	97"	140"
#11	120"	146"

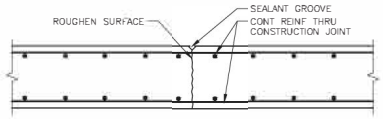
NOTES:

1. PROVIDE MINIMUM LAP SPLICE LENGTHS AND EMBEDMENTS PER TABLE UNO. EMBEDMENT LENGTH EQUALS THE LAP SPLICE LENGTH UNO.
2. LENGTHS SHOWN IN THE TABLE ARE FOR BOTTOM BARS. MULTIPLY LENGTHS BY 1.3 FOR HORIZONTAL TOP BARS WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW.
3. BAR SPACING AT LAP SPLICE IS THE MINIMUM CLEAR DISTANCE BETWEEN LAPPED BARS PLUS ONE BAR DIAMETER.
4. ALL SPLICES TO BE CONTACT SPLICES AND WIRED TOGETHER UNLESS OTHERWISE APPROVED BY ENGINEER.

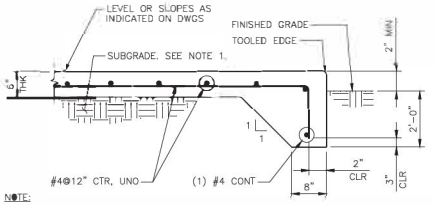
CONCRETE REINFORCING LAP AND EMBEDMENT SCHEDULE — N.T.S. — 4 / -



ROOF FLANGE CONNECTION — N.T.S. — 5 / -



CONSTRUCTION JOINT — N.T.S. — 7 / -



SLAB ON GRADE — N.T.S. — 6 / -

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AUGUST 21, 2023

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED R. WRIGHT
DRAWN R. WRIGHT
DATE AUGUST 21, 2023
CHECKED J. NERVIG
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

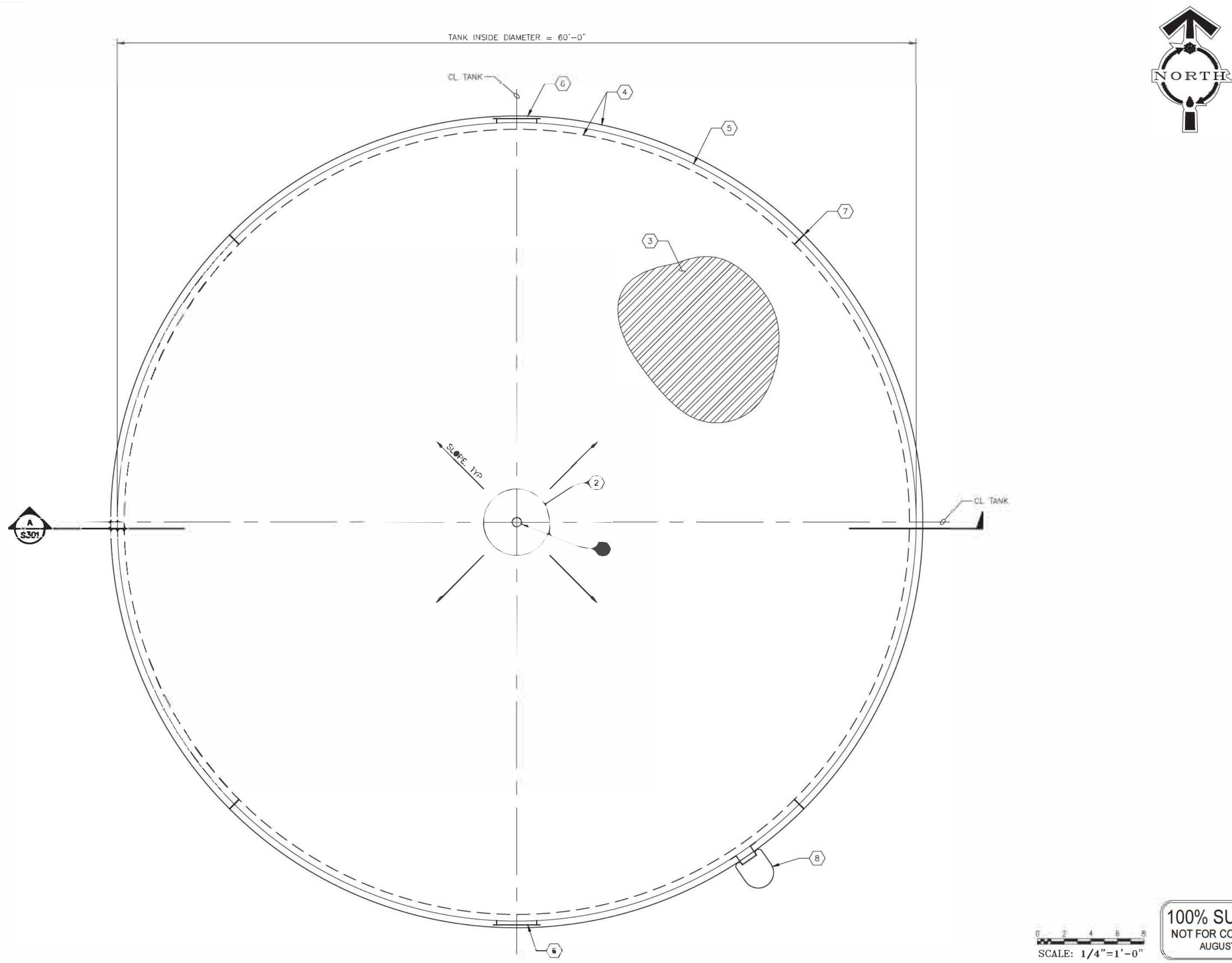
NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY. RETURN UPON COMPLETION OF PROJECT (Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
STANDARD STRUCTURAL DETAILS

PROFESSIONAL ENGINEER — STATE OF NEVADA — RYAN WRIGHT Exp: 06/30/24 CIVIL No. 030882 — 08/21/23

SHEET NUMBER
S002
24 OF 36

WSUP23-0030
EXHIBIT D



GENERAL NOTES

1. STRUCTURAL DESIGN CRITERIA SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SHOWN ON SHEET S001.
2. SEE CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
3. COAT ALL STRUCTURAL AND MISCELLANEOUS STEEL PER SPECIFICATIONS.
4. COAT CONCRETE RINGWALL PER SPECIFICATION SECTION 09 96 00.

KEY NOTES

1. STANDARD 8"ø PIPE CENTER COLUMN.
2. 1" THICK x 48" DIAMETER BASE PLATE.
3. 1/4" THICK FLOOR PLATE, TYPICAL.
4. CONCRETE RINGWALL.
5. TANK SHELL.
6. 36"ø MANWAY.
7. CONSTRUCTION JOINT IN RINGWALL, TYPICAL. PROVIDE 4 MINIMUM AT EQUAL SPACING.
8. ROOF ACCESS LADDER WITH CAGE. SEE CIVIL DRAWINGS.

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NOT FOR CONSTRUCTION
AUGUST 21, 2023

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Reno, Nevada 89521
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A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
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DRAWN R. WRIGHT
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SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
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LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
STRUCTURAL FOUNDATION PLAN

PROFESSIONAL ENGINEER – STATE OF NEVADA
RYAN WRIGHT
Exp: 06/30/24
CIVIL
No. 030882
08/21/23

SHEET NUMBER
S101
25 OF 36

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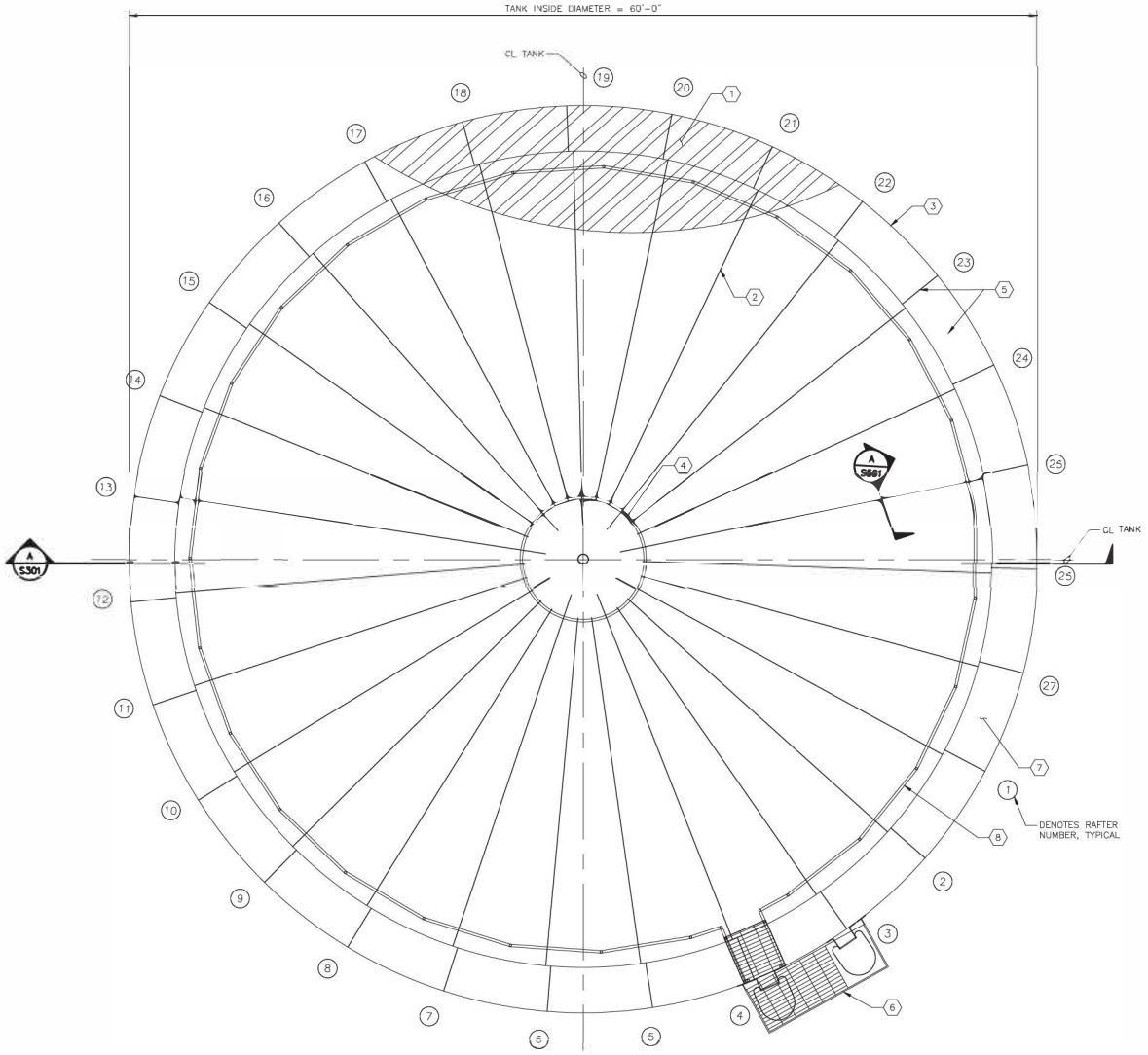
WSUP23-0030
EXHIBIT D



NORTH

SCALE: 1/4"=1'-0"

GENERAL NOTES

1. STRUCTURAL DESIGN CRITERIA SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SHOWN ON SHEET S001.
2. SEE CIVIL DRAWINGS FOR HATCHES, RAILINGS, LADDER, AND OTHER APPURTENANCES.
3. SEAL WELD AROUND AT ALL CONNECTIONS TO PREVENT CREVICE CORROSION.
4. COAT ALL STRUCTURAL AND MISCELLANEOUS STEEL PER SPECIFICATIONS.

KEY NOTES

1. 1/4" THICK ROOF PLATE, TYPICAL.
2. BENT PLATE RAFTER INTEGRAL WITH ROOF PLATE, TYPICAL. (27) TOTAL.
3. TANK SHELL.
4. STANDARD 8"ø PIPE CENTER COLUMN AND HALO SUPPORT. SEE DETAIL 2 ON SHEET S002.
5. 3'-0" DIAMETER KNUCKLE WITH DIAGONAL SUPPORT. SEE DETAIL 1 ON SHEET S301.
6. EXTERIOR LADDER WITH INTERMEDIATE LANDING PLATFORM AND CAGE.
7. OVERFLOW WEIR. SEE CIVIL DRAWINGS AND DETAIL 6 ON SHEET S501.
8. GUARDRAIL. SEE DETAIL 1 ON SHEET S002.

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

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REVISION	DESCRIPTION	BY	APP	DATE
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WORK ORDER NO. 14-0035
DESIGNED R. WRIGHT
DRAWN R. WRIGHT
DATE AUGUST 21, 2023
CHECKED J. NERWIG
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered.
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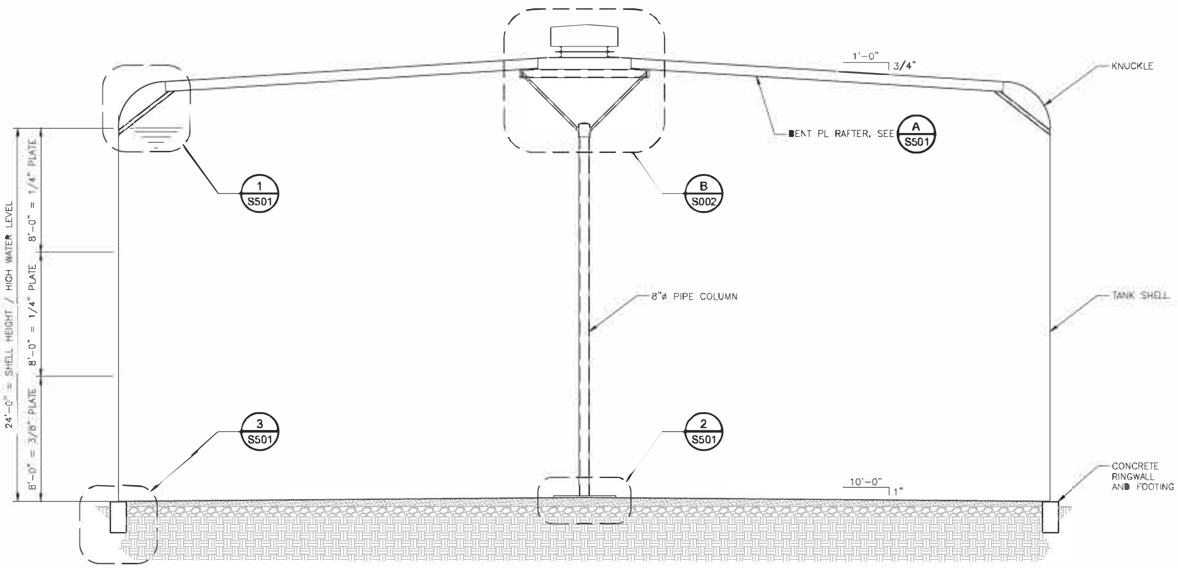
LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
STRUCTURAL ROOF PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
RYAN WRIGHT
Exp: 06/30/24
CIVIL
No. 030882
08/21/23

SHEET NUMBER
S102
26 OF 36

WSUP23-0030
EXHIBIT D



FULL TANK SECTION

SCALE: 1/4"=1'-0" — A / S101

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED R. WRIGHT
DRAWN R. WRIGHT
DATE AUGUST 21, 2023
CHECKED J. NERVIG
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

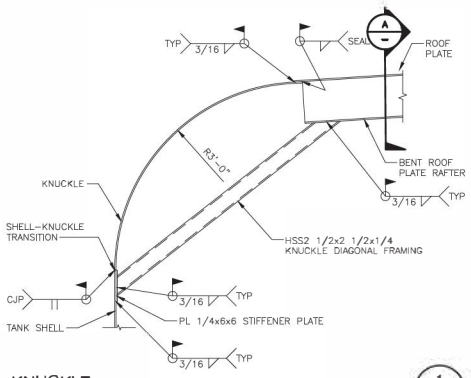
LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

STRUCTURAL
FULL TANK SECTION

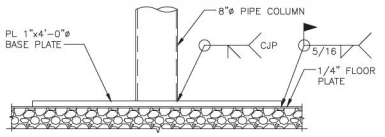
PROFESSIONAL ENGINEER – STATE OF NEVADA – RYAN WRIGHT – Exp: 06/30/24 – CIVIL – No. 030882 – 08/21/23

SHEET NUMBER
S301
27 OF 35

WSUP23-0030
EXHIBIT D



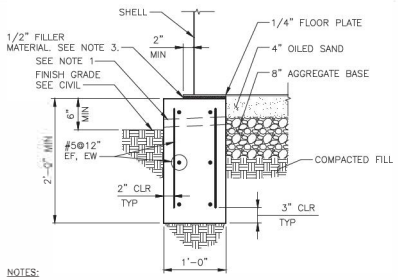
KNUCKLE — SCALE:1"=1'-0" — 1 / S301



NOTE:

1. SEE SPECIFICATIONS FOR SUBGRADE PREPARATION AND COMPACTION REQUIREMENTS.

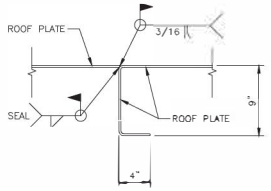
COLUMN BASE PLATE — SCALE:1"=1'-0" — 2 / S301



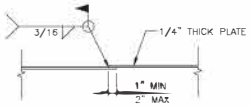
NOTES:

1. PROVIDE 1 1/2"ø DRAIN PIPE AT 5'-0" CENTERS. SLOPE 1/2" PER FOOT. PROVIDE A LAYER OF GEOTEXTILE FILTER FABRIC OVER THE INLET END OF THE DRAIN PIPE.
2. SEE SPECIFICATIONS FOR SUBGRADE PREPARATION AND COMPACTION REQUIREMENTS.
3. FILLER MATERIAL SHALL MEET THE REQUIREMENTS OF ASTM D1715.

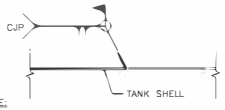
CONCRETE RINGWALL AND FOOTING — SCALE:1"=1'-0" — 3 / S301



SECTION — SCALE:1 1/2"=1'-0" — A / S102



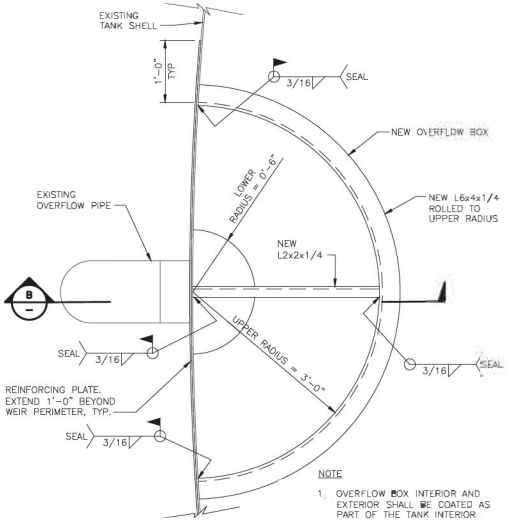
FLOOR PLATE LAP JOINT — SCALE:1 1/2"=1'-0" — 4 / -



NOTE:

1. DETAIL APPLIES TO BOTH VERTICAL AND HORIZONTAL JOINTS IN TANK SHELL.

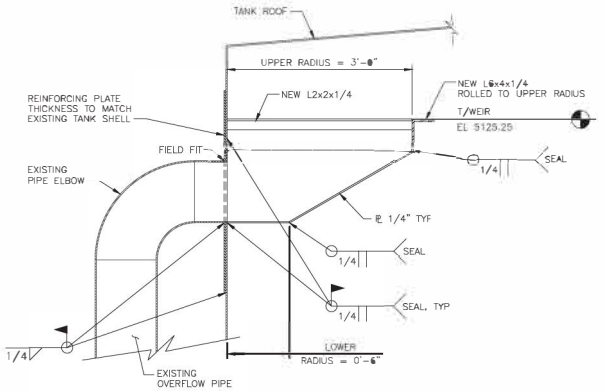
SHELL PLATE BUTT JOINT — SCALE:1 1/2"=1'-0" — 5 / -



NOTE

1. OVERFLOW BOX INTERIOR AND EXTERIOR SHALL BE COATED AS PART OF THE TANK INTERIOR.

OVERFLOW BOX TOP PLAN — N.T.S. — 6 / -



OVERFLOW SECTION — N.T.S. — 6 / -

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REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED R. WRIGHT
DRAWN R. WRIGHT
DATE AUGUST 21, 2023
CHECKED J. NERVO
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

STRUCTURAL SECTIONS AND DETAILS

PROFESSIONAL ENGINEER — STATE OF NEVADA — RYAN WRIGHT Exp: 06/30/24 CIVIL No. 030882 — 08/21/23

SHEET NUMBER
S501
28 OF 36

WSUP23-0030
EXHIBIT D

Electrical Symbols and Legend

Column 1

20A 3P OR 100AF 80AT 3P — LOW – VOLTAGE CIRCUIT BREAKER (CB). RATINGS AND NO. OF POLES AS SHOWN. WHEN SPECIFIC TYPE IS REQUIRED, X INDICATES TYPE.

TYPES:
- MCCB – MOLDED CASE
- ICCB – INSULATED CASE
- LVP – LOW – VOLTAGE POWER
- MCP – MOTOR CIRCUIT PROTECTOR (RATING PER CONNECTED LOAD)

CB — SEPARATELY MOUNTED CIRCUIT BREAKER; SEE ELECTRICAL ONE – LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION

GFP — GROUND FAULT PROTECTION

52 — MEDIUM – VOLTAGE CIRCUIT BREAKER

FUSE, SIZE, AND NUMBER OF FUSES AS NOTED

FUSED CUTOUT, CURRENT RATING, FUSE SIZE, AND NUMBER OF POLES AS NOTED

FUSIBLE SWITCH, CURRENT RATING, FUSE SIZE, AND QUANTITY AS NOTED

NON-FUSED SWITCH, CURRENT RATING, AND NUMBER OF POLES AS NOTED

DISCONNECT OR DRAWOUT CONNECTION

MAGNETIC MOTOR STARTER AND SEPARATELY MOUNTED COMBINATION MAGNETIC MOTOR STARTER

MOTOR CONTROLLER AND SEPARATELY MOUNTED MOTOR CONTROLLER WITH SHORT CIRCUIT PROTECTION AND DISCONNECT

MOTOR STARTER AND CONTROLLER SUBSCRIPTS:
- A – MAGNETIC STARTER NEMA SIZE
- B – STARTER TYPE
  - NONE – FULL VOLTAGE NON-REVERSING (FVNR)
  - FVR – FULL VOLTAGE REVERSING
  - 2S – TWO SPEED
  - RVAT – REDUCED VOLTAGE AUTO TRANSFORMER
- C – CONTROL DIAGRAM OR CONTROLS SCHEDULE NUMBER (IF REQUIRED)
- D – CONTROLLER TYPE
  - VFD – VARIABLE FREQUENCY DRIVE
  - SS – SOLID STATE

MOTOR CONTROLLER

THERMAL OVERLOAD ELEMENT

OL — THERMAL OVERLOAD RELAY CONTACT

DISCONNECT OR SAFETY SWITCH, 30A, 3P, NON-FUSED UNLESS OTHERWISE NOTED

7 1/2 OR HP — MOTOR WITH DESIGN HORSEPOWER (WHEN INDICATED)

G — GENERATOR

ATS — TRANSFER SWITCH, CURRENT RATING, AND NUMBER OF POLES AS NOTED
- ATS – AUTOMATIC
- MTS – MANUAL

TRANSFORMER
- 3-PHASE, 3-WIRE DELTA CONNECTION
- 3-PHASE, 4-WIRE GROUNDED WYE CONNECTION

LP100 208/120V 3ø, 4W — SWITCHBOARD OR PANELBOARD; NAME, VOLTAGE, PHASE, NUMBER OF WIRES WHEN INDICATED

Column 2

100 KVA — NON-MOTOR LOAD WITH DESIGN KVA, KW, OR AMP

CPT — CONTROL POWER TRANSFORMER (CPT)

VOLTAGE TRANSFORMER (VT OR PT)

CURRENT TRANSFORMER (CT)

DMP — DIGITAL METERING PACKAGE

RTM — RUN TIME METER

GROUND

LIGHTNING ARRESTER

SPD — LOW VOLTAGE SURGE PROTECTIVE DEVICE

ELECTRICAL CONNECTION

OR OR — NO ELECTRICAL CONNECTION

SV OR — SOLENOID VALVE

X Y — CONTROL/RELAY COIL; X INDICATES TYPE, Y INDICATES LOOP NO. WHEN USED

TYPES:
- CR – CONTROL RELAY
- DP – DEFINITE PURPOSE RELAY
- LC – LIGHTING CONTACTOR
- M – MOTOR STARTER
- PC – PHOTO CELL
- TC – TIME CLOCK
- TD – TIME DELAY RELAY
- TR – TIMING RELAY

NORMALLY OPEN TIME DELAY RELAY CONTACT WITH TIME DELAY ON CLOSING AFTER COIL IS ENERGIZED

NORMALLY CLOSED TIME DELAY RELAY CONTACT WITH TIME DELAY ON OPENING AFTER COIL IS ENERGIZED

NORMALLY OPEN TIME DELAY RELAY CONTACT WITH TIME DELAY ON OPENING AFTER COIL IS DE-ENERGIZED

NORMALLY CLOSED TIME DELAY RELAY CONTACT WITH TIME DELAY ON CLOSING AFTER COIL IS DE-ENERGIZED

NORMALLY OPEN TEMPERATURE SWITCH; CLOSE ON RISING TEMPERATURE

NORMALLY CLOSED TEMPERATURE SWITCH; OPEN ON RISING TEMPERATURE

NORMALLY OPEN FLOW SWITCH; CLOSE ON INCREASING FLOW

NORMALLY CLOSED FLOW SWITCH; OPEN ON INCREASING FLOW

NORMALLY OPEN LEVEL SWITCH, CLOSE ON RISING LEVEL

NORMALLY CLOSED LEVEL SWITCH, OPEN ON RISING LEVEL

NORMALLY OPEN PRESSURE SWITCH, CLOSE ON INCREASING PRESSURE

NORMALLY CLOSED PRESSURE SWITCH, OPEN ON INCREASING PRESSURE

NORMALLY OPEN LIMIT SWITCH, CLOSE ON REACHING LIMIT

NORMALLY CLOSED LIMIT SWITCH, OPEN ON REACHING LIMIT

Column 3

NORMALLY OPEN CONTACT (N.O.)

NORMALLY CLOSED CONTACT (N.C.)

FIELD WIRING EXTERNAL TO CONTROL PANEL

X — INTERLOCK; X INDICATES TYPE

TYPES:
- E – ELECTRICAL
- M – MECHANICAL
- K – KEY

HAND OFF AUTO XOO OOX — 3 POSITION SELECTOR SWITCH, MAINTAINED CONTACTS; UNLESS OTHERWISE NOTED, 2-POSITION SIMILAR

NORMALLY OPEN PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED

NORMALLY CLOSED PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED

INDICATING LIGHT, X INDICATES LENS COLOR

PUSH TO TEST INDICATING LIGHT, X INDICATES LENS COLOR

LENS COLORS:
- R – RED
- G – GREEN
- B – BLUE
- Y – YELLOW
- W – WHITE A
- – AMBER

Z — ELECTRICAL MONITORING DEVICE

TYPES:
- WHM – UTILITY WATT-HOUR METER PER UTILITY REQUIREMENTS
- AS – CURRENT SENSOR
- AM – AMP METER
- WM – WATT METER
- VS – VOLT SENSOR
- VM – VOLT METER

CONTROL PANEL INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT

CONTROL PANEL WITH DISCONNECT SWITCH INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT

J — JUNCTION OR PULL BOX

PANELBOARD (250V TO 600V)

PANELBOARD (LESS THAN 250V)

ELECTRICAL EQUIPMENT ENCLOSURE: SWITCHBOARD, MOTOR CONTROL CENTER, CONTROL PANEL, OR OTHER EQUIPMENT AS INDICATED

CEILING/PENDANT-MOUNTED LED LUMINAIRE

WALL-MOUNTED LED LUMINAIRE

CEILING/PENDANT-MOUNTED LED FIXTURE

WALL-MOUNTED LED FIXTURE

CEILING/PENDANT-MOUNTED LED FIXTURE NORMAL/EMERGENCY

WALL-MOUNTED LED FIXTURE NORMAL/EMERGENCY

DOUBLE-FACED CEILING OR WALL-MOUNTED EXIT LIGHT; DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS

SINGLE-FACED CEILING OR WALL-MOUNTED EXIT LIGHT; DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS

AREA OR ROADWAY LIGHT – POLE-MOUNTED

LIGHTING FIXTURE SUBSCRIPTS:
- X – INDICATES FIXTURE TYPE PER LIGHTING FIXTURE SCHEDULE
- Y – INDICATES CIRCUIT NUMBER FROM PANELBOARD
- z – INDICATES CONTROLLING SWITCH (IF REQUIRED)

EMERGENCY LIGHT FIXTURE, 2 ATTACHED HEADS AS SHOWN

EMERGENCY LIGHT, REMOTE MOUNTED HEAD

Column 4

PC — PHOTOCELL

TOGGLE SWITCH

SUBSCRIPTS:
- X – INDICATES TYPE
  - NONE – SINGLE POLE
  - 3 – THREE-WAY
  - 4 – FOUR-WAY
  - HP – TOGGLE SWITCH, HORSEPOWER RATED
  - K – KEY SWITCH
  - TE – MANUAL MOTOR STARTER W/ THERMAL ELEMENT
  - P – PILOT LIGHT
  - L – LIGHTED HANDLE
- Y – INDICATES CONTROLLING SWITCH (IF REQUIRED)

T — TRANSFORMER

CS — CONTROL STATION

HS — HAND SWITCH

SS — SELECTOR SWITCH

PB — PUSHBUTTON

IC — INSTRUMENTATION/CONTROL DEVICE

HA — HATCH ALARM

MS — MOTION SENSOR

VC — VALVE CONTROL

PT — PRESSURE TRANSMITTER

LS — LEVEL SWITCH

SPECIAL-PURPOSE RECEPTACLE AS DEFINED ON PLANS

PLUG-IN RECEPTACLE STRIP, QUANTITY AND SPACING OF RECEPTACLES AS NOTED OR SPECIFIED

TELECOMMUNICATIONS OUTLET JUNCTION BOX, NUMBER OF PORTS SHOWN. RUN EQUAL NUMBER OF CAT 6 CABLES TO COMMUNICATIONS BACKBOARD

FLOOR MOUNTED TELECOMMUNICATIONS OUTLET JUNCTION BOX

QUAD-DUPLEX RECEPTACLE, TWO NEMA 5-20R UNDER COMMON COVER PLATE

DUPLEX RECEPTACLE, NEMA 5-20R

FLOOR MOUNTED DUPLEX RECEPTACLE, NEMA 5-20R

SIMPLEX RECEPTACLE, NEMA 5-20R

SUBSCRIPTS:
- X – INDICATES TYPE
  - GFCI – GROUND FAULT CIRCUIT INTERRUPTER
  - WP – WATERPROOF
- Y – INDICATES CIRCUIT NUMBER FROM PANELBOARD

PEDESTAL

CONDUIT TURNING UP

CONDUIT TURNING DOWN

HOME RUN TO PANEL, 2 #12, 1 #12G IN 3/4"C UNLESS OTHERWISE NOTED

CIRCUIT RUN BETWEEN DEVICES EXPOSED IN NON-ARCHITECTURALLY FINISHED AREAS; CONCEALED IN ARCHITECTURALLY FINISHED AREAS. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT.

CONDUIT RUN UNDERGROUND, BETWEEN DEVICES CONCEALED IN NON-ARCHITECTURALLY FINISHED AREAS OR UNDER FLOOR SLAB. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT.

Column 5

CIRCUIT CONTINUATION

CONDUIT STUBBED OUT AND CAPPED

XX — CONDUIT TAG OR CIRCUIT NUMBER – WIRE AND CONDUIT SIZE AS SPECIFIED IN CIRCUIT SCHEDULE ON THE SHEETS

G — GROUND CABLE

GROUND ROD

GROUND TEST WELL

MECHANICAL GROUND CONNECTION

EXOTHERMIC GROUND CONNECTION

GENERAL NOTES:

1. THIS IS A STANDARD ELECTRICAL SYMBOLS SHEET. ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT.
2. IN GENERAL CONDUIT ROUTING IS NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS INCLUDING THOSE SHOWN ON ONE-LINES AND HOME RUNS. SEE SPECIFICATIONS FOR CONDUIT INSTALLATION REQUIREMENTS. CONDUIT ROUTINGS AND STUB-UP LOCATIONS THAT ARE SHOWN ARE APPROXIMATE. EXACT ROUTINGS SHALL BE AS REQUIRED FOR EQUIPMENT FURNISHED, FREE OF ANY INTERFERENCES.
3. WHEN BRANCH CIRCUITS ARE NOT SHOWN ON THE PLANS THE CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUITS AND CONDUCTORS REQUIRED. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE BRANCH CIRCUIT.
4. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH DRAWING FOR USAGE.
5. SEE PROJECT EQUIPMENT AND PIPING SYSTEMS DRAWING FOR SYMBOLS AND ABBREVIATIONS SPECIFIC TO THE PROJECT.

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AUGUST 21, 2023

HDR

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

Title Block

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED A. RAGNEV
DRAWN R.J. GONZALVO
DATE AUGUST 21, 2023
CHECKED W. ETTLICH
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
ELECTRICAL SYMBOLS AND LEGEND

PROFESSIONAL ENGINEER · STATE OF NEVADA · ROBB J. McCOMB · EXP. 12/31/25 · ELECTRICAL · No. 18698 · 08/21/2023

SHEET NUMBER
E001
29 OF 36

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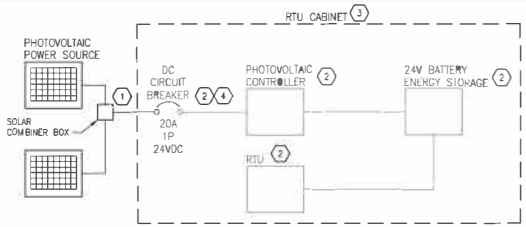
WSUP23-0030
EXHIBIT D



GENERAL NOTES:

1. PHOTOVOLTAIC SOURCE CIRCUIT CURRENTS, THE SUM OF PARALLEL- CONNECTED PV MODULE RATED SHORT-CIRCUIT CURRENTS MULTIPLIED BY 125 PERCENT PER NEC 690.8(A)(1)(1).
2. DC CIRCUIT BREAKER IS RATED NOT LESS THAN 125 PERCENT OF THE MAXIMUM CURRENT CALCULATED IN 690.8(A)(1)(1) PER NEC 690.9(B)(1).

ONE LINE DIAGRAM

KEYNOTES:

(1) CONNECT TWO AMERESCO 200J-V SOLAR PANELS IN PARALLEL AT SOLAR COMBINER BOX.

(2) PROVIDED AND INSTALLED BY TMWA.

(3) PROVIDED BY TMWA. INSTALLED BY CONTRACTOR.

(4) PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS SHALL BE LISTED AS SUITABLE FOR USE AS SERVICE EQUIPMENT AND LABELED PER NEC 690.13(B).

EQUIPMENT SCHEDULE (ES)

ES ITEM #	EQUIPMENT DESCRIPTION
1	RTU CABINET. FURNISHED BY TMWA AND INSTALLED BY CONTRACTOR. 36"W X 24"D X 72"H FREE-STANDING, CONTINUOUS HINGED, FRONT ACCESS ONLY, NEMA 4 STEEL CABINET WITH 20A 1P MAIN BREAKER, STATUS LIMIT SWITCH, AND "HELP" PUSH BUTTON CONTROLS. SAGINAW CONTROL & ENGINEERING SCE-72EL3624FS ENCLOSURE AND SCE-DS36N4 SHIELD, OR APPROVED EQUAL. SEE ES01.
2	HATCH ALARM. INDUSTRIAL SURFACE MOUNT SWITCH, SPDT, N.O., N.C. MAGNETIC-CONTACT GRI 4402A OR APPROVED EQUAL.
3	FLOAT SWITCH. NORMALLY CLOSED TETHER FLOAT SWITCH. SJE RHOMBUS #20GMWENC. NO EQUAL.
4	JUNCTION BOX. 6"H X 6"W X 4"D, NEMA 4X, 316 STAINLESS STEEL, HINGED DOOR. HOFFMAN A664CHQRFG OR APPROVED EQUAL.
5	PRESSURE TRANSMITTER. HONEYWELL #STG84L-E1G000-1-0-AHH-11S-A-10A0-00-0000. NO EQUAL.
6	JUNCTION BOX. 12"H X 12"W X 6"D, NEMA 4X, 316 STAINLESS STEEL, HANDRAIL MOUNTED. HOFFMAN A1212CHFL OR APPROVED EQUAL.
7	AMERESCO #200J-V SOLAR PANEL AND #1X-SPM UNIMOUNTING BRACKETS. NO EQUAL.
8	SOLAR COMBINER BOX. 10.5"H X 4.5"W X 3.5"D, NEMA 3R, ALUMINUM, UNIMOUNTING BRACKETS. MIDNITE MNPV3 AND TWO (2) MNEPV20 OR APPROVED EQUAL.
9	VAULT FLOAT SWITCH PN#43980 (VAULT FLOOD INDICATION). NORMALLY CLOSED BRACKET MOUNTED FLOAT SWITCH. GEMS LS-270 PN #43980. NO EQUAL.
10	JUNCTION BOX. 6"H X 6"W X 4"D, NEMA 4X, 316 STAINLESS STEEL, HINGED DOOR. HOFFMAN A606CHFL OR APPROVED EQUAL.
11	JUNCTION BOX. 16"H X 14"W X 8"D, NEMA 4X, 316 STAINLESS STEEL, HINGED DOOR. HOFFMAN A16148CHFL OR APPROVED EQUAL.

EQUIPMENT SCHEDULE NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PURCHASING AND INSTALLATION OF ALL EQUIPMENT SHOWN ON EQUIPMENT SCHEDULE UNLESS OTHERWISE NOTED.
2. THE EQUIPMENT SCHEDULE IS INTENDED TO BE AS COMPLETE AS POSSIBLE LESS STANDARD MATERIALS AND DETAILED INSTALLATION INSTRUCTIONS FOR EQUIPMENT. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT REP. PRIOR TO BID.
3. THE CONTRACTOR SHALL PROVIDE A COMPLETE INSTALLATION OF ALL EQUIPMENT AND DEVICES INDICATED ON THE EQUIPMENT SCHEDULE INCLUDING SUPPORTS AND OTHER INSTALLATION MATERIALS NEEDED.
4. THE CONTRACTOR SHALL PROVIDE, PULL, AND IDENTIFY ALL WIRES AND CABLES. TMWA WILL TERMINATE AND LAND WIRES AT RTU AND AT FIELD DEVICES. CONTRACTOR SHALL PROVIDE SUFFICIENT LENGTHS FOR ALL TERMINATIONS.
5. ALL CONDUITS ENTERING BOXES, PANELS, RTU, ETC. SHALL BE INSTALLED WITH MYERS HUBS. CAP ALL UNUSED CONDUITS.
6. CONTRACTOR SHALL SUBMIT DESCRIPTIVE LITERATURE ON ALL EQUIPMENT AND MATERIALS TO BE USED.
7. CONTRACTOR IS RESPONSIBLE FOR THEIR OWN MATERIAL QUANTITY TAKE-OFFS.

CONDUIT AND CABLE SCHEDULE

TAG	CONDUIT SIZE	FILL	REMARKS
1	1"	#18 TSP (PRESSURE TRANSMITTER)	
	1"	2#14, #14G (VALVE VAULT) 2#14 (VAULT FLOOD SWITCH)	
2	2"	PULLROPE	TURNS SHALL NOT EXCEED BEND RADIUS OF FUTURE ANTENNA CABLE. VERIFY ANTENNA CABLE WITH TMWA.
3	3/4"	2#14, #14G (TANK) 2#14 (FLOAT SWITCH)	
4	3/4"	PULLROPE	FUTURE LADDER ALARM
5	1"	2#14, #14G (TANK) 2#14 (FLOAT SWITCH) 2#14 (FUTURE LADDER ALARM)	FOR FUTURE LADDER ALARM, PROVIDE ADDITIONAL CONDUCTOR LENGTH TO REACH LADDER ALARM LOCATION AND COIL IN JUNCTION BOX ON TANK ROOF FOR FUTURE USE.
6	1"	2#10, #10G (SOLAR PANEL)	
7	3/4"	2#14, #14G (TANK)	
8	3/4"	#18 TSP (PRESSURE TRANSMITTER)	
9	3/4"	2#14, #14G (VAULT FLOOD SWITCH)	
10	3/4"	2#10, #10G (SOLAR PANEL)	

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AUGUST 21, 2023

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1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
ONE LINE DIAGRAM AND SCHEDULES

PROFESSIONAL ENGINEER - STATE OF NEVADA
ROBB J. McCOMB
EXP. 12/31/25
ELECTRICAL
No. 16670
08/21/2023

SHEET NUMBER
E002
30 OF 36

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Aug 22, 2023 - 12:25pm

WSUP23-0030
EXHIBIT D

TRUCKEE MEADOWS WATER AUTHORITY Quality. Delivered.

TMWA STANDARD CONDUIT AND WIRING REQUIREMENTS

Note: All threaded conduit to be assembled with conductive lubricant.

