ENGINEERING CONCEPTS AND DESIGN

CONSTRUCTION PLANS FOR

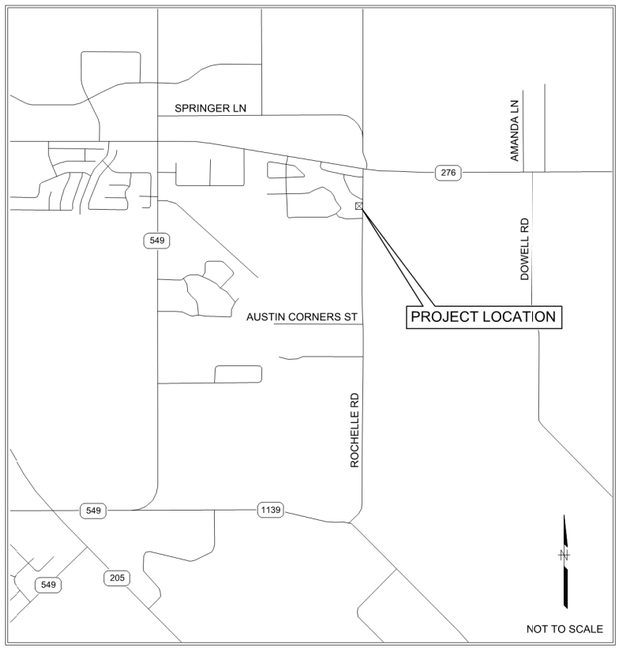
TIMBER CREEK LIFT STATION EXPANSION
CITY OF ROCKWALL, TEXAS

OWNER

CITY OF ROCKWALL, TEXAS
385 S. GOLIAD STREET
ROCKWALL, TEXAS

ENGINEER

PERKINS ENGINEERING CONSULTANTS, INC.
6001 INTERSTATE 20 WEST, SUITE 219
ARLINGTON, TEXAS 76017



SHEET INDEX

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NOVEMBER 2019

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

10/20/2022
DATE

JUSTIN A. ANGEL, P.E.
TEXAS NO. 129386

STATE OF TEXAS
JUSTIN A. ANGEL
129386
LICENSED
PROFESSIONAL ENGINEER
3/13/2020

GENERAL NOTES

GENERAL

1. BUILDING CODE: INTERNATIONAL BUILDING CODE IN THE CITY OF ROCKWALL TEXAS LATEST ADDITION.
2. DESIGN LIVE LOADS:
3. A. TYPICAL 150 PSI
4. ANY BACKGROUND DRAWINGS SHOWING ON THE STRUCTURAL PLANS ARE FOR REFERENCE ONLY. SEE CIVIL, MECHANICAL, ELECTRICAL, PLUMBING, AND OTHER DRAWINGS FOR ENTRY REQUIREMENTS OF NON-STRUCTURAL ELEMENTS
5. SECTIONS AND DETAILS INDICATED AS TYPICAL SECTIONS AND TYPICAL DETAILS SHALL BE USED AT ALL LOCATIONS WERE CONDITIONS ARE SIMILAR TO THOSE DESCRIBED IN THE DETAILS.
6. FIELD VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO START OF SHOP DRAWINGS OR CONSTRUCTION WHERE INDICATED ON DRAWINGS, SUBMIT RECORD OF FIELD CONDITIONS TO ENGINEER.
7. EXISTING CONDITIONS REQUIRING MODIFICATIONS TO DOCUMENTS FOR PROPOSED CONSTRUCTION SHALL BE IMMEDIATELY SUBMITTED TO ENGINEER.
8. REVIEW OF SUBMITTAL INFORMATION SHALL BE FOR GENERAL REQUIREMENTS OF PROJECT; AND SHALL NOT INCLUDE CHECKING OF DETAIL DIMENSIONS OR DETAILED QUANTITIES, NO REVIEW OF THE CONTRACTORS SAFETY MEASURES IN, ON, OR NEAR THE WORKSITE, OR MEANS AND METHODS OF DOING WORK.
9. CONTRACTOR SHALL CHECK ALL SHOP DRAWING SUBMITTALS FOR COMPLIANCE WITH CONTRACT DOCUMENTS.
10. CONTRACTOR SHALL INDICATE CHECKING AND APPROVAL OF SHOP DRAWINGS BY FIXING HIS SHOP DRAWINGS STAMPED WITH THE DATE OF APPROVAL AND NAME A PERSON APPROVING SHOP DRAWINGS.
11. CONSTRUCTION SCHEDULE SHALL ALLOW TWO WEEKS FOR SHOP DRAWING REVIEW AND RETURN BY THE STRUCTURAL ENGINEER. REVIEW BY THE DESIGN TEAM SHALL BE FOR GENERAL COMPLIANCE AND IN COMPLIANCE WITH THE CONTRACT DOCUMENTS.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL QUANTITIES, DIMENSIONS, CONSTRUCTION MEANS, METHODS, AND JOB SITE SAFETY.
13. ACTIONS TAKEN ON THE SHOP DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY OF COMPLIANCE WITH CONTRACT DOCUMENTS.
14. CONTRACTOR SHALL PROTECT SITE WITH TEMPORARY FENCING. TEMPORARY FENCING SHALL REMAIN WITHIN THE CITY OF ROCKWALL 100' ROW.
15. ALL ITEMS IN VALVE BOX SHALL BE BLOCKED AND SUPPORTED AS NECESSARY.
16. CONTRACTOR SHALL COAT THE WETWELL WITH RAVEN 405 OR APPROVED EQUIVALENT. SURFACE PREPARATION AS REQUIRED BY THE MANUFACTURER
17. FILL COMPACTION:
    A. CLAY SOILS WITH A PLASTICITY INDEX BELOW 25 SHOULD BE COMPACTED TO A DRY DENSITY OF AT LEAST 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D 698) AND WITHIN THE RANGE OF 1% BELOW TO 3% ABOVE THE MATERIAL'S OPTIMUM MOISTURE CONTENT.
    B. CLAY SOILS WITH A PLASTICITY INDEX EQUAL TO OR GREATER THAN 25 SHOULD BE COMPACTED TO A DRY DENSITY BETWEEN 95% AND 98% OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D 698). THE COMPACTED MOISTURE CONTENT OF THE CLAYS DURING PLACEMENT SHOULD BE WITHIN THE RANGE OF 2 TO 6% POINTS ABOVE OPTIMUM.
    C. CLAY MATERIAL USED AS FILL SHOULD BE PROCESSED SUCH THAT THE LARGEST PARTICLE OR CLOD IS LESS THAN 6 INCHES PRIOR TO COMPACTION.
    D. IN CASES WHERE EITHER MASS FILLS OR UTILITY LINES ARE MORE THAN 10 FT DEEP, THE FILL/BACKFILL BELOW 10 FT SHOULD BE COMPACTED TO AT LEAST 98% OF STANDARD PROCTOR MAXIMUM DRY DENSITY (ASTM D-698) AND WITHIN 2% OF THE MATERIAL'S OPTIMUM MOISTURE CONTENT. THE PORTION OF THE FILL/BACKFILL SHALLOWER THAN 10 FT SHOULD BE COMPACTED AS OUTLINED ABOVE.
    E. COMPACTION SHOULD BE ACCOMPLISHED BY PLACING FILL IN ABOUT 8-INCH THICK LOOSE LIFTS AND COMPACTING EACH LIFT TO AT LEAST THE SPECIFIED MINIMUM DRY DENSITY. FIELD DENSITY AND MOISTURE CONTENT TESTS SHOULD BE PERFORMED ON EACH LIFT.
18. CHECK VALVES SHALL BE AMERICAN (ACIPCO) SERIES 600 WITH LEVER AND COUNTERWEIGHT.
19. PIPE SUPPORTS SHALL BE STANDON MODEL S89 OR EQUAL FLANGED PIPE SUPPORT, OR SHALL BE PER FLANGED PIPE SUPPORT DETAIL.
20 ALL BOLTS, NUTS, WASHERS, ANCHOR BOLTS, FASTENERS, AND RELIEF STRAIN GRIPS SHALL BE 316SS. ANCHOR BOLT SYSTEMS SHALL BE EPOXY OR ADHESIVE TYPE BY HILTI, OR APPROVED EQUAL.
21. ALL DIP WITHIN THE WET WELL AND VALVE VAULT SHALL BE COATED WITH 2 EA. LAYERS OF 6 MIL. OFT DEVOE BAR-RUST 233H HIGH PERFORMANCE EPOXY, OR APPROVED EQUAL. DIP SHALL BE EPOXY LINED.

BYPASS PUMPING

1. CONTRACTOR SHALL ADHERE TO THE FOLLOWING FOR BYPASS PUMPING:
    A. SCHEDULE MEETING WITH OWNER TO REVIEW SEWER SHUTDOWN PRIOR TO REPLACING OR REHABILITATING ANY FACILITIES.
    B. OWNER RESERVES THE RIGHT TO DELAY SCHEDULE DUE TO WEATHER CONDITIONS, OR OTHER UNEXPECTED EMERGENCY WITHIN THE SEWER SYSTEM.
    C. REVIEW BYPASS PUMPING ARRANGEMENT OR LAYOUT IN THE FIELD WITH OWNER PRIOR TO BEGINNING OPERATIONS. FACILITATE PRELIMINARY BYPASS PUMPING RUN WITH OWNER STAFF PRESENT TO AFFIRM THE OPERATION IS SATISFACTORY TO THE OWNER.
    D. CONTRACTOR WILL BE LIABLE FOR CLEAN-UPS, FINES, AND ANY OTHER PROBLEMS THAT MAY OCCUR.
    E. PROVIDE ADEQUATE CAPACITY AND SIZE TO HANDLE EXISTING FLOWS PLUS ADDITIONAL FLOW THAT MAY OCCUR DURING PERIODS OF A RAINSTORM. ESTIMATE PEAK AMOUNTS OF FLOW TO BE BYPASSED AND PROVIDE BYPASS FLOW CAPACITY OF AT LEAST 125 PERCENT OF PEAK FLOW ESTIMATE. PEAK FLOW ESTIMATE IS EQUAL TO 924 GPM.
    F. OPERATE AND MAINTAIN FLOW CONTROL SYSTEM 24 HOURS PER DAY, 7 DAYS PER WEEK INCLUDING HOLIDAYS, AS REQUIRED TO CONTROL FLOW.