TABLE 26 00 00.A – CONDUIT REQUIREMENTS

	Location	Power	Control	Analog, Communication	Data	Elbow Sweeps	Stub-ups, Exposed	Stub-ups, Concealed	Grounding System	Additional Details
EXPOSED	Outside/Wet locations	RGS	RGS	RGS	RGS	RGS	PVC-RGS	PVC-RGS	BD-RGS	
EXPOSED	Wet locations. Vaults, pump stations and Well-houses or where subject to physical damage	RGS	RGS	RGS	RGS	RGS	PVC-RGS	PVC-RGS	BD-RGS	
EXPOSED	Inside dry locations. (i.e. office areas)	EMT	EMT	EMT	EMT	EMT	PVC-RGS	PVC-RGS	EMT	
EXPOSED	Inside Chemical Rooms	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)		Other specified locations
DIRECT BURY	Not in Traffic	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC-RGS	PVC-RGS	PVC-RGS		
DIRECT BURY	In Traffic	ENC-PVC	ENC-PVC	ENC-PVC	ENC-PVC	ENC-PVC-RGS	PVC-RGS	PVC-RGS		
DIRECT BURY	Underneath Concrete Slabs	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC-RGS	PVC-RGS	PVC-RGS		
PROTECTED	Concrete Encased Duct Bank	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC-RGS	PVC-RGS	PVC-RGS		
PROTECTED	In Slab	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC-RGS	PVC-RGS	PVC-RGS	RGS	All in-slab RGS shall be tape wrapped with 10 mil tape or PVC-RGS shall be used. Coordinate max conduit size with structural documents
PROTECTED	In CMU Walls	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC-RGS	PVC-RGS	PVC-RGS	PVC-RGS	
PROTECTED	In Stud Walls	EMT	EMT	EMT	EMT	EMT	EMT	EMT	EMT	

Rigid Galvanized Steel (RGS) — PVC Coated Rigid Galvanized Steel (PVC-RGS) — Bonded Rigid Galvanized Steel (BD-RGS) — Electrical Metallic Tubing (EMT) — Polyvinyl Chloride, schedule 40 (PVC, sch. 40) — Concrete Encased Polyvinyl Chloride (ENC-PVC)

TABLE 26 00 00.B – WIRING REQUIREMENTS

POWER

Phase Code/ Letter	480 VAC 3ϕ	110v-240VAC 3ϕ	120-240VAC 1ϕ
A	BR	BK	---
B	OR	RD (OR) if high L	
C	YL	BL	
N	GY	WH	WH
G	GR	GR	GR
L1	---		BK
L2			RD
AWG	size per load requirement per NEC		
Solar	Positive (RD)	Negative (BK)	Ground (GN)

CONTROL

Description	Type	Wire Color	AWG
AC	Control	YL	16 MTW
	Neutral	WH/YL	
	Ground	GN	
12 VDC	Positive	Red	
	0V or (-)	Black	
	Ground	GN	
24 VDC	Positive	BLUE	
	0V or (-)	WH/BL	
	Ground	GN	

Other Conditions	Wire Color	Cable Type	Additional Notes:
Shielded Pair	Red/Black	Belden 1120A Wet location Belden 5300FE Dry Location	All wires shall have an insulation rating of 600V, stranded, copper. Tin coated is ok Control wiring shall be type MTW/UL1015 Power Wiring shall be type XHHW

ADDITIONAL SPECIAL REQUIREMENTS

Variable Frequency Drives (VFDs)	VFD cables shall be rated for use in this application
Underwater Cable Applications	Submerged cables and connections shall be appropriate

Brown (BR) — Orange (OR) — Yellow (YL) — Grey (GY) — Green (GN) — Black (BK) — Red (RD) — Blue (BL) — White (WH) — White/Blue (WH/BL) — White/Yellow (WH/YW) — Black/White (BK/WH) — Red/Black (RD/BK)

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

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Aug 22, 2023 – 11:40am

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED A. RAGNEV
DRAWN R.J. GONZALVO
DATE AUGUST 21, 2023
CHECKED W. ETTLICH
SUBMITTED
RECOMMENDED
APPROVED

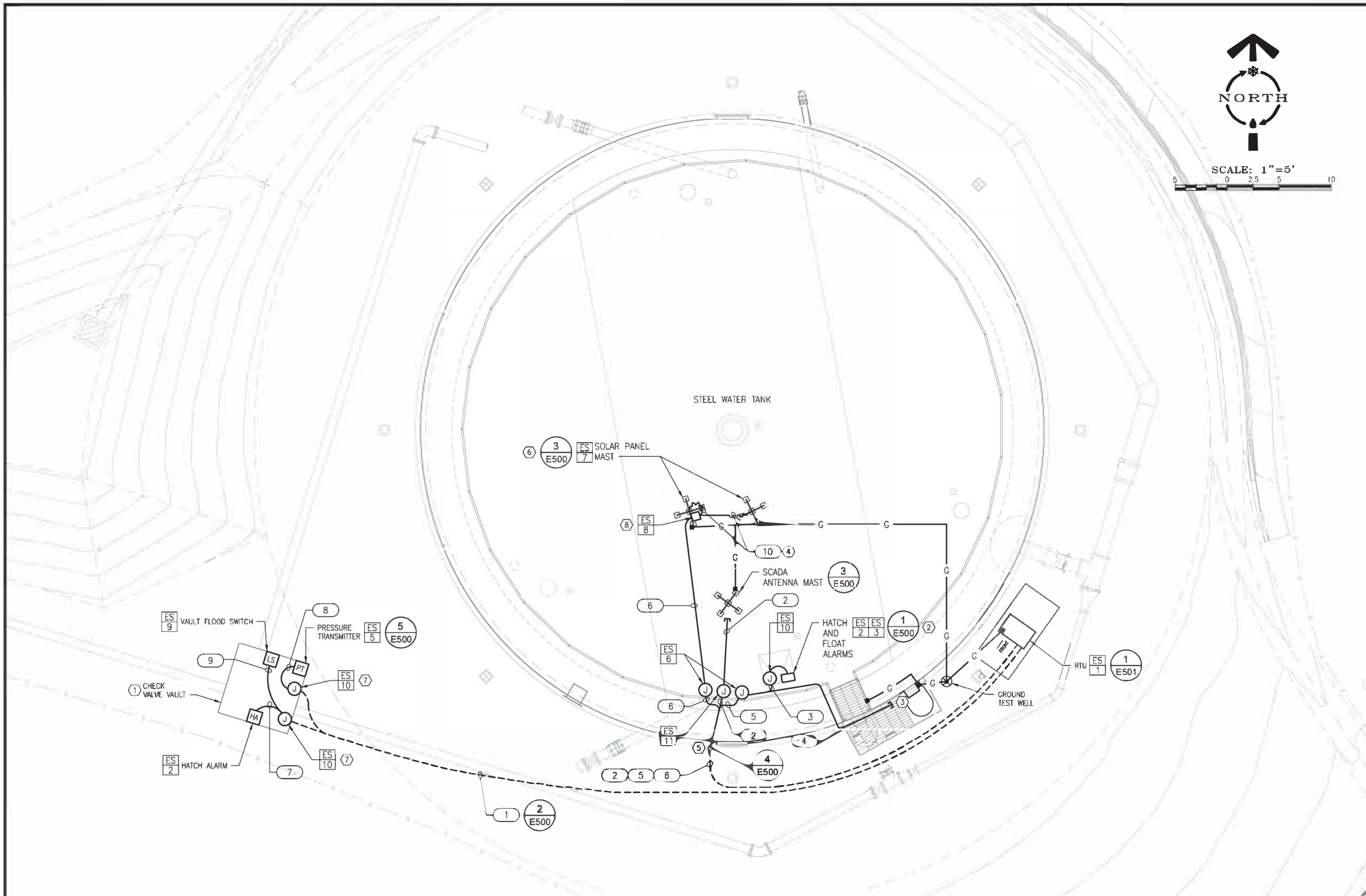
TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
CONDUIT AND WIRE REQUIREMENTS TABLE

PROFESSIONAL ENGINEER · STATE OF NEVADA
ROBB J. McCOMB
EXP. 12/31/25
ELECTRICAL
No. 18698
08/21/2023

SHEET NUMBER
E003
31 OF 36

WSUP23-0030
EXHIBIT D



KEYNOTES:

1. MOUNT RACEWAYS AND BOXES HIGH INSIDE VAULT TO AVOID IMMERSION. ROUTE ALL CONDUITS IN THE VAULT ON THE INNERSIDE OF THE VAULT WALL. ROUTE AROUND THE SIDES TO AVOID ANY CONDUITS OBSTRUCTING ACCESS, TYP.
2. NEATLY COIL AND SECURE EXCESS FLOAT SWITCH CABLE AT THE TERMINATION JUNCTION BOX.
3. FOR FUTURE LADDER HATCH ALARM. ROUTE CONDUIT TO LADDER HATCH AND CAP IMMEDIATELY ABOVE HATCH.
4. FOR CONNECTION TO SOLAR PANEL, TRANSITION FROM RIGID CONDUIT TO LIQUID TIGHT FLEXIBLE METAL CONDUIT. NOT EXCEEDING 3' LENGTH OF FLEXIBLE CONDUIT.
5. PROVIDE C-TYPE CONDULET ON EACH TANK RISER CONDUIT AS PULL-POINT AND MOUNT 3' ABOVE FINISHED GRADE.
6. MOUNT SOLAR PANEL MASTS AT LEAST 6' APART ON CENTER AND ALIGNED FROM EAST TO WEST TO MAXIMIZE SUN EXPOSURE. SOLAR PANELS SHALL BE ORIENTED SOUTH AND ANGLED FOR MAXIMUM EXPOSURE. COORDINATE ANGLE OF SOLAR PANEL FOR OPTIMAL SUN EXPOSURE ALL YEAR LONG.
7. MOUNT JUNCTION BOXES ON THE SIDE OF THE VALVE VAULT WALL AS HIGH AS POSSIBLE, TYP.
8. MOUNT COMBINER BOX ON THE SOLAR PANEL MAST. COORDINATE IN THE FIELD FOR OPTIMAL MOUNTING LOCATION.

GENERAL NOTES:

1. AREA CLASSIFICATION: OUTDOOR/WET.
2. CONDUITS TRAVERSING TANK KNUCKLE SHALL MATCH THE RADIUS OF THE KNUCKLE.
3. MOUNT CONDUITS TO GUARDRAIL WHEN POSSIBLE. OTHERWISE, MOUNT TO TANK PER DETAIL 4 ON E500.
4. SEE CONDUIT AND EQUIPMENT SCHEDULES ON E002.
5. INSTALL ALL CONDUITS ON THE TANK EXPOSED AND ROUTED IN THE SAME LOCATIONS TO AVOID AS MANY TRIPPING HAZARDS AS POSSIBLE, TYP. MOUNT BEHIND GUARD RAILS WHERE POSSIBLE.

TANK ELECTRICAL PLAN 1/- SCALE: 1" = 5'

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AUGUST 21, 2023

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HDR Engineering, Inc.
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Reno, Nevada 89521
775-337-4700

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WORK ORDER NO. 14-0035
DESIGNED A. RAGNEV
DRAWN R.J. GONZALVO
DATE AUGUST 21, 2023
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SUBMITTED
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APPROVED

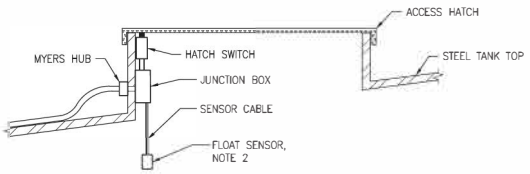
TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
TANK ELECTRICAL PLAN

PROFESSIONAL ENGINEER · STATE OF NEVADA
ROBB J. McCOMB
EXP. 12/31/25
ELECTRICAL
No. 18698
8/21/2023

SHEET NUMBER
E100
32 OF 36

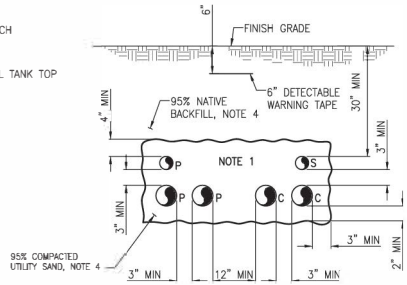
WSUP23-0030
EXHIBIT D



NOTES:

1. CONDUITS INSIDE TANK SHALL BE PVC-RGS.
2. HEIGHT OF FLOAT SENSOR SHALL BE COORDINATED WITH TMWA.

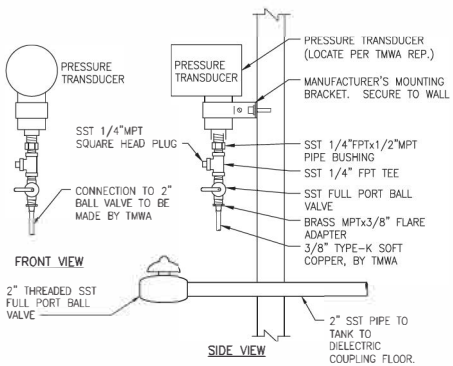
HATCH AND FLOAT ALARM DETAIL (1)
SCALE: NTS



NOTES:

1. NUMBER OF CONDUITS AS REQUIRED FOR THE APPLICATION.
2. P SUBSCRIPT ELECTRICAL POWER AND C CONTROL CONDUIT.
3. S SUBSCRIPT COMMUNICATION (RADIO, DATA, INSTRUMENTATION) CONDUIT.
4. SEE SPECIFICATIONS 26 05 43 AND 31 23 33.

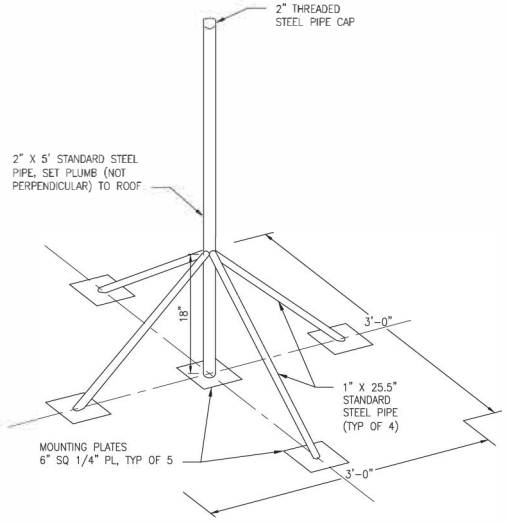
DIRECT BURIED CONDUIT DETAIL (2)
SCALE: NTS



NOTES:

1. ALL FITTINGS FOR PT MOUNTING ASSEMBLY SHALL BE SST (WITH EXCEPTION OF THE FLARE ADAPTER)
2. LOCATE PER TMWA PROJECT REPRESENTATIVE.
3. FINAL RTU CONDUCTOR TERMINATIONS BY TMWA..
4. TMWA TO INSTALL STAINLESS STEEL TUBING FROM BALL VALVE TO PT.
5. INSTALL PRESSURE TRANSDUCER PER MANUFACTURER'S INSTRUCTIONS.
6. ALL OTHER WORK SHALL BE BY CONTRACTOR.

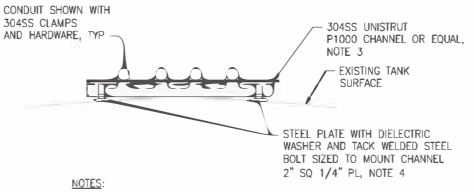
PRESSURE TRANSMITTER INSTALLATION DETAIL (5)
SCALE: NTS



NOTES:

1. TANK-TOP MASTS SHALL BE FABRICATED STEEL ASSEMBLIES WELDED TO THE TANK ROOF. COORDINATE WELDING OF MOUNTING PLATES TO OCCUR PRIOR TO TANK SURFACE PREP AND COATING. MAST SHALL RECEIVE SAME COATING AS TANK ROOF.
2. DIMENSIONS ARE NOMINAL. ADJUST AS NECESSARY TO MATCH CURVATURE OF TANK.

SOLAR PANEL AND ANTENNA MAST DETAIL (3)
SCALE: NTS



NOTES:

1. INSTALL CONDUIT SUPPORTS 10'-0" O.C. MAX.
2. ALL FITTINGS UTILIZED FOR THE CONDUIT SUPPORT SHALL BE BY THE SAME MANUFACTURER AS THE PREFORMED CHANNEL.
3. PROVIDE SPACE TO MOUNT A MINIMUM OF 3 ADDITIONAL 1" CONDUITS AT EACH LOCATION.
4. WELD TO TANK PRIOR TO TANK SURFACE PREP AND COATING. PROTECT THREADS.
5. VERTICAL CONDUIT RUN: INSTALL CONDUIT SUPPORT 2'-0" FROM THE GROUND AND ONE AT THE TOP OF TANK TO SUPPORT CONDUIT FITTINGS USED TO MAKE A 90° BEND FOR CONDUIT TO EXTEND ON TO TANK ROOF. MINIMUM OF 4 SUPPORTS SHALL BE PROVIDED ALONG VERTICAL RISE.

CONDUIT SUPPORT ON TANK (4)
SCALE: NTS

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR Engineering, Inc.
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Reno, Nevada 89521
775-337-4700

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WORK ORDER NO. 14-0035
DESIG NED A. RAGNEV
DRAWN R.J. GONZALVO
DATE AUGUST 21, 2023
CHECKED W. ETTLICH
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
ELECTRICAL DETAILS 1

PROFESSIONAL ENGINEER STATE OF NEVADA
ROBB J. McCOMB
EXP. 12/31/25
ELECTRICAL
No. 16808
08/21/2023

SHEET NUMBER
E500
33 OF 36

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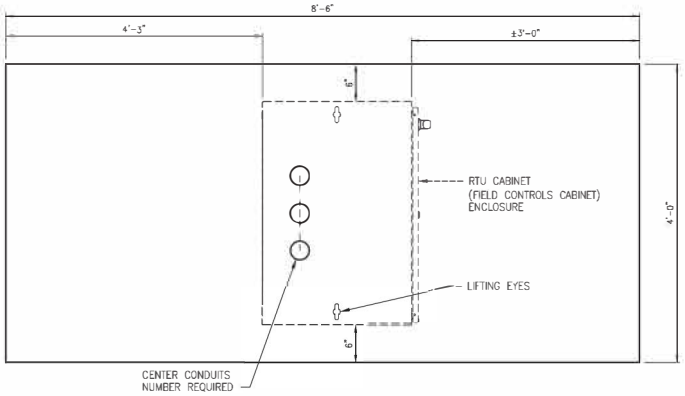
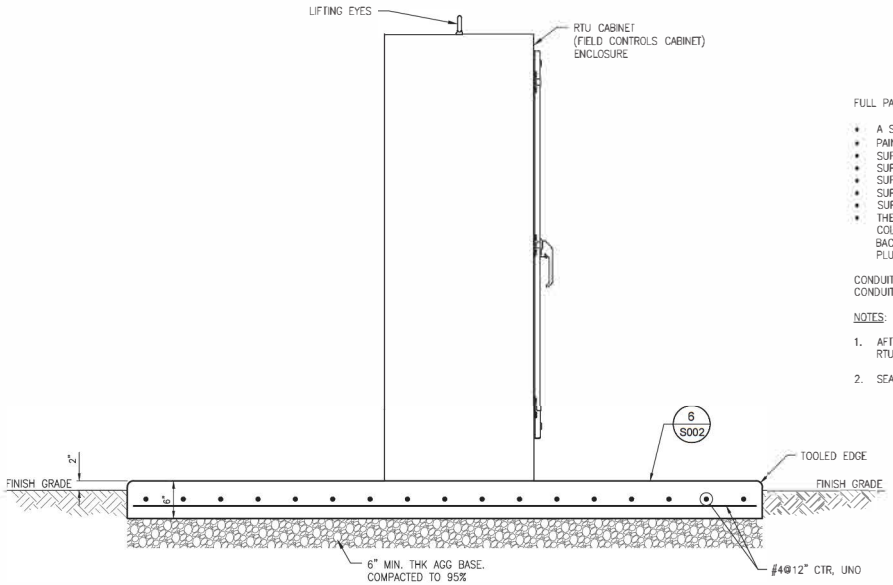
Aug 22, 2023 - 11:38am

WSUP23-0030
EXHIBIT D



RTU CONCRETE PAD PLAN



RTU CONCRETE PAD SECTION

RTU DETAIL AND NOTES 1 SCALE: NTS

NOTE:

THE DRAWING INDICATES WORK REQUIRED FOR TYPICAL EQUIPMENT ONLY. IF THE EQUIPMENT OR CONNECTIONS ARE DIFFERENT FROM WHAT IS SHOWN, PROVIDE THE MODIFICATIONS NECESSARY FOR A SAFE AND PROPERLY OPERATING INSTALLATION. THE DRAWING DIAGRAMMATICALLY INDICATES THE DESIRED LOCATION AND ARRANGEMENT OF CONDUIT RUNS, EQUIPMENT AND OTHER ITEMS. FIELD DETERMINE AND COORDINATE EXACT LOCATION BASED ON PHYSICAL SIZE AND ARRANGEMENT OF EQUIPMENT, FINISHED ELEVATIONS AND OBSTRUCTIONS. WORK OR EQUIPMENT NOT INDICATED OR SPECIFIED WHICH IS NECESSARY FOR THE COMPLETE AND PROPER OPERATION OF THE SYSTEMS SHALL BE ACCOMPLISHED WITHOUT ADDITIONAL COST TO TMWA.

FULL PARTS LIST OF THE TMWA FIELD CONTROLS CABINET IS AS FOLLOWS:

- A SAGINAW SCE-72EL3624FS (72"Hx36"Wx24"D) CABINET
- PAINTED WHITE STAINLESS STEEL (AS OPPOSED TO THE FACTORY STANDARD OF GRAY POWDER COAT)
- SUPPLIED WITH AN OPTIONAL SCE-36P30 BACK PANEL
- SUPPLIED WITH AN OPTIONAL SCE-ELPL PADLOCK HANDLE
- SUPPLIED WITH AN OPTIONAL SCE-PLWKB PADLOCK WING KNOB LATCH
- SUPPLIED WITH AN OPTIONAL SCE-DS36N4 DRIP SHIELD
- SUPPLIED WITH AN SCE-OSTOPK DOOR STOP KIT
- THE NEMA TYPE 4 RATED CABINET SHALL HAVE CONTINUOUSLY WELDED SEAMS THAT HAVE BEEN GROUND SMOOTH, A FLANGE TROUGH COLLAR AROUND ALL SIDES OF THE DOOR OPENING, AN OIL-RESISTANT DOOR SEAL GASKET, COLLAR STUDS FOR MOUNTING THE BACKPANEL, CONCEALED DOOR HINGE, MOUNTING HOLES IN BACK OF ENCLOSURE, MOUNTING HARDWARE, SEALING WASHER, AND HOLE PLUG INCLUDE, A REMOVABLE PRINT POCKET, AND GROUND STUDS ON DOOR AND BODY.

CONDUIT SHALL BE PVC COATED RIGID GALVANIZED SWEEPS AND PVC COATED RIGID GALVANIZED UP INTO THE PANEL, WITH APPROPRIATE CONDUIT BRACING.

NOTES:

1. AFTER CUTTING CONDUIT PENETRATIONS, APPLY TOUCH-UP PAINT TO EXPOSED METAL TO MINIMIZE RUSTING. SEAL CONDUITS ENTERING RTU CABINET WITH CONDUIT SEALING CLAY.
2. SEAL BOTTOM PERIMETER OF RTU CABINET WITH SIKAFLEX-1A, OR APPROVED EQUAL, TO PREVENT WATER INTRUSION.

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

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DESIGNED A. RAGNEV
DRAWN R.J. GONZALVO
DATE AUGUST 21, 2023
CHECKED W. ETTLICH
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
ELECTRICAL DETAILS 2

PROFESSIONAL ENGINEER - STATE OF NEVADA
ROBB J. McCOMB
EXP. 12/31/25
ELECTRICAL
NO. 18698
08/21/2023

SHEET NUMBER
E501
34 OF 36

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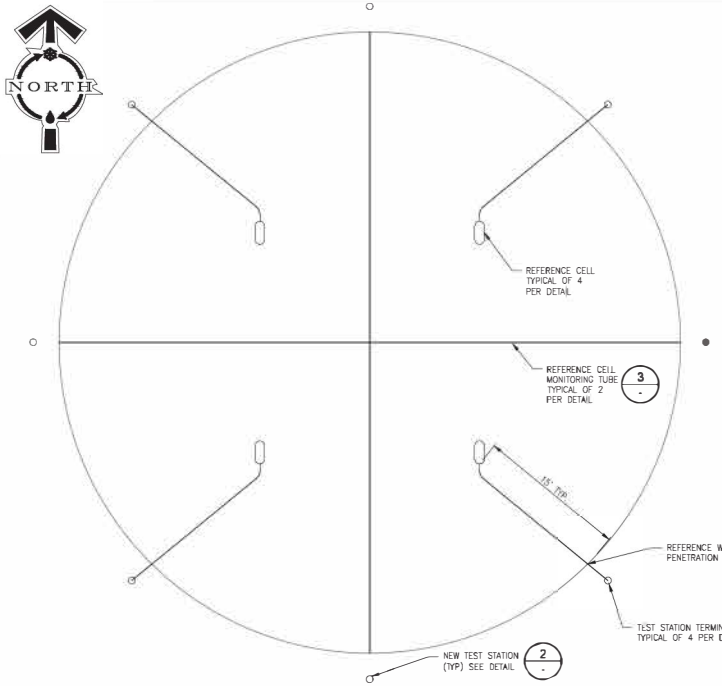
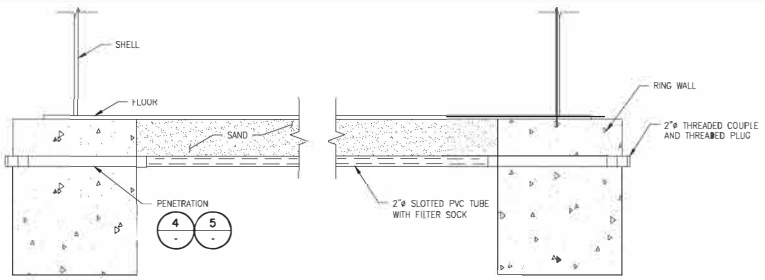
Aug 22, 2023 - 12:25pm

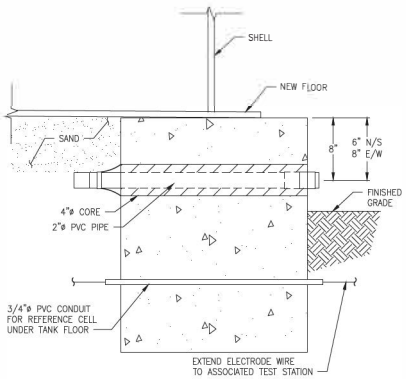
WSUP23-0030
EXHIBIT D



TEST STATION PLAN
SCALE: N.T.S. 1



REFERENCE CELL MONITORING TUBE
SCALE: N.T.S. 3



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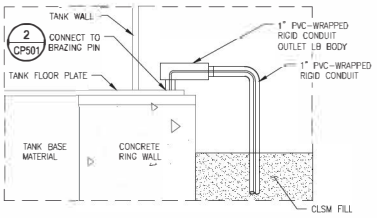
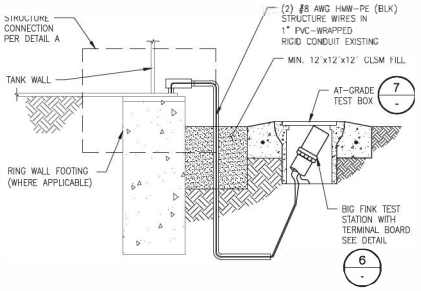
SCALE: N.T.S. 4



STRUCTURE CONNECTION DETAIL (CONCRETE RINGWALL FOUNDATION)
SCALE: N.T.S. A



TEST STATION DETAIL (CONCRETE RINGWALL FOUNDATION)
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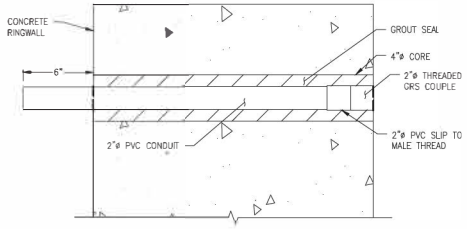
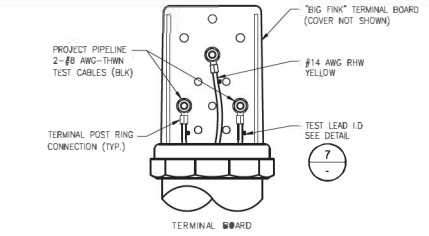
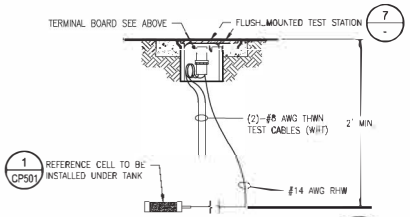
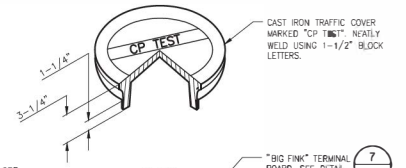


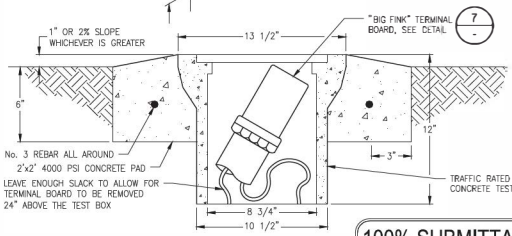
REFERENCE CELL PENETRATION ASSEMBLY
SCALE: N.T.S. 5





TEST STATION TERMINAL BOARD
SCALE: N.T.S. 6





NOTES:

1. CONCRETE BODY, TRAFFIC RATED – BROOKS 3-RT, CHRISTY G5 OR EQUAL.
2. ALL WIRES SHALL HAVE 24" MIN. SLACK IN BOX.
3. BOTTOM OF TEST BOX SHALL BE NATIVE SOIL. DO NOT PLACE ROCK, GRAVEL OR SAND IN TEST BOX.
4. TEST BOX TO BE FIELD LOCATED ±50' FROM STATIONING GIVEN ON PLAN SHEETS.
5. PROVIDE 2' x 2' x 6" THICK REINFORCED CONCRETE PAD AROUND TEST BOXES AT UNPAVED SITES. CONCRETE PAD SHALL BE LEVEL AND SURFACE SHALL BE FLUSH WITH TRAFFIC BOX.

AT-GRADE TEST STATION
SCALE: N.T.S. 7

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR

HDR Engineering, Inc.
9605 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED M. WEGNER
DRAWN K. GONZALEZ
DATE AUGUST 21, 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality Delivered
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY, RETURN UPON COMPLETION OF PROJECT (Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
CORROSION MONITORING TEST STATION DETAILS 1

SHEET NUMBER
CP500
35 OF 36

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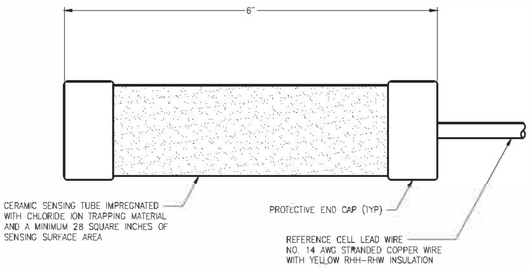
Aug 21, 2023 - 3:53pm

WSUP23-0030
EXHIBIT D

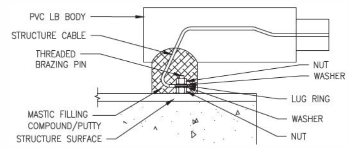


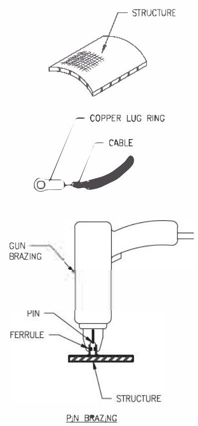
NOTES

1. THE REFERENCE ELECTRODE SHALL HAVE A MINIMUM SENSING SURFACE AREA OF 28 SQUARE INCHES. IT SHALL BE CAPABLE OF MAINTAINING A STABLE POTENTIAL WITHIN PLUS OR MINUS 10 MILLIVOLTS TO THAT OF A FRESHLY MADE COPPER SULFATE REFERENCE ELECTRODE WHILE A 3 MICROAMPERE ELECTRICAL CURRENT IS APPLIED TO IT. PROVIDE STELTH 2 MODEL SRE-007-CUY BY BORIN MANUFACTURING OR STAPERM MODEL CU-1-UGPC BY GMC CORROSION, OR APPROVED EQUAL

2. MEASURE THE ACCURACY OF EACH COPPER SULFATE REFERENCE ELECTRODE BEFORE INSTALLING IT BY MEASURING THE DC VOLTAGE DIFFERENCE BETWEEN IT AND ONE OR MORE REFERENCE ELECTRODES OF KNOWN ACCURACY. THE MEASUREMENTS SHALL BE LESS THAN PLUS OR MINUS 0.010 DC VOLTS FOR ALL REFERENCE ELECTRODES. PERFORM THESE MEASUREMENTS AFTER TOTALLY SUBMERGING THE REFERENCE ELECTRODES IN A FIVE-GALLON BUCKET OF WATER FOR A MINIMUM PERIOD OF 15 MINUTES. USE ONLY POTABLE DRINKING WATER FOR THIS TEST. BRACKISH WATER OR SALTWATER WILL AFFECT THE TEST RESULTS AND DAMAGE THE REFERENCE ELECTRODE. PROVIDE FIVE DAYS WRITTEN NOTICE TO THE ENGINEER TO ALLOW THESE TESTS TO BE WITNESSED

COPPER SULFATE REFERENCE ELECTRODE CELL
SCALE: N.T.S. (1 / CP500)





1. DEGREASE AND CLEAN STRUCTURE TO BARE, BRIGHT METAL WITH MECHANICAL DEVICES
2. STRIP WIRE INSULATION AND ATTACH FROM WIRE AND ATTACH A BAC M1 COMPRESSION TERMINAL OR APPROVED EQUAL
3. LOAD THE BRAZING GUN WITH A M8 THREADED DIRECT BRAZING PIN AND FERRULE. USE A THREADED TYPE CONNECTION FOR ABOVE-GROUND USE ONLY
4. BRAZE THE THREADED PIN TO THE SURFACE
5. TEST BRAZE BY BREAKING OFF THE SHANK OF THE PLAIN PIN WITH A HAMMER
6. COVER CONNECTION WITH MASTIC FILLED WELD CAP AND BITUMASTIC COATING 80% SOLIDS BY VOLUME OVER WELD CAP AND ALL EXPOSED METAL
7. ALL WELDS SHALL BE A MINIMUM OF 6" APART
8. ALLOW WELD COATING TO CURE PER MANUF. RECOM.

WIRING - TO - STRUCTURE WELD DETAIL
SCALE: N.T.S. (2 / CP500)

100% SUBMITTAL
NOT FOR CONSTRUCTION
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LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

CORROSION MONITORING TEST STATION DETAILS 2

SHEET NUMBER
CP501
36 OF 36

WSUP23-0030
EXHIBIT D

Map Pocket

IMPROVEMENT PLANS

for

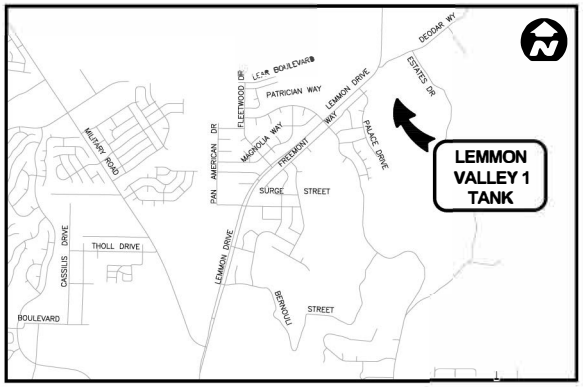
LEMMON VALLEY 1 TANK REBUILD

RENO - WASHOE COUNTY - NEVADA

TMWA PROJECT NO: 14-0035

PWP# WA-2023-XXX

SHEET INDEX



LOCATION MAPS
NTS

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD · PO BOX 30013 RENO, NEVADA 89520-3013 · PHONE: 775-834-8080

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PROFESSIONAL ENGINEER – STATE OF NEVADA
THOMAS SPEER
Expr: 06/30/24
CIVIL
No. 26995
8/25/23

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

811 Know what's below. Call before you dig.

G000
SHEET 1 OF 36

PROJECT #14-0035

K:\D_Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2 Design\1 CAD\14-0035 G000-G002.dwg
Aug 25, 2023 - 8:53am

GENERAL NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND TMWA SAFETY REGULATIONS AND SHALL MAINTAIN THE WORK AREA IN A SAFE CONDITION 24 HOURS PER DAY UNTIL THE PROJECT IS COMPLETE. WORKER AND PUBLIC SAFETY IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR NOT TMWA.

2. THE CONTRACTOR SHALL BE REQUIRED TO PREPARE, SUBMIT FOR APPROVAL AND ABIDE BY ALL TRAFFIC CONTROL PLANS AS REQUIRED BY THE CITY OF RENO. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND THE CONDITIONS OF THE PERMITS PRIOR TO HIS/HER BID.

3. AT LEAST 4 WORKING DAYS BEFORE STARTING CONSTRUCTION, THE CONTRACTOR SHALL CALL UNDERGROUND SERVICE ALERT AT 811 AND REQUEST UTILITY MARKING. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE COST OF REPAIRING EXISTING FACILITIES (PUBLIC OR PRIVATE) THAT ARE DAMAGED BY HIS OPERATIONS.

4. DEPTH AND HORIZONTAL LOCATION OF EXISTING UTILITIES DEPICTED ON THESE PLANS ARE APPROXIMATE BASED ON INFORMATION PROVIDED BY THIRD PARTIES. TMWA MAKES NO REPRESENTATION AS TO THE COMPLETENESS OR ACCURACY OF SUCH DATA, AND IT IS NOT INTENDED TO AND SHALL NOT BE RELIED UPON AS A SUBSTITUTE FOR THE INDEPENDENT INVESTIGATION BY CONTRACTOR. CONTRACTOR SHALL IDENTIFY & VERIFY THE DEPTH & LOCATION OF ALL EXISTING UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. ANY CONFLICT SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE TMWA REPRESENTATIVE. ALL EXISTING UTILITIES ARE NOT SHOWN, AND FACILITIES SHOWN MAY BE IN A LOCATION DIFFERENT FROM THAT DEPICTED.

5. SYMBOLS ARE NOT TO SCALE AND DO NOT NECESSARILY REPRESENT ACTUAL LOCATIONS OF FACILITIES.

6. CONTRACTOR IS RESPONSIBLE FOR LOCATING AND COORDINATING WORK AROUND ALL EXISTING UTILITIES.

7. CONTRACTOR SHALL VERIFY CONSTRUCTION METHODS AND OVERALL JOB APPROACH WITH TMWA AND ENGINEER PRIOR TO CONSTRUCTION.

8. CONTRACTOR SHALL PROVIDE ALL STAKING AND SURVEYING NECESSARY TO CONSTRUCT THE PROJECT. SURVEYING SHALL BE CONDUCTED BY A LICENSED SURVEYOR IN THE STATE OF NEVADA.

9. THE MATERIALS AND METHODS OF CONSTRUCTION HEREIN SPECIFIED SHALL BE FURNISHED IN ACCORDANCE WITH NAC 445A.65505 TO 445A.6723 INCLUSIVE AND THE STANDARDS OF THE TMWA CONSTRUCTION STANDARDS, STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION ("STANDARD SPECIFICATIONS" OR "ORANGE BOOK"), AMERICAN WATER WORKS ASSOCIATION (AWWA), AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), AMERICAN CONCRETE INSTITUTE (ACI), THE AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM), THE AMERICAN WELDING SOCIETY (AWS), AND MANUFACTURER STANDARDS. CONFLICTS OR QUESTIONS REGARDING THE SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE TMWA REPRESENTATIVE FOR RESOLUTION.

10. SOILS RETENTION MAY BE REQUIRED AROUND WATER METER BOXES, FIRE HYDRANTS, AND OTHER FACILITIES IF SLOPES EXCEED 15%.

11. CONTRACTOR SHALL CONTROL DUST IN ACCORDANCE WITH WASHOE COUNTY DISTRICT HEALTH DISTRICT AIR QUALITY REGULATIONS.

12. THE CONTRACTOR REALIZES THAT INCLEMENT (WINTER WEATHER) MAY OCCUR DURING THE PROPOSED WORK. NO ADDITIONAL PAYMENTS SHALL BE GRANTED FOR PROTECTING THE WORK IN PROGRESS AND DELAYS DUE TO INCLEMENT WEATHER CONDITIONS.

13. THE CONTRACTOR SHALL MAINTAIN A NEAT AND LEGIBLE DRAWING SET DENOTING ANY FIELD CHANGES THAT DEVIATE FROM THE APPROVED DESIGN ON A DAILY BASIS. PRIOR TO TMWA'S ACCEPTANCE OF THE IMPROVEMENTS AND FINAL PAYMENT THE CONTRACTOR IS TO PRESENT THIS DRAWING SET, WHICH REFLECTS ALL FIELD CHANGES TO TMWA'S PROJECT REPRESENTATIVE.

14. SEE SPECIFICATIONS FOR SEQUENCE OF CONSTRUCTION REQUIREMENTS.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL MATERIAL SPILLED OR TRACKED ONTO EXISTING ROADWAYS ON A DAILY BASIS.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES WITHIN THE LIMITS OF CONSTRUCTION, WHETHER OR NOT SAID UTILITIES ARE SHOWN ON THE PLANS. THIS RESPONSIBILITY INCLUDES CONTACTING UTILITY COMPANIES FOR LOCATIONS AND POTHOLING PRIOR TO CONSTRUCTION. REPAIR OF ANY DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION IS THE RESPONSIBILITY OF THE CONTRACTOR.

BASIS OF BEARING AND ELEVATION

BASIS OF BEARINGS: NORTH AMERICAN DATUM OF 1983 AS BASED ON FEDERAL BASE NETWORK/COOPERATIVE BASE NETWORK OBSERVATIONS IN 1994 (AKA NAD83/94), NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE AND HOLDING THE WASHOE COUNTY PUBLISHED LATITUDE AND LONGITUDE OF 39°32'16.44843" NORTH AND 119° 53' 08.87676" WEST FOR REGIONAL GPS CORS "RNO1" (WASHOE COUNTY IDENTIFIER N74SM0102B). A COMBINED GRID-TO-GROUND SCALE FACTOR OF 1.0001979939 IS USED TO SCALE THE STATE PLANE GRID COORDINATES TO GROUND.

BASIS OF ELEVATIONS: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND HOLDING THE WASHOE COUNTY PUBLISHED ELLIPSOID HEIGHT OF 1531.277 METERS (5023.865 FEET) FOR REGIONAL GPS CORS "RNO1" AND USING GEOID 99 TO DERIVE THE ORTHOMETRIC ELEVATION ABOVE MEAN SEA LEVEL.

WATER GENERAL NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT THE INTEGRITY OF EXISTING WATER LINES DURING CONSTRUCTION.

2. CONTRACTOR SHALL PROVIDE ALL MISCELLANEOUS PIPE, FITTINGS AND APPURTENANCES AS REQUIRED TO COMPLETE THE UTILITY WORK AS SHOWN.

3. TMWA DOES NOT GUARANTEE EXISTING VALVES WILL PROVIDE A COMPLETE SHUTDOWN. THE REMOVAL OF NUISANCE WATER TO CONDUCT THE WORK SHALL BE INCIDENTAL TO THE MOST APPROPRIATE BID ITEM. EXCESSIVE AMOUNTS OF WATER SHALL BE EVALUATED BY THE TMWA INSPECTOR FOR THE MOST APPROPRIATE ACTION TO PURSUE.

4. ALL WATER MAINS SHALL BE TESTED FOR PRESSURE AND LEAKAGE PER AWWA C600 & C605. TEST PRESSURE SHALL BE AS INDICATED IN CONTRACT DOCUMENTS AND NO LESS THAN 150 PSI ON MAINS NOT SPECIFICALLY CALLED OUT. DUCTILE IRON PIPELINES MUST BE PRESSURE TESTED ACCORDING TO AWWA STANDARD C600 AND PVC PIPELINES MUST BE PRESSURE TESTED ACCORDING TO AWWA STANDARD C605 PER NAC 445A.67145 (7). FOR OTHER MATERIALS, THE PIPELINES MUST BE PRESSURE TESTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION PER NAC 445A.67145 (7)(c).

5. BACTERIOLOGICAL TESTING, DISINFECTION, AND FLUSHING, FOR POTABLE WATER LINE CONSTRUCTION, SHALL BE PERFORMED PER AWWA C651. TMWA SHALL BE RESPONSIBLE FOR PERFORMING AND FUNDING UP TO TWO BACTERIOLOGICAL TESTS PER RUN OF PIPE CONSTRUCTED. IF MORE THAN TWO TESTS ARE REQUIRED, THE COST SHALL BE PLACED UPON THE CONTRACTOR. TWO (2) BACTERIOLOGICAL TESTS SHALL BE CONDUCTED PER TEST SEGMENT. BACTERIOLOGICAL TEST SAMPLES WILL NOT BE COLLECTED ON FRIDAYS, WEEKENDS, TMWA OBSERVED HOLIDAYS, OR THE DAY BEFORE A TMWA OBSERVED HOLIDAY, UNLESS AUTHORIZED BY THE TMWA INSPECTOR. BACTERIOLOGICAL TESTING OF MAIN/APPURTENANCES SHALL BE CONDUCTED BY A NEVADA CERTIFIED LABORATORY. TMWA CAN PROVIDE TESTING AT NO COST TO THE CONTRACTOR WITH A 2 WORKING DAY PRIOR NOTICE. UNLESS SPECIAL ARRANGEMENTS ARE AGREED UPON IN ADVANCE BY THE TMWA INSPECTOR SAMPLING BY TMWA LABORATORY STAFF SHALL BE LIMITED TO NORMAL WORKING HOURS MONDAY THROUGH THURSDAY.

6. PER NAC 445A.67145(6),
WATER MAIN MUST NOT BE PLACED INTO SERVICE AFTER ITS INITIAL CONSTRUCTION UNTIL:
   6.1. THE WATER MAIN HAS BEEN DISINFECTED AND FLUSHED IN ACCORDANCE WITH AWWA STANDARD C651.
   6.2. THE DISPOSAL OF ANY SPENT CHLORINE SOLUTIONS MUST BE COORDINATED WITH NDEP's BUREAU OF WATER POLLUTION CONTROL (BWPC).
   6.3. ANALYSES OF THE WATER MAIN WHICH INDICATE THAT THE WATER MEETS PRIMARY DRINKING WATER STANDARDS FOR COLIFORM BACTERIA (ABSENT FOR COLIFORM BACTERIA) HAVE BEEN OBTAINED AND REPORTED TO THE WCHD. PER AWWA STANDARD C651, TWO SETS OF CONSECUTIVE SAMPLES MUST BE TAKEN AT LEAST 24 HOURS APART FROM EVERY 1200 FEET OF MAIN, AT THE END OF THE LINE, AND FROM EACH BRANCH.

7. PRIOR TO BEING PUT INTO SERVICE, TMWA WILL DISINFECT THE TANK AND ENSURE THAT TWO COLIFORM SAMPLES PASS PRIMARY DRINKING WATER STANDARDS IN ACCORDANCE WITH AWWA C652 AND NAC 445A.67085.3.

8. AFTER THE TANKS HAVE BEEN DRAINED, TMWA WILL INSPECT SILT STOPS AND OVERFLOW PIPING FOR COMPLIANCE WITH NAC445A AND AWWA D100. ANY DEFICIENCIES INCLUDING MISSING OR NON-FUNCTIONING COMPONENTS WILL BE CORRECTED PRIOR TO COMPLETION OF THE WORK.

9. AFTER THE TANK INTERIOR IS CURED FOR THE APPROPRIATE TIME, THE TANK WILL BE FILLED WITH WATER BY TMWA AND THE WATER WILL BE HELD IN THE TANK FOR FIVE (5) DAYS. ON THE SIXTH DAY, THE WATER RETAINED IN THE TANK WILL BE TESTED ON THE SIXTH DAY BY A PROPERLY CERTIFIED LABORATORY HIRED BY TMWA FOR THE PRESENCE OF VOLATILE ORGANIC CHEMICALS, AND THE RESULTS SUBMITTED TO WASHOE COUNTY HEALTH DISTRICT FOR APPROVAL.

10. THE TANK WILL NOT BE PLACED INTO SERVICE UNTIL ALL REQUIREMENTS OF NAC 445A ARE MET.

CONTROL OF POLLUTION, NOISE, AND WATER

A. DUST SHALL BE CONTROLLED AT ALL TIMES IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASHOE COUNTY DISTRICT HEALTH DEPARTMENT.

B. THE CONTRACTOR SHALL NOT DISCHARGE OR ALLOW THE SPILLAGE OF PAINT, SOLVENT, THINNER, ENGINE OIL, FUEL, HYDRAULIC FLUID, OTHER PETROLEUM PRODUCTS, OR ANY HAZARDOUS MATERIAL. EQUIPMENT SHALL BE MAINTAINED AT ALL TIMES IN A MANNER TO PREVENT LEAKAGE AND SPILLAGE OF PETROLEUM PRODUCTS.
   1. AT A MINIMUM, TO PREVENT SOIL CONTAMINATION FROM ACCIDENTAL SPILLS, 3M POWERSORB FABRIC, OR EQUAL, SHALL BE USED UNDER ENGINES AND ENGINE DRIVEN EQUIPMENT, UNDER FUEL STORAGE AREAS, UNDER EQUIPMENT SERVICING AREAS, AND UNDER ANY OTHER AREAS WHERE PETROLEUM PRODUCTS OR HAZARDOUS MATERIALS ARE STORED OR USED.
   2. FABRIC SHALL BE PROTECTED FROM MECHANICAL DAMAGE AND ANCHORED AGAINST WIND DISPLACEMENT. AREAS WHERE PETROLEUM PRODUCTS OR HAZARDOUS MATERIALS ARE STORED SHALL BE SURROUNDED BY A BERM DESIGNED TO CONTAIN ANY SPILL THAT MAY OCCUR.
   3. THE CONTRACTOR SHALL HAVE A SPILL CLEANUP KIT CAPABLE OF CLEANING UP A SPILL OF AT LEAST 10 GALLONS OF PETROLEUM PRODUCT AT THE WORK SITE AT ALL TIMES. THE KIT SHALL BE A COMMERCIALLY AVAILABLE KIT CONTAINING OIL ABSORBING PADS OR GRANULAR ABSORBENT MATERIAL, CONTAINMENT BOOMS, AND A DISPOSAL CONTAINER. WORKERS SHALL BE INSTRUCTED IN USE OF THE KIT AND SHALL BE ADEQUATELY TRAINED AND EQUIPPED TO DEAL WITH THE ACCIDENTAL SPILL OF ANY HAZARDOUS MATERIAL USED.
   4. IN THE EVENT OF AN ACCIDENTAL SPILL OF PETROLEUM PRODUCTS OR HAZARDOUS MATERIALS THE CONTRACTOR SHALL IMMEDIATELY CONTAIN THE SPILL AND ARRANGE FOR THE MATERIAL TO BE CLEANED UP AND DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS. THE COSTS OF ALL CLEANUP AND DISPOSAL WORK SHALL BE BORNE BY THE CONTRACTOR. IF A HAZARDOUS CONDITION EXISTS THE CONTRACTOR SHALL TAKE WHATEVER ACTIONS ARE NECESSARY TO PROTECT THE PUBLIC AND WORKERS FROM INJURY, AND ADJACENT PROPERTIES FROM DAMAGE. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE TMWA REPRESENTATIVE OF THE SPILL.

C. THE CONTRACTOR SHALL EMPLOY ALL APPLICABLE BEST MANAGEMENT PRACTICES (BMPS) FOR CONTROL OF SEDIMENT AND EROSION FROM CONSTRUCTION SITES PER RECOMMENDATIONS OF THE TRUCKEE MEADOWS CONSTRUCTION SITE BMPS HANDBOOK. THE ESTIMATED AREA OF SITE DISTURBANCE FOR THIS PROJECT IS LESS THAN ONE ACRE.

D. THE CONTRACTOR SHALL CONTROL NOISE FROM HIS OPERATIONS TO LEVELS THAT ARE NOT A NUISANCE AND THAT MEET ALL LOCAL NOISE CONTROL REGULATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE NOISE LEVELS ALLOWED BY THE JURISDICTION WHERE THE WORK IS LOCATED AND TO COMPLY WITH THOSE REGULATIONS.

E. WATER DEVELOPED AS A RESULT OF THE WORK SHALL BE DISPOSED OF BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

F. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE FOR LEGAL DISPOSAL OF WATER WITHOUT DAMAGE TO ADJACENT PROPERTIES.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

GENERAL NOTES

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Exp: 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
G001
2 OF 36

K:\O_Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2 Design\1 CAD\14-0035 G000-G002.dwg
Aug 25, 2023 - 8:53am

WSUP23-0030
EXHIBIT D

LINETYPE LEGEND

- NEW WATER MAIN/SERVICE LINE
- EXISTING WATER MAIN
- EXISTING WATER SERVICE LINE
- PREVIOUSLY ABANDONED WATER SERVICE LINE
- 18"SD — EXISTING STORM DRAIN MAIN/LATERAL WITH SIZE
- 12"SS — EXISTING SANITARY SEWER MAIN WITH SIZE
- RW — EXISTING RECLAIMED WATER
- EXISTING WATER TANK DRAIN LINE WITH SIZE
- G — EXISTING NATURAL GAS MAIN/LATERAL
- T — EXISTING UNDERGROUND TELECOMMUNICATIONS FACILITY
- CATV — EXISTING UNDERGROUND CABLE TV
- F●C — EXISTING FIBER OPTIC CABLE – CHARTER COMMUNICATIONS
- UGE — EXISTING UNDERGROUND ELECTRIC FACILITY
- TS — EXISTING UNDERGROUND TRAFFIC SIGNAL FACILITY
- EXISTING ROADWAY CENTERLINE (APPROXIMATE)
- EXISTING PROPERTY LINE
- EXISTING PIPE TO BE REMOVED AND DISPOSED OF BY OTHERS
- EXISTING PIPE TO ABANDON. CONC CAP AT ENDS
- EXISTING FLOWLINE
- EXISTING FENCE LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- NEW MAJOR CONTOUR
- NEW MINOR CONTOUR
- EXISTING CONCRETE
- CONSTRUCTED BY DEVELOPER (FUTURE)

SYMBOLS

- A / M101 — SECTION IDENTIFICATION LETTER; SHEET OR DRAWING NUMBER WHERE SECTION APPEARS
- MATERIAL/GRADING TAG
- 1 — NOTE TAG
- D / S201 — SECTION/DETAIL IDENTIFICATION LETTER; SHEET OR DRAWING NUMBER WHERE SECTION/DETAIL IS TAKEN OR APPEARS
- CXXX / TYP — TYPICAL DETAIL CALLOUT FOUND ON TYPICAL DETAIL SHEETS
- FME 3021 — EXISTING EQUIPMENT TAG
- MTR 1211 — NEW EQUIPMENT TAG

HATCHING LEGEND

- CONCRETE (PLAN & SECTION)
- AC PAVING (SECTION)
- GRATING
- NEW AGGREGATE BASE OR DRAIN ROCK (SECTION)
- EXISTING AC PAVING (PLAN)
- EXISTING GRADE & FILL (SECTION)
- NEW AC PAVING (PLAN)
- ROCK SLOPE PROTECTION (PLAN & SECTION)
- REMOVE & WASTE (R&W), DEMOLISH OR ABANDON (ABND)
- CONCRETE CURB, GUTTER AND DRIVEWAY REMOVAL & REPLACEMENT
- GRAVEL ROAD SURFACING

NOTE: NOT ALL LINETYPES, SYMBOLS, HATCHES OR ABBREVIATIONS ARE REPRESENTED IN THIS PLANSET.

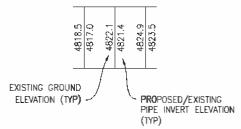
ABBREVIATIONS

±	PLUS OR MINUS	GA	GAUGE	R&W	REMOVE AND WASTE
⌀	DIAMETER	GAL	GALLONS	RAD	RADIUS
		GALV	GALVANIZED	RBP	REMOVABLE BARRIER POST
AB	AGGREGATE BASE	GB	GRADE BREAK	RCP	REINFORCED CONCRETE PIPE
AC	ASPHALT CONCRETE	GPM	GALLONS PER MINUTE	RD	ROAD
ACP	ASPHALT CONCRETE PAVEMENT	GSP	GALVANIZED STEEL PIPE	REF	REFERENCE
AGG	AGGREGATE	GV	GATE VALVE, GAS VALVE	REQD	REQUIRED
ALUM	ALUMINUM			REV	REVISION
APP	APPROVED	H	HEIGHT	RFA	RESTRAINED FLANGE ADAPTER
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE	HDPE	HIGH DENSITY POLYETHYLENE	RFCA	RESTRAINED FLANGED COUPLING ADAPTER
APN	ASSESSOR PARCEL NUMBER	HEX	HEXAGONAL	RJ	RESTRAINED-JOINT
APPROX.	APPROXIMATE(LY)	HOA	HOMEOWNERS ASSOCIATION	RMJ	RESTRAINED MECHANICAL JOINT
ARV	AIR RELEASE VALVE	HORIZ	HORIZONTAL	ROW	RIGHT OF WAY
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	HP	HORSEPOWER	RS	RESILIENT SEATED
AWWA	AMERICAN WATER WORKS ASSOCIATION	HR	HOUR	RT	RIGHT
				RTC	REGIONAL TRANSPORTATION COMMISSION
BC	BEGINNING OF CURVE	IE	INVERT ELEVATION	RTU	REMOTE TELEMETRY UNIT
BGS	BELOW GRADE SURFACE	IN	INCH	RW	RESILIENT WEDGE, RECLAIMED WATER, REDWOOD
BOT	BOTTOM	INC	INCORPORATED		
BP	BARRIER POST	INV	INVERT	S	SLOPE, SOUTH
BPS	BOOSTER PUMP STATION	IP	IRON PIPE	SCH	SCHEDULE
BV	BALL VALVE, BUTTERFLY VALVE			SD	STORM DRAIN
		L	LENGTH	SDMH	STORM DRAIN MANHOLE
C	CONCRETE SPOT ELEVATION	LB(S)	POUND(S)	SDR	STANDARD DIMENSION RATIO
C/C	CENTER-TO-CENTER	LF	LINEAR FEET	SF	SQUAREFEET
C&G	CURB AND GUTTER	LIP	LIP OF GUTTER	SQ	SQUARE
CATV	CABLE TELEVISION	LLC	LIMITED LIABILITY CORPORATION	SS, SSWR	SANITARY SEWER
CAV	COMBINATION AIR VALVE	LN	LANE	SST, SS	STAINLESS STEEL
CF	CORRECTION FACTOR	LP	LIGHT POLE	SSMH	SANITARY SEWER MANHOLE
CI	CAST IRON	LT	LEFT	SSPWC	STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
CIP	CAST IRON PIPE				
CL	CLASS, CENTER LINE	MAG	MAGNETIC	ST	STREET
CLF	CHAINLINK FENCE	MAX	MAXIMUM	STA	STATION
CLR	CLEAR	MDD	MAXIMUM DAY DEMAND, MAXIMUM DRY DENSITY	STD	STANDARD
CMU	CEMENT MASONRY UNIT	MFR	MANUFACTURER	STL	STEEL
COMP	COMPACTED	MH	MANHOLE	STMFD	SOUTH TRUCKEE MEADOWS FIRE DEPARTMENT
CONC	CONCRETE	MIN	MINIMUM	STMGID	SOUTH TRUCKEE MEADOWS GENERAL IMPROVEMENT DISTRICT
CORP	CORPORATION	MIP	MALE IRON PIPE		
CP	CONTROL POINT	MJ	MECHANICAL JOINT	SWR	SEWER
CU	COPPER, CUBIC	MLS	MORTAR LINED STEEL		
CV	CHECK VALVE, CONTROL VALVE	MPH	MILES PER HOUR	TBC	TOP BACK OF CURB
				TBD	TOP BACK OF ASPHALT DIKE
DET	DETAIL	N	NORTH	TEL	TELEPHONE
DG	DECOMPOSED GRANITE	(N)	NEW	TEMP	TEMPORARY
DI	DUCTILE IRON, DRAINAGE INLET, DROP INLET	NAC	NEVADA ADMINISTRATIVE CODE	TMH	TELEPHONE MANHOLE
DIP	DUCTILE IRON PIPE	NAVD	NORTH AMERICAN VERTICAL DATUM	TMWA	TRUCKEE MEADOWS WATER AUTHORITY
DR	DRAIN	NO	NUMBER	TR	TRANSITE (AC) PIPE, TRAFFIC
DWG	DRAWING	NPT	NATIONAL PIPE THREAD	TRW	TOP OF RETAINING WALL
		NTS	NOT TO SCALE	TW	TOP OF WALL
E	EAST			TYP	TYPICAL
EC	END OF CURVE	OAE	OR APPROVED EQUAL		
EDC	EDGE OF CONCRETE	OC	ON CENTER	UGE	UNDERGROUND ELECTRIC
EF	EACH FACE	OD	OUTSIDE DIAMETER	U.N.O.	UNLESS NOTED OTHERWISE
EG	EXISTING GRADE	OHP	OVERHEAD POWER	UV	UTILITY VAULT
EGR	EDGE OF GRAVEL ROAD	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION		
ELEV	ELEVATION			VB	VALVE BOX
EOP	EDGE OF PAVEMENT	PCC	PORTLAND CEMENT CONCRETE	VERT	VERTICAL
EP	EDGE OF PAVEMENT	PE	PLAIN END, POLYETHYLENE	VFD	VARIABLE FREQUENCY DRIVE
EPDM	ETHYLENE PROPYLENE DIENE MONOMER	PL	PROPERTY LINE	VG	VALLEY GUTTER
EX, (E)	EXISTING	PO	PUSH-ON, POST OFFICE		
		POC	POINT OF CONNECTION	W	WITH, WATER, WIDTH, WEST
FC	FLEX COUPLING	PP	POWER POLE	WM	WATER METER
FCA	FLANGED COUPLING ADAPTER	PRS	PRESSURE REDUCING/REGULATING STATION	WV	WATER VALVE
FDC	FIRE DEPARTMENT CONNECTION	PRV	PRESSURE RELEASE VALVE		
FEL&C	FUSION EPOXY LINED AND COATED	PSF	POUNDS PER SQUARE FOOT	YD	YARD
FG	FINISHED GRADE	PSI	POUNDS PER SQUARE INCH		
FH	FIRE HYDRANT	PT	PRESSURE TRANSDUCER, POINT		
FIP	FEMALE IRON PIPE	PV	PLUG VALVE		
FL	FLOWLINE, FENCELINE	PVC	POLYVINYL CHLORIDE		
FLA	FLANGE	PWP	PUBLIC WORKS PROJECT		
FLG	FLANGE				
FOC	FIBER OPTIC CABLE	R&R	REMOVE AND REINSTALL		
FT	FEET	R&S	REMOVE AND SALVAGE		
FX	FAX	R	RADIUS		

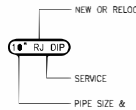
PLAN AND PROFILE SYMBOL LEGEND

- PROPOSED TEE / TAPPING SLEEVE
- PROPOSED 90° ELBOW
- PROPOSED 45° ELBOW
- PROPOSED 11.25° ELBOW
- PROPOSED VERTICAL ELBOW
- EXISTING VERTICAL ELBOW
- PROPOSED THRUST BLOCK
- PROPOSED REDUCER
- PROPOSED GATE VALVE PLAN
- PROPOSED GATE VALVE PROFILE
- PROPOSED GATE VALVE – NORMALLY CLOSED
- EXISTING ISOLATION VALVE
- EXISTING ISOLATION VALVE – NORMALLY CLOSED
- PROPOSED COUPLING
- PROPOSED CAP / FCA WITH BLIND FLANGE
- EXISTING CAP
- PROPOSED NEW WATER METER BOX AND COVER
- EXISTING WATER METER FACILITY
- PROPOSED FLUSH ASSEMBLY
- EXISTING FLUSH ASSEMBLY
- PROPOSED SSMH BY OTHERS
- EXISTING SSMH TO BE DEMO BY OTHERS
- EXISTING SINGLE CHECK VALVE
- FH — EXISTING FIRE HYDRANT
- WV — EXISTING WATER VALVE
- EXISTING STORM DRAIN MANHOLE (SDMH)
- EXISTING SANITARY SEWER MANHOLE (SSMH)
- EXISTING STORM DRAIN CATCH BASIN TYPE 1
- EXISTING STORM DRAIN CATCH BASIN TYPE 4–R
- EXISTING ROUND STORM DRAIN CATCH BASIN WITH GRATE
- EXISTING NATURAL GAS VALVE
- EXISTING NATURAL GAS CAP
- EXISTING NATURAL GAS REDUCER
- EXISTING UTILITY POLE
- EXISTING UNDERGROUND ELECTRIC VAULT WITH MANHOLE ACCESS
- EXISTING ELECTRIC BOX / VAULT (SIZES VARY)
- EXISTING ELECTRIC TRANSFORMER
- EXISTING TELECOMMUNICATIONS BOX / VAULT (SIZES VARY)
- EXISTING TELECOMMUNICATIONS VAULT WITH MANHOLE ACCESS
- EXISTING CHARTER COMMUNICATIONS CABLE TV/FIBER OPTIC BOX (SIZES VARY)
- EXISTING TRAFFIC SIGNAL BOX (SIZES VARY)
- EXISTING TRAFFIC SIGNAL CABLE MANHOLE ACCESS BOX
- EXISTING TRAFFIC SIGNAL – MULTIPLE LIGHTS WITH ARM
- EXISTING TRAFFIC SIGNAL – SINGLE LIGHT
- EXISTING STREET LIGHT
- EXISTING (FOUND) MONUMENT
- SURVEY CONTROL POINT
- MSP — EXISTING METAL SIGN POST
- EXISTING TREE
- FLOW ARROW
- BARRIER POST
- REMOVABLE BARRIER POST

PROFILE ELEVATION INDICATORS



PIPING IDENTIFICATION SYSTEM



PIPING IDENTIFICATION SYSTEM NOTE:

SEE PIPING ABBREVIATIONS THIS SHEET. SEE SPECIFICATION FOR PIPE MATERIAL NOT SPECIFICALLY CALLED OUT ON THE DRAWINGS.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY. RETURN UPON COMPLETION OF PROJECT (Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

LEGENDS, AND ABBREVIATIONS

PROFESSIONAL ENGINEER – STATE OF NEVADA – THOMAS SPEER – Exp: 06/30/24 – CIVIL – No. 26995

SHEET NUMBER
G002
3 OF 36

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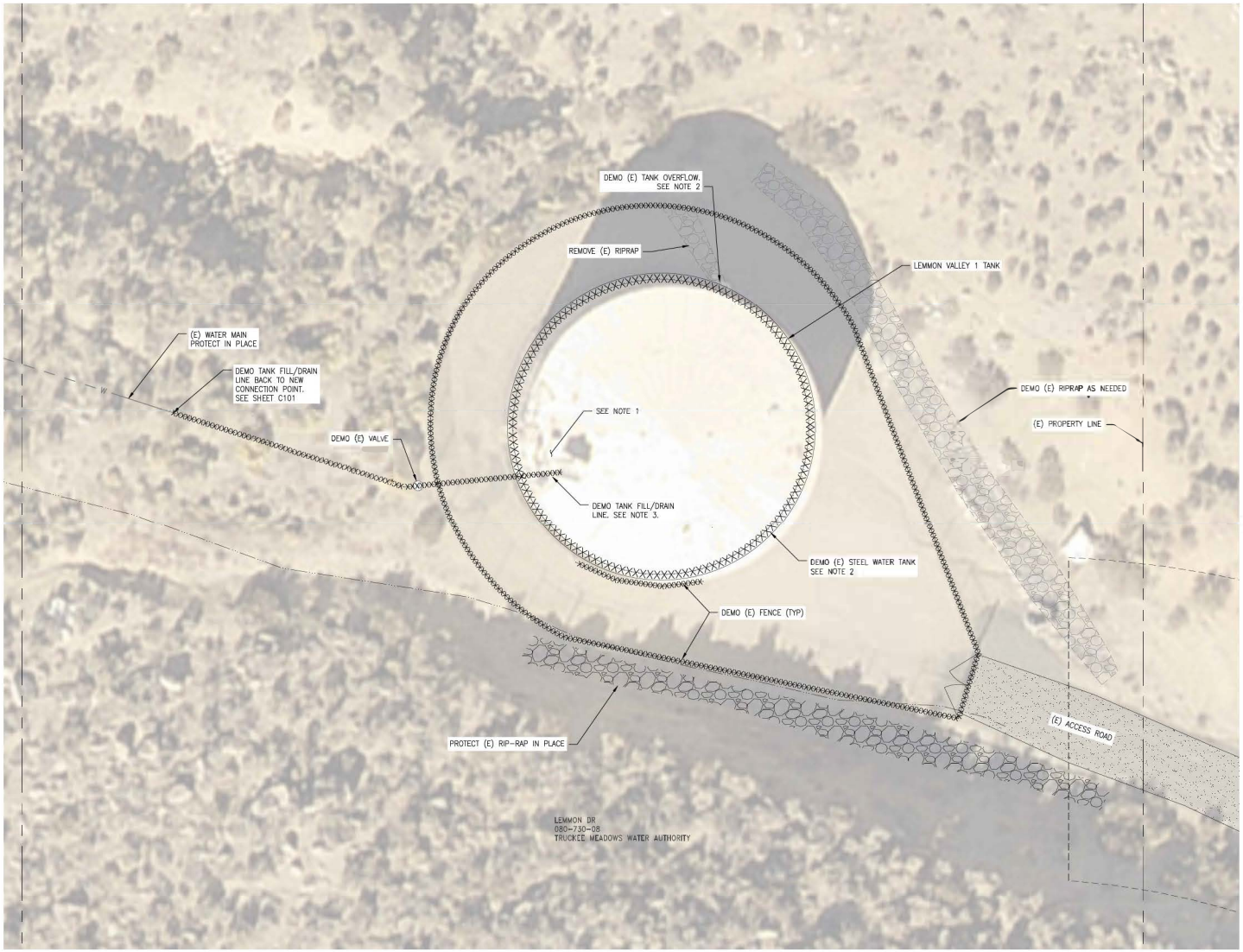
Aug 25, 2023 - 8:53am

WSUP23-0030
EXHIBIT D



NORTH

10' 5' 0 10'
SCALE
1" = 10'

NOTES:

1. ROOF MOUNTED APPURTENANCES TO BE REMOVED BY TMWA PRIOR TO DEMO.
2. DEMO (E) WATER TANK, RETAINING RING, AND APPURTENANCES.
3. CUT AND CAP (E) TANK FILL/DRAIN PIPE AT A PROPER LOCATION THAT WILL ALLOW CONNECTION FOR NEW.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
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DRAWN JRH
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1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

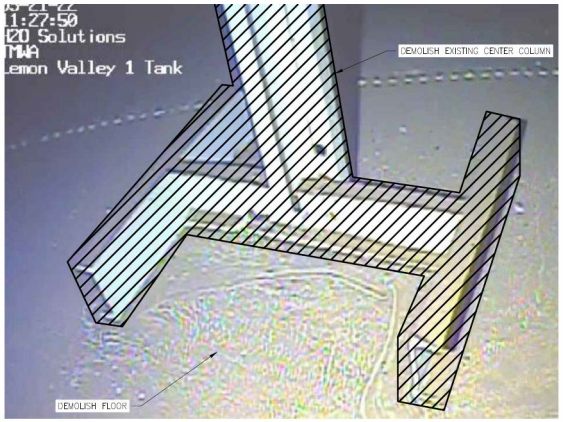
DEMOLITION PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Expc 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
D100
4 OF 36

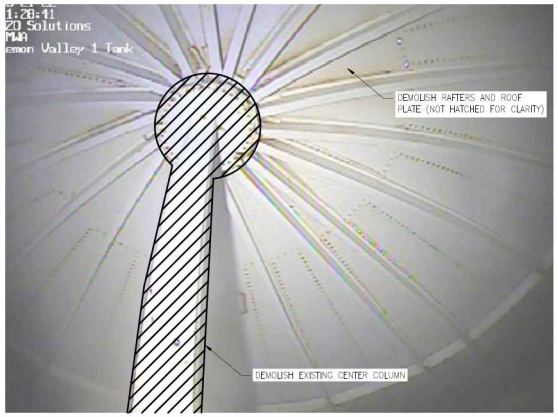
K:\C-Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2 Design\1 CAD\14-0035 D100 DEMO.dwg
Aug 25, 2023 - 8:54am

WSUP23-0030
EXHIBIT D



CENTER COLUMN - BASE

CENTER COLUMN - MIDDLE



CENTER COLUMN - TOP

NOTES:

1. THESE DETAILS ARE INTENDED TO PROVIDE THE CONTRACTOR WITH INFORMATION AS TO THE CONSTRUCTION OF THE TANK FROM THE INSIDE. NOT ALL ITEMS HAVE BEEN CALLED OUT OR HATCHED FOR CLARITY.
2. THE ENTIRE TANK IS TO BE DEMOLISHED.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN K. GONZALEZ
DATE AUG. 2023
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APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

INTERIOR DEMO DETAILS

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Expc 06/30/24
CIVIL
No. 28995
8/25/23

SHEET NUMBER
D200
5 OF 36

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Aug 25, 2023 - 10:54am

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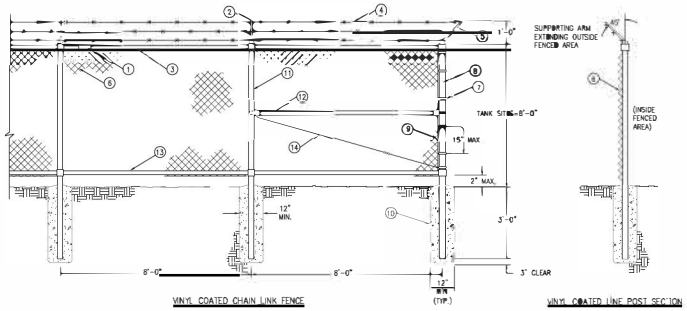
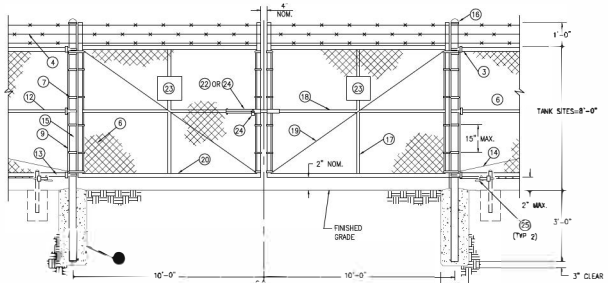
EXHIBIT D



VINYL COATED CHAIN LINK FENCE

VINYL COATED LINE POST SECTION

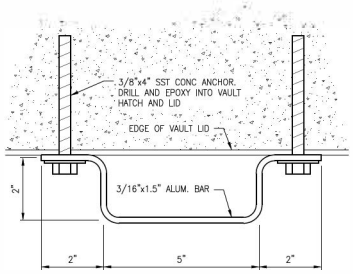


DOUBLE SWING GATE

VINYL COATED CHAIN LINK FENCE & DOUBLE SWING GATE MATERIAL LIST AND SPECIFICATIONS

1. RAIL COUPLING, OUTSIDE SLEEVE TYPE, MINIMUM 6"LONG.
2. LINE POST BARBED WIRE SUPPORTING ARM.
3. TOP RAIL, 1 1/4" NOMINAL SIZE (0.140" WALL; 2.27 LB/FT).
4. BARBED WIRE, 3 STRANDS OF 12.5 GAWIRE W/ 14 GA. 4 POINT BARBS.
5. CORNER POST BARBED WIRE SUPPORTING ARM AT 45° ANGLE (FACING OUT).
6. 9 GA. 2" VINYL COATED CHAIN LINK FABRIC. COLOR SHALL BE PER TMWA.
7. BRACE BAND OR TENSION BAND.
8. CORNER POST, 2 1/2" NOMINAL SIZE (0.203" WALL; 5.79 LB/FT).
9. TENSION BAR SECURED TO POST WITH BRACE OR TENSION BANDS.
10. CONCRETE FOOTING, TOP TO BE TROWELED TO A DENSE SMOOTH FINISH AND SLOPED TO DRAIN AWAY FROM POST. 3000 PSI MIN.
11. LINE POST, 2" NOMINAL SIZE (0.154 WALL; 3.65 LB/FT).
12. POST BRACE, 1 1/4" NOMINAL SIZE (0.140" WALL; 2.27 LB/FT).
13. BOTTOM RAIL, 1 1/4" NOMINAL SIZE (0.140" WALL; 2.27 LB/FT). NO MORE THAN 2" ABOVE GRADE.
14. TRUSS ROD, MINIMUM 3/8" DIAMETER WITH A TURNBUCKLE.
15. GATE POST, 3 1/2" NOMINAL SIZE (0.226" WALL; 9.11 LB/FT).
16. POST CAP.
17. GATE LEAF VERTICAL INTERMEDIATE BRACE SPACED SO THAT NO VERTICAL MEMBERS ARE MORE THAN 7' APART; 1 1/2" NOMINAL SIZE (0.145" WALL; 272 LB/FT).
18. GATE LEAF HORIZONTAL INTERMEDIATE BRACE 2" NOMINAL SIZE (0.154" WALL; 3.65 LB/FT).
19. DIAGONAL TRUSS ROD OF MINIMUM 3/8" NOMINAL DIAMETER, REQUIRED IF GATE LEAF IS 6' OR WIDER.
20. GATE FRAME, 2" NOMINAL (0.154" WALL; 3.65 LB/FT).
21. ALL HARDWARE, POSTS, WIRE, EXTENSION ARMS, RODS, ETC. COLOR SHALL BE PER TMWA.
22. INSTALL FABRICATED LATCH (SEE DETAIL) OR #24 PER TMWA REQUEST.
23. WARNING SIGN SUPPLIED BY TMWA.
24. STRONG ARM LATCH FOR ROUND FRAME WHERE REQUESTED BY TMWA (LOCKS PROVIDED BY TMWA).
25. INSTALL GATE KEEPING TO SECURE GATE IN OPEN POSITION. INSTALL 2"ø x 12" LONG POST WITH CONC FOOTING.

VINYL COATED CHAIN LINK FENCE DETAILS W/ 20' DOUBLE GATE — C201 TYP — N.T.S.



TOP VIEW

NOTES:

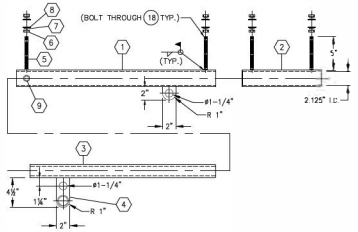
1. 2 MOUNTING BRACKETS SHALL BE INSTALLED 16" O.C. AT EACH LADDER LOCATION. TO BE LOCATED IN FIELD, COORDINATE W/ TMWA REPRESENTATIVE.

LADDER MOUNTING BRACKET — C299 TYP — SCALE: NTS

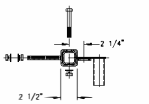
FABRICATED LATCH MATERIAL LIST		
NO.	QTY.	DESCRIPTION
1	30"	LATCH GUIDE CY LNGB – 2-1/2" X 3/16" SQUARE TUBING
2	12"	LATCH GUIDE CY LNGB – 4-1/2" X 2-1/2" X 3/16" SQUARE TUBING
3	28"	LATCH BOLT – 2" X 1/4" SQUARE TUBING
4	2	PADLOCK HASPS – 1/4" STEEL PLATE
5	4	MOUNTING STUDS – 1/2" X 5" ALL-THREAD
6	8	1/2" HEX NUTS
7	9	1/2" SPLIT LOCK WASHERS
8	9	1/2" FLAT WASHERS
9	1	LATCH BOLT STOP – 1/2" X 4" MACHINE BOLT
10	1	LATCH BOLT HANDLE – 1 1/4" X 4" SCH 40 STEEL PIPE

GENERAL NOTES

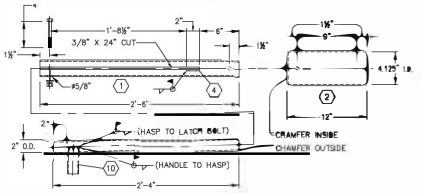
1. ALL HARDWARE AND COMPONENTS TO BE HOT-DIP GALVANIZED AFTER FABRICATION. DO NOT TIGHTEN HARDWARE MORE THAN NECESSARY.
2. OVERTIGHTENING MAY DEFORM LATCH OR GATE COMPONENTS.



TOP VIEW



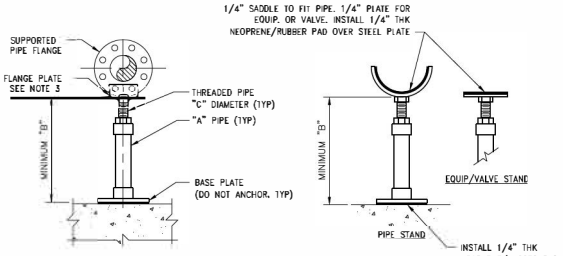
END VIEW



FRONT VIEW

FABRICATED GATE LATCH — C202 TYP — N.T.S.

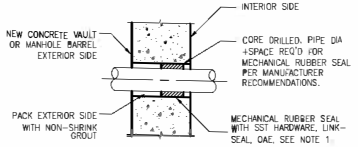
ADJUSTABLE PIPE SUPPORT SCHEDULE				
SIZE OF SUPPORTED PIPE	EXTENSION PIPE SIZE "A" SCH 40	BASE PLATE SIZE	MINIMUM DIST. FROM FLANGE TO FLOOR "B"	THREADED PIPE "C" DIAMETER
2	2"	4"x6"x 1/4"	7"	1"
2 1/2	2.5"	4"x8"x 1/4"	7"	1.5"
3	2.5"	4"x6"x 1/4"	7"	1.5"
4	3"	4"x6"x 1/4"	7"	2.5"
6	3"	4"x6"x 1/4"	7"	2.5"
8	3"	4"x6"x 1/4"	7"	2.5"
10	3"	4"x6"x 1/4"	7"	2.5"
12	3"	4"x8"x 1/4"	7"	2.5"
14	4"	6"x8"x 1/2"	9 1/2"	3"
16	4"	6"x8"x 1/2"	9 1/2"	3"



NOTES:

1. MATERIAL OF FABRICATION ASTM A35 & A53 STEEL WITH ELECTRO-GALVANIZED FINISH OR AS SPECIFIED ON THE DRAWING.
2. STANDON MODEL S89 FLANGE SUPPORT OR EQUAL. SUPPORT DOES NOT SERVE AS SEISMIC OR THRUST SUPPORT.
3. TWO BOLTS UP TO 10". 45° THEREAFTER

ADJUSTABLE PIPE SUPPORT DETAIL — C500 TYP — N.T.S.



NOTES:

1. DO NOT USE LINK-SEAL ON SDR 35 PVC PIPE.

WALL PENETRATION DETAIL — C520 TYP — N.T.S.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

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DATE AUG. 20 23
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TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

DETAILS

PROFESSIONAL ENGINEER - STATE OF NEVADA — THOMAS SPEER — Expr. 06/30/24 — CIVIL — No. 26990 — 8/25/23

SHEET NUMBER
C001
6 OF 36

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Aug 25, 2023 - 10:54am

WSUP23-0030
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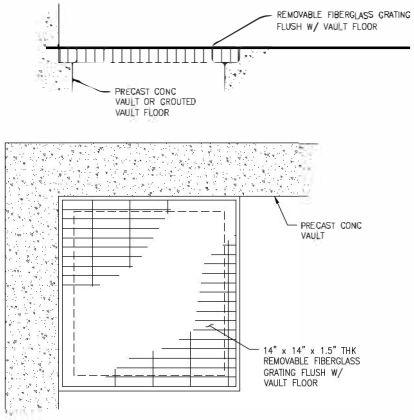
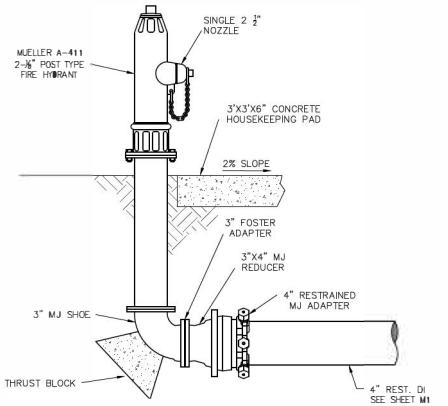
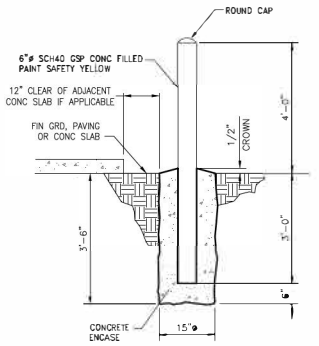


NOTES:
1. DUE TO HIGH GROUND WATER, NO DRAIN HOLE WILL BE IN THE VAULT FLOOR.
2. GRATE SHALL BE PEDESTRIAN FRIENDLY.

SUMP GRATING — N.T.S. — C521 TYP



POST HYDRANT — N.T.S. — C460 TYP



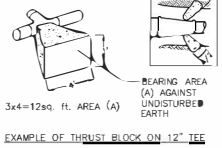
BOLLARD DETAIL — N.T.S. — C461 TYP

TYPE OF FITTING	90° BEND	45° BEND	11.25° OR 22.5° BEND	TEE OR DEAD END	CROSS W/PLUG	TEE W/PLUG	ALL PLUGS (DEAD END)
TYPICAL INSTALLATION							

REDUCER

THRUST BLOCK BEARING AREA (SQ. FT.)

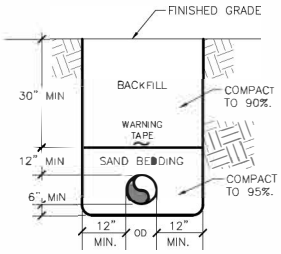
SIZE OF PIPE	90° BEND	45° BEND	11.25° OR 22.5° BEND	TEE OR DEAD END	TEE W/PLUG	CROSS W/PLUG
4"	2	1	1	3	3	4
6"	6	3	2	5	6	6
8"	7	4	3	5	8	8
10"	12	6	3	8	12	12
12"	16	8	5	12	18	18
14"	22	12	8	16	24	24
16"	30	16	8	20	30	30
18"	38	20	10	28	40	40
24"	55	35	18	46	85	85



EXAMPLE OF THRUST BLOCK ON 12" TEE

NOTES:
1. BEARING AREAS IN TABLE ARE BASED ON THE FOLLOWING:
   SOIL BEARING CAPACITY=1,500 LB./SQ. FT.
   FACTOR OF SAFETY=1.5
   TEST PRESSURE IS 100 P.S.I.
2. FOR OTHER TEST PRESSURES: REQUIRED BEARING AREA = $\frac{\text{TEST PRESSURE (P.S.I.)}}{100\ \text{P.S.I.}}$ X AREA IN TABLE ABOVE
3. THRUST BLOCKS TO BE CONSTRUCTED OF 2000 P.S.I. CONCRETE.
4. BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL.
5. JOINTS, BOLTS, AND FACE PLUGS TO BE KEPT CLEAR OF CONCRETE BY USE OF PLASTIC WRAP. SIDES SHALL BE WOOD FORMED UNLESS APPROVED BY ENGINEER.
6. REDUCERS SHALL REQUIRE THRUST BLOCKS EQUIVALENT TO THOSE CALLED FOR 45 DEGREE FITTINGS. REQUIRED BEARING AREAS SHALL BE GOVERNED BY THE LARGEST DIAMETER OF THE REDUCER.

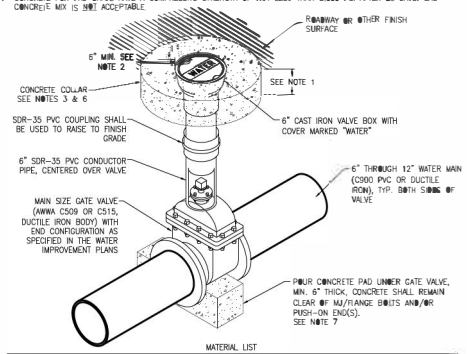
THRUST BLOCK DETAILS — N.T.S. — C462 TYP



NOTES:
1. ALL TRENCHES MUST CONFORM TO APPLICABLE TMWA, CITY, STATE, COUNTY, AND OSHA SPECIFICATIONS AND REQUIREMENTS.