CITY OF ROCKWALL

GENERAL

1. DEVELOPER/ENGINEER MUST ENSURE THAT ALL DESIGN AND CONSTRUCTION IS IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS AND MUST PROVIDE CERTIFICATION ON FINAL PLANS. A COPY OF ALL DETERMINATIONS, PERMITS, AND APPROVALS RECEIVED FROM FEDERAL, STATE, AND LOCAL AGENCIES MUST BE PROVIDED. ENGINEERING DESIGN AND PLANS SUBMITTED TO THE ENGINEERING DIVISION BY THE DEVELOPER/DESIGN ENGINEER SHALL BE IN CONFORMANCE WITH THE ADOPTED STANDARDS OF DESIGN AND CONSTRUCTION THAT ARE IN AFFECT WHEN THE 1ST SUBMITTAL IS RECEIVED BY THE ENGINEERING DIVISION.
2. CONTRACTOR SHALL CONFORM TO THE REQUIREMENTS IN THE LATEST EDITION OF THE CITY OF ROCKWALL GENERAL NOTES PUBLISHED TO THE CITY WEBSITE WWW.ROCKWALL.COM
3. INSPECTION OF CONSTRUCTION AND VERIFICATION OF COMPLIANCE TO THE PLANS AND SPECIFICATIONS SHALL BE CONDUCTED BY THE CITY OF ROCKWALL STAFF UNDER THE DIRECTION OF THE CITY ENGINEER.
4. ALL FRANCHISE AND PUBLIC UTILITIES WITHIN A RESIDENTIAL DEVELOPMENT SHALL BE PLACED UNDERGROUND.
5. THE DEVELOPER SHALL BE RESPONSIBLE FOR SUBMITTAL OF INFORMATION NEEDED TO DESIGN PRIVATE UTILITIES FOR THE DEVELOPMENT.
6. THE FINAL ENGINEERING DRAWINGS SHALL CONFORM TO THE ESTABLISHED "ENGINEERING DRAWINGS REQUIREMENTS" AND THE STANDARDS OF DESIGN AND CONSTRUCTION.
7. FINAL ACCEPTANCE SHALL OCCUR WHEN ALL THE ITEMS ON THE CHECKLIST FOR FINAL ACCEPTANCE HAVE BEEN COMPLETED AND SIGNED-OFF BY THE CITY. AFTER IMPROVEMENTS HAVE BEEN CONSTRUCTED, THE DEVELOPER SHALL BE RESPONSIBLE FOR PROVIDING TO THE CITY "AS BUILT" OR "RECORD DRAWINGS". THE DESIGN ENGINEER SHALL FURNISH A DIGITAL FILE OF THE PROJECT FORMATTED IN AUTO CAD 14 OR 2000 FORMAT OR NEWER AND ADOBE ACROBAT (.PDF) FORMAT WITH A CD-ROM. THE DISK SHALL INCLUDE A FULL SET OF PLANS ALONG WITH ANY LANDSCAPING, WALL PLANS, AND DETAILS SHEETS.

WASTEWATER SYSTEM

1. THE DESIGN AND CONSTRUCTION OF THE WASTEWATER SYSTEM TO SERVE THE DEVELOPMENT SHALL BE IN ACCORDANCE WITH GOOD ENGINEERING PRINCIPLES, THE STANDARDS OF DESIGN, THE STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE STANDARD DETAILS, AND THE REQUIREMENTS OF THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ). NO CONSTRUCTION SHALL COMMENCE PRIOR TO THE APPROVAL OF THE PLANS AND SPECIFICATIONS BY THE CITY OF ROCKWALL. ALL WASTEWATER MAINS AND LIFT STATIONS SHALL BE SIZED AND LOCATED TO CONFORM TO THE PROJECTED FLOWS IN ACCORDANCE WITH THE LATEST WASTEWATER MASTER PLAN.
2. THE WASTEWATER LINES SHALL BE SIZED TO MEET THE PEAK-DAY DRY WEATHER FLOW PLUS AN APPROPRIATE ALLOWANCE FOR INFILTRATION OF STORM WATER. THE MINIMUM WASTEWATER MAIN SIZE (OTHER THAN SERVICE LINES) FOR ALL DEVELOPMENTS SHALL BE EIGHT INCHES (8") IN DIAMETER. THE DESIGN CRITERIA AND CALCULATION SHALL BE SUBMITTED TO THE CITY WITH THE PLANS AND SPECIFICATIONS.

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

10/20/2022

JUSTIN A. ANGEL, P.E. DATE
TEXAS NO. 129386

STATE OF TEXAS
JUSTIN A. ANGEL
129386
LICENSED
PROFESSIONAL ENGINEER

3/13/2020

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

ONE INCH

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY

GENERAL NOTES

ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSION

Date: MARCH 2020
Designed: JAA
Drawn: SRG
Reviewed: MAP
PEC Proj. No.: ECD 18-004
SEQ. of

SHEET NO.
G-01

GENERAL NOTES

GENERAL ITEMS

1. All construction shall conform to the requirements of the "Standard Specifications for Public Works Construction" by the North Texas Central Council of Governments, 5th edition amended by the City of Rockwall. The CONTRACTOR shall reference the latest City of Rockwall standard details provided in the Rockwall Public Works Department, Engineering Divisions "Standards of Design and Construction" manual for details not provided in these plans. The CONTRACTOR shall possess one set of the NCTCOG Standard Specifications and Details and the City of Rockwall's "Standards of Design and Construction" manual on the project site at all times
2. The CONTRACTOR shall protect existing property monumentation and primary control. Any such points which the CONTRACTOR believes will be destroyed shall have offset points established by the CONTRACTOR prior to construction. Any monumentation destroyed by the CONTRACTOR shall be re-established at CONTRACTOR's expense by a registered professional land surveyor.
3. Upon the CITIES request the CONTRACTOR shall provide survey Northings, Eastings and Elevations by registered professional land surveyor for: any existing utilities that may be in conflict with the proposed improvements of the construction plans, and any proposed installation to verify it has been installed per plan. (no separate pay)
4. Any item called out for on the plans that does not have a specific bid item shall be subsidiary to the project and no separate pay shall be given.
5. The CONTRACTOR is solely responsible for performing all construction layouts from the site layout control points, and from the dimensions and centerlines shown. The CONTRACTOR must notify the engineer of any discrepancies before proceeding with the work.
6. CONTRACTOR shall take all available precautions to control dust. CONTRACTOR shall control dust by sprinkling water (no separate pay), or as approved by the City and engineer.
7. CONTRACTOR shall video record and provide a copy to the construction inspector of the entire job site before construction starts. Video record of the site will be used to dispute discrepancies of any preexisting conditions of the project site before construction begins.
8. It is the CONTRACTOR's responsibility to maintain a neat and accurate redline record of construction for the City's records. The CONTRACTOR shall provide the City full size reproducible markups that record all construction deviating from the plans. These redline construction plan records shall be submitted to the City at the end of the job and sign by the CONTRACTOR. These records must be received or the City will not release final retainage or acceptance on the job.

EROSION CONTROL & VEGETATION

1. The CONTRACTOR or developer shall be responsible, as the entity exercising operational control, for all permitting as required by the Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ). This includes, but is not limited to, preparation of the Storm Water Pollution Prevention Plan (SWPPP), the Construction Site Notice (CSN), the Notice of Intent (NOI), the Notice of Termination (NOT) and any Notice of Change (NOC) and is required to pay all associated fees
2. Erosion control devices as shown on the erosion control plan for the project shall be installed prior to the start of land disturbing activities.
3. All erosion control devices are to be installed in accordance with the approved plans, specifications and Storm Water Pollution Prevention Plan (SWPPP) for the project. Erosion control devices shall be placed and in working order prior to start of construction. Changes are to be reviewed by the design engineer and the City of Rockwall prior to implementation.
4. If the Erosion Control Plans and Storm Water Pollution Prevention Plan (SWPPP) as approved cannot appropriately control erosion and off-site sedimentation from the project, the erosion control plan and/or the SWPPP is required to be revised and any changes reported to the Texas Commission on Environmental Quality (TCEQ), when applicable.
5. All erosion control devices shall be inspected weekly by the CONTRACTOR and after all major rain events, or more frequently as dictated in the project Storm Water Pollution Prevention Plan (SWPPP). CONTRACTOR shall provide copies of inspection's reports to the engineering inspection after each inspection.
6. The CONTRACTOR shall not dispose of waste and any materials into streams, waterways or floodplains. The CONTRACTOR shall secure all excavation at the end of each day and dispose of all excess materials. Disposal site shall be documented and provided to the City.
7. CONTRACTOR shall grade ground and ditches disturbed by construction to prevent ponding of storm water runoff. Grading shall be subsidiary to the appropriate bid item for unclassified street and unclassified channel excavation. Topsoil shall be stockpiled and replaced to a minimum depth of 6-inches and disc harrowed to a minimum depth of 4-inches (no pay item). CONTRACTOR shall replace grass areas disturbed by construction activities with solid sod. Sodded areas shall be watered and maintained until established.
8. The CONTRACTOR shall provide 4 inches of top soil in all parkways that are to be sodded. Top soil shall be approved by the City in writing. Topsoil shall be subsidiary to placement of grass/sod.
9. All areas outside pavement disturbed by construction activities shall have grass sod established immediately. Sod shall match existing yard type. Payment shall be made under the appropriate bid schedule item. Areas disturbed outside the R.O.W. or limits of construction shall have grass sod established immediately at the CONTRACTOR's expense.

FRANCHISE UTILITY NOTES

1. Reasonable effort has been made to show the location of all known underground franchise utilities and service lines. However, the owner assumes no responsibility for failure to show any or all existing subsurface franchise utilities or utility line, or to show them in their exact location. The CONTRACTOR shall be responsible for the protection of all existing utilities, service lines or the like, which are exposed by the construction operation.
2. Existing franchise utilities shown in these plans reflect approximate locations prior to relocations. Some relocations have occurred with utility pole, gas, phone and cable utilities. The CONTRACTOR shall contact 811/Dig-Tess to locate existing and new utilities not shown in these plans.
3. CONTRACTOR shall support utilities where crossing with proposed storm sewer, water lines and sanitary sewers. Method of support shall be provided to the owner 24 hours prior to crossing.
4. The location off all Atmos gas lines, AT&T, Charter/Spectrum and TXU/Oncor electric underground phone lines in these plans are approximate. The CONTRACTOR shall contact Atmos, TXU/Oncor, AT&T and Charter/Spectrum to verify location and depth of all existing gas, electric and phone lines prior to construction.
5. CONTRACTOR shall have and pay for TXU/Oncor, AT&T and/or Charter/Spectrum support and protect all power, guy wires or cable and/or light poles in the work area.
6. Any damage incurred to existing franchise utilities, appurtenances, utility poles, light standards, etc. By construction related activities shall be the sole responsibility of the CONTRACTOR

TRAFFIC CONTROL

1. A suggested traffic control sequence plan is provided in the plan set. At a minimum the CONTRACTOR will be required to use the suggested sequence plan. If the CONTRACTOR choses to change the traffic control sequencing, a traffic control sequencing plan and traffic control sheets of each phase will have to be provided for review and approval by the City. All shall be signed and sealed by a Registered Professional Engineer with the State of Texas.
2. All new Detouring or Traffic Control Plans submitted by the City for review and approval a minimum of 21 calendar days prior to planned day of implementation.
3. CONTRACTOR shall notify the City 14 Calendar days prior to changing Detouring and Traffic Control for each Phase and Segment. This is to give time for Contractor to place Message Boards for warning of Detour Change and for City Notification to other departments, emergency services, mail delivery, school district, and trash services.
4. Pedestrian and vehicular traffic flow, safety and access shall be maintained during all phases of construction. Barricading and traffic control during construction shall be the responsibility of the CONTRACTOR and shall conform to the "Texas Manual on Uniform Traffic Control Devices ", latest edition, Part IV in particular. Traffic flow and access shall be maintained during all phases of construction unless otherwise noted on the traffic control plan. The CONTRACTOR is responsible for providing traffic safety measures for work on the project. The CONTRACTOR shall assume full responsibility for public safety in the construction area during the duration of construction activities.
5. The CONTRACTOR shall furnish, install, maintain and remove all necessary traffic control devices in conformance with the Texas Manual on Uniform Traffic Control Devices (Part 6). The CONTRACTOR shall provide access to properties at all times during each phase of construction to all local residents, businesses, mail service, trash pick-up and emergency services.
6. No traffic signs shall be taken down without permission from the City. CONTRACTOR needing to move and replace traffic sign for construction purposes should be paid for under traffic control bid item.
7. CONTRACTOR will furnish and install all signage in accordance with TMUTCD guidelines. Prior to installation of signage, CONTRACTOR shall stake locations and receive approval from City on locations. All signage that is removed by the CONTRACTOR shall be saved and delivered to municipal service center, streets division. All replaced signs shall be new. See City requirements for sign materials

MAILBOXES, MAIL SERVICE AND TRASH SERVICE NOTES

1. Existing mailboxes in conflict with construction shall be temporarily taken out of service. Were possible the CONTRACTOR shall attempt to move and reset the same mailbox. When not possible to reuse the old mailbox, the mailbox shall be removed and replace to the same or better condition and placed in a location approved by the city/property owner. Photographs of the mailbox shall be taken with the address shown, shall be provided to the city prior to being removed.
2. Payment for removal and replacement of existing mailbox will be paid for under the appropriate bid item. Brick mailbox shall match existing brick.
3. Temporary mailbox shall be provided and maintained throughout the project where existing mail boxes are being removed. Addresses shall be provided on all temporary mail boxes. (No Separate Pay)
4. Trash service shall be maintained throughout the duration of construction. On collection days the contractor shall move trash and recycling receptacles to location along street to be collected and moved back to original location at the end of the day. (No Separate Pay)

FENCES, TREES, LANDSCAPING, AND IRRIGATION NOTES

1. The removal, replacement or reconstruction of any fence for the convenience of construction shall be at the CONTRACTOR's expense (no separate pay). New materials shall match existing fences. All wood fences shall be replaced with new cedar with the post matching City requirements.
2. Temporary fencing shall be required where there is evidence of livestock and where damaged or removed fences are not to be replaced by the end of the same work day.
3. The removal and replacement of all shrubs, plants, trees, etc. For the convenience of construction shall be at the CONTRACTOR's expense (no separate pay). New shrubs, tree, etc. shall be equal to or better than existing ones.
4. All shrubs, plants, trees, etc. must be approved by the City before removal.
5. The CONTRACTOR shall locate and record existing irrigation systems prior to construction. If irrigations systems are damaged during construction the CONTRACTOR shall repair to same or better condition. An irrigator licensed in the state of Texas shall repair all damaged caused by construction. CONTRACTOR shall coordinate any irrigation work with the City of Rockwall and property owner's representatives. (No Separate Pay).
6. CONTRACTOR shall replace any trees removed or destroyed that are not shown in these plans to be removed or shall pay fair market value to the owner as determined by the owner. (No Separate Pay).

UTILITY NOTES

1. Reasonable effort has been made to show the location and type of all known City of Rockwall underground wet utilities and service lines. However, the City of Rockwall assumes no responsibility for failure to show any or all existing City of Rockwall underground wet utilities and service lines, or to show them in their exact location. The CONTRACTOR shall be responsible for the protection of all existing utilities, service lines or the like, which are exposed by the construction operation.
2. Bidders shall make any investigation of existing subsurface conditions as deemed necessary at no expense to the City of Rockwall. Neither the City of Rockwall nor the engineer will be responsible in any way for additional compensation for excavation work performed under this contract due to the CONTRACTOR's assumptions.
3. CONTRACTOR shall adjust all City of Rockwall utilities to the final grades.
4. CONTRACTOR shall be responsible for the protection of all existing service lines crossed or exposed by construction operations. Where existing service lines are cut, broken or damaged, the CONTRACTOR shall immediately replace the service line with same type of original construction or better.
5. The CONTRACTOR shall excavate and field locate the horizontal and vertical location of existing utility crossing locations utilizing provided project control. The CONTRACTOR shall immediately notify the engineer of any discrepancies identified between the CONTRACTORs field verified existing utility location and proposed location of utilities for the project.
6. The CONTRACTOR shall abide by all applicable federal, state, and local laws governing excavation. The CONTRACTOR shall provide detailed plans and specifications for trench safety systems that comply with applicable laws governing excavation. These plans shall be sealed by an engineer experienced in the design of trench safety systems, registered in the state of Texas. The CONTRACTOR shall submit completed trench safety plan to the engineer and City prior to commencing work. The CONTRACTOR shall be solely responsible for all aspects of work related to excavations.
7. Dewatering of utility trenches, bores pits, and any other excavations shall be no separate pay and shall be subsidiary to the other pay items on the project.

WATER LINE NOTES

1. The CONTRACTOR shall maintain existing water service at all times during construction.
2. Proposed water lines shall be AWWA C900-16 PVC Pipe (blue in color) for all sizes, DR 14 (PC 305) for pipeline sizes 12-inch and smaller, and DR 18 (PC 235) for 14-inch and larger water pipelines unless otherwise shown on water plan and profiles sheets. Proposed water lines shall be constructed with minimum cover of 4 feet for 6-inch through 8-inch, 5 feet for 12-inch through 18-inch and 6 feet for 20-inch and larger.
3. Proposed water line embedment shall be NCTCOG Class 'B-3' as amended by the City of Rockwall's public works standards of design and construction manual.
4. CONTRACTOR shall coordinate the shutting down of all water lines with the City of Rockwall, Public Works, Water Division. The City shall operate all water valves.
5. CONTRACTOR shall furnish and install gasket on water lines between all dissimilar metals and at valves (both existing and proposed).
6. All fire hydrants and valves removed and salvaged shall be returned to the City of Rockwall municipal service center.
7. Blue EMS pads shall be installed at every change in direction, valve, curb stop and service tap on the proposed water line and every 250'.
8. CONTRACTOR to install new meter boxes, all fittings and new meters per each service complete including connection to the main line. CONTACTOR shall be responsible to coordinate with Utility Billing 972-771-7736 in getting new meters for the project.
9. Existing meter and meter boxes, and valve stem and covers not specifically called to be relocated shall be adjusted to match final grades (no pay item). Any meter in pavement shall have a traffic rated lid.
10. All water valve extensions, bolts, nuts and washers shall be 316 Stainless Steel.
11. All fire hydrants bolts, nuts and washers that are buried shall be 316 Stainless Steel.
12. Abandoned water lines to remain in place shall be cut and plugged and all void spaces within the abandoned line shall be filled with grout, flowable fill or an expandable permanent foam product. Valves to be abandoned in place shall have any extensions and the valve box removed and shall be capped in concrete

WASTEWATER LINE NOTES

1. The CONTRACTOR shall maintain existing wastewater service at all times during construction.
2. Wastewater line for 4-inch through 15-inch shall be Green PVC – SDR 35 (ASTM D3034) [less 10 ft cover] and SDR 26 (ASTM D3034) [10 ft or more cover]. For 18-inch and lager wastewater line shall be Green PVC – PS 46 (ASTM F679) [less 10 ft cover] and PS 115 (ASTM F679) [10 ft or more cover].
3. Proposed wastewater line embedment shall be NCTCOG Class 'II' as amended by the City of Rockwall's public works standard design and construction manual.
4. Green EMS pads shall be installed at every 250', manhole, clean out and service lateral on proposed wastewater lines.
5. All existing wastewater services shall be transferred from wastewater lines being abandoned to proposed wastewater lines. Transferring wastewater services shall include double clean outs at the property lines, caps, tees, wyes, plugs and connection. Payment for transferring wastewater services shall be paid per each, under the appropriate bid schedule item.
6. CONTRACTOR shall CCTV all existing wastewater lines that are to be abandoned to ensure that all laterals are accounted for and transferred to proposed wastewater lines. (no separate pay)
7. All abandoned wastewater and force main lines shall be cut and plugged and all void spaces within the abandoned line shall be filled with grout, flowable fill or an expandable permanent foam product.
8. Existing manholes and cleanouts not specifically called to be relocated shall be adjusted to match final grades (no pay item).
9. All wastewater pipes and public services shall be inspected by photographic means (television and DVD) prior to final acceptance. The contractor shall furnish a DVD to the Engineering Division Construction Inspector for review. Any sags, open joints, cracked pipes, etc. shall be repaired or removed by the contractor at the contractor's expense. A television survey will be performed as part of the final testing in the twentieth (20^{th}) month of the maintenance period.
10. All manholes (public or private) shall be fitted with inflow prevention. The inflow prevention shall conform to the measures called out in standard detail R-5031.
11. All new or existing manholes being modified shall have corrosion protection being Raven Liner 405 epoxy coating, ConShield, or approved equal.. Consheild must have terracotta color dye mixed in the precast and cast-in-place concrete. Where connections to existing manholes are made the contractor shall rehab manhole as necessary and install a 125 mil thick coating of Raven Liner 405 or approved equal.

DEMOLITION, REMOVAL, DISPOSAL AND EXCAVATION NOTES

1. CONTRACTOR shall remove and properly dispose of all existing concrete and HMAC pavement outside of the City limits as required for construction of the project. All cost shall be included in the appropriate item in the bid schedule.
2. Payments for removal and replacement of street, driveway and sidewalk pavement shall be based on plan quantity and no adjustments will be made unless approved in writing by the City engineer.
3. All pavements to be removed and replaced shall be saw cut to full depth along neat lines shown in the plans. Proposed concrete pavement shall be constructed with longitudinal butt construction joints at all connections to existing concrete pavement. Concrete Pavement to be removed and replaced shall be full panel replacement.
4. The CONTRACTOR shall remove from the project area all surplus material. This work shall be incidental and not a separate pay item. Surplus materials from excavation include dirt, trash, rock measuring greater than 6" in the largest dimension, etc. Shall be properly disposed of at a site acceptable to the City of Rockwall if within the City limits. No excess excavated material shall be deposited in low areas or along natural drainage ways without written permission from the affected property owner and the City of Rockwall. If the CONTRACTOR places excess materials in these areas without written permission, he will be responsible for all damages resulting from such fill and he shall remove the material at his own cost.
5. All excavation on the project is unclassified. If soil borings were conducted they are provided in the bid/contract documents.