TRENCH DETAIL (TYP) — N.T.S. — C463 TYP

NOTES:
1. CONCRETE COLLAR SHALL BE MINIMUM 6-INCHES THICK OR MATCH PAVEMENT THICKNESS, WHICHEVER IS GREATER, UNLESS OTHERWISE SPECIFIED BY THE JURISDICTIONAL AGENCY RESPONSIBLE FOR THE ROADWAY.
2. FOR MULTIPLE VALVE/RISER BOXES IN CLOSE PROXIMITY, A MONOLITHIC CONCRETE COLLAR MAY BE POURED.
3. CONTRACTOR AND/OR DESIGN ENGINEER SHALL CONSULT WITH THE JURISDICTIONAL AGENCY RESPONSIBLE FOR THE ROADWAY FOR REQUIREMENTS THAT MAY VARY FROM THIS STANDARD PRIOR TO CONSTRUCTION.
4. ALL BOLTS AND EXPOSED METAL SHALL BE COATED WITH BRUSHED-ON MASTIC.
5. GATE VALVE, DUCTILE IRON PIPE, AND OTHER METAL PARTS SHALL BE ENCASED WITH POLYETHYLENE WRAP PER AWWA C105.
6. UNLESS OTHERWISE SPECIFIED BY THE JURISDICTIONAL AGENCY RESPONSIBLE FOR THE ROADWAY, PORTLAND CEMENT CONCRETE (P.C.C.) FOR CONCRETE COLLAR SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4,000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS, MINIMUM 5 SACKS OF CEMENT PER CUBIC YARD WITH A MAXIMUM WATER/CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6% ±1.5%, SLUMP AT 1 TO 4 INCHES. BAG CONCRETE MIX IS NOT ACCEPTABLE.
7. CONCRETE FOR PAD SHALL HAVE A COMPRESSIVE STRENGTH OF NOT LESS THAN 3,000 PSI AFTER 28 DAYS. BAG CONCRETE MIX IS NOT ACCEPTABLE.



MATERIAL LIST

QTY	DESCRIPTION
1	MAIN SIZE GATE VALVE (AWWA C509 OR C515, DUCTILE IRON BODY) WITH END CONFIGURATION AS SPECIFIED IN THE WATER IMPROVEMENT PLANS
1	MASTIC (1 GALLON CAN – BRUSH ON)
1	6" ø SDR-35 PVC CONDUCTOR PIPE SECTION
1	6" ø CAST IRON VALVE BOX WITH COVER MARKED "WATER"
1	FULL FACE GASKET
1	CONCRETE BULK – PAD AND COLLAR

IN-LINE GATE VALVE W/ CONC COLLAR — SCALE: NTS — 10J-2 TYP

PERMIT SET
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AUGUST, 2023

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LEMMON VALLEY 1 TANK REBUILD
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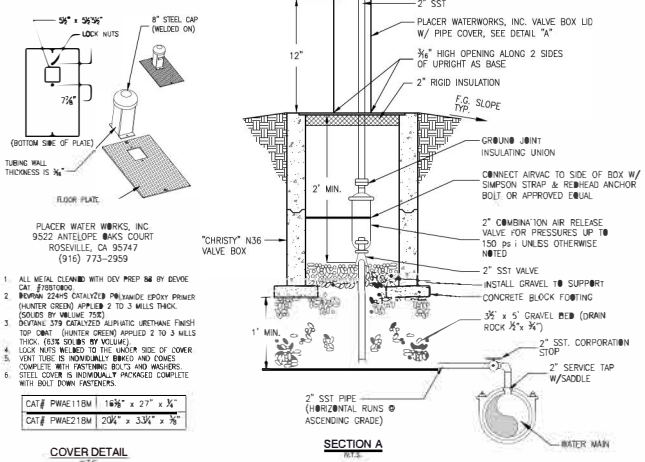
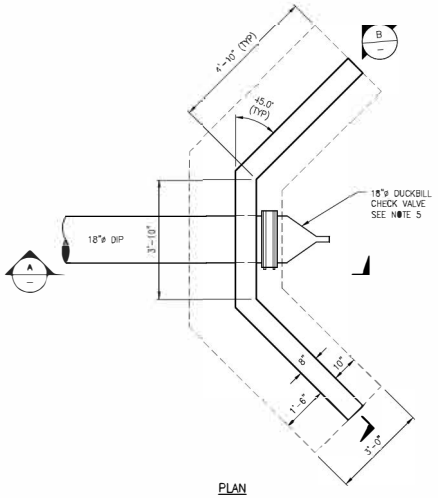
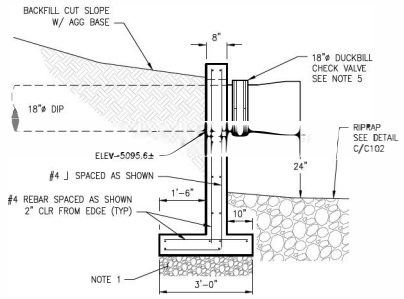
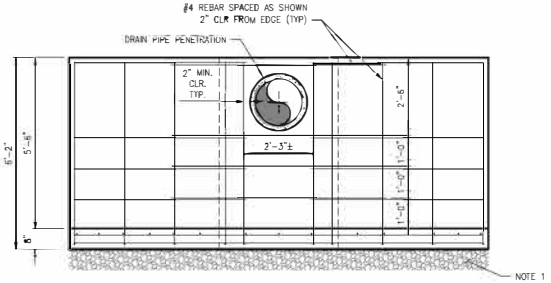








NOTES:

1. 8" THICK TYPE 2 AGG BASE COMPACTED TO 95% M.D.D. IF SUBGRADE IS UNSUITABLE, CONTACT ENGINEER.
2. CHAMFER EXPOSED EDGES OF HEADWALL: 1/2"
3. HEADWALL CONCRETE:
   - 3.1. MAX WATER CEMENT RATIO: 0.45
   - 3.2. MIN COMPRESSIVE STRENGTH: 4000 PSI – 28 DAY BREAK
   - 3.3. SLUMP: 1-4 INCHES
   - 3.4. 4-7% ENTRAINED AIR
   - 3.5. ALL OTHER INFO. SEE SECTION 03 00 05 CONCRETE OF THE SPECIFICATIONS
4. REINFORCING STEEL:
   - 4.1. MIN BENDING DIAMETER IS 3" ON #4 BARS
   - 4.2. ALL BARS SHALL REMAIN UNMOVED DURING POURING OF CONCRETE
   - 4.3. MAY BE BENT OR CUT ONSITE
5. DUCKBILL SLEEVE MUST BE EPDM. ALL HARDWARE MUST BE STAINLESS STEEL. A MAX OF 2" OF UPSTREAM HYDROSTATIC HEAD REQUIRED FOR OPENING. MUST BE RESISTANT TO FREEZING OPEN OR CLOSED. MUST DISPLAY MFR. NAME, VALVE MODEL, SIZE, AND SERIAL NO. OUTSIDE OF THE PRODUCT. ACCEPTABLE PRODUCTS INCLUDE:
   - 5.1. RED VALVE, TIDEFLEX SERIES, TF-1 SLIDE-ON TYPE
   - 5.2. PROCO PRODUCTS, SERIES 700 PROFLEX RUBBER CHECK VALVE
   - 5.3. ONYX VALVE CO., SERIES DBF

DRAIN OUTLET DETAIL
SCALE: 1/2" = 1'-0"
C800 TYP

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

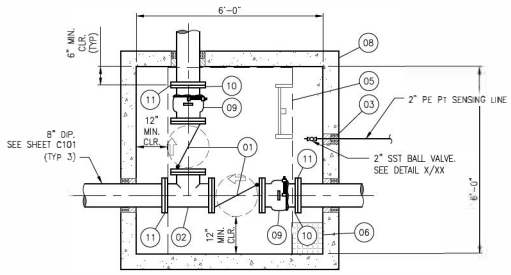
DETAILS

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Expc 06/30/24
CIVIL
No. 26992
8/25/23

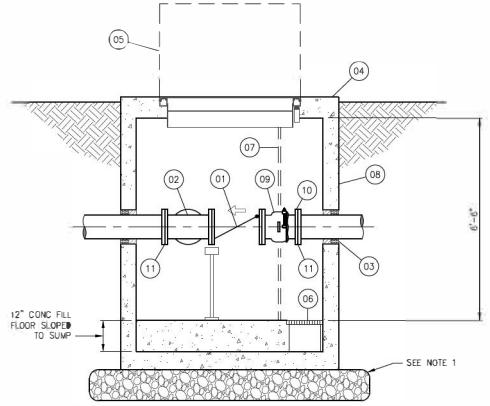
SHEET NUMBER
C003
8 OF 36

K:\C_Active Capital Projects\14-0035 Lemmon Valley Tank 1 Rebuild\2 Design\1 CAD\14-0035 C003X DETAILS.dwg
Aug 25, 2023 - 10:54am

WSUP23-0030
EXHIBIT D



PLAN



SECTION

CHECK VALVE VAULT DETAIL

SCALE: 1/2" = 1'-0"

A / C004

EQUIPMENT/MATERIAL SCHEDULE			
TAG	DESCRIPTION	DETAIL	SPEC
01	8"ø SWING-FLEX CHECK VALVE W/ BACKFLOW ACTUATOR, DI BODY AND COVER WITH EPDM COVERED DISC, SST BOLTS, NUTS, AND WASHERS, O.A.E.		–
02	8"ø SCH40 STL FLG'D TEE		40 05 24
03	PIPE PENETRATION (TYP)	C520/TYP	
04	CONCRETE LID, THICKNESS OF CONCRETE, STEEL REINFORCEMENT SIZING, STEEL PLACEMENT, AND HATCH PLACEMENT SHALL BE STAMPED BY A NEVADA LICENSED ENG.		03 00 05
05	ALUMINUM ACCESS HATCH; INCIDENTAL H20 LOADING; DOUBLE LEAF WITH 72" X 48" CLEAR OPENING; SS TYPE 316 HARDWARE; SPRING ASSIST; SLAMLOCK; RECESSED PADLOCK AND LIFT HANDLE; 2" INSULATION WITHIN LID; HINGES ON SHORT SIDE; USF FABRICATION TDH, OR EQUAL. SHALL BE CASTED INTO THE CONCRETE LID (NOTE BUBBLE 14). LID DRAIN TO BE DIRECTED OUTSIDE OF VAULT TO DAYLIGHT; FIELD FIT AS NEEDED.		03 00 05
06	12" X 12" X 12" SUMP BLOCKOUT W/ REMOVABLE CRATE	C521/TYP	
07	16" WIDE ALUMINUM LADDER WITH RAIL SAFETY EXTENSIONS. CONSTRUCT AND MOUNT TO MEET OSHA STANDARDS. LADDER DESIGN TO BE STAMPED BY A NEVADA LICENSED ENG.	C29 9/TYP	03 00 05
08	PRECAST CONCRETE VAULT – INTERNAL DIMENSIONS L: 6' – W: 8' – D: 7.5' VAULT SHALL BE DESIGNED AND STAMPED BY A NEVADA LICENSED ENG.		03 00 05
09	8"ø RPCA ROMAC ALPHA D.A.E.		–
10	8"ø SCH40 STL FLG'D FLG/PE SPOOL		40 05 24
11	8"ø DIELECTRIC ISOLATION KIT		–

NOTES:

1. PROVIDE 24" THICK LAYER OF TYPE 2 AB COMPACTED TO 95%, EXTEND 12" BEYOND VAULT WALLS IN ALL DIRECTIONS, WRAPPED IN FILTER FABRIC.
2. FINISHED GRADE SURFACE TO MATCH ADJACENT LANDSCAPING, BACKFILL PER SPEC SECTION 31 23 0 0. SLOPE FINISHED GRADE AWAY FROM VAULT.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-00 3
DESIGNED TES
DRAWN JRH
DATE AUG. 20 3
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE 775-834-8080

NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY, RETURN UPON COMPLETION OF PROJECT (Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

DETAILS

PROFESSIONAL ENGINEER – STATE OF NEVADA
THOMAS SPEER
Expc 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
C004
9 OF 36

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Aug 25, 2023 - 10:54am

WSUP23-0030
EXHIBIT D

NOTES:

1. ACCESS TO SITE SHALL BE PROVIDED ON (E) ACCESS EASEMENT AS SHOWN. MAX GRADE IS AROUND 20%.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0226
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

OVERALL SITE PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Expr: 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
C100
10 OF 36

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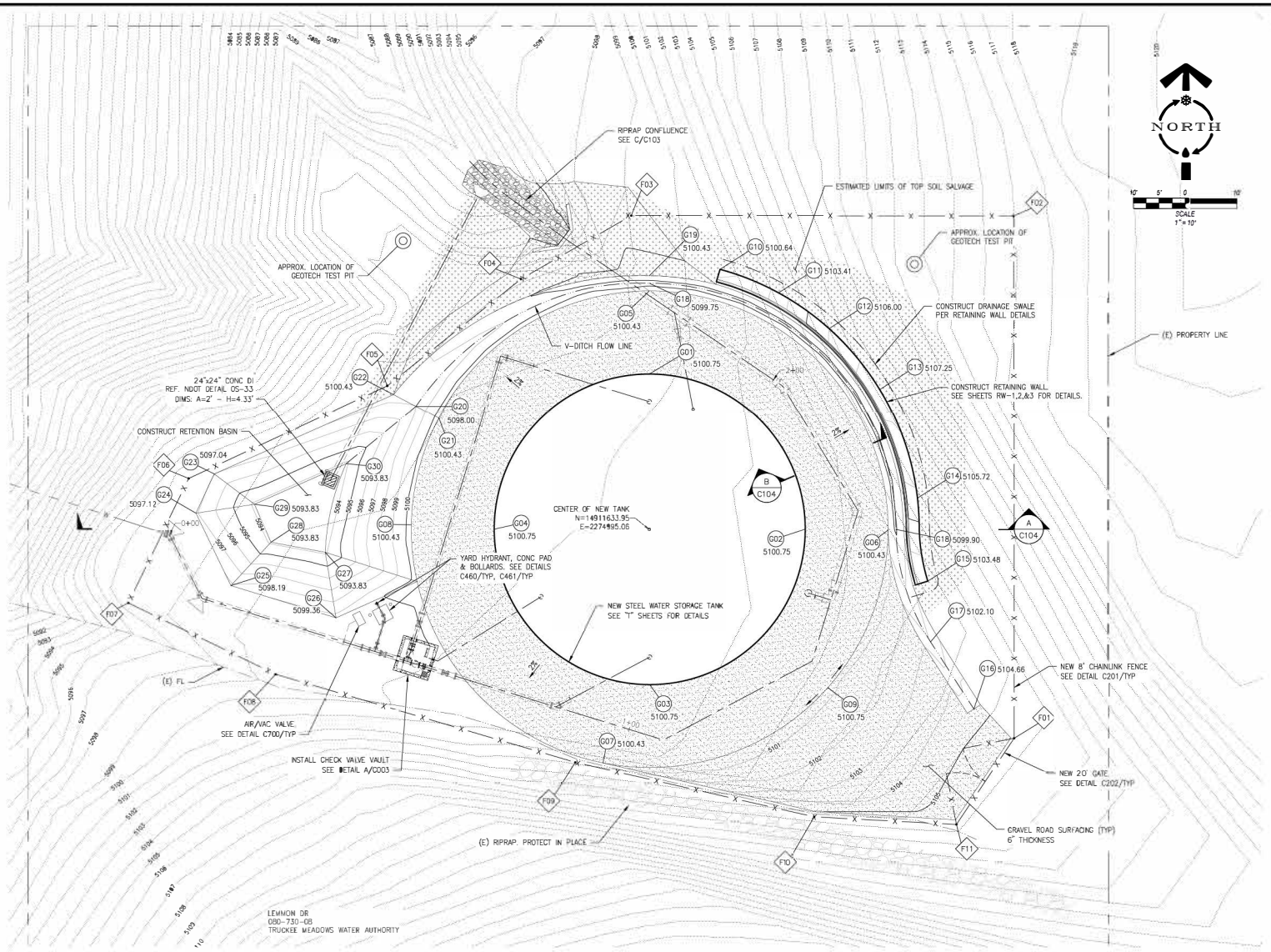
Aug 25, 2023 - 8:36am

WSUP23-0030
EXHIBIT D



GRADING TAG TABLE

TAG	NORTHING	EASTING	ELEV	DESCRIPTION
G01	14911663.95	2274995.06	5100.75	TANK PAD
G02	14911633.95	2275025.06	5100.75	TANK PAD
G03	14911603.95	2274995.06	5100.75	TANK PAD
G04	14911633.95	2274965.06	5100.75	TANK PAD
G05	14911679.95	2274995.06	5100.43	FG
G06	14911633.78	2275041.06	5100.43	FG
G07	14911588.84	2274986.05	5100.43	FG
G08	14911634.80	2274949.07	5100.43	FG
G09	14911603.37	2275029.43	5100.75	FG
G10	14911684.12	2275008.72	5100.64	TOP BACK OF WALL
G11	14911679.58	2275019.99	5103.41	TOP BACK OF WALL
G12	14911672.70	2275029.74	5106.00	TOP BACK OF WALL
G13	14911660.95	2275039.50	5107.25	TOP BACK OF WALL
G14	14911639.94	2275046.72	5105.72	TOP BACK OF WALL
G15	14911623.92	2275048.71	5103.48	TOP BACK OF WALL
G16	14911599.25	2275057.60	5104.66	SWALE FL
G17	14911612.20	2275049.26	5102.10	SWALE FL
G18	14911681.45	2274995.06	5099.75	SWALE FL
G18	14911633.91	2275042.56	5099.90	SWALE FL
G19	14911682.91	2274995.10	5100.43	FG
G20	14911657.70	2274950.07	5098.00	SWALE FL
G21	14911655.42	2274954.38	5100.43	FG
G22	14911659.98	2274945.75	5100.43	FG
G23	14911644.61	2274911.05	5097.04	FG
G24	14911637.04	2274907.53	5097.12	FG
G25	14911623.06	2274914.26	5098.19	FG
G26	14911616.84	2274934.55	5099.36	FG
G27	14911629.49	2274932.46	5093.83	FG
G28	14911631.43	2274922.00	5093.83	FG
G29	14911638.75	2274918.81	5093.83	FG
G30	14911646.59	2274936.50	5093.83	FG

FENCE TAG TABLE

TAG	NORTHING	EASTING	DESCRIPTION
F01	14911593.59	2275065.37	FENCE ANGLE
F02	14911694.45	2275065.37	FENCE ANGLE
F03	14911694.45	2274991.59	FENCE ANGLE
F04	14911682.24	2274970.32	FENCE ANGLE
F05	14911661.66	2274944.53	FENCE ANGLE
F06	14911643.73	2274906.12	FENCE ANGLE
F07	14911619.73	2274894.41	FENCE ANGLE
F08	14911605.95	2274922.88	FENCE ANGLE
F09	14911588.95	2274980.71	FENCE ANGLE
F10	14911578.44	2275026.81	FENCE ANGLE
F11	14911576.97	2275054.25	FENCE ANGLE

NOTES:

1. ESTIMATED VOLUMES/AREAS:
   - 1.1. ESTIMATED TOTAL CUT VOLUME: 566 CY
   - 1.2. ESTIMATED GRAVEL ROAD SURFACING VOLUME: 95 CY
   - 1.3. ESTIMATED TOP SOIL SALVAGE: 1,500 SF
2. CONTRACTOR SHALL CONTROL DUST AND NOISE AND IMPLEMENT BEST MANAGEMENT PRACTICES FOR WATER (FROM STORM OR CONSTRUCTION) WHILE MOBILIZED ON THE SITE. SEE SHEET G001 FOR MORE INFORMATION.

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY, RETURN UPON COMPLETION OF PROJECT (Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

GRADING PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Expc 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
C101
11 OF 36

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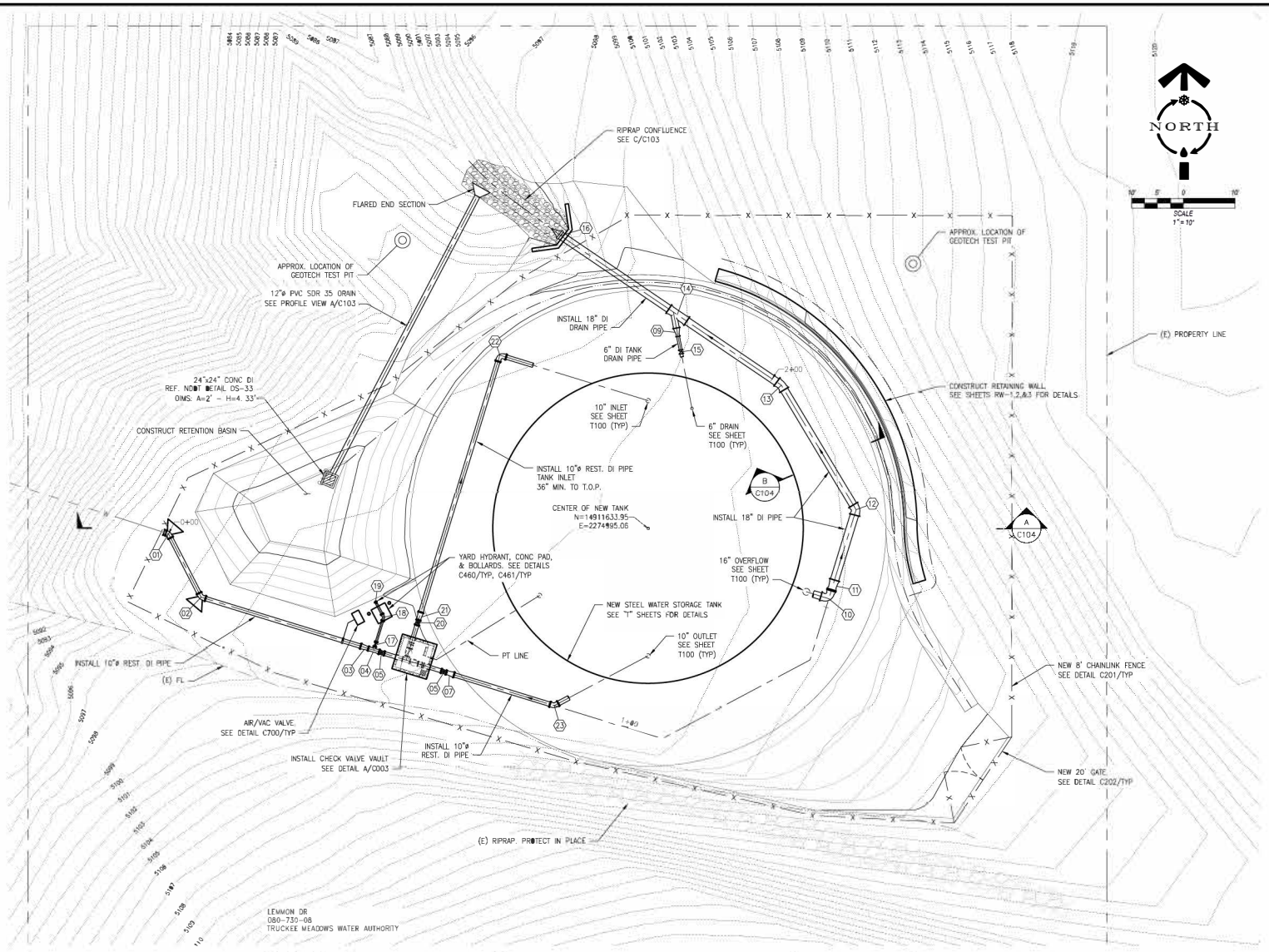
Aug 25, 2023 - 10:55am

WSUP23-0030
EXHIBIT D



(#) PIPING TAG TABLE

TAG	DESCRIPTION
01	10"ø FLG×MJ DI 45° BEND W/ REST. GLAND, FCA, AND THRUST BLOCK
02	10"ø DI MJ 45° BEND W/ RES'. GLANDS, AND THRUST BLOCK
03	10"x8" MJ LEB REDUCER
04	8"x8"x4" MJ DI TEE
05	8"ø MJ RSGV
06	NA
07	10"x8" MJ LEB RED.
08	NA
09	12"x6" SEB DI RED.
10	16"ø DI MJ 90° BEND W/ MJ ADAPTER
11	16"x18" DI MJ RED
12	18"ø DI MJ 45° BEND
13	18"ø DI MJ 22.5° BEND
14	18"x12" DI MJ WYE
15	6"ø MJ RSGV
16	DRAIN OUTLET, SEE DETAIL C800/TYP
17	4" MJ RSGV
18	4" ø EBST. MJ 45° BEND
19	4"ø YARD HYDRANT
20	8" ø EBST. MJ RSGV
21	10"x8" MJ LEB RED.
22	10"ø DI MJ 90° BEND W/ REST. GLANDS
23	10"ø DI MJ 45° BEND W/ RES'. GLANDS

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

YARD PIPING PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Exp: 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
C102
12 OF 36

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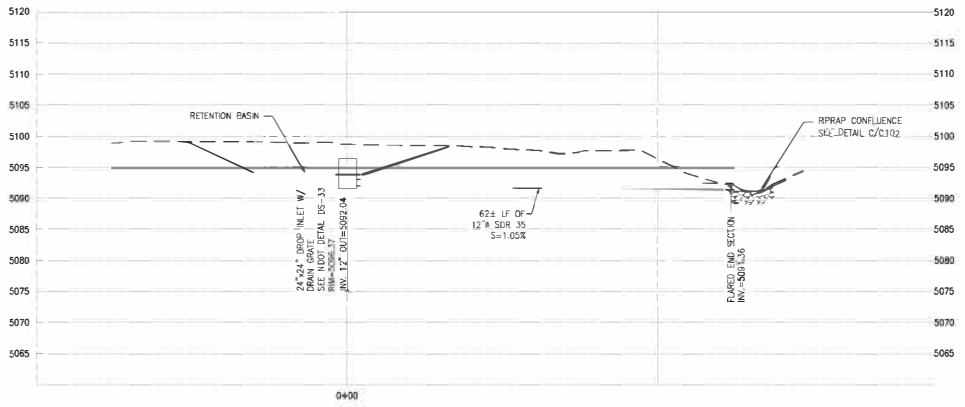
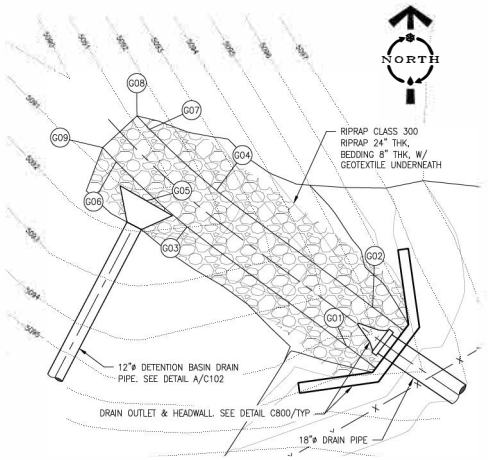
Aug 25, 2023 - 10:55am

WSUP23-0030
EXHIBIT D



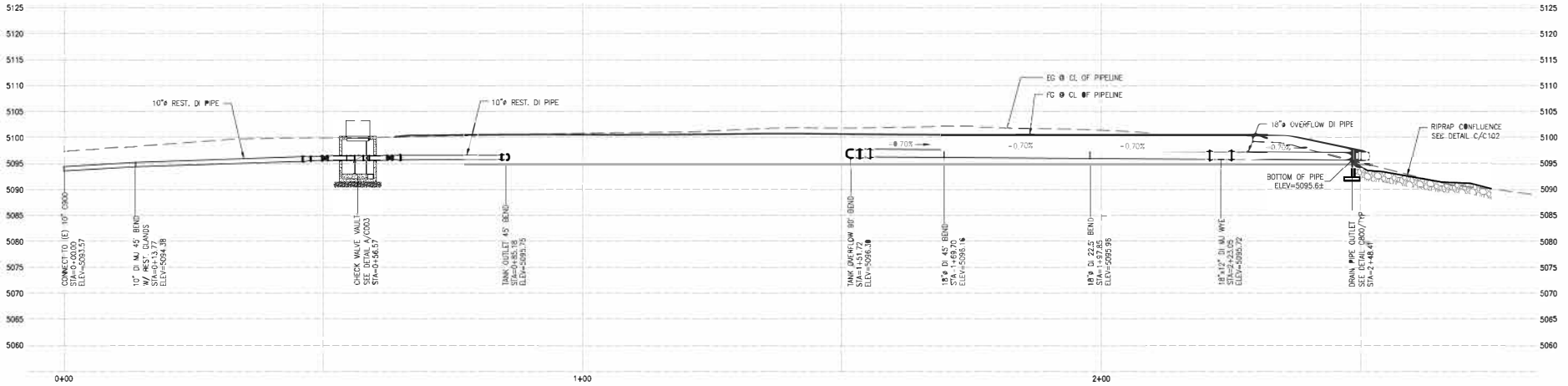
PROFILE VIEW
SCALE: 1" = 10'
A
C101



GRADING TAG TABLE

TAG	NORTHING	EASTING	DESCRIPTION
G01	14911690.44	2274975.67	24" BELOW DRAIN OUTLET
G02	14911692.80	2274977.38	24" BELOW DRAIN OUTLET
G03	14911698.06	2274985.45	5091.66
G04	14911700.39	2274987.34	5091.66
G05	14911699.73	2274962.85	5091.37 FLARED END SECTION
G06	14911702.23	2274960.90	5091.18
G07	14911704.32	2274963.05	5091.18
G08	14911705.18	2274962.24	5091.13
G09	14911703.15	2274960.03	5091.13

RIPRAP CONFLUENCE PLAN
SCALE: 1/4" = 1'-0"
C
C101



PROFILE VIEW
SCALE: 1" = 10'
B
C101

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
PROFILE VIEWS & CONFLUENCE PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Exp: 06/30/24
CIVIL
No. 28990
8/25/23

SHEET NUMBER
C103
13 OF 36

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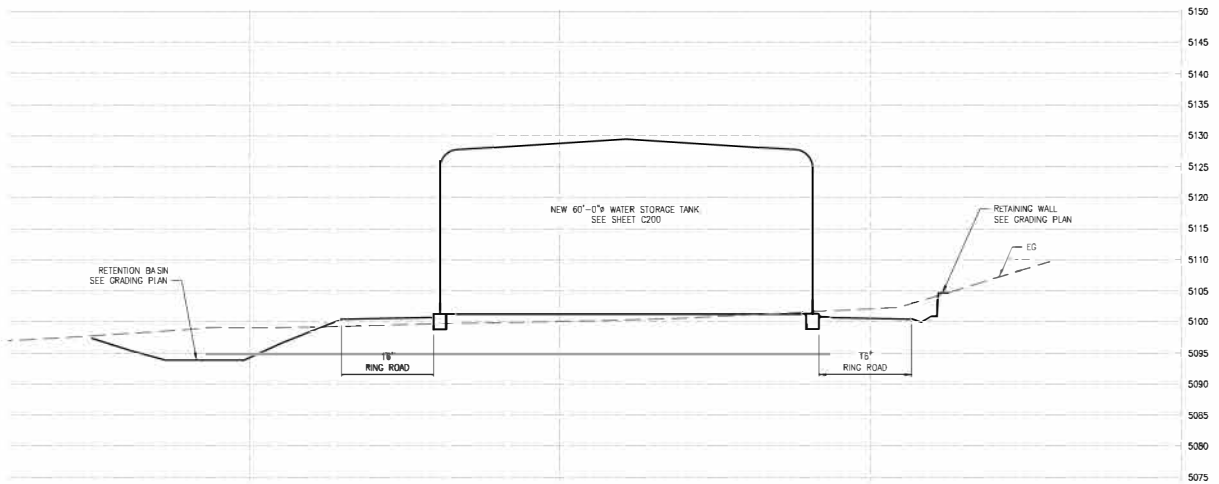
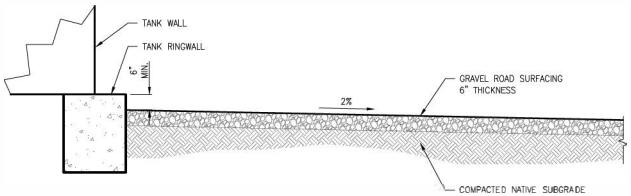
Aug 25, 2023 - 10:55am

WSUP23-0030
EXHIBIT D



SECTION VIEW — SCALE: 1" = 10' — A / C101



RING ROAD SURFACING — SCALE: 1/2" = 1'-0" — B / C101

PERMIT SET
NOT FOR CONSTRUCTION
AUGUST, 2023

REVISION	DESCRIPTION	BY	APP	DATE

WORK ORDER NO. 14-0035
DESIGNED TES
DRAWN JRH
DATE AUG. 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

SECTIONS

PROFESSIONAL ENGINEER - STATE OF NEVADA
THOMAS SPEER
Exp: 06/30/24
CIVIL
No. 26995
8/25/23

SHEET NUMBER
C104
14 OF 36

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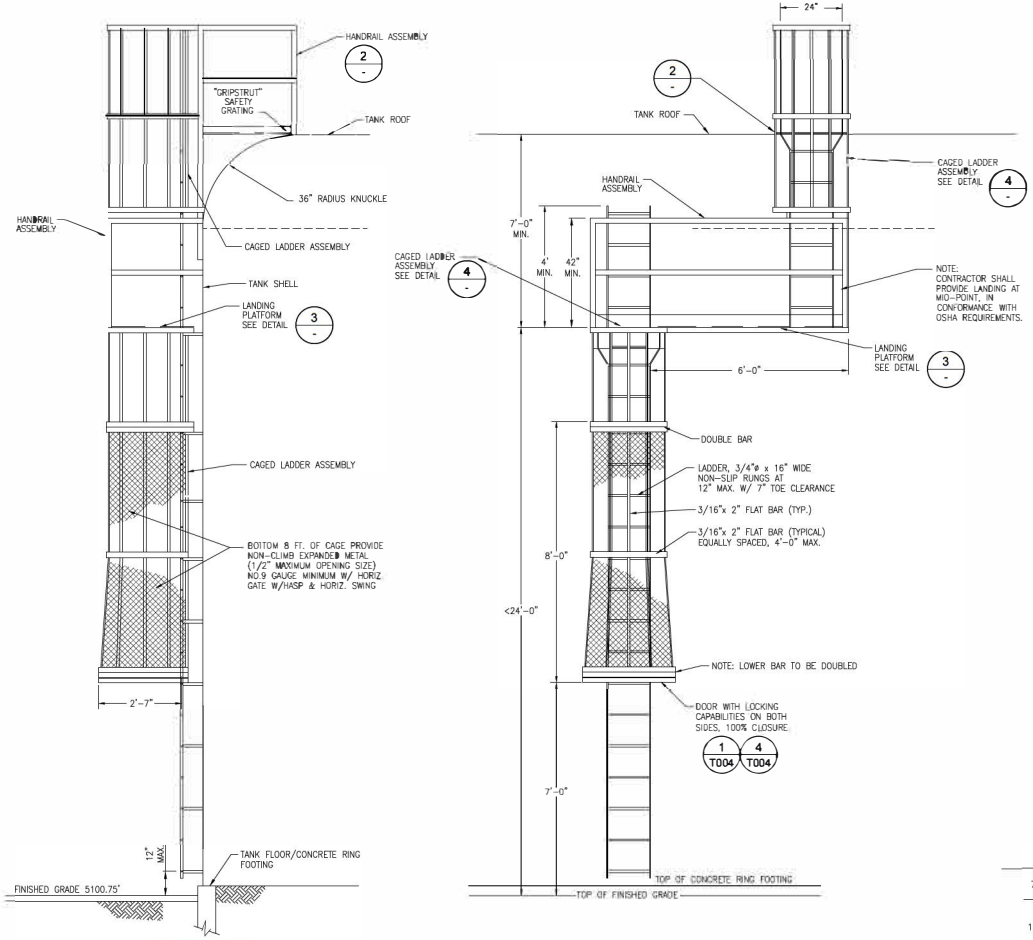
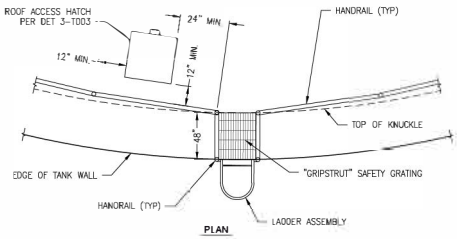
Aug 25, 2023 - 8:36am

WSUP23-0030
EXHIBIT D



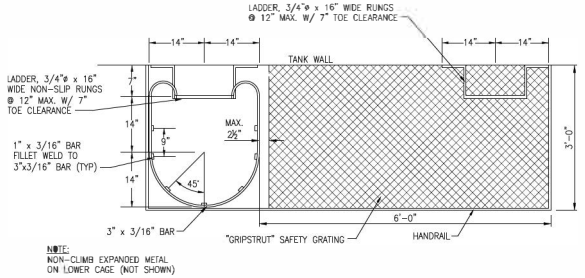
NOTES:
1. PERMANENT EXTERIOR LADDER AND LANDING SHALL BE CONSTRUCTED TO COMPLY WITH THE REQUIREMENTS OF SECTION 304.2.1.2 OF THE 2021 UNIFORM MECHANICAL CODE.
2. DETAIL SHOWN IS CONCEPTUAL IN NATURE. CONTRACTOR IS RESPONSIBLE TO DESIGN THE EXTERIOR LADDERS, LANDINGS, AND CAGES. PROVIDE ADDITIONAL SUPPORTS AS NEEDED TO RESIST WIND AND SEISMIC LOADS. CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS STAMPED BY A NEVADA LICENSED P.E.

EXTERIOR LADDER DETAIL 1 N.T.S. -



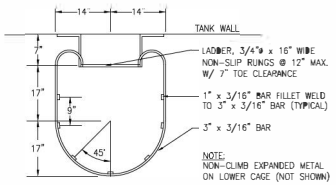
NOTES:
1. FABRICATE HANDRAILS IN ACCORDANCE WITH SEC. 05 52 05.
2. PLAN "B" APPLIES TO ROOFS WITH KNUCKLES ONLY.

ROOF LANDING AND HANDRAIL DETAILS 2 N.T.S. -



NOTE:
NON-CLIMB EXPANDED METAL ON LOWER CAGE (NOT SHOWN)

LANDING PLATFORM 3 N.T.S. -



NOTE:
NON-CLIMB EXPANDED METAL ON LOWER CAGE (NOT SHOWN)

LADDER CAGE PLAN 4 N.T.S. -

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR Engineering, Inc.
9605 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED J. BELLIN
DRAWN K. GONZALEZ
DATE AUGUST 21, 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY, RETURN UPON COMPLETION OF PROJECT (Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

TANK DETAILS - 1

SHEET NUMBER
T001
15 OF 36

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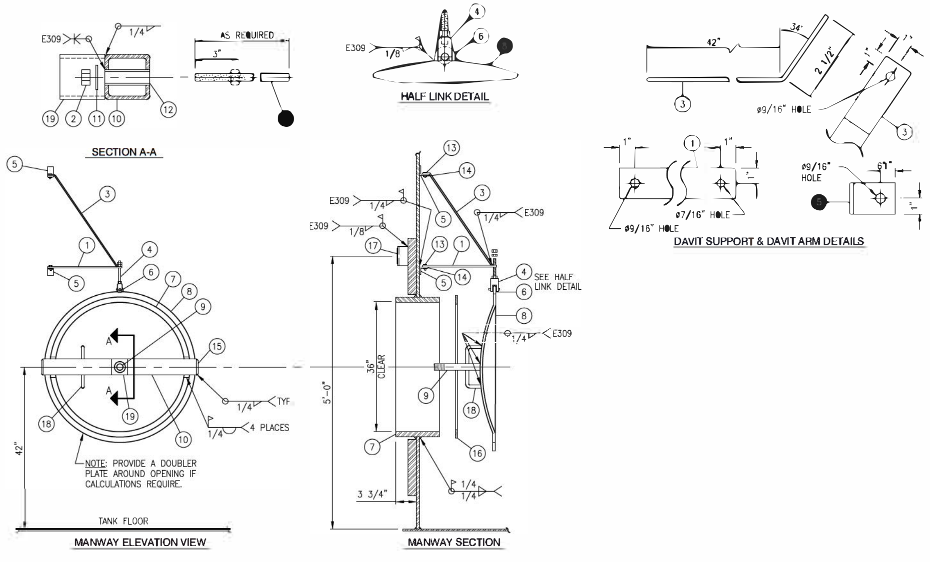
Aug 21, 2023 - 3:05pm

WSUP23-0030
EXHIBIT D



SECTION A-A
HALF LINK DETAIL
DAVIT SUPPORT & DAVIT ARM DETAILS
MANWAY ELEVATION VIEW
MANWAY SECTION
AS REQUIRED
E309
ø9/16" HOLE
ø7/16" HOLE
SEE HALF LINK DETAIL
4 PLACES
NOTE: PROVIDE A DOUBLER PLATE AROUND OPENING IF CALCULATIONS REQUIRE.
TANK FLOOR
36" CLEAR
5'-0"
3 3/4"
42"

NOTES:

1. DETAIL SHOWN IS CONCEPTUAL IN NATURE. CONTRACTOR IS RESPONSIBLE TO DESIGN THE MANWAYS AND SUPPORTS. CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS STAMPED BY A NEVADA LICENSED P.E.