PAVING

1. All paving roadway sections thickness, strength, reinforcement, joint type, joint spacing and subgrade treatment shall match the typical sections and details called out in the plans. If not called out on the plans all concrete paving shall conform to the minimum requirements in the Standards of Design and Construction.
2. Reinforcing steel shall be tied (100%). Reinforcing steel shall be set on plastic chairs. Bar laps shall be minimum 30 diameters. Sawed transverse dummy joints shall be spaced every 15 feet or 1.25 time longitudinal butt joint spacing whichever is less. Sawing shall occur within 5 to 12 hours after the pour, including sealing. Otherwise, the section shall be removed and longitudinal butt joint constructed.
3. All proposed HMAC street pavement shall consist of 4 inches of Type B (Base) with 2 inches of Type D (Surface) on top of 6" flex base (if not specified in the plans)
4. No sand shall be allowed under any paving.
5. Concrete mix design shall be submitted to the City for review and approval prior to placement.
6. Fly ash may be used in concrete pavement locations provided that the maximum cement reduction does not exceed 20% by weight per C.Y. of concrete. The fly ash replacement shall be 1.25 lbs per 1.0 lb cement reduction.
7. All curb and gutter shall be integral (monolithic) with the pavement.
8. All fill shall be compacted by sheep's foot roller to a minimum 95% standard proctor. Maximum loose lift for compaction shall be 8 inches. All lifts shall be tested for density by an independent laboratory approved by the City.
9. All proposed sidewalks shall include barrier free ramps at intersecting streets, alleys, etc. Barrier free ramps shall meet current City and ADA requirements and be approved by the Texas Department of Licensing and Regulation (TDLR).
10. Sidewalks shall be doweled into pavement where it abuts curbs and driveways. Expansion joint material shall be used at these locations (no pay item).
11. All connection of proposed concrete pavement to existing concrete pavement shall include a longitudinal butt joint as the load transfer device. Concrete saw cuts for all driveways and sidewalks shall be subsidiary to the appropriate bid item for driveway and sidewalk replacement. All longitudinal butt joints shall be clean, straight and smooth (not jagged in appearance)
12. There shall be no separate payment for subgrade preparation under driveway and sidewalk areas and all cost shall be included in the appropriate items of the bid schedule.
13. Cracks formed in concrete pavement shall be repaired or removed by the CONTRACTOR at the City's discretion.

DRAINAGE / STORM SEWER NOTES

1. The CONTRACTOR shall maintain drainage at all times during construction. Ponding of water in streets, drives, trenches, etc. will not be allowed. Existing drainage ways shall not be blocked or removed unless explicitly stated in the plans or written approval is given by the City.
2. All structural concrete shall be 4200 psi compressive strength at 28 days minimum 7.0 sack, air entrained, unless noted otherwise.
3. Proposed storm sewer embedment shall be NCTCOG Class 'B' as amended by the City of Rockwall's Public Works, Engineering Division Standards of Design and Construction Manual.
4. All storm pipe shall be reinforced concrete pipe (RCP), Class III, unless otherwise noted.

GENERAL CONSTRUCTION NOTES
September 2019

CITY OF ROCKWALL
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
385 S. Goliad P (972) 771-7746
Rockwall, Texas 75087 F (972) 771-7748

STATE OF TEXAS
JUSTIN A. ANGEL
129386
LICENSED
PROFESSIONAL ENGINEER
3/13/2020

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

10/20/2022
JUSTIN A. ANGEL, P.E. DATE
TEXAS NO. 129386

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.
ONE INCH

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY

CITY OF ROCKWALL
GENERAL
CONSTRUCTION NOTES

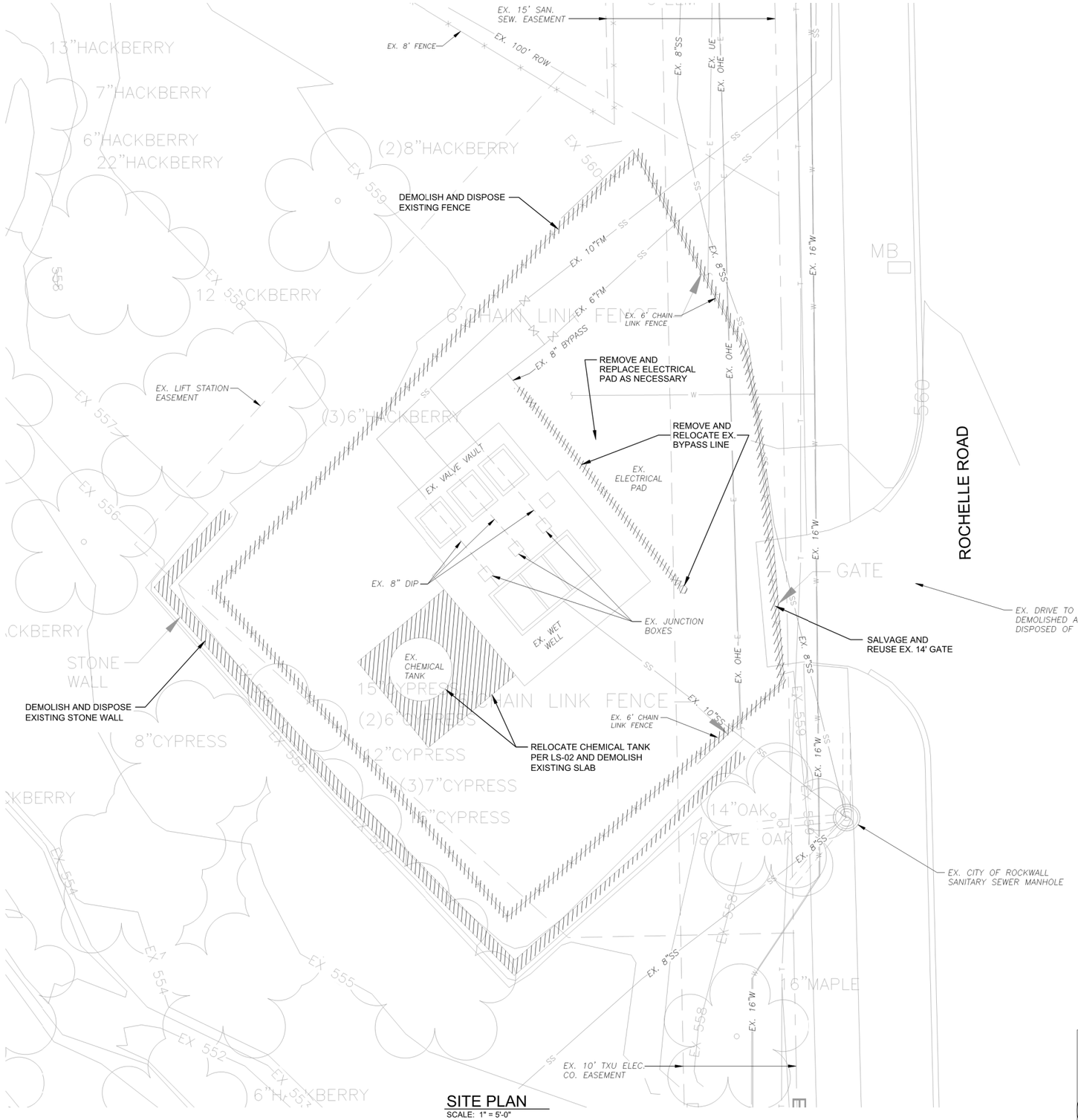
ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION
EXPANSION

Date: MARCH 2020
Designed: JAA
Drawn: SRG
Reviewed: MAP
PEC Proj. No.: ECD 18-004
SEQ. of

SHEET NO.
G-02

PRINTED: 9/29/2022 9:54 AM C:\Users\MaryAnn Gutierrez\Dropbox (PEC)\ACAD PEC\ECD 18-004 Timber Creek LS\GTS Only\CAD\G-02 CONST NOTES.dwg SAVED: 9/29/2022 9:32 AM USER: S. Gutierrez



SITE PLAN
SCALE: 1" = 5'-0"

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

ONE INCH

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10/20/2022
JUSTIN A. ANGEL, P.E. DATE
TEXAS NO. 129386

STATE OF TEXAS
JUSTIN A. ANGEL
129386
LICENSED
PROFESSIONAL ENGINEER
3/13/2020

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY

EXISTING SITE PLAN

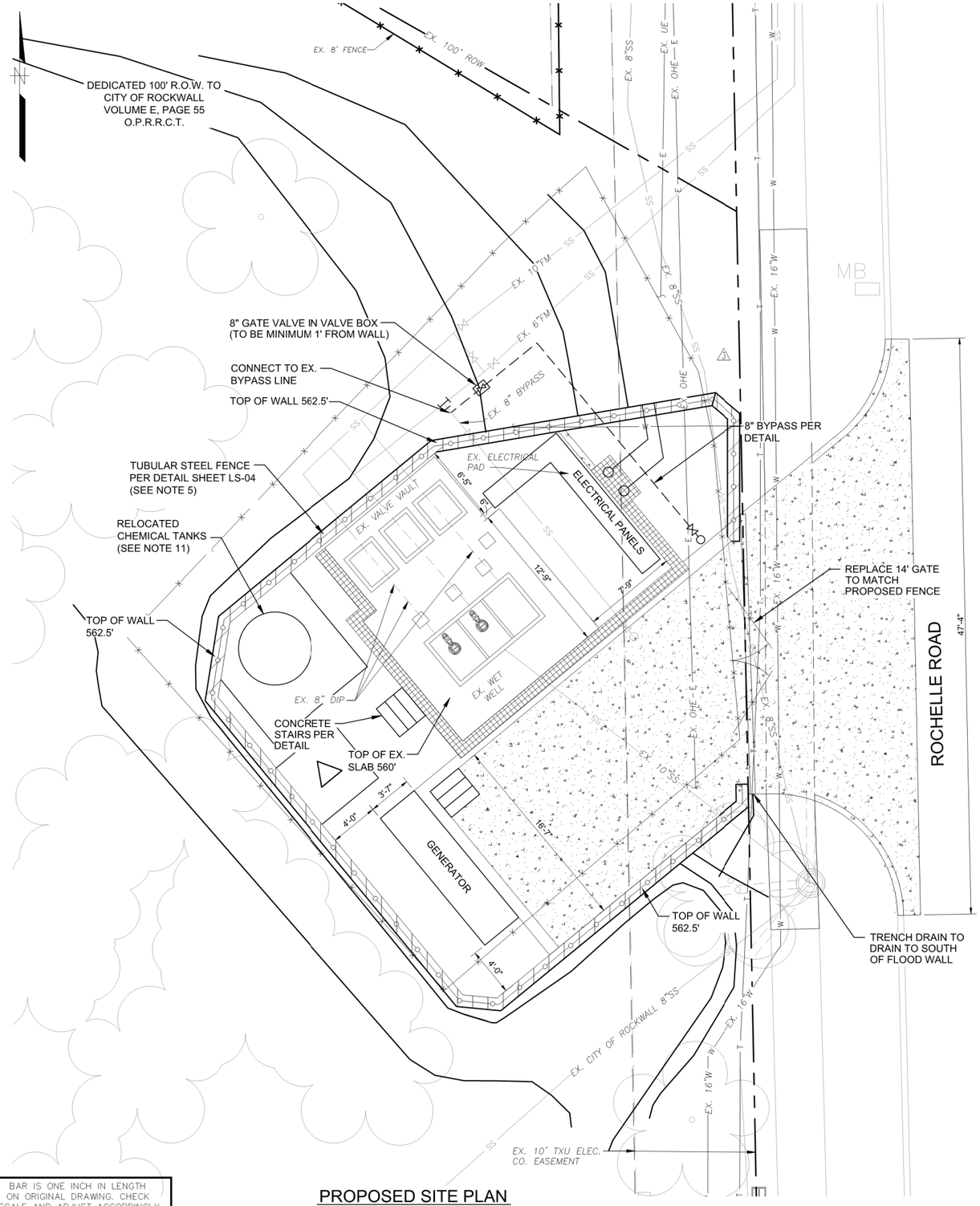
ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSION

Date:	MARCH 2020
Designed:	JAA
Drawn:	SRG
Reviewed:	MAP
PEC Proj. No.	ECD 18-004
SEQ.	of

SHEET NO.
LS-01

PRINTED: 9/29/2022 9:56 AM C:\Users\MaryAnn Gutierrez\Dropbox (PEC)\ACAD PEC\ECD 18-004 Timber Creek LS\GTS Only\CAD\LS-01 Ex Site Plan.dwg SAVED: 9/29/2022 9:32 AM USER: S. Gutierrez



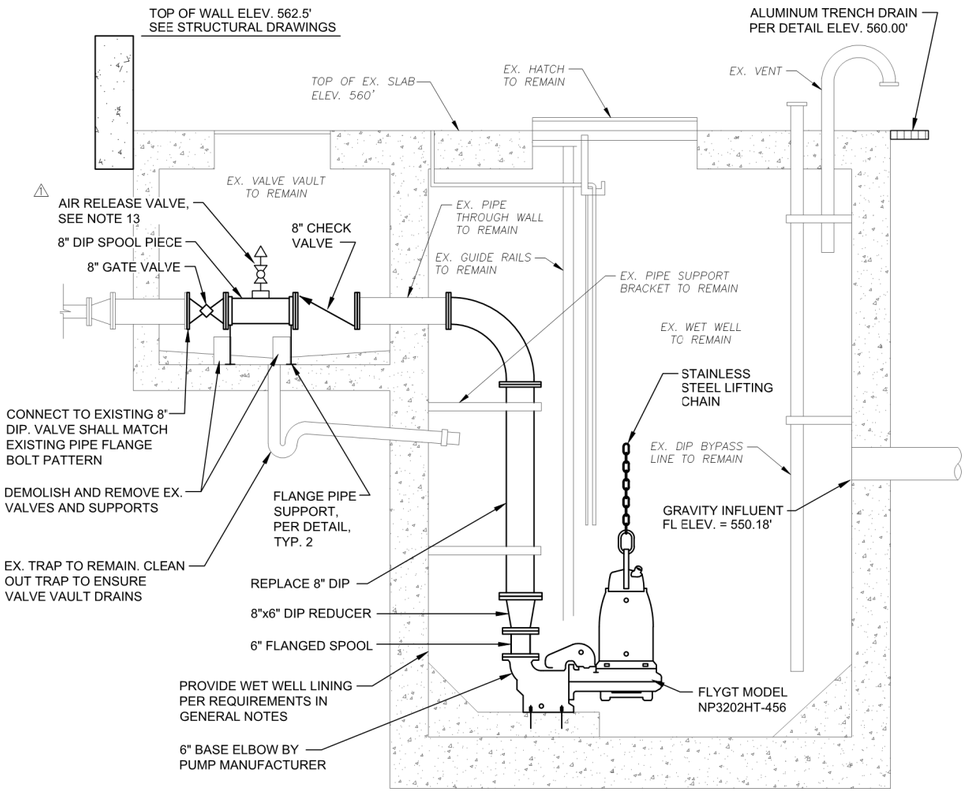
PROPOSED SITE PLAN
SCALE: 1" = 5'-0"

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

ONE INCH

LIFT STATION NOTES:

1. ALL DUCTILE IRON PIPING SHALL BE ANSI / AWWA C110 DUCTILE IRON, FLANGED STANDARD THICKNESS.
2. EXTERIOR OF ALL DUCTILE IRON PIPING SHALL BE LINED WITH TWO 8.0 MIL COATS (16 MIL TOTAL DFT) OF TENEMEC SERIES 431 PERMA-SHIELD OR APPROVED EQUAL. INTERIOR SHALL BE LINED WITH PROTECTO 401.
3. ALL EXPOSED METALLIC PIPE (NON-GALVANIZED, NON-STAINLESS STEEL OR ALUMINUM) AND FITTINGS WITHIN THE WET WELL AND VALVE VAULT SHALL BE COATED WITH A MINUMUM OF TWO 6.0 MIL COATS (12 MILS DFT) OF DEVOE BAR-RUST 233H HIGH PERFORMANCE EPOXY COATING OR APPROVED EQUAL.
4. CONTRACTOR SHALL COORDINATE LOCATION OF ALL APPURTENANCES WITH ITT FLYGT. BASE ELBOW ANCHOR BOLT TYPE, LOCATION AND ORIENTATION SHALL BE COORDINATED BY THE CONTRACTOR THROUGH ITT FLYGT ANCHORS FOR BASE ELBOWS SHALL BE INSTALLED PER ITT FLYGT RECOMMENDATIONS.
5. PROVIDE 4 BOLT FLANGE AS RECOMMENDED BY FENCE MANUFACTURER FOR FENCE INSTALLATION ON TOP OF FLOOD WALL.
6. CHECK VALVES SHALL BE SWING TYPE WITH LEVER AND SPRING, FL XFL ENDS. ACCEPTABLE MANUFACTURERS: MUELLER A-2600, KENNEDY FIG.126, WATEROUS SERIES 6800, OR APPROVED EQUAL.
7. GATE VALVE SHALL BE NON-RISING STEM, FL x FL ENDS. ACCEPTABLE MANUFACTURERS: MUELLER A-2360,KENNEDY / CLOW / M&H 4561 N, WATEROUS RESILIENT WEDGE 500, OR APPROVED EQUAL.
8. FUEL TANK MUST BE IN COMPLIANCE WITH EPA AND UL 142 STANDARDS
9. CONNECT 8" BYPASS PIPING WITH A RESTRAINED FLANGED COUPLING ADAPTER.
10. PUMP MANUFACTURER TO PROVIDE FLOATS AND LEVEL TRANSMITTER.
11. RELOCATE EXISTING ELECTRICAL AND CONTROLS TO CHEMICAL TANK. COORDINATE RELOCATION WITH RECOMMENDATIONS BY EVOQUA. INSTALL CHEMICAL TANK ON EQUIPMENT PAD PER DETAIL.
12. REMOVE EXISTING PUMPS AND DELIVER TO PUBLIC WORKS SHOP. ⚠
13. ⚠ INSTALL 1/2" NPT BRANCH CONNECTION WITH 1/2" STAINLESS STEEL NIPPLES, 1/2" STAINLESS STEEL BALL VALVE, AND 1/2" AIR/VACUUM RELEASE VALVE. CONTRACTOR TO ROUTE DISCHARGE PIPING TO FLOOR DRAIN.



PROPOSED WET WELL SECTION
SCALE: 1" = 2'-0"

WETWELL PUMP OPERATING LEVELS:

ALL PUMPS OFF	= 544.92'
LEAD PUMP "ON"	= 547.67'
LAG PUMP "ON"	= 549.00'
HIGH-LEVLE ALARM	= 549.75'

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

10/20/2022
JUSTIN A. ANGEL, P.E. DATE
TEXAS NO. 129386

STATE OF TEXAS
JUSTIN A. ANGEL
129386
LICENSED
PROFESSIONAL ENGINEER
3/13/2020

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY
1	12/4/20	ADDENDUM 1 RESSUED SHEET	JAA
2	2/16/21	REVISION PER OWNER COMMENTS	JAA
3	4/30/21	RELOCATION OF FLOODWALL	JAA