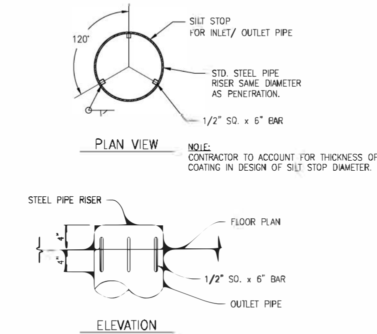
36" DIAMETER MANWAY

N.T.S. 1 -

PROPOSED MATERIAL LIST

NO	DESCRIPTION	TOTAL QTY	SPECIFICATIONS
1	FLAT BAR, 3/8" x 2" x 28" LG.	1	SS304
2	HEX NUT, 3/4" HEAVY	1	A307
3	FLAT BAR, 1/4" x 2" x 44 1/2" LG.	1	SS304
4	CLEVIS ROD END w/ THREADED ROD 3/8" x 12" w/(3) NUTS	1	SS304
5	ANGLE, 3" x 3" x 3/8" x 2" LG.	2	A36
6	HALF RING, 5/16" x 2 1/4"	1	SS18-8
7	PLATE, 1" x 8 1/2" x 9'-8 1/4" LG. ROLLED TO 36" I.D.	1	A573-70
8	40 x 32 FLARED & DISHED HEAD, 3/8" x 32" DISH RAD, 4" FLANGE	1	A36
9	ROUND BAR, 3/4" DIA. LENGTH AS REQUIRED w/ 3" NC T.O.E.	1	SS304
10	SQUARE TUBE SUPPORT, 3" x 3" x 1/4" x 42" LG	1	A500
11	3/4" HEAVY FLAT WASHER	1	A307
12	PIPE, 1" x STD. WT. x 3" LG.	1	SS304
13	BOLT, 1/2"-13 NC x 1 1/2" LG. w/ NYLOCK NUT & WASHER	2	SS304
14	NYLON ISOLATING KIT	2	NYLON
15	FLAT BAR END CAP, 2 1/2" x 1/4" x 2 1/2" LG.	2	A36
16	RING GASKET x 1/4" 60 DUROMETER-HARDNESS	1	NSF-61 EPDM
17	STD. AWWA TANK NAMEPLATE (ONE PER TANK) RIVET TO MOUNTING PLATE	1	SS304
18	MANWAY DOOR HANDLE, ø 1/2" ROD x 6" x 4"	1	SS304
19	NUT SECURITY COVER, HHS 3 x 3 x 1/4" x 3" LG.	1	SS304

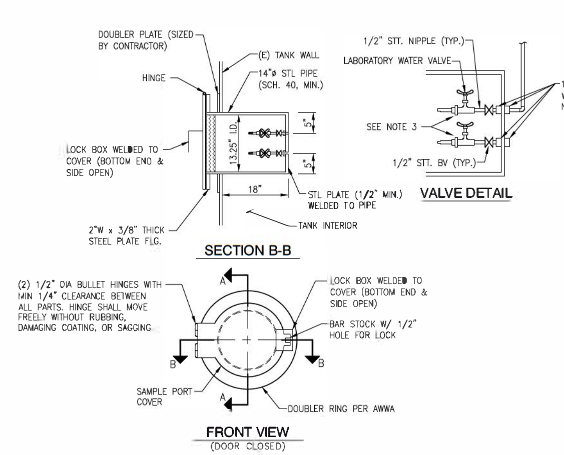
NUMBER REQUIRED IS PER MANWAY (EXCLUDING ITEM 17, WHICH IS PER TANK)
NUMBER OF MANWAYS REQUIRED: 2



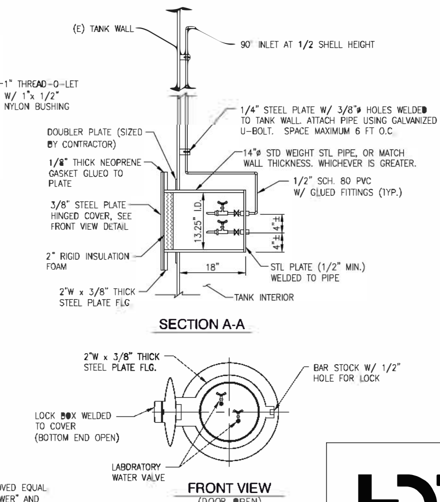
SILT STOP FOR INLET/ OUTLET PIPE
120°
STD. STEEL PIPE RISER SAME DIAMETER AS PENETRATION.
1/2" SQ. x 6" BAR
PLAN VIEW
NOTE: CONTRACTOR TO ACCOUNT FOR THICKNESS OF COATING IN DESIGN OF SILT STOP DIAMETER.
STEEL PIPE RISER
FLOOR PLAN
1/2" SQ. x 6" BAR
OUTLET PIPE
ELEVATION

SILT TRAP DETAIL

N.T.S. 2 -



DOUBLER PLATE (SIZED BY CONTRACTOR)
(E) TANK WALL
HINGE
14"ø STL PIPE (SCH. 40, MIN.)
LOCK BOX WELDED TO COVER (BOTTOM END & SIDE OPEN)
13.25" I.D.
18"
STL PLATE (1/2" MIN.) WELDED TO PIPE
2"W x 3/8" THICK STEEL PLATE FLG.
TANK INTERIOR
SECTION B-B
1/2" STT. NIPPLE (TYP.)
LABORATORY WATER VALVE
1" THREAD-O-LET W/ 1"x 1/2" NYLON BUSHING
SEE NOTE 3
1/2" STT. BV (TYP.)
VALVE DETAIL
(2) 1/2" DIA BULLET HINGES WITH MIN 1/4" CLEARANCE BETWEEN ALL PARTS. HINGE SHALL MOVE FREELY WITHOUT RUBBING, DAMAGING COATING, OR SAGGING.
LOCK BOX WELDED TO COVER (BOTTOM END & SIDE OPEN)
BAR STOCK W/ 1/2" HOLE FOR LOCK
SAMPLE PORT COVER
DOUBLER RING PER AWWA
FRONT VIEW
(DOOR CLOSED)



(E) TANK WALL
90° INLET AT 1/2 SHELL HEIGHT
1/4" STEEL PLATE W/ 3/8"ø HOLES WELDED TO TANK WALL. ATTACH PIPE USING GALVANIZED U-BOLT. SPACE MAXIMUM 6 FT O.C.
DOUBLER PLATE (SIZED BY CONTRACTOR)
14"ø STD WEIGHT STL PIPE, OR MATCH WALL THICKNESS. WHICHEVER IS GREATER.
1/8" THICK NEOPRENE GASKET GLUED TO PLATE
1/2" SCH. 80 PVC W/ GLUED FITTINGS (TYP.)
3/8" STEEL PLATE HINGED COVER, SEE FRONT VIEW DETAIL
2" RIGID INSULATION FOAM
13.25" I.D.
18"
STL PLATE (1/2" MIN.) WELDED TO PIPE
2"W x 3/8" THICK STEEL PLATE FLG
TANK INTERIOR
SECTION A-A
2"W x 3/8" THICK STEEL PLATE FLG.
BAR STOCK W/ 1/2" HOLE FOR LOCK
LOCK BOX WELDED TO COVER (BOTTOM END OPEN)
LABORATORY WATER VALVE
FRONT VIEW
(DOOR OPEN)

SAMPLE TAP NOTES:

1. INSTALL TAP 54" FROM FINISHED GRADE TO CENTERLINE.
2. LABORATORY WATER VALVE TO BE CHICAGO FAUCETS MODEL 937-CP WITH 204 HANDLE OR APPROVED EQUAL.
3. PROVIDE IDENTIFICATION TAGS FOR SAMPLE VALVES PER SPEC SEC 10 14 00. TAGS TO READ "LOWER" AND "UPPER @ XX FT". WHERE XX IS HEIGHT OF 90° INLET ABOVE TANK FLOOR.

TMWA DOUBLE SAMPLE TAP DETAIL

N.T.S. 3 -

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AUGUST 21, 2023

HDR

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

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WORK ORDER NO. 14-0035
DESIGNED J. BELLIN
DRAWN K. GONZALEZ
DATE AUGUST 21, 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD

RENO, NEVADA

TANK DETAILS - 2

SHEET NUMBER
T002
15 OF 36

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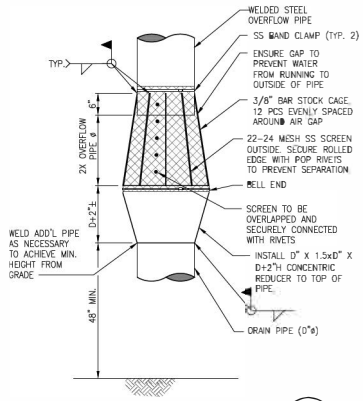
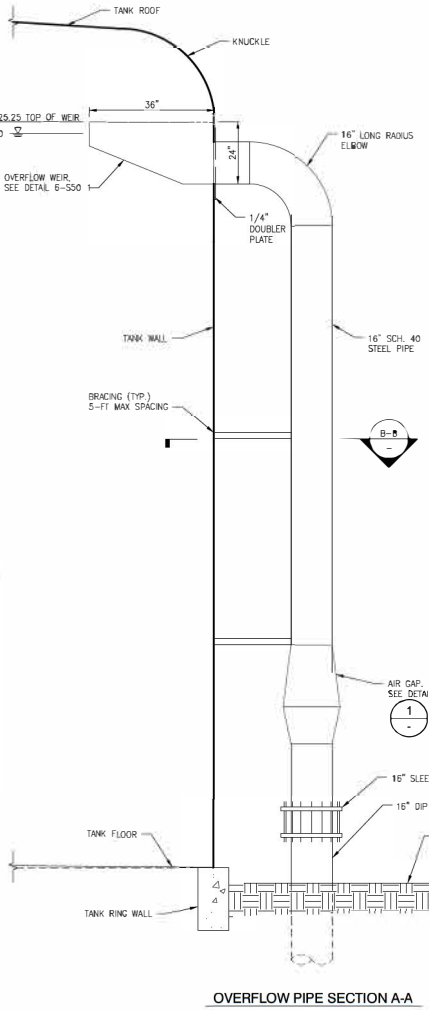
Aug 21, 2023 - 3:12pm

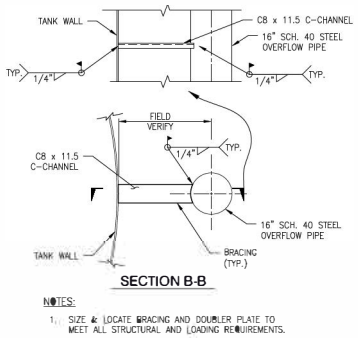
WSUP23-0030
EXHIBIT D



OVERFLOW AIR GAP DETAIL 1 N.T.S.



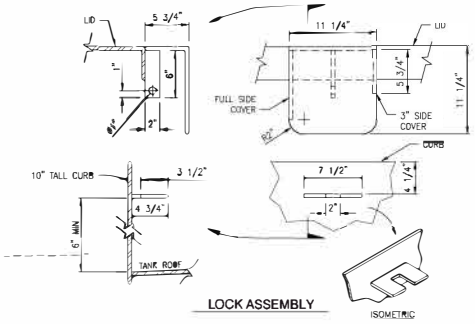
OVERFLOW PIPE SECTION A-A



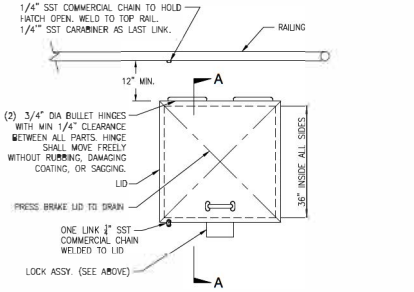
SECTION B-B

NOTES:
1. SIZE & LOCATE BRACING AND DOUBLER PLATE TO MEET ALL STRUCTURAL AND LOADING REQUIREMENTS.

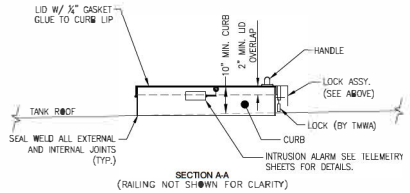
OVERFLOW PIPE DETAIL 2 SCALE: 1"=2'-0"



LOCK ASSEMBLY ISOMETRIC



TOP VIEW



SECTION A-A
(RAILING NOT SHOWN FOR CLARITY)

NOTES:
1. ALL HATCH COMPONENTS TO BE WELDED. NO BOLTS, SCREWS, OR OTHER FASTENERS.
2. LOCKED HATCH SHALL HAVE NO MORE THAN 0.5" PLAY.
3. LID SHALL CLOSE AND LOCK SMOOTHLY WITH COATINGS AND GASKETS IN PLACE, WITHOUT ADDITIONAL FORCE REQUIRED.

36" SQUARE AWWA ROOF HATCH 3 N.T.S.

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AUGUST 21, 2023

HDR Engineering, Inc.
9605 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

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DRAWN K. GONZALEZ
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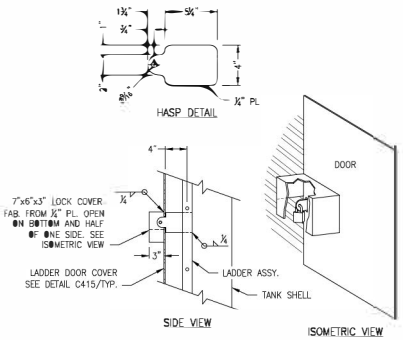
TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

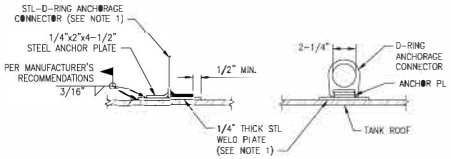
TANK DETAILS - 3

SHEET NUMBER
T003
17 OF 36

WSUP23-0030
EXHIBIT D



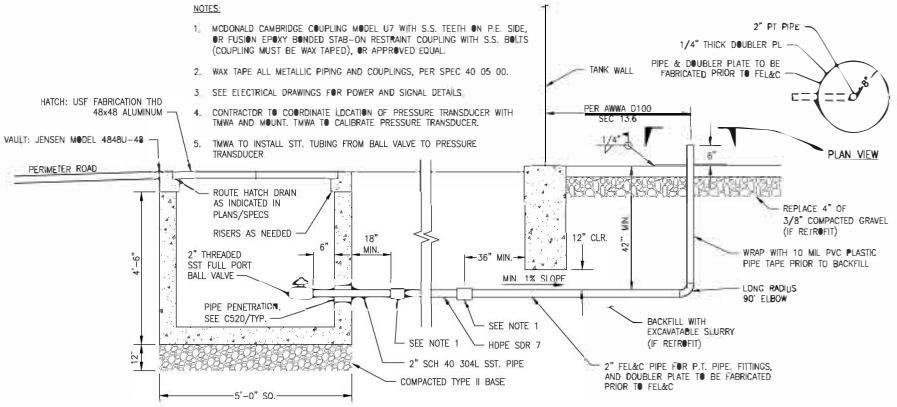
LADDER LOCK DETAIL — 1 — N.T.S.



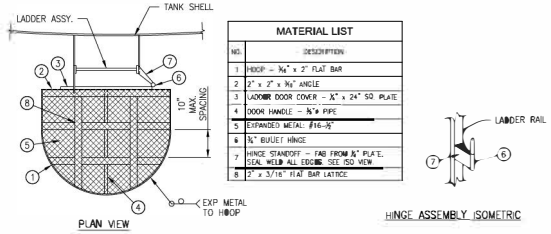
NOTE
1. STEEL D-RING AND PLATE SHALL BE MODEL NO. 2101634 AS MANUFACTURED BY DBI SALA, OR APPROVED EQUAL. THE D-RING AND PLATE SHALL BE COATED AFTER THE PLATE IS WELDED TO THE TANK. THE D-RING SHALL ROTATE FREELY AND SHALL NOT BE WELDED TO THE TANK OR PLATE. COATING SHALL CONFORM TO SPECIFICATIONS.
2. TYPICAL PLACEMENT 3-FT CLEAR OF ADJACENT STRUCTURES, COORDINATE W/ TMWA PROJECT REPRESENTATIVE.

FALL PROTECTION ANCHOR POINT DETAIL — 2 — N.T.S.

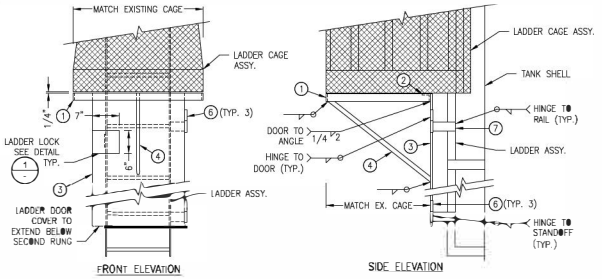
NOTES:
1. MCDONALD CAMBRIDGE COUPLING MODEL U7 WITH S.S. TEETH ON P.E. SIDE, OR FUSION EPOXY BONDED STAB-ON RESTRAINT COUPLING WITH S.S. BOLTS (COUPLING MUST BE WAX TAPED), OR APPROVED EQUAL.
2. WAX TAPE ALL METALLIC PIPING AND COUPLINGS, PER SPEC 40 05 00.
3. SEE ELECTRICAL DRAWINGS FOR POWER AND SIGNAL DETAILS.
4. CONTRACTOR TO COORDINATE LOCATION OF PRESSURE TRANSDUCER WITH TMWA AND MOUNT. TMWA TO CALIBRATE PRESSURE TRANSDUCER.
5. TMWA TO INSTALL STT. TUBING FROM BALL VALVE TO PRESSURE TRANSDUCER



PRESSURE TRANSDUCER PIPE — 3 — N.T.S.

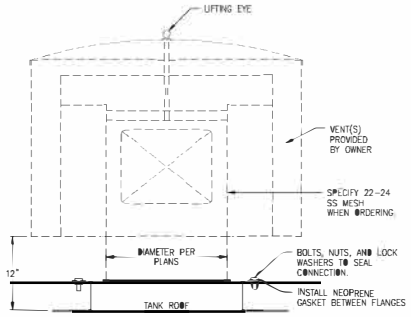


MATERIAL LIST	
NO.	DESCRIPTION
1	HOOP – ¾" x 2" FLAT BAR
2	2" x 2" x ¼" ANGLE
3	LADDER DOOR COVER – ¼" x 24" SQ PLATE
4	DOOR HANDLE – ½" PIPE
5	EXPANDED METAL: #16-½"
6	¾" BULLET HINGE
7	HINGE STANDOFF – FAB FROM ¾" PLATE. SEAL WELD ALL EDGES. SEE ISO VIEW
8	2" x 3/16" FLAT BAR LATTICE



NOTES:
1. ALL GATE COMPONENTS TO BE WELDED. NO BOLTS, SCREWS, OR OTHER FASTENERS.

LADDER SECURITY GATE DETAIL — 4 — N.T.S.



TYPICAL VENT

NOTES:
1. PER NEVADA ADMINISTRATIVE CODE, VENT MESH SHALL BE STAINLESS STEEL WITH 22-24 OPENINGS PER INCH. CONTRACTOR SHALL ENSURE PROPER MESH IS PROVIDED.
2. CONTRACTOR SHALL VERIFY VENT SIZE WITH MANUFACTURER.
3. VENT SHALL BE EQUIPPED WITH A FAIL-SAFE MECHANISM TO ENSURE PROPER OPERATION IN THE EVENT OF A FROZEN OR BLOCKED SCREEN PER AWWA D-100 SECTION 7.5.2.
4. PREP AND PAINT VENT ACCORDING TO SPECIFICATION SECTION 09 96 00.
5. ALLOWABLE VENT IS ALWAYS SAFE TANK VENT BY ADVANCETANK, NO EQUAL.
6. EXISTING FLANGE MAY REQUIRE MODIFICATION TO FIT.
7. VENT FLANGE SHALL BE SEALED TIGHT.

TANK VENT — 5 — N.T.S.

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NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR Engineering, Inc.
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Reno, Nevada 89521
775-337-4700

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WORK ORDER NO. 14-0035
DESIGNED J. BELLIN
DRAWN K. GONZALEZ
DATE AUGUST 21, 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

TANK DETAILS - 4

SHEET NUMBER
T004
18 OF 36

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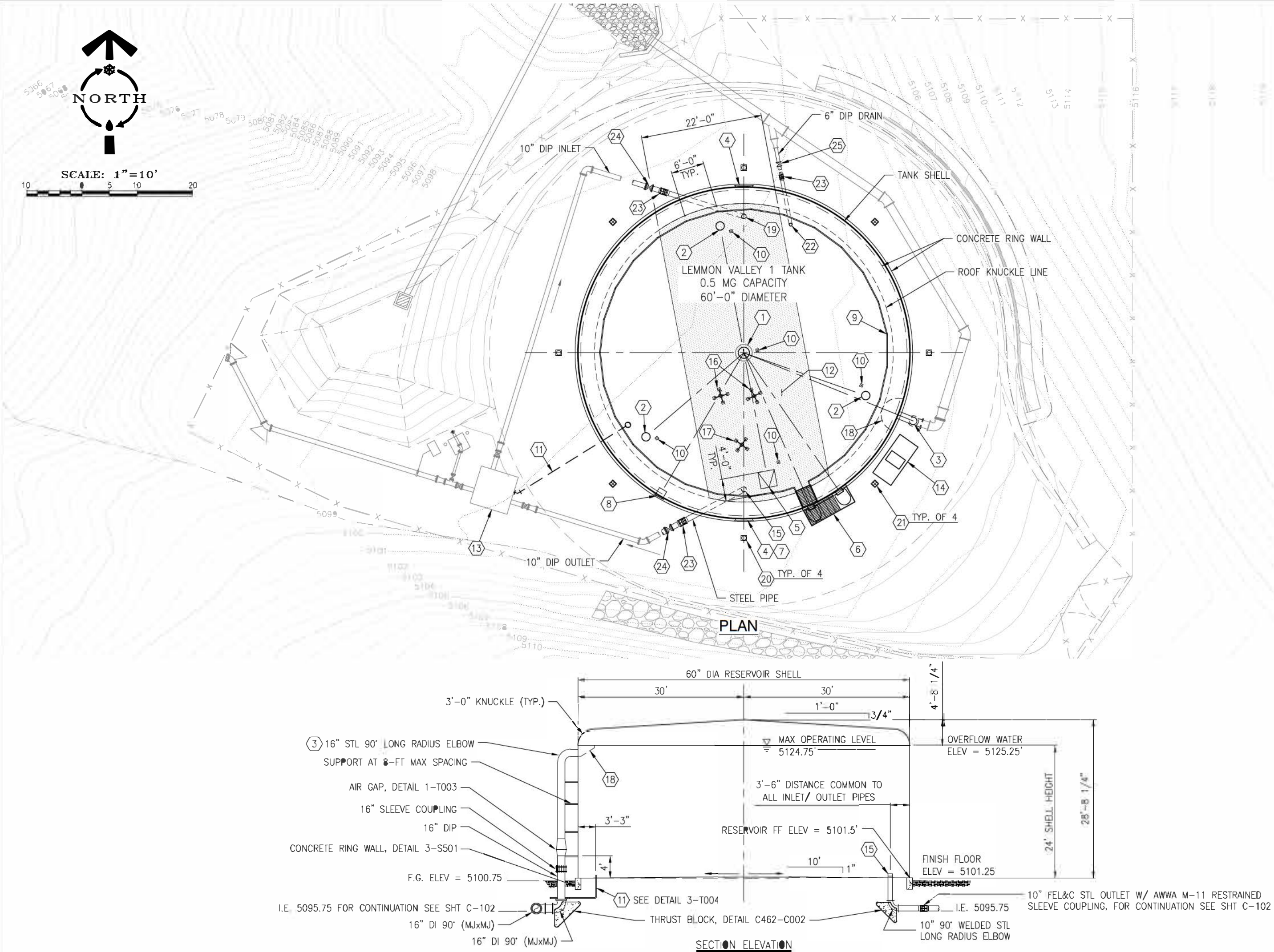
Aug 21, 2023 - 3:31pm

WSUP23-0030
EXHIBIT D



NORTH
SCALE: 1"=10'
10 0 5 10 20
22'-0"
6'-0" TYP.
6" DIP DRAIN
10" DIP INLET
TANK SHELL
CONCRETE RING WALL
ROOF KNUCKLE LINE
LEMMON VALLEY 1 TANK
0.5 MG CAPACITY
60'-0" DIAMETER
4'-0" TYP.
TYP. OF 4
10" DIP OUTLET
STEEL PIPE
PLAN
60" DIA RESERVOIR SHELL
30'
30'
1'-0"
3/4"
4'-8 1/4"
3'-0" KNUCKLE (TYP.)
16" STL 90° LONG RADIUS ELBOW
SUPPORT AT 8-FT MAX SPACING
AIR GAP, DETAIL 1-T003
16" SLEEVE COUPLING
16" DIP
CONCRETE RING WALL, DETAIL 3-S501
F.G. ELEV = 5100.75
I.E. 5095.75 FOR CONTINUATION SEE SHT C-102
16" DI 90° (MJxMJ)
16" DI 90° (MJxMJ)
MAX OPERATING LEVEL
5124.75'
OVERFLOW WATER
ELEV = 5125.25'
3'-6" DISTANCE COMMON TO
ALL INLET/ OUTLET PIPES
3'-3"
RESERVOIR FF ELEV = 5101.5'
10'
1"
4'
24' SHELL HEIGHT
28'-8 1/4"
FINISH FLOOR
ELEV = 5101.25
SEE DETAIL 3-T004
THRUST BLOCK, DETAIL C462-C002
I.E. 5095.75
10" FEL&C STL OUTLET W/ AWWA M-11 RESTRAINED
SLEEVE COUPLING, FOR CONTINUATION SEE SHT C-102
10" 90° WELDED STL
LONG RADIUS ELBOW
SECTION ELEVATION

TANK PLAN & COMPOSITE ELEVATION
SCALE: 1"=10'
1 -

KEY NOTES:

1. CENTER VENT PROVIDED BY TMWA, 24-IN DIAMETER, DETAIL 5-T004. CONTRACTOR RESPONSIBLE TO FABRICATE FLANGE TO ACCOMMODATE VENTS. APPLY COATING SYSTEM PER SPEC SECTION 09 96 00.
2. PERIMETER VENT PROVIDED BY TMWA, 18-IN DIAMETER. CONTRACTOR RESPONSIBLE TO FABRICATE FLANGE TO ACCOMMODATE VENTS. DETAIL 5-T004. APPLY COATING SYSTEM SECTION 09 96 00.
3. OVERFLOW AIR GAP, DETAIL 1-T003.
4. INSTALL 36-IN DIA MANWAY, DETAIL 1-T002.
5. 36-IN SQ HINGED ROOF HATCH W/ LOCK BOX FACING TANK CENTER, DETAIL 3-T003.
6. EXTERIOR LADDER ASSEMBLY W/ SAFETY CAGE, DETAILS 1&2-T001.
7. INSTALL TANK NAMEPLATE PER DETAIL 1-T002 AND SPEC 10 14 00.
8. SAMPLE TAP, DETAIL 3-T002.
9. GUARDRAIL 162-LF, DETAIL 1-S002.
- FALL PROTECTION ANCHOR POINT, DETAIL 2-T004.
11. 2-IN SENSING PIPE TO PRESSURE TRANSDUCER IN CHECK VALVE VAULT, DETAIL 3-T004.
12. AREA SHOWN TO RECEIVE A NON-SLIP COATING. REFER TO SECTION 09 96 00 OF THE SPECIFICATIONS. TAPE EDGE FOR A CLEAN LINE.
13. CHECK VALVE VAULT, DETAIL A-C004.
14. 8'-6"x4'-0" PAD FOR RTU AND BATTERY, DETAILS 6-S002 AND 1-E501.
15. 10-IN OUTLET WITH SILT STOP, DETAIL 2-T002.
- SOLAR PANEL MAST, DETAIL 3-E500.
17. SCADA ANTENNA MAST, DETAIL 3-E500. COORDINATE LOCATION WITH TMWA.
18. OVERFLOW BOX, DETAIL 2-T003.
19. 10-IN FEL&C STEEL INLET.
20. CP MONITORING STATION, SEE SHT CP500.
21. CP REFERENCE CELL, SEE SHT CP500.
22. 6-IN DRAIN OUTLET.
23. FLEX COUPLING W/ M11 RESTRAINT HARNESS.
24. 10-IN GATE VALVE (MJxMJ).
25. 6-IN GATE VALVE (MJxMJ).

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR

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TRUCKEE MEADOWS WATER AUTHORITY
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1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
TANK PLAN AND ELEVATION

SHEET NUMBER
T100
19 OF 36

WSUP23-0030
EXHIBIT D

GENERAL NOTES

1) NO WALL SHALL BE CONSTRUCTED ON AN UNSTABLE SLOPE. IF IT IS DETERMINED IN THE FIELD THAT THE EXISTING SLOPE IS NOT STABLE, THE SLOPE MUST FIRST BE STABILIZED (I.E. MSE, SOIL NAILING OR APPROVED ALTERNATE).THE CONTRACTOR IS RESPONSIBLE FOR STABILITY DURING CONSTRUCTION.

2) PERMANENT BMP'S SHALL BE DESIGNED AND INSTALLED TO CONVEY STORM WATER TO PROPERLY DESIGNED STORM WATER CONTROL SYSTEMS, AND PROVIDE EROSION PROTECTION AT THE TOE OF THE WALL TO PREVENT STORM WATER RUNOFF FROM UNDERCUTTING BASE OF RETAINING WALLS.

3) EROSION CONTROL MEASURES WILL REQUIRE MAINTENANCE OVER THE LIFETIME OF THE DEVELOPMENT AND SHOULD BE CONSIDERED A PRIMARY MAINTENANCE OBJECTIVE.

4) CONSTRUCTION OBSERVATION AND INSPECTIONS:

   a. THE OWNER'S QUALIFIED INSPECTION FIRM SHALL VERIFY THE MATERIALS SUPPLIED BY THE CONTRACTOR MEET ALL THE REQUIREMENTS OF THE SPECIFICATION. THIS INCLUDES ALL SUBMITTALS AND PROPER INSTALLATION OF THE SYSTEM.

   b. THE CONTRACTOR'S FIELD CONSTRUCTION SUPERVISOR SHALL HAVE DEMONSTRATED EXPERIENCE AND BE QUALIFIED TO DIRECT ALL WORK AT THE SITE.

5) GENERAL DEFINITIONS

   c. SEGMENTED RETAINING WALL UNITS: DRY-STACKED COLUMN OF CONCRETE UNITS THAT CREATE THE MASS OF A CONVENTIONAL SEGMENTED RETAINING WALL (SRW). REFER TO DETAIL SHEETS RW-2 ANDRW-3.

   d. UNIT DRAINAGE FILL: FREE-DRAINING, COARSE GRAINED AGGREGATES PLACED IN THE CORES AND BETWEEN THE SRW UNITS EXTENDING A MINIMUM LATERAL DISTANCE OF 12-INCHES BEHIND THE TAIL OF THE SRW UNITS . REFER TO TABLE 1 FOR GRADATION REQUIREMENTS). UNIT DRAINAGE FILL SHALL BE FREE OF ORGANIC, CLAY, OR OTHER DELETERIOUS MATERIALS.

   e. REINFORCED SOIL: COMPACTED SOIL (REFER TO TABLE 3) CONFINED BY/BETWEEN GEOGRID REINFORCEMENT APPLICABLE TO REINFORCED SRW SYSTEMS. SRW UNITS AND REINFORCED SOILS ARE TREATED AS A SINGLE HOMOGENOUS ZONE CONTRIBUTING TO THE MASS AND WIDTH OF THE STRUCTURE; THEREFORE, 100% COVERAGE FOR EACH REINFORCED LAYER IS REQUIRED. REFER TO SHEET RW-2 AND RW-3 FOR ADDITIONAL INFORMATION.

   f. EMBEDMENT TRENCH: TRENCH EXCAVATED AT BASE OF RETAINING WALL FOR LEVELING PAD CONSTRUCTION.

   g. LEVELING PAD: LEVEL SURFACE CONSTRUCTED USING COMPACTED TYPE 2, CLASS B AGGREGATE BASE (2012 STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION), USED TO DISTRIBUTE THE WEIGHT OF THE DRY-STACKED COLUMN OF SRW UNITS OVER A WIDER FOUNDATION AREA AND PROVIDE WORKING SURFACE DURING CONSTRUCTION.

   h. FOUNDATION SOIL: SOIL MASS DIRECTLY UNDERLYING THE RETAINING WALL SECTION.

   i. WALL EMBEDMENT : DEPTH OF SRW BELOW THE FINISHED GRADE ELEVATION. THE EMBEDMENT DEPTH SHALL BE A MINIMUM OF 2 FEET FOR FROST PROTECTION.

   j. EXPOSED HEIGHT: PORTION OF SRW ABOVE THE FINISHED GRADE ELEVATION

   k. TOTAL WALL HEIGHT: WALL EMBEDMENT + EXPOSED HEIGHT

CONSTRUCTION NOTES

6) EMBEDMENT TRENCH CONSTRUCTION SHALL INCLUDE:

   a. SUBGRADE SOILS SHALL BE PREPARED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL INVESTIGATION REPORT.

   b. REMEDIAL EARTHWORK (IF REQUIRED) SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL INVESTIGATION REPORT.

8) LEVELING PAD CONSTRUCTION SHALL INCLUDE :

   a. A MINIMUM 6 IN. THICK LAYER OF COMPACTED TYPE 2, CLASS B AGGREGATE BASE (SSPWC) COMPACTED TO AT LEAST 95% RELATIVE COMPACTION. THE RESULTING LEVELING COURSE SHALL BE FIRM, LEVEL BEARING PAD ON WHICH TO PLACE THE FIRST COURSE OF CONCRETE SRW UNITS.

   b. THE LEVELING PAD SHALL EXTEND LATERALLY A MINIMUM OF 6 INCHES IN FRONT OF AND BEHIND THE SRW.

9) SEGMENTED RETAINING WALL (SWR) PLACEMENT

   a. ALL MATERIALS SHALL BE INSTALLED AT THE PROPER ELEVATION AND ORIENTATION AS SHOWN IN THE WALL DETAILS ON THE CONSTRUCTION PLANS. THE SRW UNITS SHALL BE INSTALLED IN GENERAL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE DRAWINGS SHALL GOVERN IN ANY CONFLICT BETWEEN THE TWO REQUIREMENTS. PLACE UNITS ACCORDING TO NCMA'S "SEGMENTAL RETAINING WALL INSTALLATION GUIDE" AND SEGMENTAL RETAINING WALL UNIT MANUFACTURER'S WRITTEN INSTRUCTIONS.

   b. UNITS WITH CHIPPED, DAMAGED, SPALLING, OR STAINED FACES SHALL NOT BE PLACED IN THE RETAINING WALL.

   c. FIRST COURSE OF UNITS SHALL BE PLACED ON THE LEVELING PAD AT THE APPROPRIATE LINE AND GRADE. ALIGNMENT AND LEVEL SHALL BE CHECKED IN ALL DIRECTIONS TO ENSURE THAT ALL UNITS ARE IN FULL CONTACT WITH THE LEVELING COURSE AND PROPERLY SEATED.

   d. TAMP UNITS INTO BASE LEVELING PAD AS NECESSARY TO BRING TOPS OF UNITS INTO A LEVEL PLANE. PLACE UNITS FOR FULL LENGTH OF WALL. PLACE UNITS IN FIRM CONTACT WITH EACH OTHER, PROPERLY ALIGNED AND LEVEL.

   e. FOR SUBSEQUENT UNITS, REMOVE EXCESS FILL AND DEBRIS FROM TOP OF UNITS IN COURSE BELOW. PLACE UNITS IN FIRM CONTACT, PROPERLY ALIGNED AND DIRECTLY ON COURSE BELOW.

   f. PLACE THE FRONT OF THE BLOCKS SIDE-BY-SIDE. DO NOT LEAVE GAPS BETWEEN ADJACENT UNITS. LAYOUT OF CORNERS AND CURVES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

   c. INSTALL SHEAR/CONNECTING DEVICES PER MANUFACTURER'S RECOMMENDATIONS.VERTICAL SETBACK SHALL MEET THE REQUIREMENTS ON THE DETAIL SHEETS.

   d. MAXIMUM HORIZONTAL GAP BETWEEN ERECTED UNITS SHALL BE ≤ 1/2 INCH (13 MM).

   e. PLACE AND COMPACT DRAINAGE FILL WITHIN AND BEHIND WALL UNITS. PLACE AND COMPACT BACKFILL SOIL BEHIND DRAINAGE FILL. FOLLOW WALL ERECTION AND DRAINAGE FILL CLOSELY WITH STRUCTURE BACKFILL.

   f. PRIOR TO PLACEMENT AND COMPACTION OF UNIT DRAINAGE FILL , BACKFILL MAXIMUM STACKED VERTICAL HEIGHT OF SRW UNITS SHALL NOT EXCEED THREE COURSES OR 4 FEET, WHICHEVER IS LESS .

10) SRW UNIT SHEAR CONNECTORS (FIBERGLASS REINFORCEMENT PINS):

   a. PINS SHALL BE CAPABLE OF HOLDING THE GEOGRID IN THE PROPER DESIGN POSITION.

   b. REINFORCEMENT PINS SHALL BE 1/2-INCH (12 MM) DIAMETER THERMOSET ISOPTHALIC POLYESTER RESIN PULTRUDED FIBERGLASS REINFORCEMENT PINS WITH THE FOLLOWING REQUIREMENTS:

   c. FLEXURAL STRENGTH IN ACCORDANCE WITH ASTM D4476: 128,000 PSI (882 MPA) MINIMUM.

   d. SHORT BEAM SHEAR IN ACCORDANCE WITH ASTM D4475: 6,400 PSI (44 MPA) MINIMUM.

11) UNIT DRAINAGE FILL AND BACK-OF-WALL DRAINAGE:

   a. UNIT DRAINAGE FILL SHALL MEET THE REQUIREMENTS OF TABLE 1 AND BE A MINIMUM ONE CUBIC FOOT OF DRAINAGE FILL FOR EACH SQUARE FOOT OF WALL FACE.

   b. BACK-OF-WALL DRAINS (WHERE DETAILED) SHALL CONSIST OF 4" DIAMETER SLOTTED OR PERFORATED PVC DRAIN PIPE OR APPROVED ALTERNATE. THE DRAIN PIPE SHALL BE INSTALLED IN GENERAL ACCORDANCE WITH THE MANUFACTURERS' RECOMMENDATIONS AND SLOPED AT LEAST 1% TO DRAIN TO DAYLIGHT SECTION. ALL DRAINAGE PIPES SHALL BE DAYLIGHTED, IN NO CASE SHALL A BACK-DRAIN DEAD-END INTO THE BACK OF WALL.

   c. DAYLIGHTED DRAINAGE LATERALS SHALL BE SPACED AT MAXIMUM 50 FT SPACING ALONG THE WALL FACE. A RODENT GRADE SHALL BE USED ON ALL DAYLIGHTED PIPE ENDS.

   d. A SEPARATION GEOTEXTILE SHALL BE PLACED BETWEEN THE RETAINED BACKFILL AND/OR REINFORCED SOIL AND DRAIN ROCK INTERFACE. THE GEOTEXTILE SHALL BE NON-WOVEN MEETING THE REQUIREMENTS OF TABLE 2 (SEPARATION GEOTEXTILE MINIMUM STRENGTH AND HYDRAULIC PROPERTIES).

12) REINFORCED SOIL BACKFILL SHALL MEET THE SPECIFICATIONS OF TABLE 3, PLACEMENT OF REINFORCED SOIL AND RETAINED BACKFILL SHALL :

   a. BE IN COMPACT LIFTS SUCH THAT DISTURBANCE OF THE SRW ALIGNMENT DOES NOT OCCUR. OVER-COMPACTION OF RETAINED BACKFILL DURING RETAINING WALL CONSTRUCTION SHALL BE AVOIDED. HEAVY CONSTRUCTION EQUIPMENT SHALL NOT BE USED FOR PLACING AND/OR COMPACTING BACKFILL ADJACENT TO THE RETAINING WALL, AND SHOULD BE KEPT A MINIMUM OF THREE FEET OR AT A DISTANCE DETERMINED BY A 1H:1V SLOPE AWAY FROM THE BASE OF THE WALL, WHICHEVER IS GREATER.

   b. REINFORCED SOIL SHALL BE PLACED, SPREAD AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF SLACK IN THE GEOGRID AND INSTALLATION DAMAGE.

   c. REINFORCED SOIL AND RETAINED BACKFILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT TO EXCEED 6 INCHES WHERE HAND COMPACTION IS USED, OR 8 - 10 INCHES WHERE HEAVIER COMPACTION EQUIPMENT IS USED. LIFT THICKNESS SHALL BE FIELD ADJUSTED TO ENSURE DENSIFICATION IS REALIZED THROUGHOUT THE ENTIRE LIFT THICKNESS,ONLY LIGHTWEIGHT HAND-OPERATED EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET FROM THE TAIL THE MODULAR CONCRETE UNITS.

   d. REINFORCED SOIL AND RETAINED BACKFILL SHALL BE COMPACTED TO AT LEAST 90% RELATIVE COMPACTION BASED ON ASTM D1557. MOISTURE CONDITIONING PRIOR TO PLACEMENT IS RECOMMENDED TO ENSURE THE MOISTURE CONTENT OF THE BACKFILL MATERIAL IS UNIFORMLY DISTRIBUTED THROUGHOUT EACH LAYER AT ±2% OF OPTIMUM.

   e. CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY THE GEOGRID REINFORCEMENT. A MINIMUM FILL THICKNESS OF 6 INCHES IS REQUIRED PRIOR TO THE USE OF CONSTRUCTION VEHICLES OVER THE GEOGRID. VEHICLE TURNING SHALL BE KEPT TO A MINIMUM TO PREVENT DISPLACEMENT THE FILL AND DAMAGE TO THE GEOGRID.

   f. AT THE END OF EACH DAY'S OPERATION, THE CONTRACTOR SHALL SLOPE THE LAST LIFT OF REINFORCED SOIL AND RETAINED BACKFILL AWAY FROM THE WALL UNITS TO DIRECT RUNOFF AWAY FROM WALL FACE. THE CONTRACTOR SHALL NOT ALLOW SURFACE RUNOFF FROM ADJACENT AREAS TO ENTER THE WALL CONSTRUCTION SITE.

13) CAP BLOCK PLACEMENT

   a. THE CAP BLOCK AND/OR TOP SRW UNIT SHALL BE BONDED TO THE SRW UNITS BELOW USING AN APPROVED MASONRY CAP ADHESIVE SUCH AS SRW PRODUCTS SUPERIOR STRENGTH SOLVENT (HTTPS://SRWPRODUCTS.COM/PRODUCTS/ADHESIVES/SUPERIOR-STRENGTH-SOLVENT-BASED-ADHESIVE/) OR APPROVED ALTERNATE . THE BLOCK SHALL BE DRY AND SWEPT CLEAN PRIOR TO ADHESIVE PLACEMENT.

14) REFER TO THE PROJECT GEOTECHNICAL INVESTIGATION REPORT (CME, 2023) FOR ADDITIONAL SITE PREPARATION AND FILL PLACEMENT RECOMMENDATIONS.

15) GEOGRID INSTALLATION (REFER TO SHEETS RW-2 AND RW-3 FOR ADDITIONAL DETAILS):

   a. SHALL BE PERFORMED IN GENERAL ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION. IN ADDITION:

   b. GEOGRID SHALL BE ORIENTED WITH THE HIGHEST STRENGTH AXIS PERPENDICULAR TO THE WALL ALIGNMENT.

   c. GEOGRID REINFORCEMENT SHALL BE PLACED AT THE STRENGTHS, LENGTHS AND ELEVATIONS SHOWN ON THE CONSTRUCTION DESIGN DRAWINGS OR AS DIRECTED BY THE ENGINEER.

   d. THE GEOGRID SHALL BE LAID HORIZONTALLY ON COMPACTED BACKFILL AND ATTACHED TO THE MODULAR WALL UNITS. PLACE THE NEXT COURSE OF MODULAR CONCRETE UNITS OVER THE GEOGRID. THE GEOGRID SHALL BE PULLED TAUT AND ANCHORED PRIOR TO BACKFILL PLACEMENT ON THE GEOGRID.

   e. GEOGRID REINFORCEMENTS SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTHS AND PLACED SIDE-BY-SIDE TO PROVIDE 100% COVERAGE AT EACH LEVEL (UNLESS OTHERWISE NOTED BY MANUFACTURER)

   f. PLACE SOIL REINFORCEMENT IN HORIZONTAL JOINTS OF RETAINING WALL WHERE INDICATED AND ACCORDING TO SOIL-REINFORCEMENT MANUFACTURER'S WRITTEN INSTRUCTIONS.

   g. EMBED REINFORCEMENT WITHIN SRW UNITS PER MANUFACTURER RECOMMENDATIONS AND STRETCH TIGHT OVER COMPACTED BACKFILL. ANCHOR SOIL REINFORCEMENT TO SRW PER BLOCK MANUFACTURERS' RECOMMENDATIONS BEFORE PLACING FILL.

   h. PLACE ADDITIONAL SOIL REINFORCEMENT AT CORNERS AND CURVES OF WALLS TO PROVIDE CONTINUOUS REINFORCEMENT REFER TO DETAILS ON SHEET RW-2. FAILURE TO PROPERLY PLACE GEOGRID IN THESE ZONES MAY RESULT IN UNSATISFACTORY PERFORMANCE OF THE WALL.

16) RECOMMENDED SPECIAL INSPECTION REQUIREMENTS

   h. EMBEDMENT TRENCH AND LEVELING PAD: PERIODIC, INCLUDES FIELD DENSITY TESTING OF BOTH PREPARED SUBGRADE AND LEVELING PAD.

   i. DRAIN INSTALLATION: PERIODIC VISUAL OBSERVATION

   j. GENERAL WALL CONSTRUCTION, DRAINAGE FILL, AND COMPACTION OF BACKFILL: CONTINUOUS FOR GEOGRID REINFORCED WALLS, PERIODIC OBSERVATION FOR GRAVITY WALLS.

17) RELATIVE DENSITY AND MOISTURE CONTENT REQUIREMENTS FOR PLACEMENT OF THE LEVELING PAD AND REINFORCED SOIL AND RETAINED BACKFILL IS INCLUDED IN TABLE 4 ON SHEET RW-1

18) CME'S RETAINING WALL DESIGN INCLUDES A SNOW LOAD OF 31 PSF. DESIGN ASSUMES THAT ALL OTHER SURCHARGE LOADS BEHIND THE WALLS WILL BE A MINIMUM DISTANCE EQUAL TO OR GREATER THAN THE TOTAL WALL HEIGHT. ALTERNATIVELY, IF FOUNDATION LOADS ARE NOT SUFFICIENTLY OFFSET , BUILDING FOUNDATIONS SHALL BE DEEPENED TO REMOVE LOADING FROM THE ZONE OF INFLUENCE OF THE RETAINING WALL. THE "ZONE OF INFLUENCE" SHALL BE APPROXIMATED BY A 1 VERTICAL BY 1 HORIZONTAL (1V:1H) PROJECTION LINE (DOWNWARD AND OUTWARD) FROM THE EXTERIOR EDGE OF THE STRUCTURE FOUNDATION (E.G., "ZONE OF INFLUENCE"). IF THIS ASSUMPTION IS INACCURATE, THE SITE CIVIL DESIGNER SHALL NOTIFY OUR OFFICE IMMEDIATELY TO CONFIRM DESIGN CALCULATIONS.

19) SRW UNIT COLOR AND FINISH SHALL CONFORM TO THE PROJECT SPECIFICATIONS.

20) IF A CONFLICT IN THE PROJECT SPECIFICATIONS AND THE SRW PLAN SET ARE OBSERVED, PLEASE NOTIFY CONSTRUCTION MATERIALS ENGINEERS, INC. TO PROVIDE ADDITIONAL GUIDANCE AND/OR RECOMMENDATIONS.

TABLE 1 : GRADATION REQUIREMENTS FOR UNIT DRAINAGE FILL

SIEVE SIZE	PERCENT PASSING
1 IN	100
3/4 IN	75-100
NO. 4	0-60
NO. 40	0-50
NO. 200	0-5

* SEE GENERAL NOTES 5d, SHEET RW-2 AND RW-3 FOR ADDITIONAL INFORMATION

TABLE 2 : SEPARATION GEOTEXTILE MINIMUM STRENGTH AND HYDRAULIC PROPERTIES

TRAPEZOID TEAR STRENGTH (ASTM D 4533)	80 LBS
PUNCTURE STRENGTH (ASTM D 4833)	80 LBS
GRAB STRENGTH (ASTM D 4632)	200 LBS
BURST STRENGTH (ASTM D 3786)	250 PSI
MINIMUM PERMITTIVITY (ASTM D 4491)	>0.2 SEC
APPARENT OPENING SIZE (ASTM D 4751)	<0.25 MM

TABLE 3: SPECIFICATIONS FOR REINFORCED SOIL BACKFILL

SIEVE SIZE	PERCENT PASSING BY WEIGHT
4-INCH	100
2.5 INCH	100
NO. 40	30-50
NO. 200	15-30

MAXIMUM LIQUID LIMIT	MINIMUM INTERNAL FRICTION ANGLE (ϕ)	MAXIMUM PLASTIC INDEX
45	34°	25

ASTM TEST METHODS D6913, D4318, D3080

TABLE 4 : MINIMUM RELATIVE DENSITY REQUIREMENTS (ASTM D1557)

MATERIAL TYPE	MATERIAL SPECIFICATION	MINIMUM RELATIVE DENSITY	ACCEPTABLE MOISTURE CONTENTS
LEVELING COURSE	TYPE 2, CLASS B AGGREGATE BASE (SECTION 200.00-1 OF 2012 SSPWC)	95%	±2 % OF OPTIMUM
REINFORCED SOIL	REFER TO TABLE 3 (SHEET RW-1)	90%	±2 % OF OPTIMUM
RETAINED BACKFILL	IN-PLACE NATIVE ONSITE SOIL/BEDROCK	90% (**REQUIRED FOR FILL ONLY**)	±2 % OF OPTIMUM

GENERAL GUIDANCE FOR TEMPORARY CUT SLOPES [OSHA PART 1926, VOLUME 54, NUMBER 209 OF THE FEDERAL REGISTER (TABLE B-1, OCTOBER 31, 1989)]

SOIL OR ROCK TYPE	DESCRIPTION	MAXIMUM ALLOWABLE TEMPOARY SLOPE	
STABLE BEDROCK	NATURAL SOLID MINERAL MATTER THAT CAN BE EXCAVATED WITH VERTICAL SIDES AND REMAIN INTACT WHILE EXPOSED. IT ISUSUALLY IDENTIFED BY A ROCK NAME SUCH AS GRANITE OR SANDSTONE. DETERMINING WHETHER A DEPOSIT IS OF THIS TYPE MAY BE DIFFICULT UNLESS IT IS KNOWN WHETHER CRACKS EXIST AND WHETHER OR NOT THE CRACKS RUN INTO OR AWAY FROM THE EXCAVATION.	Vertical	90°
TYPE A	COHESIVE SOILS WITH AN UNCONFINED COMPRESSIVE STRENGTH OF 1.5 TONS PER SQUARE FOOT (TSF) (144 KPA) OR GREATER. EXAMPLES OF TYPE A COHESIVE SOILS ARE OFTEN CLAY, SILTY CLAY, SANDY CLAY, CLAY LOAM AND, IN SOME CASES, SILTY CLAY LOAM AND SANDY CLAY LOAM. (NO SOIL IS TYPE A IF IT IS FISSURED, IS SUBJECT TO VIBRATION OF ANY TYPE, HAS PREVIOUSLY BEEN DISTURBED, IS PART OF A SLOPED, LAYERED SYSTEM WHERE THE LAYERS DIP INTO THE EXCAVATION ON A SLOPE OF 4 HORIZONTAL TO 1 VERTICAL (4H:1V) OR GREATER, OR HAS SEEPING WATER.	3H:4V	53°
TYPE B	COHESIVE SOILS WITH AN UNCONFINED COMPRESSIVE STRENGTH GREATER THAN 0.5 TSF (48 KPA) BUT LESS THAN 1.5 TSF (144 KPA). EXAMPLES OF OTHER TYPE B SOILS ARE: ANGULAR GRAVEL, SILT, SILT LOAM, PREVIOUSLY DISTURBED SOILS UNLESS OTHERWISE CLASSIFIED AS TYPE C; SOILS THAT MEET THE UNCONFINED COMPRESSIVE STRENGTH OR CEMENTATION REQUIREMENTS OF TYPE A SOILS BUT ARE FISSURED OR SUBJECT TO VIBRATION; DRY UNSTABLE ROCK; AND LAYERED SYSTEMS SLOPING INTO THE TRENCH AT A SLOPE LESS THAN 4H:1V (ONLY IF THE MATERIAL WOULD BE CLASSIFIED AS A TYPE B SOIL).	1H:1V	45°
TYPE C	COHESIVE SOILS WITH AN UNCONFINED COMPRESSIVE STRENGTH OF 0.5 TSF (48 KPA) OR LESS. OTHER TYPE C SOILS INCLUDE GRANULAR SOILS SUCH AS GRAVEL, SAND AND LOAMY SAND, SUBMERGED SOIL, SOIL FROM WHICH WATER IS FREELY SEEPING, AND SUBMERGED ROCK THAT IS NOT STABLE. ALSO INCLUDED IN THIS CLASSIFICATION IS MATERIAL IN A SLOPED, LAYERED SYSTEM WHERE THE LAYERS DIP INTO THE EXCAVATION OR HAVE A SLOPE OF FOUR HORIZONTAL TO ONE VERTICAL (4H:1V) OR GREATER. LAYERED GEOLOGICAL STRATA WHERE SOILS ARE CONFIGURED IN LAYERS, I.E., WHERE A LAYERED GEOLOGIC STRUCTURE EXISTS, THE SOIL MUST BE CLASSIFIED ON THE BASIS OF THE SOIL CLASSIFICATION OF THE WEAKEST SOIL LAYER. EACH LAYER MAY BE CLASSIFIED INDIVIDUALLY IF A MORE STABLE LAYER LIES BELOW A LESS STABLE LAYER, I.E., WHERE A TYPE C SOIL RESTS ON TOP OF STABLE ROCK.	3H:2V	34°

* REFER TO PROJECT GEOTECHNICAL INVESTIGATION REPORT FOR ADDITIONAL INFORMAITON

Stella A. Hardy — Digitally signed by Stella A. Hardy Date: 2023.04.03 08:33:33 -07'00'

STELLA A. HARDY

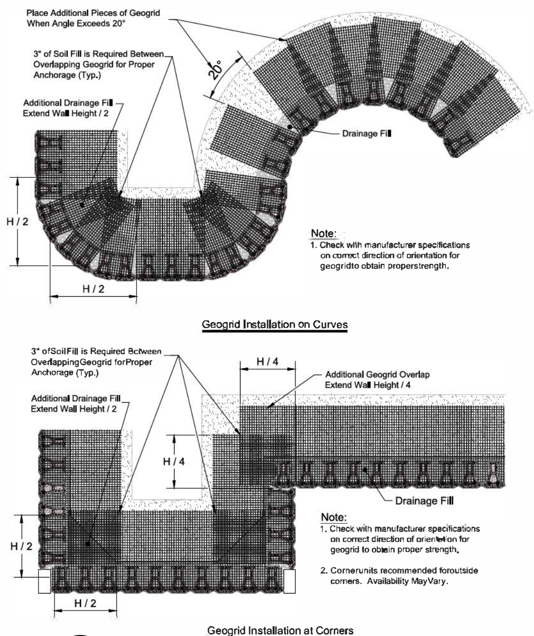
CME CONSTRUCTION MATERIALS ENGINEERS INC.
304 SIERRA MANOR DRIVE, SUITE 1
RENO, NEVADA 89511

TRUCKEE MEADOWS WATER AUTHORITY
LEMMON VALLEY WATER TANK RETAINING WALL
GENERAL NOTES AND TYPICAL SRW WALL DETAILS
WASHOE COUNTY APN 080-730-18

PROJECT NO.: 3152

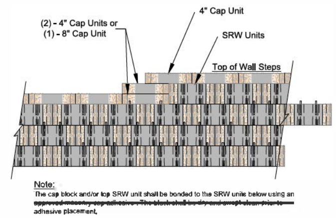
SHEET
RW-1

WSUP23-0030
EXHIBIT D



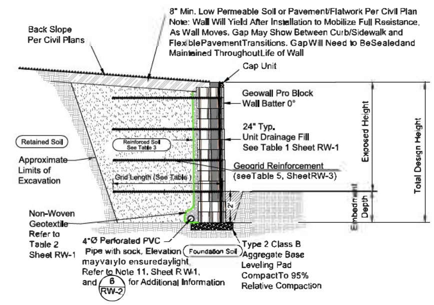
Place Additional Pieces of Geogrid When Angle Exceeds 20°
3" of Soil Fill is Required Between Overlapping Geogrid for Proper Anchorage (Typ.)
Additional Drainage Fill Extend Wall Height / 2
20°
Drainage Fill
H / 2
H / 2
Note:
1. Check with manufacturer specifications on correct direction of orientation for geogridto obtain properstrength.
Geogrid Installation on Curves
3" ofSoilFill is Required Between OverlappingGeogrid forProper Anchorage (Typ.)
Additional Drainage Fill Extend Wall Height / 2
H / 4
Additional Geogrid Overlap Extend Wall Height / 4
H / 4
Drainage Fill
H / 2
H / 2
Note:
1. Check with manufacturer specifications on correct direction of orientation for geogrid to obtain proper strength.
2. Cornerunits recommended foroutside corners. Availability MayVary.
Geogrid Installation at Corners

1 RW-2 TYPICAL GEOGRID INSTALLATION AT CORNERS AND CURVES
N.T.S



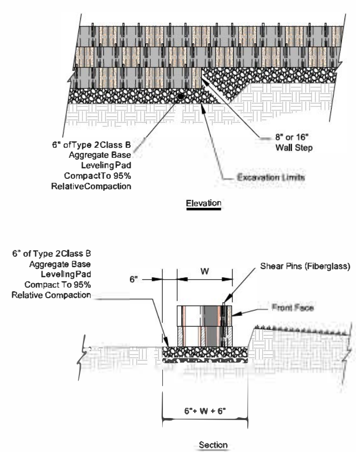
2 RW-2 TYPICAL WALL CAP DETAIL WITH STEPPED CONFIGURATION
N.T.S

NOTES:
1) REFER TO CIVIL PLANS FOR GENERAL WALL GEOMETRY INCLUDING EXPOSED HEIGHT, TOP OF WALL AND BOTTOM OF WALL ELEVATION, AND BACKSLOPE .
2) SRW REINFORCED BACKFILL GEOGRID DESIGN IS BASED ON MIRAFI MIRAGRID 3XT.
3) RELATIVE DENSITY AND MOISTURE CONTENT REQUIREMENTS FOR PLACEMENT OF THE LEVELING PAD AND REINFORCED SOIL IS INCLUDED ON SHEET RW-1.
4) TYPICAL DETAILS PRESENTED ON RW-2 WERE COMPILED USING BASALITE TYPICAL DETAILS AND GENERAL PRODUCT SPECIFICATIONS. MODIFICATIONS TO THE STANDARD DETAILS WERE COMPLETED BY CONSTRUCTION MATERIALS ENGINEERS, INC. (CME). PLEASE CONTACT OUR OFFICE IF CLARIFICATION OF DETAILS, NOTES, SPECIFICATIONS, OR TABLES PRESENTED HEREIN ARE REQUIRED.
5) REFER TO MANUFACTURER RECOMMENDATIONS FOR INSTALLATION (HTTPS://BASALITE.COM).

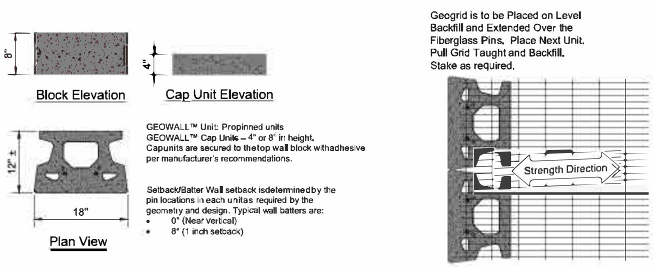


8" Min. Low Permeable Soil or Pavement/Flatwork Per Civil Plan Note: Wall Will Yield After Installation to Mobilize Full Resistance, As Wall Moves, Gap May Show Between Curb/Sidewalk and FlexiblePavementTransitions. GapWill Need to BeSealedand Maintained ThroughoutLife of Wall
Back Slope Per Civil Plans
Cap Unit
Geowall Pro Block Wall Batter 0°
24" Typ. Unit Drainage Fill See Table 1 Sheet RW-1
Retained Soil
Reinforced Soil See Table 3
Approximate Limits of Excavation
Grid Length (See Table)
Geogrid Reinforcement (seeTable 5, SheetRW-3)
Exposed Height
Total Design Height
Embedment Depth
Non-Woven Geotextile Refer to Table 2 Sheet RW-1
4"Ø Perforated PVC Pipe with sock. Elevation mayvaryto ensuredaylight. Refer to Note 11, Sheet RW-1, and 6 RW-2 for Additional Information
Foundation Soil
Type 2 Class B Aggregate Base Leveling Pad CompactTo 95% Relative Compaction

4 RW-2 TYPICAL GEOGRID REINFORCED WALL SECTION AND SCHEDULE
N.T.S



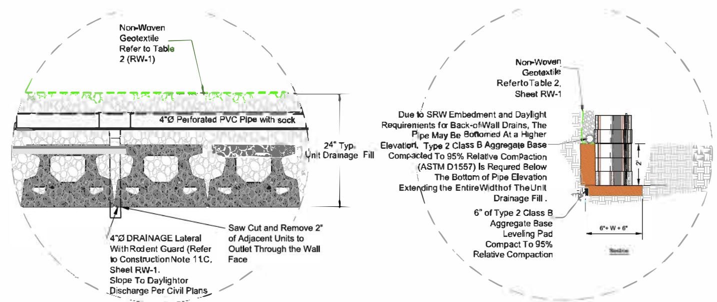
6" ofType 2Class B Aggregate Base LevelingPad CompactTo 95% RelativeCompaction
8" or 16" Wall Step
Excavation Limits
Elevation
6" of Type 2Class B Aggregate Base LevelingPad Compact To 95% Relative Compaction
6"
W
Shear Pins (Fiberglass)
Front Face
6"+ W + 6"
Section



8"
Block Elevation
4"
Cap Unit Elevation
12" ±
18"
Plan View
GEOWALL™ Unit: Propinned units
GEOWALL™ Cap Units – 4" or 8" in height.
Capunits are secured to thetop wall block withadhesive per manufacturer's recommendations.
Setback/Batter Wall setback isdeterminedby the pin locations in each unitas required by the geometry and design. Typical wall batters are:
• 0" (Near vertical)
• 8" (1 inch setback)
Geogrid is to be Placed on Level Backfill and Extended Over the Fiberglass Pins. Place Next Unit. Pull Grid Taught and Backfill. Stake as required.
Strength Direction

5 RW-2 TYPICAL SRW UNIT DETAIL
N.T.S

3 RW-2 TYPICAL AGGREGATE BASE LEVELING PAD DETAIL
N.T.S



Non-Woven Geotextile Refer to Table 2 (RW-1)
4"Ø Perforated PVC Pipe with sock
24" Typ. Unit Drainage Fill
4"Ø DRAINAGE Lateral WithRodent Guard (Refer to ConstructionNote 11C, Sheet RW-1. Slope To Daylightor Discharge Per Civil Plans
Saw Cut and Remove 2" of Adjacent Units to Outlet Through the Wall Face
Non-Woven Geotextile RefertoTable 2, Sheet RW-1
Due to SRW Embedment and Daylight Requirements for Back-ofWall Drains, The Pipe May Be Bottomed At a Higher Elevation. Type 2 Class B Aggregate Base Compacted To 95% Relative Compaction (ASTM D1557) Is Required Below The Bottom of Pipe Elevation Extending the EntireWidthof TheUnit Drainage Fill.
6" of Type 2 Class B Aggregate Base Leveling Pad Compact To 95% Relative Compaction
6"+ W + 6"
Section

6 RW-2 TYPICAL BACK-OF-WALL DRAIN AND DAYLIGHT REQUIREMENTS
N.T.S

Stella A. Hardy Digitally signed by Stella A. Hardy Date: 2023.04.03 08:33:50 -07'00'

STELLA A. HARDY
DATE SIGNED: 04/03/2023

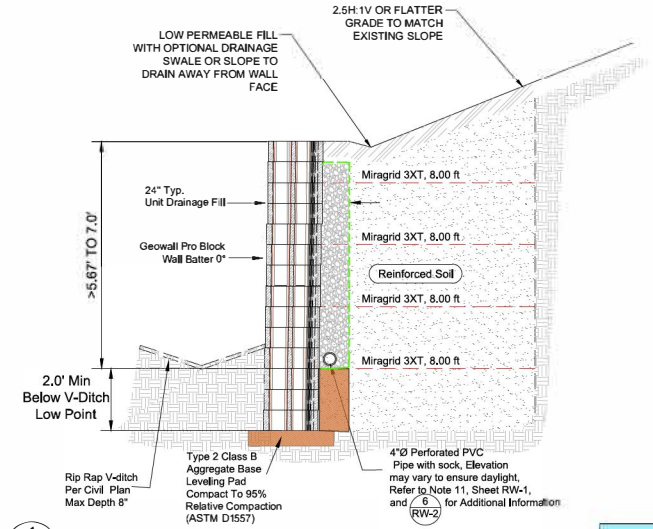
REVISION NO. | DATE | COMMENT

CME CONSTRUCTION MATERIALS ENGINEERS INC.
300 SIERRA MANOR DRIVE, SUITE 1
RENO, NEVADA 89511

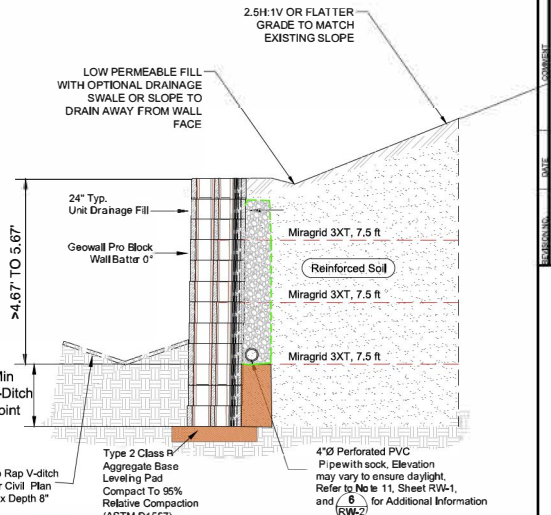
TRUCKEE MEADOWS WATER AUTHORITY
LEMMON VALLEY WATER TANK RETAINING WALL
SRW TYPICAL DETAILS AND NOTES
WASHOE COUNTY 080-730-18
PROJECT NO.: 3152
DATE: 01/30/2023

SHEET
RW-2

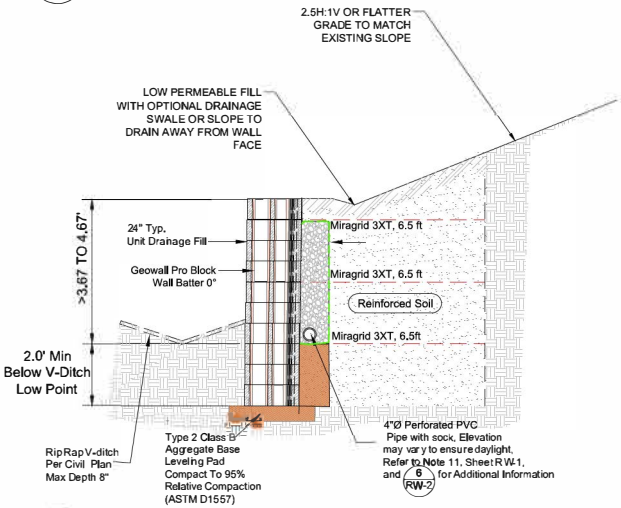
WSUP23-0030
EXHIBIT D



1 RW-3 TYPICAL SRW WALL SECTION EXPOSED HEIGHT >5.67' TO 7.0' (N.T.S)



2 RW-3 TYPICAL SRW WALL SECTION EXPOSED HEIGHTS >4.67' TO 5.67' (N.T.S)



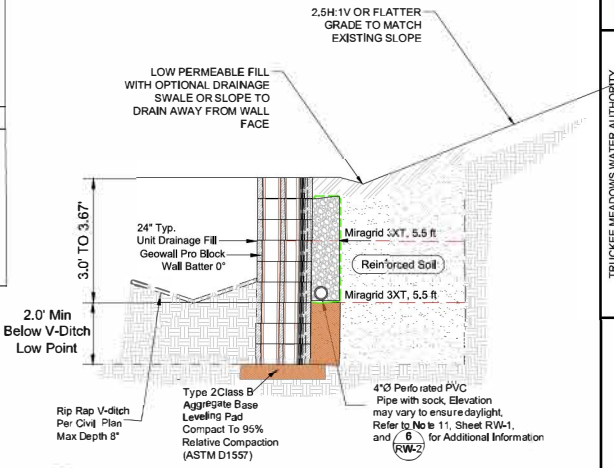
3 RW-3 TYPICAL SRW WALL SECTION EXPOSED HEIGHTS >3.67' TO 4.67" (N.T.S)

TABLE 5: GEOGRID REINFORCEMENT SCHEDULE

EXPOSED WALL HEIGHT (FT)	TOTAL WALL HEIGHT INCLUDING EMBEDMENT (FT)	BACKSLOPE ANGLE	NUMBER OF GEOGRID LAYERS	GEOGRID LAYER ELEVATIONS FROM TOP OF LEVELING PAD (FT)	MINIMUM GEOGRID EMBEDMENT LENGTH (FT)	GRID TYPE	GEOGRID VERTICAL SPACING (FT)
>5.67' TO 7.0	>8.3 TO 9.67	2.5H:1V OR FLATTER	4	2.0, 4.0, 6.0, 8.0	8.0	MIRAFI 3XT	2.0
>4.67' TO 5.67	>7.3 TO 8.3	2.5H:1V OR FLATTER	3	2.0, 4.0, 6.0	7.5		
>3.67' TO 4.67	>6.3 TO 7.3	2.5H:1V OR FLATTER	3	2.0, 4.0, 6.0	6.5		
3.0 TO 3.67	5.67 TO 6.3	2.5H:1V OR FLATTER	2	2.0, 4.0	5.5		
LESS THAN 3.0	LESS THAN 5.67	2.5H:1V OR FLATTER	1	2.0	4.5		

NOTES:

1. TO MAINTAIN 100% LAYER COVERAGE FOR GEOGRID PLACEMENT, 1ST LAYER OF GEOGRID MUST BE PLACED AT THE TOP INTERFACE OF THE 3RD BLOCK UP FROM THE LEVELING COURSE AND CONTINUE AT 2 FOOT VERTICAL INTERVALS SPACINGS UNTIL THE TOTAL NUMBER OF LAYERS HAVE BEEN INSTALLED.
2. DEPTH OF GEOGRID EMBEDMENT WILL VARY BASED ON TOP OF WALL ELEVATION AND BLOCK SIZE. CALCULATIONS SUPPORT MAXIMUM EXPOSED WALL HEIGHT OF UP TO 7.0 FEET.
3. THE LENGTH OF GEOGRID REINFORCEMENT VARIES BY WALL HEIGHT TO LIMIT THE NEED FOR UNNECESSARY CUT ALONG THE BEDROCK SLOPE. CARE SHOULD BE TAKEN DURING CONSTRUCTION TO ENSURE THE APPROPRIATE LENGTHS OF GEOGRID REINFORCEMENT HAVE BEEN IMPLEMENTED INTO THE DESIGN. IN NO CASE SHALL THE GEOGRID LENGTHS BE LESS THAN THE MINIMUM PRESENTED ON THE PLAN SET.
4. WHERE A V-DITCH OR SWALE WILL BE LOCATED WITHIN 5 FEET LATERALLY OF THE BASE OF THE WALL, THE DEPTH OF WALL EMBEDMENT SHALL BE INCRESED IN DEPTH EQUAL TO THE DEPTH OF THE V-DITCH OR SWALE.



4 RW-3 TYPICAL SRW WALL SECTION EXPOSED HEIGHT 3.0 TO 3.67 (N.T.S)

Stella A. Hardy

CONSTRUCTION MATERIALS ENGINEERS INC.

TRUCKEE MEADOWS WATER AUTHORITY
LEMMON VALLEY WATER TANK RETAINING WALL
SRW TYPICAL WALL SECTIONS
WASHOE COUNTY T 060-730-18
PROJECT NO. 3192 DATE 01/09/2023

SHEET RW-3

WSUP23-0030
EXHIBIT D

GENERAL STRUCTURAL NOTES (GSN)

GENERAL

G1. SCOPE
THE NOTES ON THIS SHEET AND THE STANDARD STRUCTURAL DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT WHETHER SPECIFICALLY CALLED OUT OR NOT, EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY ON THE STRUCTURAL SHEETS. IF THERE ARE QUESTIONS, THEY SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER AND ANSWERED IN WRITING PRIOR TO CONSTRUCTION.

G2. APPLICABLE SPECIFICATIONS AND CODES
A. 2018 INTERNATIONAL BUILDING CODE (IBC 2018) WITH APPLICABLE EDITIONS OF THE CODE REFERENCED STANDARDS AND WITH NORTHERN NEVADA AMENDMENTS
B. 2016 MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURE (ASCE 7-16)
C. 2014 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-14)
D. 2016 STEEL CONSTRUCTION MANUAL, 15TH ED (AISC 360-16)
E. 2011 WELDED CARBON STEEL TANKS FOR WATER STORAGE (AWWA D100-11)

G3. DESIGN CRITERIA
A. DEAD LOAD: ACTUAL TRIBUTARY STRUCTURE WEIGHT
B. LIVE LOAD:
1. RESERVOIR ROOF (PER AWWA D100): = 15 PSF
C. WIND:
1. ULTIMATE WIND SPEED: = 135 MPH
2. ALLOWABLE STRESS WIND SPEED: = 104 MPH
3. EXPOSURE: = C
4. IMPORTANCE FACTOR: = 1.15
4. STRUCTURE IS ENCLOSED.
D. SEISMIC:
1. WELDED CARBON STEEL WATER STORAGE TANK:
a. OCCUPANCY CATEGORY: = IV
b. IMPORTANCE FACTOR: = 1.50
c. SITE CLASS: = C
d. SPECTRAL RESPONSE ACCELERATION: SS = 1.456
e. SPECTRAL RESPONSE ACCELERATION: S1 = 0.495
f. SPECTRAL RESPONSE COEFFICIENT: SDS = 1.165
g. SPECTRAL RESPONSE COEFFICIENT: SD1 = 0.495
h. SEISMIC DESIGN CATEGORY: = D
i. ANALYSIS PROCEDURE: = AWWA D100
E. SNOW LOAD:
1. GROUND SNOW LOAD: = 31 PSF
2. EXPOSURE FACTOR: C_e = 0.9
3. THERMAL FACTOR: C_t = 1.0
4. ROOF SLOPE FACTOR: C_s = 1.0
5. IMPORTANCE FACTOR: I_s = 1.2

G4. SAFETY
SAFETY AND STRUCTURE STABILITY DURING CONSTRUCTION ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. STRUCTURES HAVE BEEN DESIGNED TO RESIST CODE FORCES AS A COMPLETED STRUCTURE. THE TANK SHELL SHALL BE SHORED AS REQUIRED TO RESIST CODE FORCES AT ALL TIMES DURING CONSTRUCTION. PROVIDE STIFFENERS AROUND ANY TEMPORARY ACCESS OPENING CUT INTO THE SHELL.

G5. SPECIAL INSPECTIONS
SPECIAL INSPECTIONS ARE REQUIRED IN ACCORDANCE WITH CHAPTER 1 AND CHAPTER 17 OF THE IBC. PAYMENT FOR THESE INSPECTIONS IS NOT THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL PROVIDE FOR FULL ACCESS TO THE WORK BY THE SPECIAL INSPECTOR AND SHALL PROVIDE FOR THESE INSPECTIONS IN THE CONSTRUCTION SCHEDULE IN ACCORDANCE WITH THE CITY OF RENO REQUIREMENTS. A STATEMENT OF RESPONSIBILITY SHALL BE SUBMITTED UNDER SEPARATE COVER WITH THE PERMIT APPLICATION AS REQUIRED UNDER IBC SECTION 1704. SPECIAL INSPECTIONS ARE REQUIRED FOR THE FOLLOWING WORK:
A. TANK COATING SYSTEM
B. STRUCTURAL WELDING
C. CONCRETE

G6. STANDARD STRUCTURAL DETAILS
THE STANDARD STRUCTURAL DETAILS DEPICT TYPICAL DETAILING TO BE USED ON THIS PROJECT. CONDITIONS NOT EXPLICITLY SHOWN ON THE DRAWINGS SHALL BE MADE SIMILAR TO THE STANDARD STRUCTURAL DETAILS SHOWN. OBTAIN APPROVAL OF THE ENGINEER IN WRITING FOR SIMILAR CONDITIONS PRIOR TO CONSTRUCTION.

G7. CONFLICTS
IN CASES WHERE CONFLICTS OCCUR BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE MOST STRINGENT REQUIREMENTS SHALL APPLY FOR BID PURPOSES, UNLESS OTHERWISE RESOLVED IN WRITING DURING THE BID PHASE.

G8. GEOTECHNICAL
THE FOLLOWING NON-CONTRACTUAL GEOTECHNICAL REPORT WAS DEVELOPED FOR THIS PROJECT AND IS THE BASIS OF THE STRUCTURAL DESIGN:
NAME OF GEOTECHNICAL FIRM: CONSTRUCTION MATERIALS ENGINEERS, INC.
ADDRESS: 300 SIERRA MANOR DRIVE, SUITE 1, RENO, NEVADA 89511
REPORT NUMBER: 3152
REPORT DATE: FEBRUARY 1, 2023
A. ALLOWABLE NET SOIL BEARING PRESSURE = 4500 PSF (SUSTAINED LOADS)
= 6000 PSF (WIND/SEISMIC LOADS)
B. ACTIVE LATERAL EARTH PRESSURE = 35 PSF
C. PASSIVE LATERAL EARTH PRESSURE = 300 PSF
D. COEFFICIENT OF FRICTION = 0.48

G9. TANK FOUNDATION
SUBGRADE PREPARATION BELOW TANK AND CONCRETE RINGWALL SHALL BE PER THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT REFERENCED ABOVE. BACKFILL BELOW TANK INSIDE OF CONCRETE RINGWALL TO 8 INCHES MINIMUM THICKNESS WITH AB COURSE CONFORMING TO ASTM C33, SIZE #7 AND COMPACTED TO 95% DENSITY IN ACCORDANCE WITH ASTM D698 AND 4 INCHES MINIMUM FINAL THICKNESS OF OILED SAND.

STEEL

S1. DESIGN STRENGTHS:
SQUARE OR RECTANGULAR HSS: Fy=46 KSI
PIPE: Fy=35 KSI
ALL OTHER PLATES AND SHAPES: Fy=36 KSI

S2. DIMENSIONS
TO CENTERLINES OF COLUMNS AND BEAMS, TOP SURFACES OF BEAMS AND TUBES AND BACKS OF CHANNELS AND ANGLES UNO.

S3. ELEVATIONS
TOP OF STEEL REFERS TO TOP SURFACE OF MEMBER OR FLANGE UNO

S4. WHEN FILLET WELD SIZE IS NOT INDICATED, PROVIDE MAXIMUM WELD SIZE BASED ON MATERIAL THICKNESS IN ACCORDANCE WITH AISC AND AWWA SPECIFICATIONS

S5. CONFORM TO AISC 360, STEEL CONSTRUCTION MANUAL

CONCRETE

C1. DESIGN STRENGTHS:
f'c = 4,000 PSI
fy = 60,000 PSI

C2. CONCRETE COVER
UNLESS OTHERWISE NOTED OR SHOWN, PROVIDE CONCRETE COVER FOR REINFORCING AS FOLLOWS:
CONCRETE DEPOSITED AGAINST EARTH: 3 IN
ALL OTHER: 2 IN
SEE DRAWINGS FOR EXCEPTIONS

C3. ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE ACI MANUAL OF STANDARD PRACTICE. SEE SPECIFICATIONS FOR ADDITIONAL REINFORCING PLACEMENT REQUIREMENTS.

C4. PROVIDE 3/4 IN CHAMFERS AT ALL EXPOSED EDGES. NOT ALL CHAMFERS MAY BE SHOWN ON DRAWINGS

C5. ABSOLUTELY NO WELDING OF REINFORCING BARS OR USING HEAT TO BEND REINFORCING BARS SHALL BE ALLOWED WITHOUT SPECIFIC APPROVAL FROM THE STRUCTURAL ENGINEER.

GENERAL STRUCTURAL ABBREVIATIONS

A/E	ARCHITECT/ENGINEER
AB	ANCHOR BOLT
ADDL	ADDITIONAL
ADH	ADHESIVE
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
ALUM	ALUMINUM
ANC	ANCHOR
APRX	APPROXIMATE
APVD	APPROVED
ARCH	ARCHITECTURAL
BC	BOTTOM CHORD
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BOL	BOLLARD
BOT	BOTTOM
BP	BASE PLATE
BRG	BEARING
BTB	BACK TO BACK
BTW	BETWEEN
C	CHANNEL SHAPE
CHD	CHORD
CIP	CAST-IN-PLACE
CJ	CONSTRUCTION JOINT
CJP	CONTINUOUS JOINT PENETRATION
CL	CENTERLINE
CLJ	CONTROL JOINT
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CTC	CENTER TO CENTER
CTR	CENTER
CY	CUBIC YARD
D	DEEP
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DEMO	DEMOLITION
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIST	DISTANCE
DL	DEAD LOAD
DT	DOUBLE TEE
DTL	DETAIL
DWG	DRAWING
DWL	DOWEL
E	EAST
EA	EACH
ECC	ECCENTRIC
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
EW	EACH WAY
EWEF	EACH WAY, EACH FACE
EWTB	EACH WAY, TOP AND BOTTOM
EXP	EXPANSION
EXST	EXISTING
FAB	FABRICATOR
FD	FLOOR DRAIN
FDTN	FOUNDATION
FG	FINISHED GRADE
FIG	FIGURE
FIN	FINISH
FLR	FLOOR
FOC	FACE OF CONCRETE, FACE OF CURB
FR	FRAME
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET, FOOT
FTG	FOOTING
FV	FIELD VERIFY
GA	GAGE (METAL THICKNESS)
GALV	GALVANIZED
GEN	GENERAL
GR	GRADE
GRTG	GRATING
H1E	STANDARD ACI HOOK ONE END
H2E	STANDARD ACI HOOK BOTH ENDS
HC	HOLLOW CORE
HDR	HEADER
HK	HOOK
HORIZ	HORIZONTAL
HP	HIGH POINT
HS	HEADED STUD
HSS	HOLLOW STRUCTURAL SHAPE
HT	HEIGHT
ID	INSIDE DIAMETER
IF	INSIDE FACE
IN	INCH
INFO	INFORMATION
INT	INTERIOR, INTERSECTION
INV	INVERT
JF	JOINT FILLER
JST	JOIST
JT	JOINT
K	KIP
KB	KNEE BRACE
KLF	KIPS PER LINEAR FOOT
KSI	KIPS PER SQUARE INCH
L	ANGLE, LENGTH
LAD	LADDER
LB	POUND
LF	LINEAR FOOT
LG	LONG
LIN	LINEAR
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LNG	LONGITUDINAL
LOC	LOCATION
LP	LOW POINT
LWC	LIGHTWEIGHT CONCRETE
MAX	MAXIMUM
MBR	MEMBER
MC	MOMENT CONNECTION
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
ML	MASONRY LINTEL
N	NORTH
NIC	NOT IN CONTRACT
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OH	OVERHEAD
OPNG	OPENING
OPP	OPPOSITE
OVHG	OVERHANG
PAR	PARALLEL
PCF	POUNDS PER CUBIC FOOT
PCLJ	PARTIAL CONTROL JOINT
PEN	PENETRATION
PEMB	PRE ENGINEERED METAL BUILDING
PL	PLATE
PLBG	PLUMBING
PLF	POUNDS PER LINEAR FOOT
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PS	PIPE SUPPORT, PUMP STATION
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
RECT	RECTANGULAR
REF	REFERENCE
REINF	REINFORCING
REQD	REQUIRED
REV	REVISION
RO	ROUGH OPENING
RTW	RETAINING WALL
S	SOUTH
SCH	SCHEDULE
SECT	SECTION
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SL	SLOPE
SLTD	SLOTTED
SOG	SLAB ON GRADE
SPA	SPACING
SPEC	SPECIFICATION
SQ	SQUARE
SST	STAINLESS STEEL
STD	STANDARD
STIR	STIRRUP
STL	STEEL
STR	STRUCTURAL, STRAIGHT
SUSP	SUSPENDED
T&B	TOP AND BOTTOM
T/	TOP OF
TD	TRENCH DRAIN
TEMP	TEMPORARY
THK	THICK
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOG	TOP OF GRATING
TOM	TOP OF MASONRY
TOS	TOP OF SLAB, TOP OF STEEL
TOW	TOP OF WALL
TPG	TOPPING, THROUGH PLATE GIRDER
TYP	TYPICAL
ULT	ULTIMATE
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VOL	VOLUME
W	WEST, WIDE, WIDE FLANGE BEAM
W/	WITH
W/O	WITHOUT
WF	WIDE FLANGE
WLD	WELDED
WM	WIRE MESH
WP	WORK POINT
WS	WATERSTOP
WT	WEIGHT
WWF	WELDED WIRE FABRIC

GENERAL NOTES:

1. THESE ABBREVIATIONS APPLY TO THE STRUCTURAL SET OF CONTRACT DRAWINGS
2. LISTING OF ABBREVIATIONS DOES NOT IMPLY THAT ALL ABBREVIATIONS ARE USED IN THE CONTRACT DRAWINGS.
3. ABBREVIATIONS SHOWN ON THIS SHEET INCLUDE VARIATIONS OF A WORD. FOR EXAMPLE, "MOD" MAY MEAN MODIFY OR MODIFICATION; "INC" MAY MEAN INCLUDED OR INCLUDING AND "REINF" MAY MEAN EITHER REINFORCE OR REINFORCING.

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED R. WRIGHT
DRAWN R. WRIGHT
DATE AUGUST 21, 2023
CHECKED J. NERVIG
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
GENERAL STRUCTURAL NOTES AND ABBREVIATIONS

PROFESSIONAL ENGINEER STATE OF NEVADA
RYAN WRIGHT
Exp: 06/30/24
CIVIL
No. 030882
08/21/23

SHEET NUMBER
S001
23 OF 36

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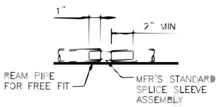
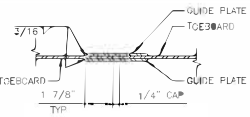
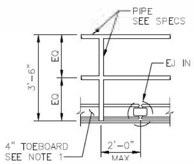
EXHIBIT D



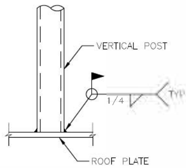
RAIL SLIP JOINT



TOEBOARD EXPANSION JOINT



GUARDRAIL ELEVATION



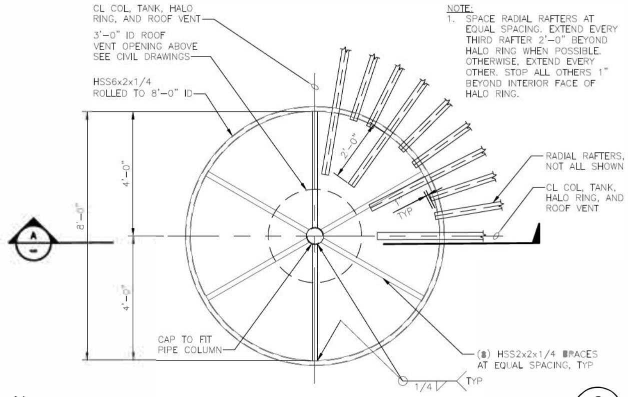
POST MOUNTING TO STEEL

NOTES:

1. TOEBOARDS SHALL BE PLACED 1/4" CLEAR MAX ABOVE WALKING SURFACE.
2. 6'-0" MAXIMUM SPACING BETWEEN POSTS.
3. GUARDRAILS SHALL BE WELDED ASSEMBLIES.
4. REFER TO SPECIFICATION SECTION 05 52 05 FOR ADDITIONAL INFORMATION.

STEEL GUARDRAIL

1 / - N.T.S.