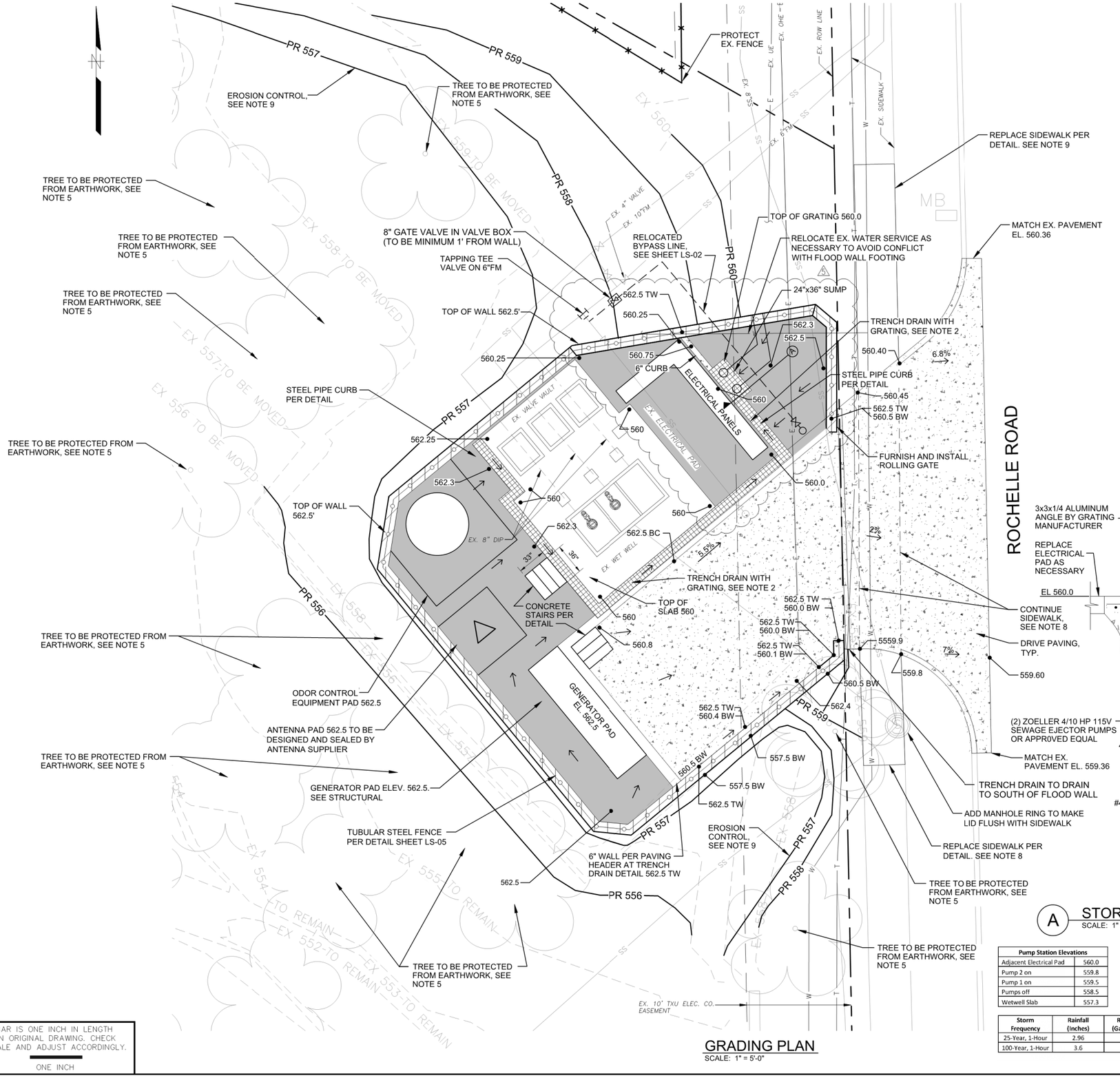
PROPOSED SITE PLAN AND WET WELL SECTION

ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSION

Date:	MARCH 2020
Designed:	JAA
Drawn:	SRG
Reviewed:	MAP
PEC Proj. No.	ECD 18-004
SEQ.	of

SHEET NO.
LS-02



GRADING PLAN

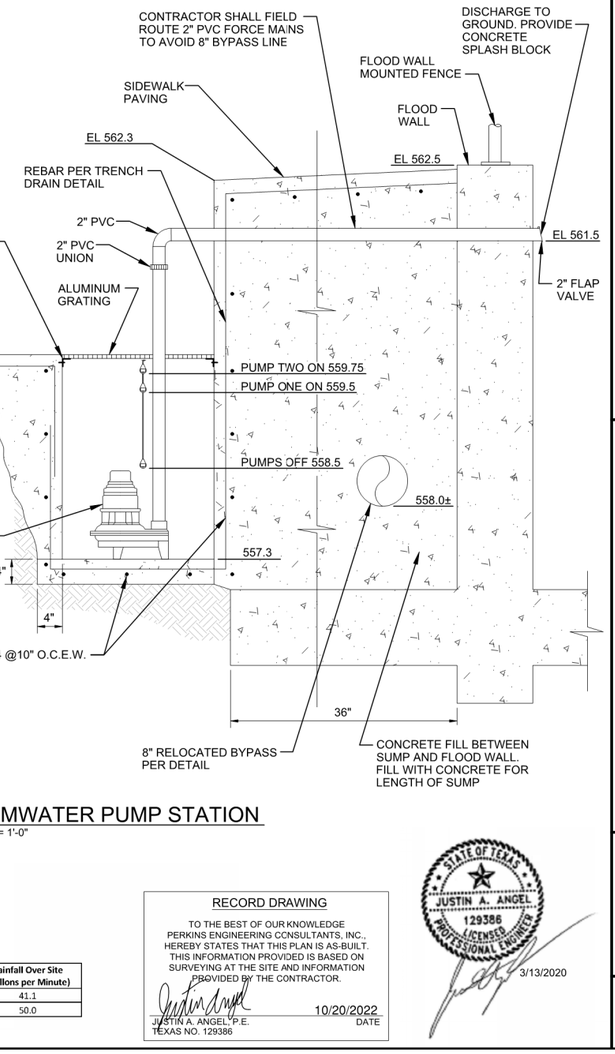
SCALE: 1" = 5'-0"

NOTES:

1. DEMOLISH AND REMOVE EXISTING CHAIN LINK FENCE.
2. DRAINS SHALL BE SLOPED TO PROMOTE DRAINING AND PREVENT STANDING WATER. SEE DETAIL.
3. USE NON-SHRINK GROUT TO SLOPE TO DRAIN
4. SEE DETAILS FOR PAVING TO TRENCH DRAIN CONNECTION.
5. TREES AND LANDSCAPING SHALL BE PROTECTED. IF REMOVAL OF TREE IS REQUIRED, WRITTEN APPROVAL FROM THE CITY IS REQUIRED PRIOR TO REMOVAL. REVEGETATE DISTURBED AREAS TO PRIOR CONDITIONS AND MAINTAIN UNTIL ESTABLISHED.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING STORM WATER POLLUTION PREVENTION PLAN AND EROSION CONTROL DEVICES IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
7. SIDEWALK SHALL HAVE A LESS THAN 2% CROSS SLOPE. SIDEWALK PER CITY OF ROCKWALL STANDARD CONSTRUCTION DETAILS.
8. SIDEWALK REPLACEMENT SHALL EXTEND TO ONE SIDEWALK PANEL BEYOND DISTURBED SIDEWALK.
9. PROVIDE EROSION CONTROL FABRIC PER STRUCTURAL DETAILS FOR SLOPES GREATER THAN 4:1.

LEGEND

- EX — EXISTING CONTOUR
- PR — PROPOSED CONTOUR
- SIDEWALK PAVING



A STORMWATER PUMP STATION

SCALE: 1" = 1'-0"

Pump Station Elevations	
Adjacent Electrical Pad	560.0
Pump 2 on	559.8
Pump 1 on	559.5
Pumps off	558.5
Wetwell Slab	557.3

Storm Frequency	Rainfall (inches)	Rainfall Over Site (Gallons per Minute)
25-Year, 1-Hour	2.96	41.1
100-Year, 1-Hour	3.6	50.0

RECORD DRAWING

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JUSTIN A. ANGEL, P.E.
TEXAS NO. 129386

10/20/2022
DATE

STATE OF TEXAS
JUSTIN A. ANGEL
129386
LICENSED
PROFESSIONAL ENGINEER

3/13/2020

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ONE INCH

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY
1	3/5/21	REVISED SHEET	JAA
2	3/23/21	REVISED SHEET	JAA
3	4/01/21	REVISED SHEET	JAA
4	4/19/21	REVISED SHEET	JAA
5	4/30/21	RELOCATION OF FLOODWALL	JAA

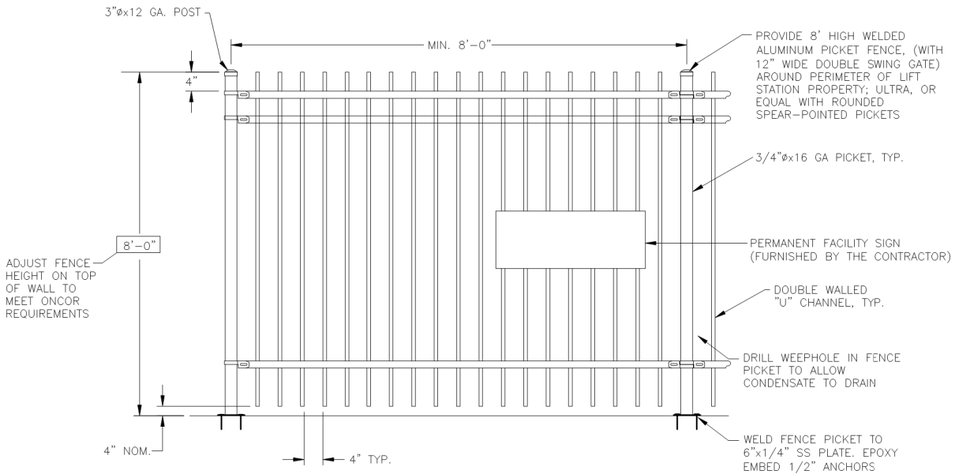
GRADING PLAN

ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSION

Date: MARCH 2020
Designed: JAA
Drawn: SRG
Reviewed: MAP
PEC Proj. No. ECD 18--004
SEQ. of

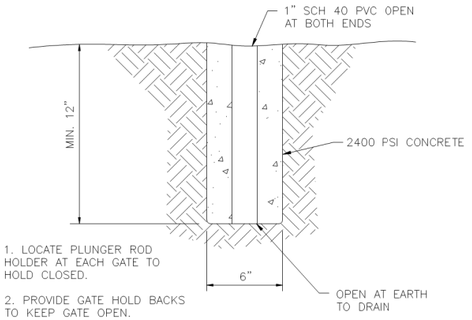
SHEET NO.
LS-03



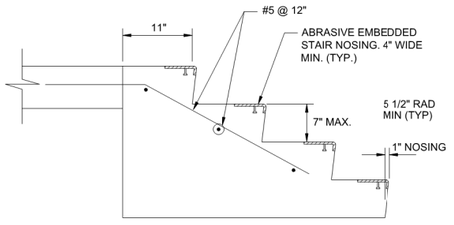
NOTES:

1. PROVIDE LOCK ASSEMBLY TO SECURE GATE WITH A PADLOCK.
2. 8 FT ALUMINUM PICKET FENCE USING 6005 T5 ALLOY POWDER COATED BLACK WITH A MINIMUM CURE FILM THISCKNESS OF 2.0.
3. FENCE SAHLL CONFORM WITH CITY OF ROCKWALL STANDARDS OF DESIGN AND CONSTRUCTION SECTION 5.4.4.2COLOR BLACK WITH SATIN FINISH.