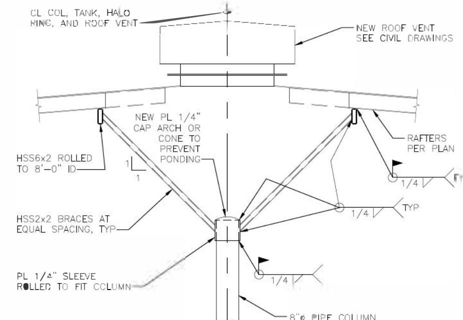


NOTE:

1. SPACE RADIAL RAFTERS AT EQUAL SPACING. EXTEND EVERY THIRD RAFTER 2'-0" BEYOND HALO RING WHEN POSSIBLE. OTHERWISE, EXTEND EVERY OTHER. STOP ALL OTHERS 1" BEYOND INTERIOR FACE OF HALO RING.

HALO SUPPORT

2 / - N.T.S.

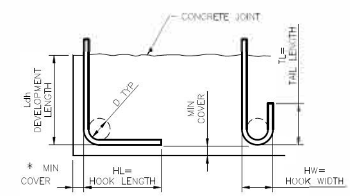


NOTE:

1. PREFABRICATE HALO ON COLUMN SLEEVE. ADJUST HALO POSITION AND ELEVATION AS NEEDED BEFORE WELDING ONTO COLUMN.

HALO SECTION

A / - N.T.S.



90° STD HOOK **180° STD HOOK**

HOOK DEVELOPMENT LENGTHS f'c =4.0 ksi fy = 60 ksi					
BAR SIZE	HL	HW	TL	D	Ldh
#3	6"	3"	4"	2 1/4"	6"
#4	8"	4"	4 1/2"	3"	7"
#5	10"	5"	5"	3 3/4"	9"
#6	1'-0"	6"	6"	4 1/2"	10"
#7	1'-2"	7"	7"	5 1/4"	12"
#8	1'-4"	8"	8"	6"	14"
#9	1'-7"	11 3/4"	10 1/2"	9 1/2"	15"
#10	1'-10"	1'-1 1/4"	11 1/2"	10 3/4"	17"
#11	2'-0"	1'-2 3/4"	1'-1"	12"	19"

NOTES:

1. PROVIDE MINIMUM HOOK DEVELOPMENT LENGTHS PER TABLE UNO.
2. ALL HOOKS SHOWN ON THE DRAWINGS SHALL BE STANDARD HOOKS UNO.

REINFORCING HOOK SCHEDULE

3 / - N.T.S.

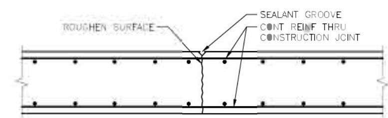
LAP SPLICE AND EMBEDMENT LENGTHS f'c =4.0 ksi fy = 60 ksi		
BAR SIZE	BARS SPACED GREATER THAN 4"	BARS SPACED LESS THAN OR EQUAL TO 4"
#3	14"	20"
#4	19"	32"
#5	29"	46"
#6	39"	62"
#7	55"	87"
#8	69"	107"
#9	78"	116"
#10	97"	140"
#11	120"	146"

NOTES:

1. PROVIDE MINIMUM LAP SPLICE LENGTHS AND EMBEDMENTS PER TABLE UNO. EMBEDMENT LENGTH EQUALS THE LAP SPLICE LENGTH UNO.
2. LENGTHS SHOWN IN THE TABLE ARE FOR BOTTOM BARS. MULTIPLY LENGTHS BY 1.3 FOR HORIZONTAL TOP BARS WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW.
3. BAR SPACING AT LAP SPLICE IS THE MINIMUM CLEAR DISTANCE BETWEEN LAPPED BARS PLUS ONE BAR DIAMETER.
4. ALL SPLICES TO BE CONTACT SPLICES AND WIRED TOGETHER UNLESS OTHERWISE APPROVED BY ENGINEER.

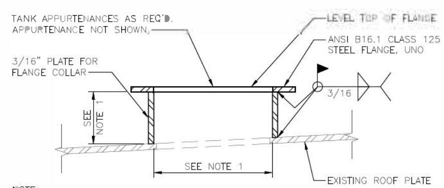
CONCRETE REINFORCING LAP AND EMBEDMENT SCHEDULE

4 / - N.T.S.



CONSTRUCTION JOINT

7 / - N.T.S.

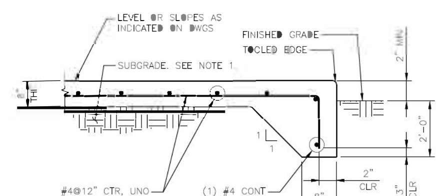


NOTE:

1. SEE CIVIL DRAWINGS FOR REQUIRED WIDTH AND HEIGHT OF FLANGES. HEIGHT OF FLANGE SHALL BE MEASURED FROM THE HIGH SIDE OF A SLOPED ROOF.

ROOF FLANGE CONNECTION

5 / - N.T.S.



NOTE:

1. SEE GENERAL NOTE G9 ON SHEET S001 FOR SUBGRADE PREPARATION AND COMPACTION REQUIREMENTS.

SLAB ON GRADE

6 / - N.T.S.

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR

HDR Engineering, Inc.
98 0Double R Blvd., Suite 101
Reno, Nevada 8 9521
775-337-4700

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REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED R. WRIGHT
DRAWN R. WRIGHT
DATE AUGUST 21, 2023
CHECKED J. NERVIG
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

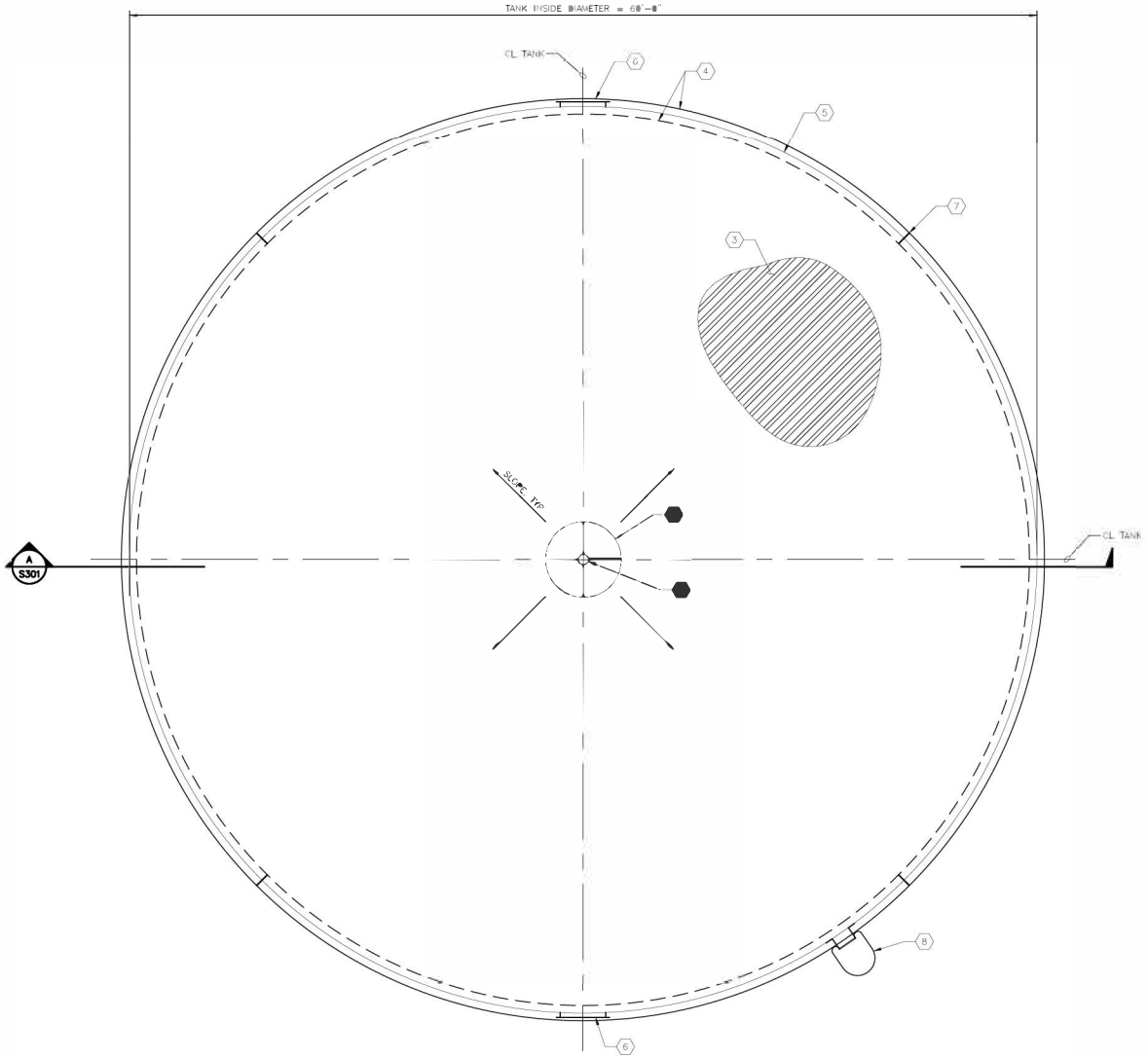
LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA

STANDARD STRUCTURAL DETAILS

PROFESSIONAL ENGINEER - STATE OF NEVADA
RYAN WRIGHT
Exp: 06/30/24
CIVIL
No. 030892
08/21/23

SHEET NUMBER
S002
24 OF 36

WSUP23-0030
EXHIBIT D



NORTH

GENERAL NOTES

1. STRUCTURAL DESIGN CRITERIA SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SHOWN ON SHEET S001.
2. SEE CIVIL DRAWINGS FOR ADDITIONAL INFORMATION.
3. COAT ALL STRUCTURAL AND MISCELLANEOUS STEEL PER SPECIFICATIONS.
4. COAT CONCRETE RINGWALL PER SPECIFICATION SECTION 09 96 00.

KEY NOTES

1. STANDARD 8"ø PIPE CENTER COLUMN.
2. 1" THICK x 48" DIAMETER BASE PLATE.
3. 1/4" THICK FLOOR PLATE, TYPICAL.
4. CONCRETE RINGWALL.
5. TANK SHELL.
6. 36"ø MANWAY.
7. CONSTRUCTION JOINT IN RINGWALL, TYPICAL. PROVIDE 4 MINIMUM AT EQUAL SPACING.
8. ROOF ACCESS LADDER WITH CAGE. SEE CIVIL DRAWINGS.

SCALE: 1/4"=1'-0"

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AUGUST 21, 2023

HDR

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED R. WRIGHT
DRAWN R. WRIGHT
DATE AUGUST 21, 2023
CHECKED J. NERWIG
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. P.O. BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8000

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
STRUCTURAL FOUNDATION PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
RYAN WRIGHT
Exp: 06/30/24
CIVIL
No. 030882
08/21/23

SHEET NUMBER
S101
25 OF 36

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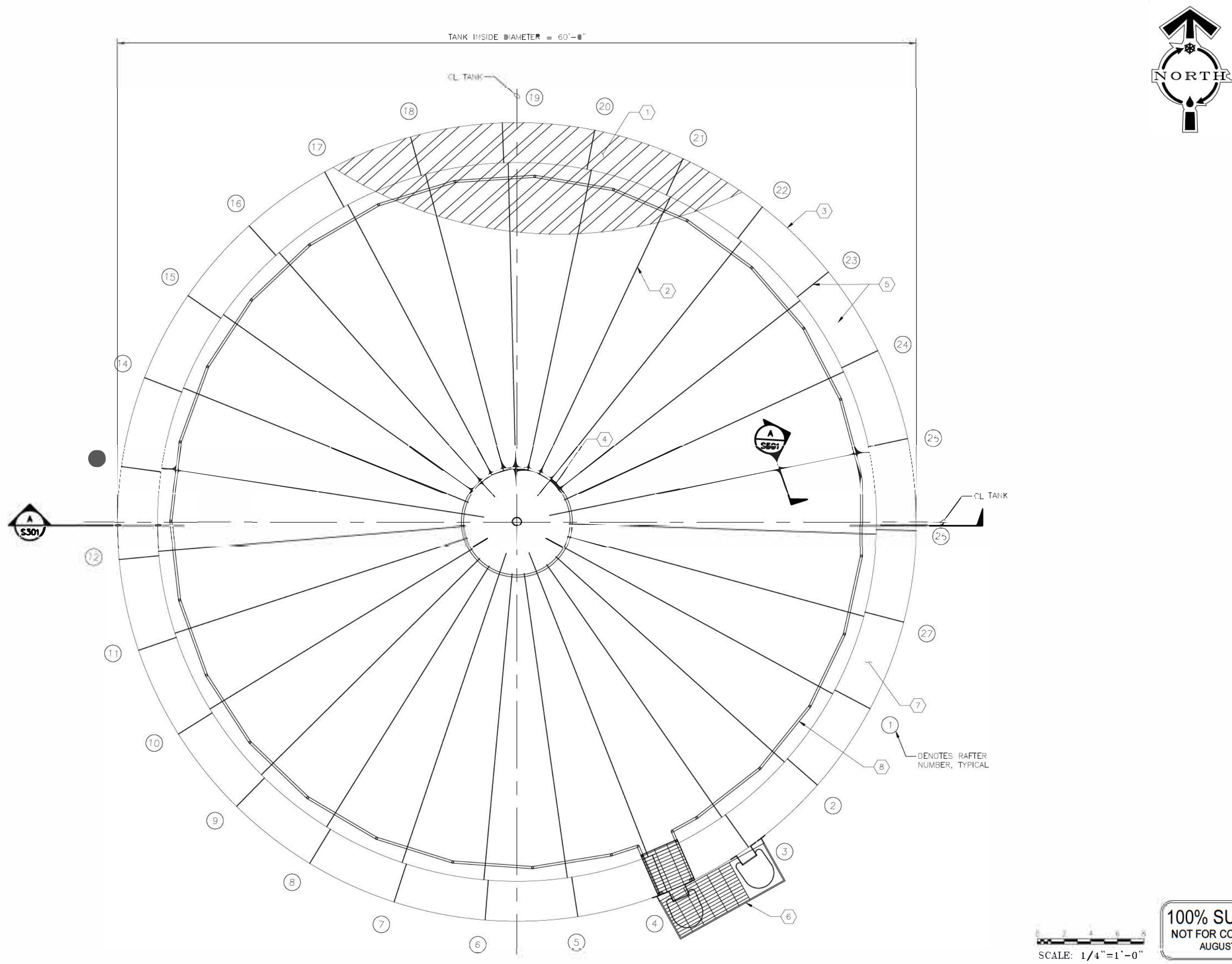
EXHIBIT D



GENERAL NOTES

1. STRUCTURAL DESIGN CRITERIA SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SHOWN ON SHEET S001.
2. SEE CIVIL DRAWINGS FOR HATCHES, RAILINGS, LADDER, AND OTHER APPURTENANCES.
3. SEAL WELD AROUND AT ALL CONNECTIONS TO PREVENT CREVICE CORROSION.
4. COAT ALL STRUCTURAL AND MISCELLANEOUS STEEL PER SPECIFICATIONS.

KEY NOTES

1. 1/4" THICK ROOF PLATE, TYPICAL.
2. BENT PLATE RAFTER INTEGRAL WITH ROOF PLATE, TYPICAL. (27) TOTAL.
3. TANK SHELL.
4. STANDARD 8"ø PIPE CENTER COLUMN AND HALO SUPPORT. SEE DETAIL 2 ON SHEET S002.
5. 3'-0" DIAMETER KNUCKLE WITH DIAGONAL SUPPORT. SEE DETAIL 1 ON SHEET S301.
6. EXTERIOR LADDER WITH INTERMEDIATE LANDING PLATFORM AND CAGE.
7. OVERFLOW WEIR. SEE CIVIL DRAWINGS AND DETAIL 6 ON SHEET S501.
8. GUARDRAIL. SEE DETAIL 1 ON SHEET S002.

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AUGUST 21, 2023

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775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
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WORK ORDER NO. 14-0035
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DRAWN R. WRIGHT
DATE AUGUST 21, 2023
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SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

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PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY, RETURN UPON COMPLETION OF PROJECT
(Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
STRUCTURAL ROOF PLAN

PROFESSIONAL ENGINEER - STATE OF NEVADA
RYAN WRIGHT
Exp: 06/30/24
CIVIL
No. 030882
08/21/23

SHEET NUMBER
S102
26 OF 35

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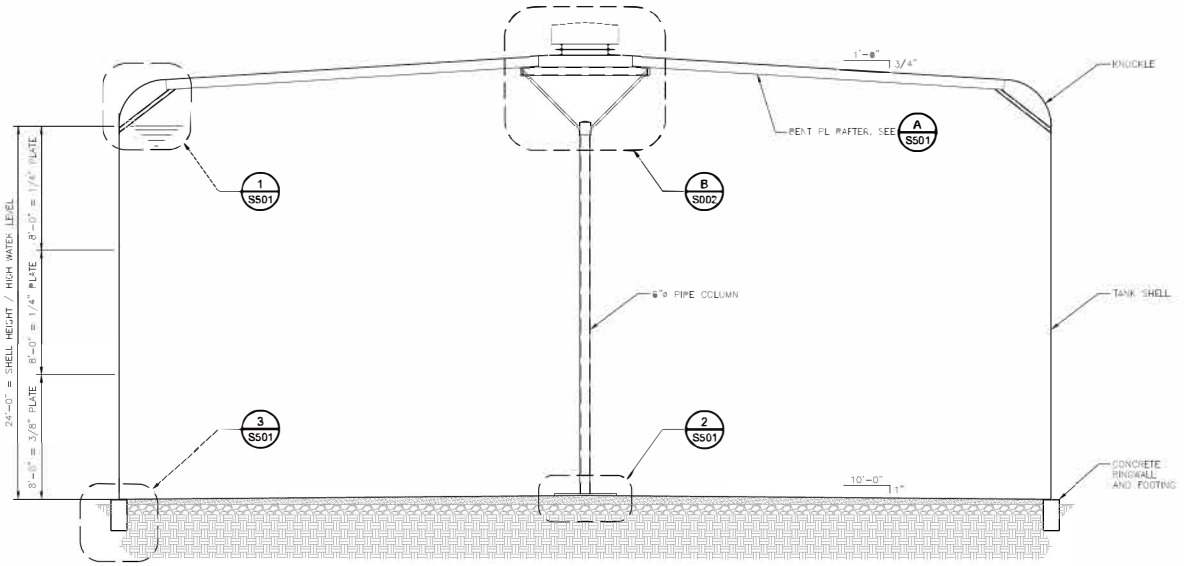
WSUP23-0030
EXHIBIT D



FULL TANK SECTION

SCALE: 1/4"=1'-0" A S101

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AUGUST 21, 2023

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9805 Double R Blvd., Suite 101
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A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED R. WRIGHT
DRAWN R. WRIGHT
DATE AUGUST 21, 2023
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SUBMITTED
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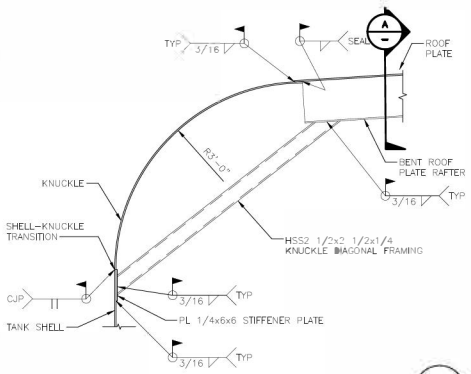
TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. P.O. BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
STRUCTURAL
FULL TANK SECTION

PROFESSIONAL ENGINEER - STATE OF NEVADA
RYAN WRIGHT
Exp: 06/30/24
CIVIL
No. 030882
08/21/23

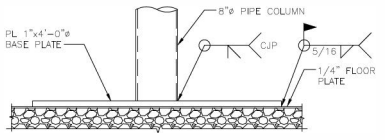
SHEET NUMBER
S301
27 OF 36

WSUP23-0030
EXHIBIT D



KNUCKLE

SCALE: 1"=1'-0" — 1 / S301

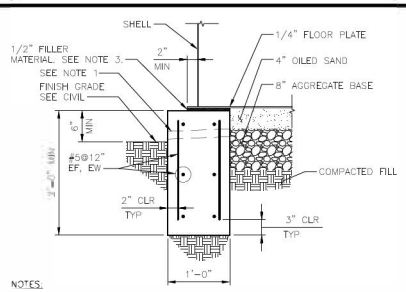


NOTE:

1. SEE SPECIFICATIONS FOR SUBGRADE PREPARATION AND COMPACTION REQUIREMENTS.

COLUMN BASE PLATE

SCALE: 1"=1'-0" — 2 / S301

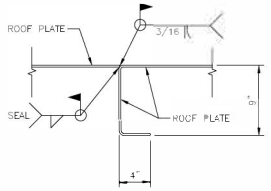


NOTES:

1. PROVIDE 1 1/2"ø DRAIN PIPE AT 5'-0" CENTERS, SLOPE 1/2" PER FOOT. PROVIDE A LAYER OF GEOTEXTILE FILTER FABRIC OVER THE INLET END OF THE DRAIN PIPE.
2. SEE SPECIFICATIONS FOR SUBGRADE PREPARATION AND COMPACTION REQUIREMENTS.
3. FILLER MATERIAL SHALL MEET THE REQUIREMENTS OF ASTM D1751.

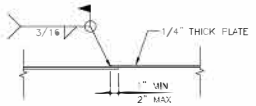
CONCRETE RINGWALL AND FOOTING

SCALE: 1"=1'-0" — 3 / S301



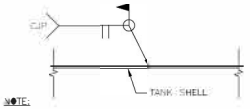
SECTION

SCALE: 1 1/2"=1'-0" — A / S102



FLOOR PLATE LAP JOINT

SCALE: 1 1/2"=1'-0" — 4 / -

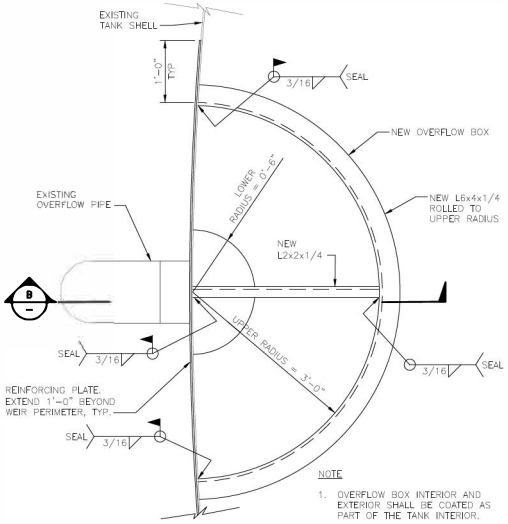


NOTE:

1. DETAIL APPLIES TO BOTH VERTICAL AND HORIZONTAL JOINTS IN TANK SHELL.

SHELL PLATE BUTT JOINT

SCALE: 1 1/2"=1'-0" — 5 / -

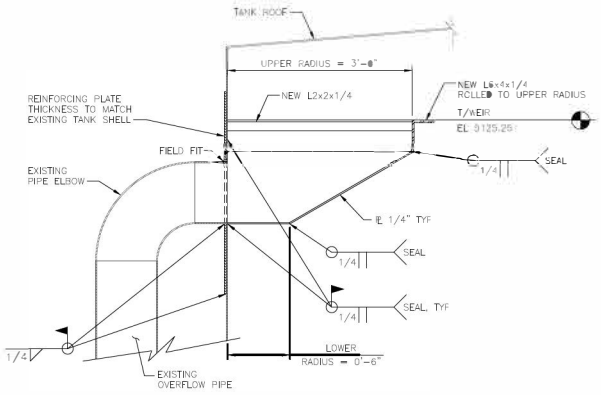


NOTE

1. OVERFLOW BOX INTERIOR AND EXTERIOR SHALL BE COATED AS PART OF THE TANK INTERIOR.

OVERFLOW BOX TOP PLAN

N.T.S. — 6 / -



OVERFLOW SECTION

N.T.S. — B / -

100% SUBMITTAL
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AUGUST 21, 2023

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9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO.	14-0035
DESIGNED	R. WRIGHT
DRAWN	R. WRIGHT
DATE	AUGUST 21, 2023
CHECKED	J. NERVIG
SUBMITTED	
RECOMMENDED	
APPROVED	

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. P.O. BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
STRUCTURAL SECTIONS AND DETAILS

PROFESSIONAL ENGINEER — STATE OF NEVADA — RYAN WRIGHT — Exp: 06/30/24 — CIVIL — No. 030882 — 08/21/23

SHEET NUMBER
S501
28 OF 36

WSUP23-0030
EXHIBIT D

20A OR 100AF 3P 80AT 3P — LOW – VOLTAGE CIRCUIT BREAKER (CB). RATINGS AND NO. OF POLES AS SHOWN. WHEN SPECIFIC TYPE IS REQUIRED, X INDICATES TYPE

TYPES:
MCCB – MOLDED CASE
ICCB – INSULATED CASE
LVP – LOW – VOLTAGE POWER
MCP – MOTOR CIRCUIT PROTECTOR (RATING PER CONNECTED LOAD)

CB — SEPARATELY MOUNTED CIRCUIT BREAKER; SEE ELECTRICAL ONE – LINE DIAGRAM OR SCHEDULE FOR DESCRIPTION

GFP — GROUND FAULT PROTECTION

52 — MEDIUM – VOLTAGE CIRCUIT BREAKER

FUSE, SIZE, AND NUMBER OF FUSES AS NOTED

FUSED CUTOUT, CURRENT RATING, FUSE SIZE, AND NUMBER OF POLES AS NOTED

FUSIBLE SWITCH, CURRENT RATING, FUSE SIZE, AND QUANTITY AS NOTED

NON-FUSED SWITCH, CURRENT RATING, AND NUMBER OF POLES AS NOTED

DISCONNECT OR DRAWOUT CONNECTION

MAGNETIC MOTOR STARTER AND SEPARATELY MOUNTED COMBINATION MAGNETIC MOTOR STARTER

MOTOR CONTROLLER AND SEPARATELY MOUNTED MOTOR CONTROLLER WITH SHORT CIRCUIT PROTECTION AND DISCONNECT

MOTOR STARTER AND CONTROLLER SUBSCRIPTS:
A – MAGNETIC STARTER NEMA SIZE
B – STARTER TYPE
NONE – FULL VOLTAGE NON-REVERSING (FVNR)
FVR – FULL VOLTAGE REVERSING
2S – TWO SPEED
RVAT – REDUCED VOLTAGE AUTO TRANSFORMER
C – CONTROL DIAGRAM OR CONTROLS SCHEDULE NUMBER (IF REQUIRED)
D – CONTROLLER TYPE
VFD – VARIABLE FREQUENCY DRIVE
SS – SOLID STATE

MOTOR CONTROLLER

THERMAL OVERLOAD ELEMENT

THERMAL OVERLOAD RELAY CONTACT

DISCONNECT OR SAFETY SWITCH, 30A, 3P, NON-FUSED UNLESS OTHERWISE NOTED

7 1/2 OR HP — MOTOR WITH DESIGN HORSEPOWER (WHEN INDICATED)

G — GENERATOR

ATS — TRANSFER SWITCH, CURRENT RATING, AND NUMBER OF POLES AS NOTED
ATS – AUTOMATIC
MTS – MANUAL

TRANSFORMER
3-PHASE, 3-WIRE DELTA CONNECTION
3-PHASE, 4-WIRE GROUNDED WYE CONNECTION

LP100 208/120V 3Ø, 4W — SWITCHBOARD OR PANELBOARD; NAME, VOLTAGE, PHASE, NUMBER OF WIRES WHEN INDICATED

100 KVA — NON-MOTOR LOAD WITH DESIGN KVA, KW, OR AMP

CPT — CONTROL POWER TRANSFORMER (CPT)

VOLTAGE TRANSFORMER (VT OR PT)

CURRENT TRANSFORMER (CT)

DMP — DIGITAL METERING PACKAGE

RTM — RUN TIME METER

GROUND

LIGHTNING ARRESTER

SPD — LOW VOLTAGE SURGE PROTECTIVE DEVICE

ELECTRICAL CONNECTION

OR OR — NO ELECTRICAL CONNECTION

SV OR — SOLENOID VALVE

X Y — CONTROL/RELAY COIL; X INDICATES TYPE, Y INDICATES LOOP NO. WHEN USED
TYPES:
CR – CONTROL RELAY
DP – DEFINITE PURPOSE RELAY
LC – LIGHTING CONTACTOR
M – MOTOR STARTER
PC – PHOTO CELL
TC – TIME CLOCK
TD – TIME DELAY RELAY
TR – TIMING RELAY

NORMALLY OPEN TIME DELAY RELAY CONTACT WITH TIME DELAY ON CLOSING AFTER COIL IS ENERGIZED

NORMALLY CLOSED TIME DELAY RELAY CONTACT WITH TIME DELAY ON OPENING AFTER COIL IS ENERGIZED

NORMALLY OPEN TIME DELAY RELAY CONTACT WITH TIME DELAY ON OPENING AFTER COIL IS DE-ENERGIZED

NORMALLY CLOSED TIME DELAY RELAY CONTACT WITH TIME DELAY ON CLOSING AFTER COIL IS DE-ENERGIZED

NORMALLY OPEN TEMPERATURE SWITCH; CLOSE ON RISING TEMPERATURE

NORMALLY CLOSED TEMPERATURE SWITCH; OPEN ON RISING TEMPERATURE

NORMALLY OPEN FLOW SWITCH; CLOSE ON INCREASING FLOW

NORMALLY CLOSED FLOW SWITCH; OPEN ON INCREASING FLOW

NORMALLY OPEN LEVEL SWITCH, CLOSE ON RISING LEVEL

NORMALLY CLOSED LEVEL SWITCH, OPEN ON RISING LEVEL

NORMALLY OPEN PRESSURE SWITCH, CLOSE ON INCREASING PRESSURE

NORMALLY CLOSED PRESSURE SWITCH, OPEN ON INCREASING PRESSURE

NORMALLY OPEN LIMIT SWITCH, CLOSE ON REACHING LIMIT

NORMALLY CLOSED LIMIT SWITCH, OPEN ON REACHING LIMIT

NORMALLY OPEN CONTACT (N.O.)

NORMALLY CLOSED CONTACT (N.C.)

FIELD WIRING EXTERNAL TO CONTROL PANEL

INTERLOCK; X INDICATES TYPE
TYPES:
E – ELECTRICAL
M – MECHANICAL
K – KEY

OFF HAND AUTO XOO OOX — 3 POSITION SELECTOR SWITCH, MAINTAINED CONTACTS: UNLESS OTHERWISE NOTED, 2-POSITION SIMILAR

NORMALLY OPEN PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED

NORMALLY CLOSED PUSHBUTTON, MOMENTARY CONTACT UNLESS OTHERWISE NOTED

INDICATING LIGHT, X INDICATES LENS COLOR

PUSH TO TEST INDICATING LIGHT, X INDICATES LENS COLOR

LENS COLORS:
R – RED
G – GREEN
B – BLUE
Y – YELLOW
W – WHITE
A – AMBER

Z — ELECTRICAL MONITORING DEVICE
TYPES:
WHM – UTILITY WATT-HOUR METER PER UTILITY REQUIREMENTS
AS – CURRENT SENSOR
AM – AMP METER
WM – WATT METER
VS – VOLT SENSOR
VM – VOLT METER

CONTROL PANEL INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT

CONTROL PANEL WITH DISCONNECT SWITCH INTEGRAL OR PROVIDED WITH ASSOCIATED EQUIPMENT

J — JUNCTION OR PULL BOX

PANELBOARD (250V TO 600V)

PANELBOARD (LESS THAN 250V)

ELECTRICAL EQUIPMENT ENCLOSURE: SWITCHBOARD, MOTOR CONTROL CENTER, CONTROL PANEL, OR OTHER EQUIPMENT AS INDICATED

CEILING/PENDANT-MOUNTED LED LUMINAIRE

WALL-MOUNTED LED LUMINAIRE

CEILING/PENDANT-MOUNTED LED FIXTURE

WALL-MOUNTED LED FIXTURE

CEILING/PENDANT-MOUNTED LED FIXTURE NORMAL/EMERGENCY

WALL-MOUNTED LED FIXTURE NORMAL/EMERGENCY

DOUBLE-FACED CEILING OR WALL-MOUNTED EXIT LIGHT; DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS

SINGLE-FACED CEILING OR WALL-MOUNTED EXIT LIGHT; DIRECTIONAL ARROWS (IF REQUIRED) AS INDICATED ON PLANS

AREA OR ROADWAY LIGHT – POLE-MOUNTED

LIGHTING FIXTURE SUBSCRIPTS:
X – INDICATES FIXTURE TYPE PER LIGHTING FIXTURE SCHEDULE
Y – INDICATES CIRCUIT NUMBER FROM PANELBOARD
z – INDICATES CONTROLLING SWITCH (IF REQUIRED)

EMERGENCY LIGHT FIXTURE, 2 ATTACHED HEADS AS SHOWN

EMERGENCY LIGHT, REMOTE MOUNTED HEAD

PC — PHOTOCELL

TOGGLE SWITCH
SUBSCRIPTS:
X – INDICATES TYPE
NONE – SINGLE POLE
3 – THREE-WAY
4 – FOUR-WAY
HP – TOGGLE SWITCH, HORSEPOWER RATED
K – KEY SWITCH
TE – MANUAL MOTOR STARTER W/ THERMAL ELEMENT
P – PILOT LIGHT
L – LIGHTED HANDLE
Y – INDICATES CONTROLLING SWITCH (IF REQUIRED)

T — TRANSFORMER
CS — CONTROL STATION
HS — HAND SWITCH
SS — SELECTOR SWITCH
PB — PUSHBUTTON
IC — INSTRUMENTATION/CONTROL DEVICE
HA — HATCH ALARM
MS — MOTION SENSOR
VC — VALVE CONTROL
PT — PRESSURE TRANSMITTER
LS — LEVEL SWITCH

SPECIAL-PURPOSE RECEPTACLE AS DEFINED ON PLANS

PLUG-IN RECEPTACLE STRIP, QUANTITY AND SPACING OF RECEPTACLES AS NOTED OR SPECIFIED

TELECOMMUNICATIONS OUTLET JUNCTION BOX, NUMBER OF PORTS SHOWN, RUN EQUAL NUMBER OF CAT 6 CABLES TO COMMUNICATIONS BACKBOARD

FLOOR MOUNTED TELECOMMUNICATIONS OUTLET JUNCTION BOX

QUAD-DUPLEX RECEPTACLE, TWO NEMA 5-20R UNDER COMMON COVER PLATE

DUPLEX RECEPTACLE, NEMA 5-20R

FLOOR MOUNTED DUPLEX RECEPTACLE, NEMA 5-20R

SIMPLEX RECEPTACLE, NEMA 5-20R
SUBSCRIPTS:
X – INDICATES TYPE
GFCI – GROUND FAULT CIRCUIT INTERRUPTER
WP – WATERPROOF
Y – INDICATES CIRCUIT NUMBER FROM PANELBOARD

PEDESTAL

CONDUIT TURNING UP

CONDUIT TURNING DOWN

HOME RUN TO PANEL, 2 #12, 1 #12G IN 3/4"C UNLESS OTHERWISE NOTED

CIRCUIT RUN BETWEEN DEVICES EXPOSED IN NON-ARCHITECTURALLY FINISHED AREAS; CONCEALED IN ARCHITECTURALLY FINISHED AREAS. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT.

CONDUIT RUN UNDERGROUND, BETWEEN DEVICES CONCEALED IN NON-ARCHITECTURALLY FINISHED AREAS OR UNDER FLOOR SLAB. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE CIRCUIT.

CIRCUIT CONTINUATION

CONDUIT STUBBED OUT AND CAPPED

CONDUIT TAG OR CIRCUIT NUMBER – WIRE AND CONDUIT SIZE AS SPECIFIED IN CIRCUIT SCHEDULE ON THE SHEETS

G — GROUND CABLE

GROUND ROD

GROUND TEST WELL

MECHANICAL GROUND CONNECTION

EXOTHERMIC GROUND CONNECTION

GENERAL NOTES:

1. THIS IS A STANDARD ELECTRICAL SYMBOLS SHEET. ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT.
2. IN GENERAL CONDUIT ROUTING IS NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS INCLUDING THOSE SHOWN ON ONE-LINES AND HOME RUNS. SEE SPECIFICATIONS FOR CONDUIT INSTALLATION REQUIREMENTS. CONDUIT ROUTINGS AND STUB-UP LOCATIONS THAT ARE SHOWN ARE APPROXIMATE, EXACT ROUTINGS SHALL BE AS REQUIRED FOR EQUIPMENT FURNISHED, FREE OF ANY INTERFERENCES.
3. WHEN BRANCH CIRCUITS ARE NOT SHOWN ON THE PLANS THE CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUITS AND CONDUCTORS REQUIRED. CONDUIT AND CONDUCTOR SIZES SHALL BE THE SAME AS THE HOMERUN FOR THE BRANCH CIRCUIT.
4. SCREENING OR SHADING OF WORK IS USED TO INDICATE EXISTING COMPONENTS OR TO DE-EMPHASIZE PROPOSED IMPROVEMENTS TO HIGHLIGHT SELECTED TRADE WORK. REFER TO CONTEXT OF EACH DRAWING FOR USAGE.
5. SEE PROJECT EQUIPMENT AND PIPING SYSTEMS DRAWING FOR SYMBOLS AND ABBREVIATIONS SPECIFIC TO THE PROJECT.

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED A. RAGNEV
DRAWN R.J. GONZALVO
DATE AUGUST 21, 2023
CHECKED W. ETTLICH
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

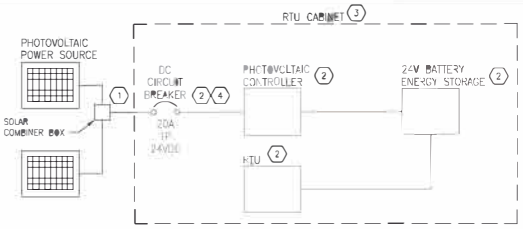
NOT REPRODUCIBLE
PROPERTY OF TRUCKEE MEADOWS WATER AUTHORITY, RETURN UPON COMPLETION OF PROJECT
(Per Homeland Security Act)

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
ELECTRICAL SYMBOLS AND LEGEND

PROFESSIONAL ENGINEER STATE OF NEVADA — ROBB J. McCOMB — EXP. 12/31/25 — ELECTRICAL — No. 18698

SHEET NUMBER
E001
28 OF 36

WSUP23-0030
EXHIBIT D



GENERAL NOTES:

1. PHOTOVOLTAIC SOURCE CIRCUIT CURRENTS, THE SUM OF PARALLEL- CONNECTED PV MODULE RATED SHORT-CIRCUIT CURRENTS MULTIPLIED BY 125 PERCENT PER NEC 690.8(A)(1)(1).
2. DC CIRCUIT BREAKER IS RATED NOT LESS THAN 125 PERCENT OF THE MAXIMUM CURRENT CALCULATED IN 690.8(A)(1)(1) PER NEC 690.9(B)(1).

ONE LINE DIAGRAM

KEYNOTES:

(1) CONNECT TWO AMERESCO 200J-V SOLAR PANELS IN PARALLEL AT SOLAR COMBINER BOX.

(2) PROVIDED AND INSTALLED BY TMWA.

(3) PROVIDED BY TMWA. INSTALLED BY CONTRACTOR.

(4) PHOTOVOLTAIC SYSTEM DISCONNECTING MEANS SHALL BE LISTED AS SUITABLE FOR USE AS SERVICE EQUIPMENT AND LABELED PER NEC 690.13(B).

EQUIPMENT SCHEDULE (ES)

ES ITEM #	EQUIPMENT DESCRIPTION
1	RTU CABINET, FURNISHED BY TMWA AND INSTALLED BY CONTRACTOR. 36"W X 24"D X 72"H FREE-STANDING, CONTINUOUS HINGED, FRONT ACCESS ONLY, NEMA 4 STEEL CABINET WITH 20A 1P MAIN BREAKER, STATUS LIMIT SWITCH, AND "HELP" PUSH BUTTON CONTROLS. SAGINAW CONTROL & ENGINEERING SCE-72EL3624FS ENCLOSURE AND SCE-0S36N4 SHIELD, OR APPROVED EQUAL. SEE E501.
2	HATCH ALARM, INDUSTRIAL SURFACE MOUNT SWITCH, SPDT, N.O., N.C. MAGNETIC-CONTACT GRI 4402A OR APPROVED EQUAL.
3	FLOAT SWITCH, NORMALLY CLOSED TETHER FLOAT SWITCH. SJE RHOMBUS #20GMWENC. NO EQUAL.
4	JUNCTION BOX, 6"H X 6"W X 4"D, NEMA 4X, 316 STAINLESS STEEL, HINGED DOOR. HOFFMAN A664CHQRFG OR APPROVED EQUAL.
5	PRESSURE TRANSMITTER. HONEYWELL #STG84L-E1G000-1-0-AHH-11S-A-10A0-00-0000. NO EQUAL.
6	JUNCTION BOX, 12"H X 12"W X 6"D, NEMA 4X, 316 STAINLESS STEEL, HANDRAIL MOUNTED. HOFFMAN A1212CHFL OR APPROVED EQUAL.
7	AMERESCO #200J-V SOLAR PANEL AND #1X-SPM UNIMOUNTING BRACKETS. NO EQUAL.
8	SOLAR COMBINER BOX, 10.5"H X 4.5"W X 3.5"D, NEMA 3R, ALUMINUM, UNIMOUNTING BRACKETS. MIDNITE MNPV3 AND TWO (2) MNEPV20 OR APPROVED EQUAL.
9	VAULT FLOAT SWITCH PN#43980 (VAULT FLOOD INDICATION). NORMALLY CLOSED BRACKET MOUNTED FLOAT SWITCH. GEMS LS-270 PN #43980. NO EQUAL.
10	JUNCTION BOX, 6"H X 6"W X 4"D, NEMA 4X, 316 STAINLESS STEEL, HINGED DOOR. HOFFMAN A606CHFL OR APPROVED EQUAL.
11	JUNCTION BOX, 16"H X 14"W X 8"D, NEMA 4X, 316 STAINLESS STEEL, HINGED DOOR. HOFFMAN A16148CHFL OR APPROVED EQUAL.

EQUIPMENT SCHEDULE NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PURCHASING AND INSTALLATION OF ALL EQUIPMENT SHOWN ON EQUIPMENT SCHEDULE UNLESS OTHERWISE NOTED.
2. THE EQUIPMENT SCHEDULE IS INTENDED TO BE AS COMPLETE AS POSSIBLE LESS STANDARD MATERIALS AND DETAILED INSTALLATION INSTRUCTIONS FOR EQUIPMENT. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT REP. PRIOR TO BID.
3. THE CONTRACTOR SHALL PROVIDE A COMPLETE INSTALLATION OF ALL EQUIPMENT AND DEVICES INDICATED ON THE EQUIPMENT SCHEDULE INCLUDING SUPPORTS AND OTHER INSTALLATION MATERIALS NEEDED.
4. THE CONTRACTOR SHALL PROVIDE, PULL, AND IDENTIFY ALL WIRES AND CABLES. TMWA WILL TERMINATE AND LAND WIRES AT RTU AND AT FIELD DEVICES. CONTRACTOR SHALL PROVIDE SUFFICIENT LENGTHS FOR ALL TERMINATIONS.
5. ALL CONDUITS ENTERING BOXES, PANELS, RTU, ETC. SHALL BE INSTALLED WITH MYERS HUBS. CAP ALL UNUSED CONDUITS.
6. CONTRACTOR SHALL SUBMIT DESCRIPTIVE LITERATURE ON ALL EQUIPMENT AND MATERIALS TO BE USED.
7. CONTRACTOR IS RESPONSIBLE FOR THEIR OWN MATERIAL QUANTITY TAKE-OFFS.