TUBULAR STEEL FENCE DETAIL
NOT TO SCALE



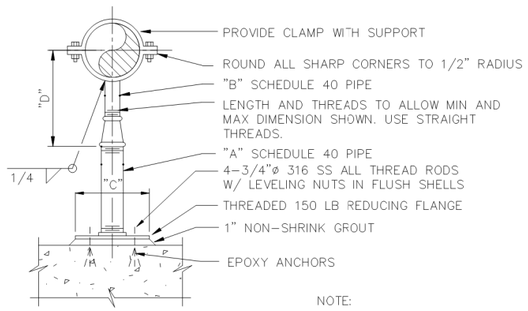
GATE PLUNGER ROD HOLDER
NOT TO SCALE



CONCRETE STEPS
NOT TO SCALE

ADJUSTABLE PIPE SADDLE SUPPORT SCHEDULE DIMENSIONS IN INCHES					
SIZE OF SUPPORTED PIPE	PIPE SIZE "A"	PIPE SIZE "B"	"C"	"D" MINIMUM	"D" MAXIMUM
* 2 1/2	2 1/2	1 1/2	9	8	13
3	2 1/2	1 1/2	9	8 1/2	13 1/2
3 1/2	2 1/2	1 1/2	9	8 1/2	13 1/2
4	3	2 1/2	9	9 1/2	14
6	3	2 1/2	9	10 1/2	15 1/2
8	3	2 1/2	9	11 1/2	16 1/2
10	3	2 1/2	9	13 1/2	18 1/2
12	3	2 1/2	9	15	19 1/2
14	4	3	11	16 1/2	20 1/2
16	4	3	11	17 1/2	22 1/2
18	6	3 1/2	13 1/2	19 1/2	24
20	6	3 1/2	13 1/2	21	25 1/2
24	6	4	13 1/2	23 1/2	28 1/2
30	6	4	13 1/2	27	31 1/2
32	6	4	13 1/2	28 1/2	32 1/2
36	6	4	13 1/2	30 1/2	34 1/2

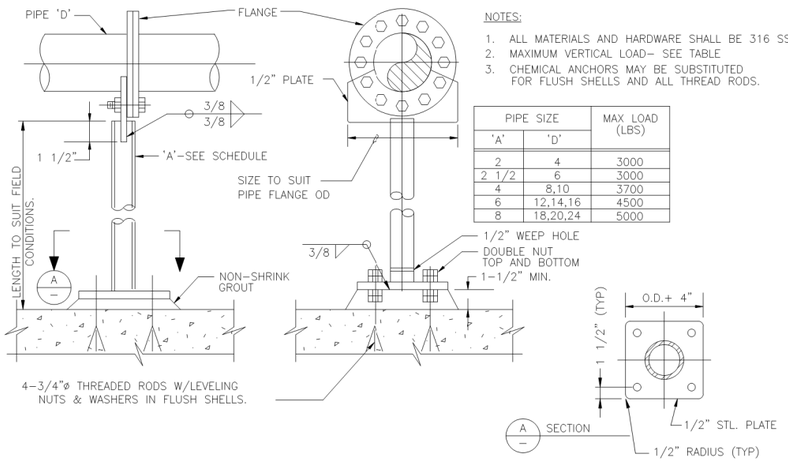
* USE 2 1/2" SUPPORTS FOR PIPES LESS THAN 2 1/2"ø



NOTE:

1. ALL METALS SHALL BE HOT DIPPED GALVANIZED EXCEPT FOR HARDWARE AND ANCHORS, WHICH SHALL BE 316SS.

GALVANIZED 316 SS ADJUSTABLE PIPE SADDLE SUPPORT
NOT TO SCALE

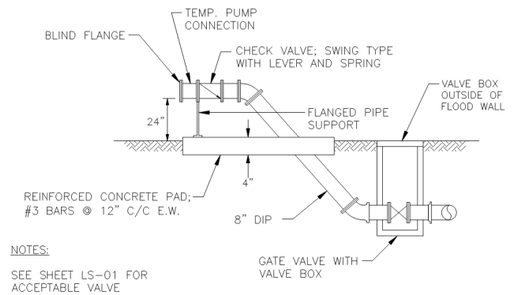


NOTES:

1. ALL MATERIALS AND HARDWARE SHALL BE 316 SS.
2. MAXIMUM VERTICAL LOAD- SEE TABLE
3. CHEMICAL ANCHORS MAY BE SUBSTITUTED FOR FLUSH SHELLS AND ALL THREAD RODS.

PIPE SIZE 'A'	PIPE SIZE 'D'	MAX LOAD (LBS)
2	4	3000
2 1/2	6	3000
4	8,10	3700
6	12,14,16	4500
8	18,20,24	5000

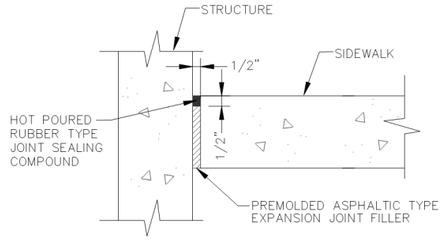
FLANGED PIPE SUPPORT
NOT TO SCALE



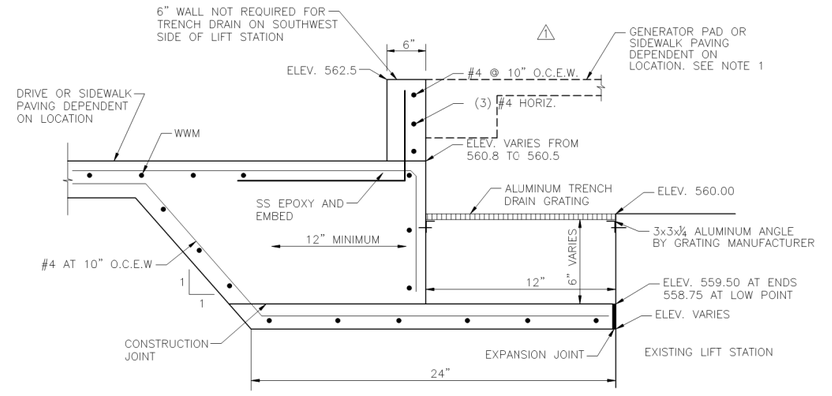
NOTES:

SEE SHEET LS-01 FOR ACCEPTABLE VALVE MANUFACTURERS.

BYPASS PUMPING DETAIL
NOT TO SCALE



ISOLATION JOINT AT STRUCTURE
NOT TO SCALE



PAVING HEADER AT TRENCH DRAIN
NOT TO SCALE

NOTES:

1. WHERE APPLICABLE, GENERATOR PAD AND SIDEWALK PAVING SHALL BE LOCATED ON THE SAME SIDE OF HEADER AS TRENCH DRAIN SHOWN.
2. 6" WALL REQUIRED FOR TRENCH DRAIN FACING DRIVE AND GENERATOR ONLY.

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

10/20/2022
JUSTIN A. ANGEL, P.E. DATE
TEXAS NO. 129386

STATE OF TEXAS
JUSTIN A. ANGEL
129386
LICENSED
PROFESSIONAL ENGINEER
3/13/2020

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ONE INCH

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY
1	4/30/21	RELOCATION OF FLOODWALL	JAA

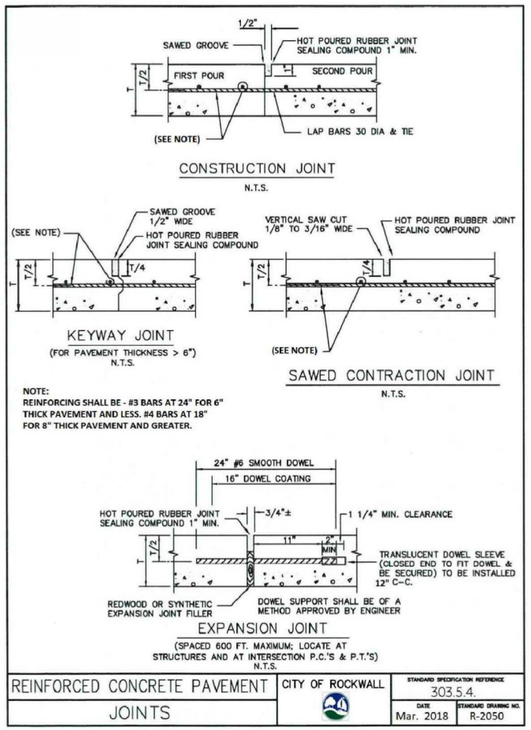
ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSION

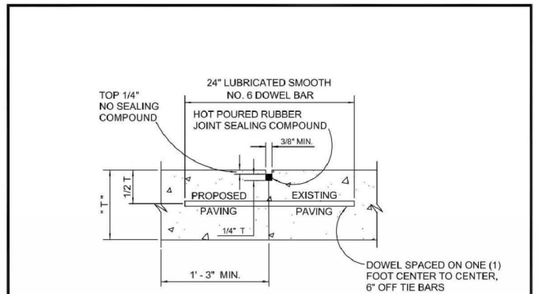
DETAILS I

Date:	MARCH 2020
Designed:	JAA
Drawn:	SRG
Reviewed:	MAP
PEC Proj. No.	ECD 18-004
SEQ.	of

SHEET NO.
LS-04



REINFORCED CONCRETE PAVEMENT	CITY OF ROCKWALL	STANDARD SPECIFICATION REFERENCE
JOINTS		303.5.4.
	DATE Mar. 2018	STANDARD DRAWING NO. R-2050

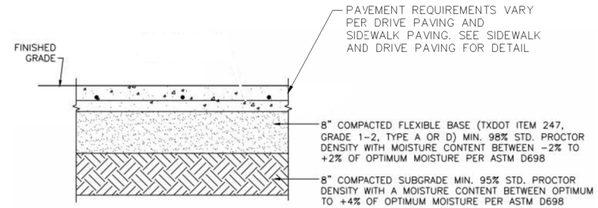


NOTES: T = PAVEMENT

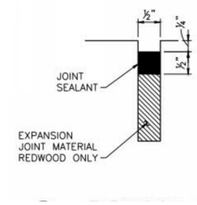
1. LONGITUDINAL BUTT CONSTRUCTION MAY BE UTILIZED IN PLACE OF LONGITUDINAL HINGED (KEYWAY) JOINT AT CONTRACTORS OPTION.
2. DOWEL BARS SHALL BE DRILLED INTO PAVEMENT HORIZONTALLY BY USE OF A MECHANICAL RIG.
3. DRILLING BY HAND IS NOT ACCEPTABLE, PUSHING DOWEL BARS INTO GREEN CONCRETE NOT ACCEPTABLE.