CONDUIT AND CABLE SCHEDULE

TAG	CONDUIT SIZE	FILL	REMARKS
1	1"	#18 TSP (PRESSURE TRANSMITTER)	
	1"	2#14, #14G (VALVE VAULT) 2#14 (VAULT FLOOD SWITCH)	
2	2"	PULLROPE	TURNS SHALL NOT EXCEED BEND RADIUS OF FUTURE ANTENNA CABLE. VERIFY ANTENNA CABLE WITH TMWA.
3	3/4"	2#14, #14G (TANK) 2#14 (FLOAT SWITCH)	
4	3/4"	PULLROPE	FUTURE LADDER ALARM
5	1"	2#14, #14G (TANK) 2#14 (FLOAT SWITCH) 2#14 (FUTURE LADDER ALARM)	FOR FUTURE LADDER ALARM, PROVIDE ADDITIONAL CONDUCTOR LENGTH TO REACH LADDER ALARM LOCATION AND COIL IN JUNCTION BOX ON TANK ROOF FOR FUTURE USE.
6	1"	2#10, #10G (SOLAR PANEL)	
7	3/4"	2#14, #14G (TANK)	
8	3/4"	#18 TSP (PRESSURE TRANSMITTER)	
9	3/4"	2#14, #14G (VAULT FLOOD SWITCH)	
10	3/4"	2#10, #10G (SOLAR PANEL)	

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REVISION	DESCRIPTION	BY	APP.	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED A. RAGNEV
DRAWN R.J. GONZALVO
DATE AUGUST 21, 2023
CHECKED W. ETTLICH
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
ONE LINE DIAGRAM AND SCHEDULES

PROFESSIONAL ENGINEER - STATE OF NEVADA
ROBB J. McCOMB
EXP 12/31/25
ELECTRICAL
NO. 18898
08/21/2023

SHEET NUMBER
E002
30 OF 36

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WSUP23-0030
EXHIBIT D

TMWA STANDARD CONDUIT AND WIRING REQUIREMENTS

Note: All threaded conduit to be assembled with conductive lubricant.

TABLE 26 00 00.A – CONDUIT REQUIREMENTS

	Location	Power	Control	Analog, Communication	Data	Elbow Sweeps	Stub-ups, Exposed	Stub-ups, Concealed	Grounding System	Additional Details
EXPOSED	Outside/Wet locations	RGS	RGS	RGS	RGS	RGS	PVC-RGS	PVC-RGS	BD-RGS	
	Wet locations. Vaults, pump stations and Well-houses or where subject to physical damage	RGS	RGS	RGS	RGS	RGS	PVC-RGS	PVC-RGS	BD-RGS	
	Inside dry locations. (i.e. office areas)	EMT	EMT	EMT	EMT	EMT	PVC-RGS	PVC-RGS	EMT	
	Inside Chemical Rooms	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)		Other specified locations
DIRECT BURY	Not in Traffic	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC-RGS	PVC-RGS	PVC-RGS		
	In Traffic	ENC-PVC	ENC-PVC	ENC-PVC	ENC-PVC	ENC-PVC-RGS	PVC-RGS	PVC-RGS		
	Underneath Concrete Slabs	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC-RGS	PVC-RGS	PVC-RGS		
PROTECTED	Concrete Encased Duct Bank	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC-RGS	PVC-RGS	PVC-RGS		
	In Slab	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC-RGS	PVC-RGS	PVC-RGS	RGS	All in-slab RGS shall be tape wrapped with 10 mil tape or PVCRGS shall be used. Coordinate max conduit size with structural documents
	In CMU Walls	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC (sch. 40)	PVC-RGS	PVC-RGS	PVC-RGS	PVC-RGS	
	In Stud Walls	EMT	EMT	EMT	EMT	EMT	EMT	EMT	EMT	

Rigid Galvanized Steel (RGS) | PVC Coated Rigid Galvanized Steel (PVC-RGS) | Bonded Rigid Galvanized Steel (BD-RGS) | Electrical Metallic Tubing (EMT) | Polyvinyl Chloride, schedule 40 (PVC, sch. 40) | Concrete Encased Polyvinyl Chloride (ENC-PVC)

TABLE 26 00 00.B – WIRING REQUIREMENTS

	Phase Code/ Letter	480 VAC 3ϕ	110v-240VAC 3ϕ	120-240VAC 1ϕ
POWER	A	BR	BK	---
	B	OR	RD *(OR) if high L*	
	C	YL	BL	
	N	GY	WH	WH
	G	GR	GR	GR
	L1	---		BK
	L2			RD
	AWG	size per load requirement per NEC		
	Solar	Positive (RD)	Negative (BK)	Ground (GN)

	Description	Type	Wire Color	AWG	Other Conditions	Wire Color	Cable Type	Additional Notes:
CONTROL	AC	Control	YL	16 MTW	Shielded Pair	Red/Black	Belden 1120A Wet location	All wires shall have an insulation rating of 600V, stranded, copper. Tin coated is ok Control wiring shall be type MTW/UL1015 Power Wiring shall be type XHHW
		Neutral	WH/YL					
		Ground	GN				Belden 5300FE Dry Location	
	12 VDC	Positive	Red					
		0V or (-)	Black					
		Ground	GN		ADDITIONAL SPECIAL REQUIREMENTS			
	24 VDC	Positive	BLUE		Variable Frequency Drives (VFDs)			VFD cables shall be rated for use in this application
		0V or (-)	WH/BL		Underwater Cable Applications			Submerged cables and connections shall be appropriate
		Ground	GN					

Brown (BR) | Orange (OR) | Yellow (YL) | Grey (GY) | Green (GN) | Black (BK) | Red (RD) | Blue (BL) | White (WH) | White/Blue (WH/BL) | White/Yellow (WH/YW) | Black/White (BK/WH) | Red/Black (RD/BK)

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REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED A. RAGNEV
DRAWN R.J. GONZALVO
DATE AUGUST 21, 2023
CHECKED W. ETTLICH
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
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LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
CONDUIT AND WIRE REQUIREMENTS TABLE

PROFESSIONAL ENGINEER · STATE OF NEVADA · ROBB J McCOMB · EXP. 12/31/25 · ELECTRICAL · No. 18698 · 08/21/2023

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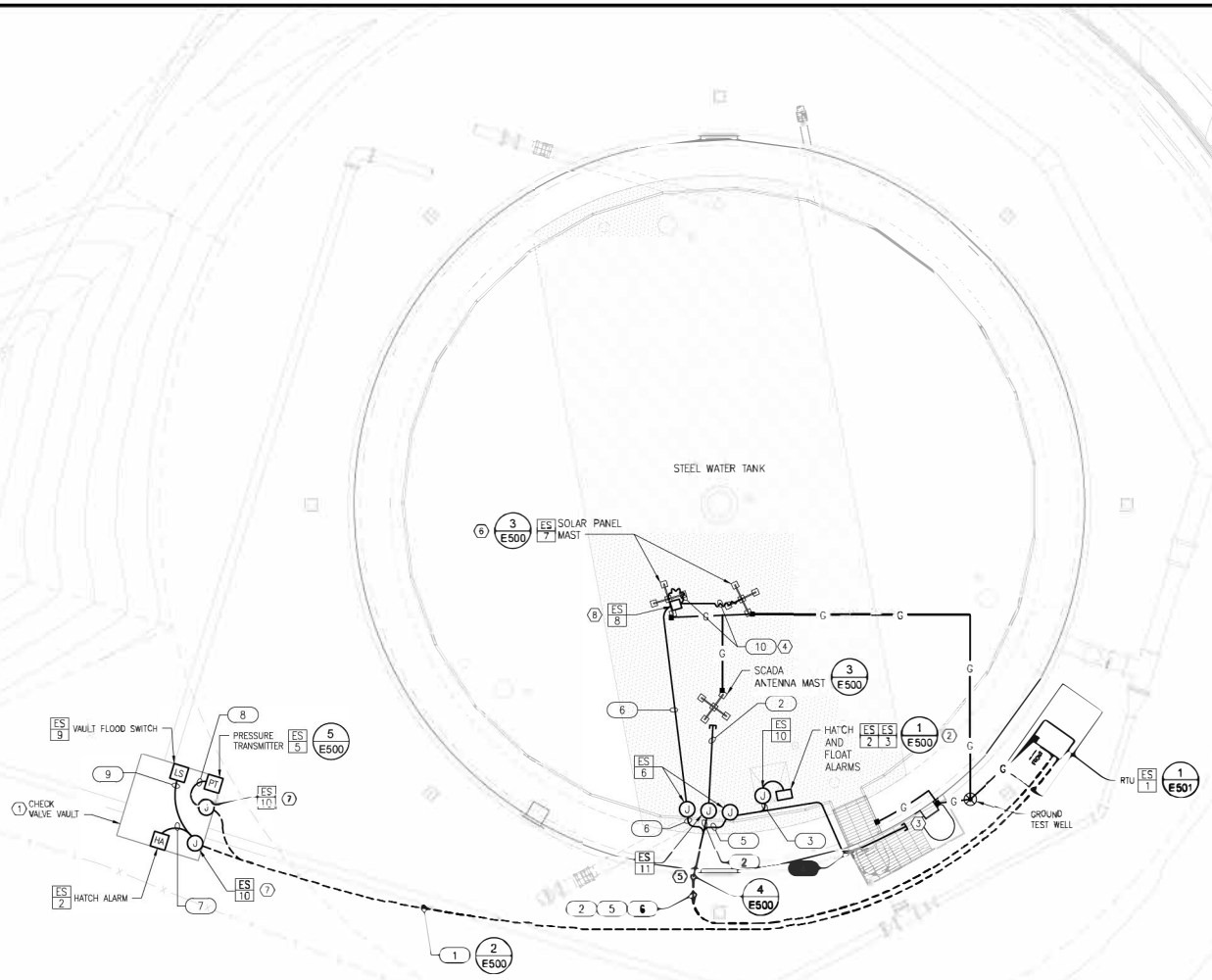

TANK ELECTRICAL PLAN

SCALE: 1" = 5'

KEYNOTES:

- MOUNT RACEWAYS AND BOXES HIGH INSIDE VAULT TO AVOID IMMERSION. ROUTE ALL CONDUITS IN THE VAULT ON THE INNERSIDE OF THE VAULT WALL. ROUTE AROUND THE SIDES TO AVOID ANY CONDUITS OBSTRUCTING ACCESS, TYP.
- (2) NEATLY COIL AND SECURE EXCESS FLOAT SWITCH CABLE AT THE TERMINATION JUNCTION BOX.
- (3) FOR FUTURE LADDER HATCH ALARM, ROUTE CONDUIT TO LADDER HATCH AND CAP IMMEDIATELY ABOVE HATCH.
- FOR CONNECTION TO SOLAR PANEL, TRANSITION FROM RIGID CONDUIT TO LIQUID TIGHT FLEXIBLE METAL CONDUIT. NOT EXCEEDING 3' LENGTH OF FLEXIBLE CONDUIT.
- (5) PROVIDE C-TYPE CONDULET ON EACH TANK RISER CONDUIT AS PULL-POINT AND MOUNT 3' ABOVE FINISHED GRADE.
- MOUNT SOLAR PANEL MASTS AT LEAST 6' APART ON CENTER AND ALIGNED FROM EAST TO WEST TO MAXIMIZE SUN EXPOSURE. SOLAR PANELS SHALL BE ORIENTED SOUTH AND ANGLED FOR MAXIMUM EXPOSURE. COORDINATE ANGLE OF SOLAR PANEL FOR OPTIMAL SUN EXPOSURE ALL YEAR LONG.
- (7) MOUNT JUNCTION BOXES ON THE SIDE OF THE VALVE VAULT WALL AS HIGH AS POSSIBLE, TYP.
- (8) MOUNT COMBINER BOX ON THE SOLAR PANEL MAST. COORDINATE IN THE FIELD FOR OPTIMAL MOUNTING LOCATION.

GENERAL NOTES:

1. AREA CLASSIFICATION: OUTDOOR/WET.
2. CONDUITS TRAVERSING TANK KNUCKLE SHALL MATCH THE RADIUS OF THE KNUCKLE.
3. MOUNT CONDUITS TO GUARDRAIL WHEN POSSIBLE. OTHERWISE, MOUNT TO TANK PER DETAIL 4 ON E500.
4. SEE CONDUIT AND EQUIPMENT SCHEDULES ON E002.
5. INSTALL ALL CONDUITS ON THE TANK EXPOSED AND ROUTED IN THE SAME LOCATIONS TO AVOID AS MANY TRIPPING HAZARDS AS POSSIBLE, TYP. MOUNT BEHIND GUARD RAILS WHERE POSSIBLE.

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DESIGNED A. RAGNEV
DRAWN R.J. GONZALVO
DATE AUGUST 21, 2023
CHECKED W. ETTLICH
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APPROVED

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LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
TANK ELECTRICAL PLAN

PROFESSIONAL ENGINEER, STATE OF NEVADA
ROBB J McCOMB
EXP. 12/31/25
ELECTRICAL
No. 18698
08/21/2023

SHEET NUMBER
E100
32 OF 36

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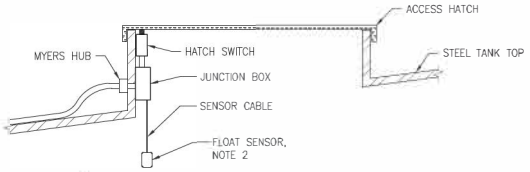
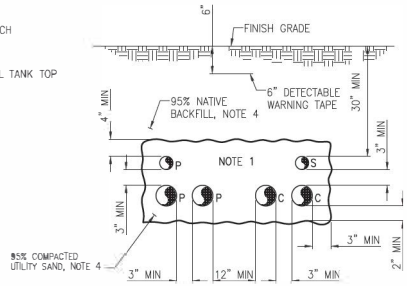


NOTES:

1. CONDUITS INSIDE TANK SHALL BE PVC-RGS.
2. HEIGHT OF FLOAT SENSOR SHALL BE COORDINATED WITH TMWA.

HATCH AND FLOAT ALARM DETAIL 1

SCALE: NTS

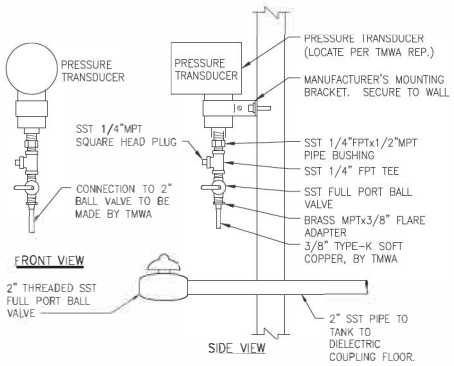


NOTES:

1. NUMBER OF CONDUITS AS REQUIRED FOR THE APPLICATION.
2. P SUBSCRIPT ELECTRICAL POWER AND C CONTROL CONDUIT.
3. S SUBSCRIPT COMMUNICATION (RADIO, DATA, INSTRUMENTATION) CONDUIT.
4. SEE SPECIFICATIONS 26 05 43 AND 31 23 33.

DIRECT BURIED CONDUIT DETAIL 2

SCALE: NTS

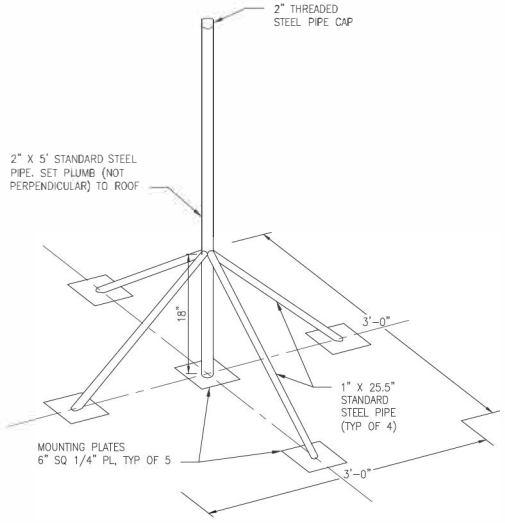


NOTES:

1. ALL FITTINGS FOR PT MOUNTING ASSEMBLY SHALL BE SST (WITH EXCEPTION OF THE FLARE ADAPTER)
2. LOCATE PER TMWA PROJECT REPRESENTATIVE.
3. FINAL RTU CONDUCTOR TERMINATIONS BY TMWA.
4. TMWA TO INSTALL STAINLESS STEEL TUBING FROM BALL VALVE TO PT.
5. INSTALL PRESSURE TRANSDUCER PER MANUFACTURER'S INSTRUCTIONS.
6. ALL OTHER WORK SHALL BE BY CONTRACTOR.

PRESSURE TRANSMITTER INSTALLATION DETAIL 5

SCALE: NTS

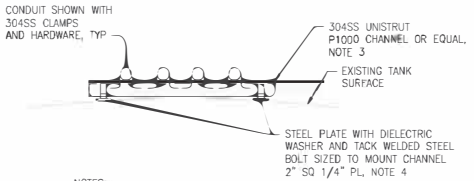


NOTES:

1. TANK-TOP MASTS SHALL BE FABRICATED STEEL ASSEMBLIES WELDED TO THE TANK ROOF. COORDINATE WELDING OF MOUNTING PLATES TO OCCUR PRIOR TO TANK SURFACE PREP AND COATING. MAST SHALL RECEIVE SAME COATING AS TANK ROOF.
2. DIMENSIONS ARE NOMINAL. ADJUST AS NECESSARY TO MATCH CURVATURE OF TANK.

SOLAR PANEL AND ANTENNA MAST DETAIL 3

SCALE: NTS



NOTES:

1. INSTALL CONDUIT SUPPORTS 10'-0" O.C. MAX.
2. ALL FITTINGS UTILIZED FOR THE CONDUIT SUPPORT SHALL BE BY THE SAME MANUFACTURER AS THE PREFORMED CHANNEL.
3. PROVIDE SPACE TO MOUNT A MINIMUM OF 3 ADDITIONAL 1" CONDUITS AT EACH LOCATION.
4. WELD TO TANK PRIOR TO TANK SURFACE PREP AND COATING. PROTECT THREADS.
5. VERTICAL CONDUIT RUN: INSTALL CONDUIT SUPPORT 2'-0" FROM THE GROUND AND ONE AT THE TOP OF TANK TO SUPPORT CONDUIT FITTINGS USED TO MAKE A 90° BEND FOR CONDUIT TO EXTEND ON TO TANK ROOF. MINIMUM OF 4 SUPPORTS SHALL BE PROVIDED ALONG VERTICAL RISE.

CONDUIT SUPPORT ON TANK 4

SCALE: NTS

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DESIGNED A. RAGNEV
DRAWN R.J. GONZALVO
DATE AUGUST 21, 2023
CHECKED W. ETTLICH
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
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1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
ELECTRICAL DETAILS 1

PROFESSIONAL ENGINEER - STATE OF NEVADA
ROBB J. McCOMB
EXP. 12/31/25
ELECTRICAL
No. 18698
08/21/2023

SHEET NUMBER
E500
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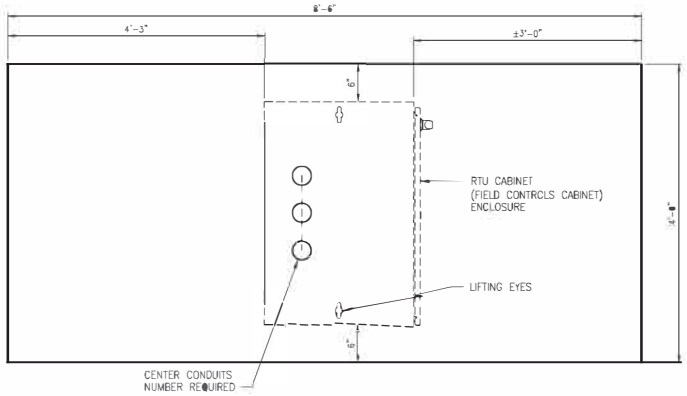
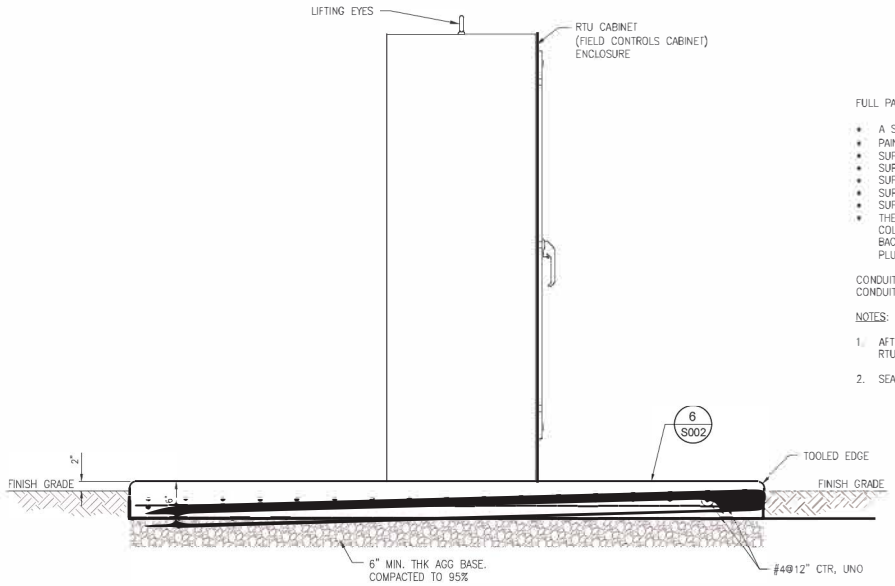


RTU CONCRETE PAD PLAN



RTU CONCRETE PAD SECTION

RTU DETAIL AND NOTES 1 / - SCALE: NTS

NOTE:

THE DRAWING INDICATES WORK REQUIRED FOR TYPICAL EQUIPMENT ONLY. IF THE EQUIPMENT OR CONNECTIONS ARE DIFFERENT FROM WHAT IS SHOWN, PROVIDE THE MODIFICATIONS NECESSARY FOR A SAFE AND PROPERLY OPERATING INSTALLATION. THE DRAWING DIAGRAMMATICALLY INDICATES THE DESIRED LOCATION AND ARRANGEMENT OF CONDUIT RUNS, EQUIPMENT AND OTHER ITEMS. FIELD DETERMINE AND COORDINATE EXACT LOCATION BASED ON PHYSICAL SIZE AND ARRANGEMENT OF EQUIPMENT, FINISHED ELEVATIONS AND OBSTRUCTIONS. WORK OR EQUIPMENT NOT INDICATED OR SPECIFIED WHICH IS NECESSARY FOR THE COMPLETE AND PROPER OPERATION OF THE SYSTEMS SHALL BE ACCOMPLISHED WITHOUT ADDITIONAL COST TO TMWA.

FULL PARTS LIST OF THE TMWA FIELD CONTROLS CABINET IS AS FOLLOWS:

- A SAGINAW SCE-72EL3624FS (72"Hx36"Wx24"D) CABINET
- PAINTED WHITE STAINLESS STEEL (AS OPPOSED TO THE FACTORY STANDARD OF GRAY POWDER COAT)
- SUPPLIED WITH AN OPTIONAL SCE-36P30 BACK PANEL
- SUPPLIED WITH AN OPTIONAL SCE-ELPL PADLOCK HANDLE
- SUPPLIED WITH AN OPTIONAL SCE-PLWKB PADLOCK WING KNOB LATCH
- SUPPLIED WITH AN OPTIONAL SCE-DS36N4 DRIP SHIELD
- SUPPLIED WITH AN SCE-OSTOPK DOOR STOP KIT
- THE NEMA TYPE 4 RATED CABINET SHALL HAVE CONTINUOUSLY WELDED SEAMS THAT HAVE BEEN GROUND SMOOTH, A FLANGE TROUGH COLLAR AROUND ALL SIDES OF THE DOOR OPENING, AN OIL-RESISTANT DOOR SEAL GASKET, COLLAR STUDS FOR MOUNTING THE BACKPANEL, CONCEALED DOOR HINGE, MOUNTING HOLES IN BACK OF ENCLOSURE, MOUNTING HARDWARE, SEALING WASHER, AND HOLE PLUG INCLUDE, A REMOVABLE PRINT POCKET, AND GROUND STUDS ON DOOR AND BODY.

CONDUIT SHALL BE PVC COATED RIGID GALVANIZED SWEEPS AND PVC COATED RIGID GALVANIZED UP INTO THE PANEL, WITH APPROPRIATE CONDUIT BRACING.

NOTES:

1. AFTER CUTTING CONDUIT PENETRATIONS, APPLY TOUCH-UP PAINT TO EXPOSED METAL TO MINIMIZE RUSTING. SEAL CONDUITS ENTERING RTU CABINET WITH CONDUIT SEALING CLAY.
2. SEAL BOTTOM PERIMETER OF RTU CABINET WITH SIKAFLEX-1A, OR APPROVED EQUAL, TO PREVENT WATER INTRUSION.

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LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
ELECTRICAL DETAILS 2

PROFESSIONAL ENGINEER - STATE OF NEVADA
ROBB J. McCOMB
EXP. 12/31/25
ELECTRICAL
No. 18698
08/21/2023

SHEET NUMBER
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34 OF 36

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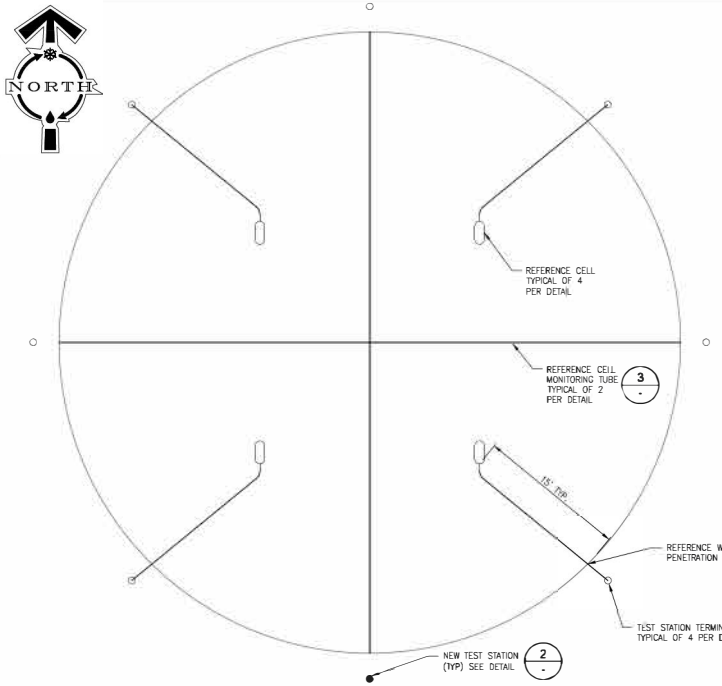

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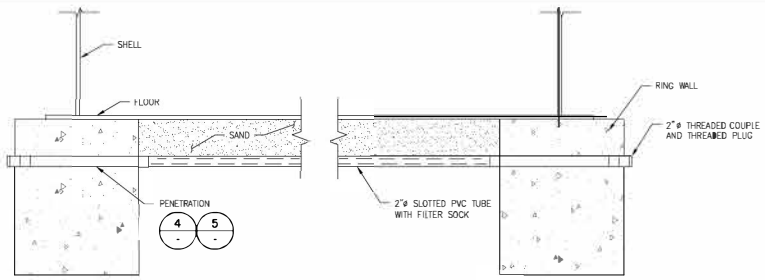

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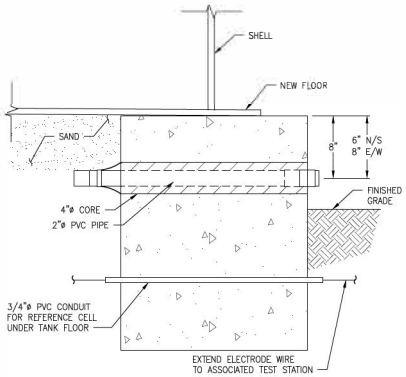

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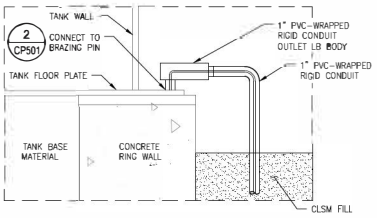
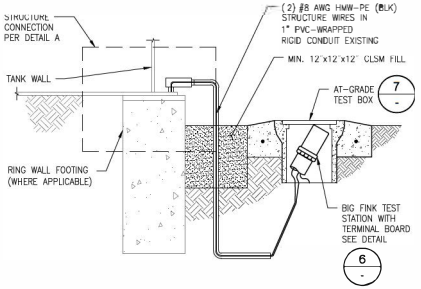
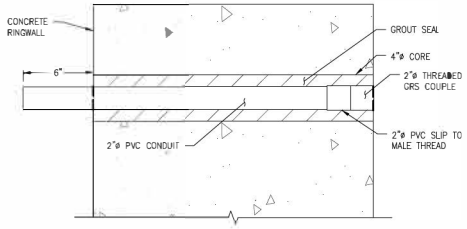


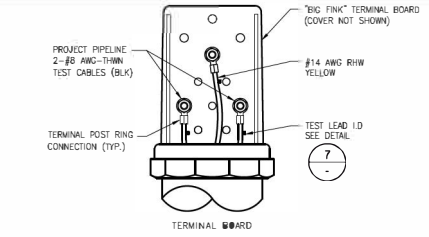
STRUCTURE CONNECTION DETAIL (CONCRETE RINGWALL FOUNDATION)
SCALE: N.T.S. A



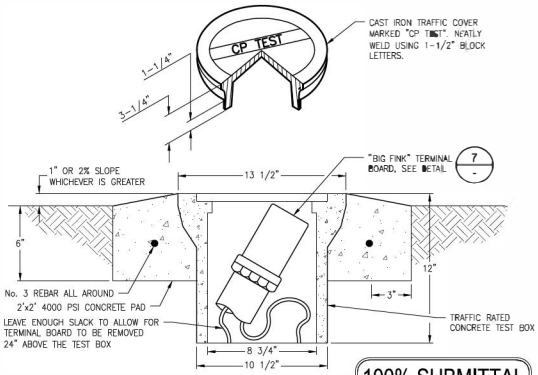
TEST STATION DETAIL (CONCRETE RINGWALL FOUNDATION)
SCALE: N.T.S. 2



REFERENCE CELL PENETRATION ASSEMBLY
SCALE: N.T.S. 5



TEST STATION TERMINAL BOARD
SCALE: N.T.S. 6



NOTES:

1. CONCRETE BODY, TRAFFIC RATED – BROOKS 3-RT, CHRISTY G5 OR EQUAL.
2. ALL WIRES SHALL HAVE 24" MIN. SLACK IN BOX.
3. BOTTOM OF TEST BOX SHALL BE NATIVE SOIL. DO NOT PLACE ROCK, GRAVEL OR SAND IN TEST BOX.
4. TEST BOX TO BE FIELD LOCATED ±50' FROM STATIONING GIVEN ON PLAN SHEETS.
5. PROVIDE 2' x 2' x 6" THICK REINFORCED CONCRETE PAD AROUND TEST BOXES AT UNPAVED SITES. CONCRETE PAD SHALL BE LEVEL AND SURFACE SHALL BE FLUSH WITH TRAFFIC BOX.

AT-GRADE TEST STATION
SCALE: N.T.S. 7

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR Engineering, Inc.
9605 Double R Blvd., Suite 101
Reno, Nevada 89521
775-333-4700

REVISION	DESCRIPTION	BY	APP.	DATE
A	100% DESIGN SUBMITTAL			08/21/23

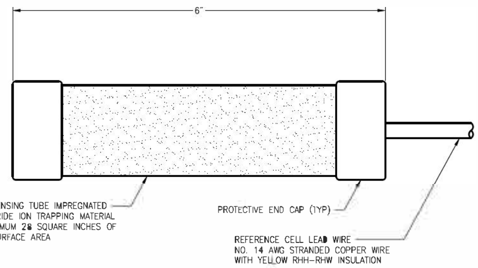
WORK ORDER NO. 14-0035
DESIGNED M. WEGNER
DRAWN K. GONZALEZ
DATE AUGUST 21, 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
CORROSION MONITORING
TEST STATION DETAILS 1

SHEET NUMBER
CP500
35 OF 36

WSUP23-0030
EXHIBIT D

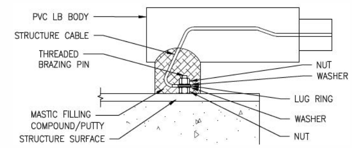


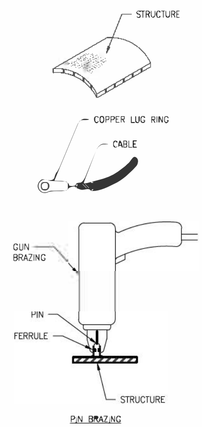
NOTES

1. THE REFERENCE ELECTRODE SHALL HAVE A MINIMUM SENSING SURFACE AREA OF 28 SQUARE INCHES. IT SHALL BE CAPABLE OF MAINTAINING A STABLE POTENTIAL WITHIN PLUS OR MINUS 10 MILLIVOLTS TO THAT OF A FRESHLY MADE COPPER SULFATE REFERENCE ELECTRODE WHILE A 3 MICROAMPERE ELECTRICAL CURRENT IS APPLIED TO IT. PROVIDE STELTH 2 MODEL SRE-007-CUY BY BORIN MANUFACTURING OR STAPERM MODEL CU-1-UGPC BY GMC CORROSION, OR APPROVED EQUAL

2. MEASURE THE ACCURACY OF EACH COPPER SULFATE REFERENCE ELECTRODE BEFORE INSTALLING IT BY MEASURING THE DC VOLTAGE DIFFERENCE BETWEEN IT AND ONE OR MORE REFERENCE ELECTRODES OF KNOWN ACCURACY. THE MEASUREMENTS SHALL BE LESS THAN PLUS OR MINUS 0.010 DC VOLTS FOR ALL REFERENCE ELECTRODES. PERFORM THESE MEASUREMENTS AFTER TOTALLY SUBMERGING THE REFERENCE ELECTRODES IN A FIVE-GALLON BUCKET OF WATER FOR A MINIMUM PERIOD OF 15 MINUTES. USE ONLY POTABLE DRINKING WATER FOR THIS TEST. BRACKISH WATER OR SALTWATER WILL AFFECT THE TEST RESULTS AND DAMAGE THE REFERENCE ELECTRODE. PROVIDE FIVE DAYS WRITTEN NOTICE TO THE ENGINEER TO ALLOW THESE TESTS TO BE WITNESSED

COPPER SULFATE REFERENCE ELECTRODE CELL
1 / CP500
SCALE: N.T.S.





1. DEGREASE AND CLEAN STRUCTURE TO BARE, BRIGHT METAL WITH MECHANICAL DEVICES.
2. STRIP WIRE INSULATION AND ATTACH FROM WIRE AND ATTACH A BAC M1 COMPRESSION TERMINAL OR APPROVED EQUAL.
3. LOAD THE BRAZING GUN WITH A M8 THREADED DIRECT BRAZING PIN AND FERRULE. USE A THREADED TYPE CONNECTION FOR ABOVE-GROUND USE ONLY.
4. BRAZE THE THREADED PIN TO THE SURFACE.
5. TEST BRAZE BY BREAKING OFF THE SHANK OF THE PLAIN PIN WITH A HAMMER.
6. COVER CONNECTION WITH MASTIC FILLED WELD CAP AND BITUMASTIC COATING 80% SOLIDS BY VOLUME OVER WELD CAP AND ALL EXPOSED METAL.
7. ALL WELDS SHALL BE A MINIMUM OF 6" APART.
8. ALLOW WELD COATING TO CURE PER MANUF. RECOM..

WIRING - TO - STRUCTURE WELD DETAIL
2 / CP500
SCALE: N.T.S.

100% SUBMITTAL
NOT FOR CONSTRUCTION
AUGUST 21, 2023

HDR

HDR Engineering, Inc.
9805 Double R Blvd., Suite 101
Reno, Nevada 89521
775-337-4700

C:\pwworking\west01\d2946610\CP501.dwg
Aug 21, 2023 - 1:07pm

REVISION	DESCRIPTION	BY	APP	DATE
A	100% DESIGN SUBMITTAL			08/21/23

WORK ORDER NO. 14-0035
DESIGNED M. WEGNER
DRAWN K. GONZALEZ
DATE AUGUST 21, 2023
CHECKED
SUBMITTED
RECOMMENDED
APPROVED

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK REBUILD
RENO, NEVADA
CORROSION MONITORING TEST STATION DETAILS 2

SHEET NUMBER
CP501
36 OF 36

WSUP23-0030
EXHIBIT D

WOOD RODGERS

September 22, 2023

Katy Stark
Planner
Washoe County
Planning & Building Division-Community Services Department
1001 East Ninth Street
Reno, NV 89512

RE: Request to modify standards regarding WSUP23-00030 (TMWA Lemmon Valley Tank 1 Rebuild)

Katy,

Wood Rodgers, Inc. has prepared an updated request to modify standards in relation to the TMWA Lemmon Valley Tank 1 Rebuild Special Use Permit (WSUP23-00030) that was submitted to the county on September 8, 2023. During a site visit on September 18, 2023, county planning staff indicated three design standards that were addressed and may require a modification to the standards. This letter will provide more information to the specific standards outlined in the Washoe County Development Code.

1.) **Request to modify the parking surface standards outlined in Section 110.410.25 (e).**
The Applicant is requesting to modify Section 110.410.25(e) to allow for 6-inch compact gravel to be used as an alternative surface to the asphalt or concrete that is required for "driveways and maneuvering" areas. This will include the access road as well as the sixteen-foot wide (16 ft) ring road around the water tank that will be used for service and maintenance vehicles.

Service and maintenance vehicles are anticipated to service the tank monthly and will not generate significant traffic to justify a nonporous surface and, no parking is required as most vehicles accessing the site will only be parked during maintenance with no need for long-term parking. Furthermore, the proposed surface will minimize the runoff produced during a precipitation event when compared to an asphalt or concrete surface. This is particularly important in the North Valleys where onsite retention is required to help minimize flows to Swan Lake.

2.) **Request to modify the screening requirements outlined in Section 110.412.40 (d).**
The screening standards for civic use type that are adjacent to a residential use requires that a solid fence be located along the property line and be greater than six feet (6 ft) and less than seven feet (7 ft) tall to help minimize the visual impact to the adjacent uses. However, it should be noted that the surrounding residential use is a single dwelling unit on a forty (40) acre parcel and the dwelling unit is located approximately 470-feet from the project site and is not visible from the dwelling unit as the water tank is located at an elevation of 5,100 feet compared to the dwelling unit which sits at 5,024-feet. A difference of 76-feet.

The request is proposing a fence that is setback from the property line and varies from approximately 17-50 feet along the eastern property boundary, 50-80 feet along the north property boundary, 20-90 feet along the western property boundary, and 50-90 feet along the

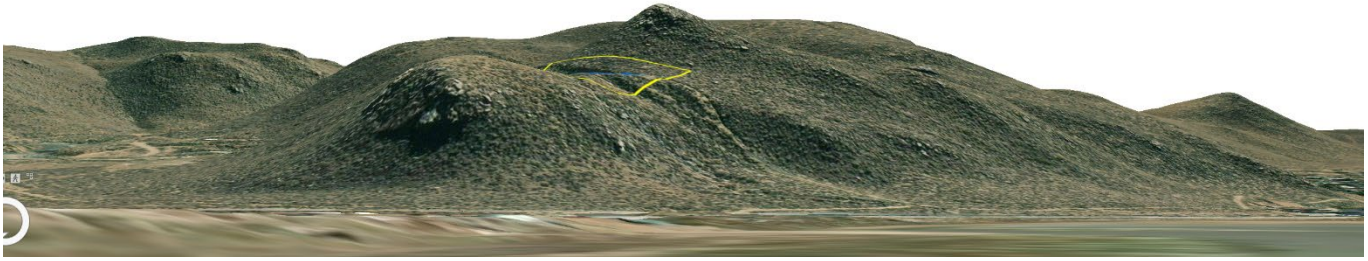
southern boundary. The fence is setback to minimize the development area of the site and to help mitigate the visual impact of the fence for all surrounding properties. By setting the fence back from the property line to generally follow the area around the disturbed or developed ground, the fence is less visible when viewing the site from adjacent properties (see photos below).

The fence is proposed to be eight feet (8 ft) high, with one foot (1 ft) of barbed wire for a maximum height of nine feet (9 ft). This exceeds the maximum 7 ft requirement. The proposed fence is designed in accordance with the Department of Homeland Security regulations for water tank safety. The fence is proposed to be chain link and will not be solid for security purposes and to help minimize the visual impact to the surrounding area. Since much of the site will remain undeveloped the nature of a chain link fence will let the natural background show through when viewed from surrounding properties and help blend more cohesively when compared to a sloid fence. Finally, the portion of the site that will be most visible, the water tank, will still being visible above any required fence line height.

The images below help demonstrate the required location of a fence along the property line (yellow) as required in Section 110.142.40 (d), with the proposed fence location with the modified standard (blue):

Aerial view looking east with Lemmon Drive and the existing neighborhood along Palace Drive.

Aerial view looking south from Lemmon Drive.



View from Lemmon Drive looking southwest.

3.) Temporary irrigation for the proposed revegetation areas.

There was discussion regarding temporary irrigation for the proposed revegetation. In reviewing the Washoe County Development Code, it appears that the proposed request will be in compliance with the standards outlined in Section 110.412.67 Revegetation, which does not require temporary or permanent irrigation. The standards, however, require that the disturbed areas reach a plant density of 70% of the pant density of the adjacent undisturbed areas regardless of irrigation. The proposed revegetation is not considered formal landscape which typically requires trees and ground cover. The types of plants proposed in the seed mix are native and fall under the "low water use zones" outlined in Section 110.412.60 (c)(3) which survive on natural precipitation without supplemental water. Therefore, if the landscape standards outline in the original application (Section 110.412.40) are modified to include the revegetation areas, the revegetation will need to meet the requirements in Section 110.412.67 and will not need to modify the irrigation standards.

If you need additional information please feel free to contact our office at (775) 823-9770.

Sincerely,
WOOD RODGERS, INC.

Eric Hasty, AICP
Project Planner – Planning

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.
1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK PHOTO RENDERING
LEMMON DRIVE & DEODAR WAY LOOKING EAST

8' CHAINLINK FENCE

DATE:	SEPT. 2023
DRAWN BY:	JRH
WORK ORDER #:	14-0035
SCALE:	NTS

EXHIBIT
P1

TRUCKEE MEADOWS WATER AUTHORITY
Quality. Delivered.

1355 CAPITAL BLVD. PO BOX 30013 RENO, NEVADA 89520-3013 PHONE: 775-834-8080

LEMMON VALLEY 1 TANK PHOTO RENDERING
LEMMON DRIVE & DEODAR WAY LOOKING EAST

8' CHAINLINK FENCE WITH SLATS

DATE:	SEPT. 2023
DRAWN BY:	JRH
WORK ORDER #:	14-0035
SCALE:	NTS

EXHIBIT

P2