LONGITUDINAL BUTT JOINT
NOT TO SCALE

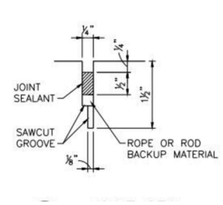
REINFORCED CONCRETE PAVEMENT	CITY OF ROCKWALL	
LONGITUDINAL BUTT JOINT		DATE OCT. '17 / DRAWING NO. R-2051



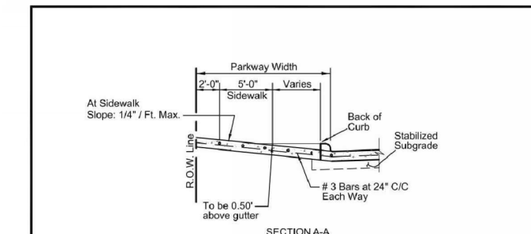
SITE PAVING DETAIL
NOT TO SCALE



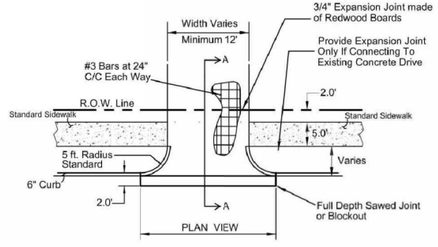
EXPANSION JOINT
NOT TO SCALE



JOINT SEAL
NOT TO SCALE



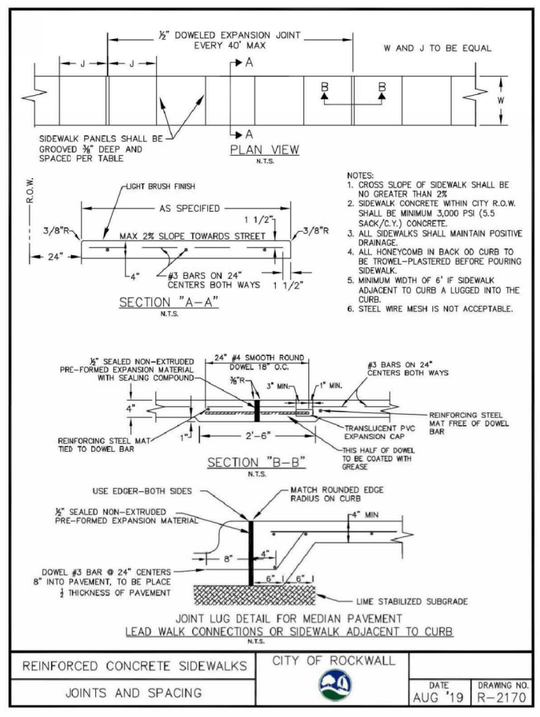
NOTE:
Sidewalk section thru driveway to be poured same thickness as driveway - 6" Thick 3,600 P.S.I. Reinf. Conc. Pvmt. w/ #3 Bars @ 24" O.C.E.W. (Grade 60 Steel)



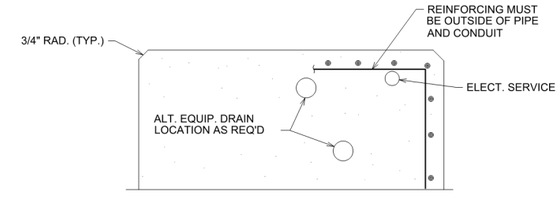
DRIVEWAY DETAILS
(Not to Scale)

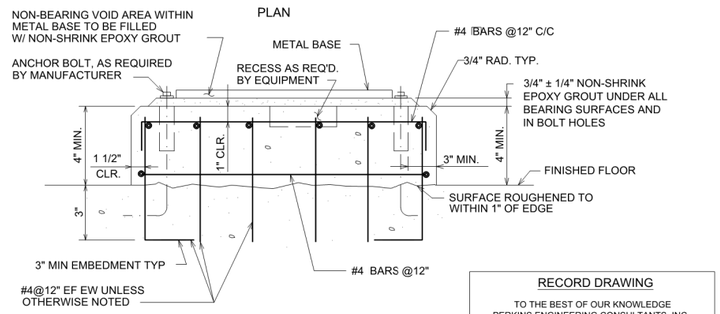
DRIVEWAY DETAIL	CITY OF ROCKWALL	
RESIDENTIAL DRIVEWAY		DATE AUG '19 / DRAWING NO. R-2150

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.
ONE INCH



REINFORCED CONCRETE SIDEWALKS	CITY OF ROCKWALL	
JOINTS AND SPACING		DATE AUG '19 / DRAWING NO. R-2170





EQUIPMENT BASE
NOT TO SCALE

EQUIPMENT BASE AND ANCHOR BOLT NOTES:

1. ALL EQUIPMENT, INCLUDING TANKS, SHALL HAVE A CONCRETE EQUIPMENT BASE TO SUIT.
2. ANCHOR BOLTS SHALL BE SIZED FOR THE EQUIPMENT LOAD PLUS SEISMIC LOADS. (ZONE 1).
3. ANCHOR BOLTS SHALL BE SET IN POCKETS, EITHER PIPE OR BLOCKOUTS. ANCHOR BOLT SHALL PENETRATE STRUCTURAL SLAB AS REQ'D. TO MEET MINIMUM EMBEDMENT REQUIRED BY MANUFACTURER.
4. DRILLED HOLES WITH A.B. SET IN NON-SHRINK EPOXY GROUT MAY BE USED IN LIEU OF HOOKED BOLTS. EXPANSION SHELL TYPE BOLTS SHALL NOT BE USED.
5. ALL PENETRATIONS FOR CONDUIT AND PIPING SHALL BE WITHIN CONCRETE EQUIPMENT PAD. PAD TO BE CONFIGURED ACCORDINGLY.
6. PIPE AND CONDUIT FOR FUTURE EQUIPMENT SHALL BE CAPPED FLUSH W/ FINISHED FLOOR.

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

JUSTIN A. ANGEL, P.E. TEXAS NO. 129386 — DATE 10/20/2022

STATE OF TEXAS
JUSTIN A. ANGEL
129386
LICENSED
PROFESSIONAL ENGINEER
3/13/2020

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY

DETAILS II

ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSION

Date:	MARCH 2020
Designed:	JAA
Drawn:	SRG
Reviewed:	MAP
PEC Proj. No.	ECD 18-004
SEQ.	of

SHEET NO.
LS-05

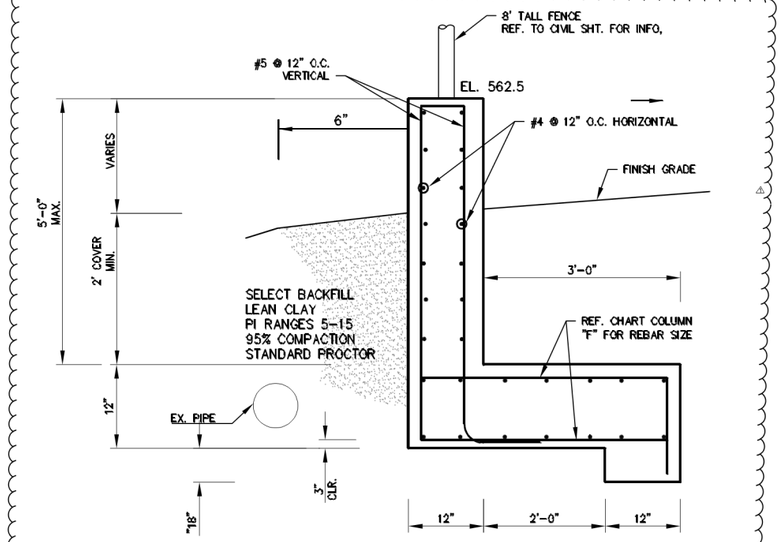
PRINTED: 9/29/2022 10:01 AM C:\Users\MaryAnn Gutierrez\Dropbox (PEC)\ACAD PEC\ECD 18-004 Timber Creek LS\GTS Only\CAD\LS-X DETAILS 1-2.dwg SAVED: 9/29/2022 9:33 AM USER: S. Gutierrez

RETAINING WALL INFORMATION TABLE:

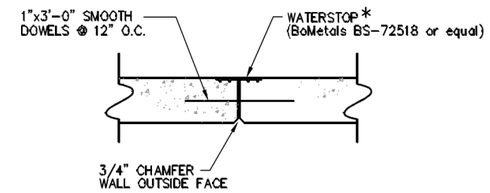
WALL TABLE:

HEIGHT (H)	"A"	"B"	"C"	"D"	"E"	"F"	"G"
2'-0" – 3'-0"	2'-0"	1'-0"	1'-6"	1'-0"	1'-0"	#4 @12"	#4 @12"
3'-0" – 5'-0"	2'-6"	1'-0"	3'-0"	1'-4"	1'-6"	#4 @10"	#4 @12"
5'-0" – 6'-0"	3'-0"	1'-0"	3'-6"	1'-4"	1'-6"	#5 @12"	#4 @12"
6'-0" – 7'-0"	4'-0"	1'-0"	3'-6"	1'-4"	2'-0"	#5 @8"	#4 @12"
7'-0" – 8'-0"	5'-0"	1'-0"	3'-6"	1'-4"	2'-0"	#5 @8"	#4 @12"

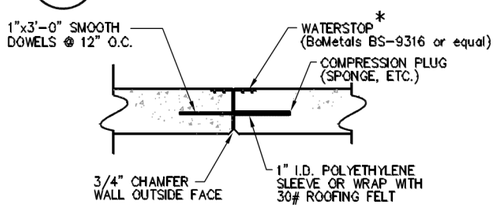
1. RETAINING WALL:
   - -MINIMUM SAFETY FACTOR:
     BEARING – 2 S.F.
     SLIDING – 1.5 S.F.
     OVERTURNING – 2 S.F.
   - -CONTROL JOINT SPACING:
     MAX. – 16' O.C.
     MIN. – 8' O.C.



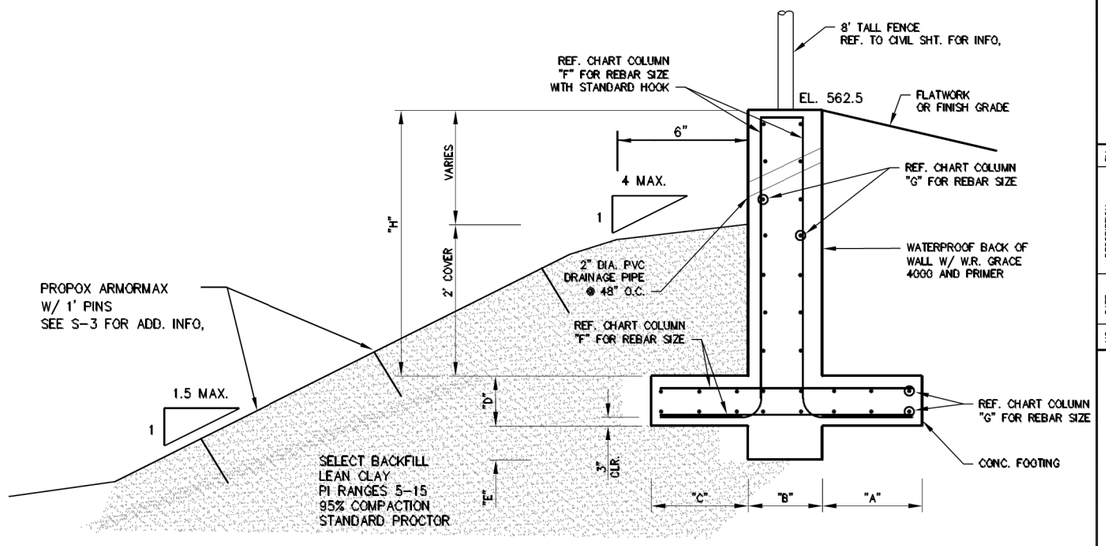
LIFT STATION WALL @ PIPE CONFLICT



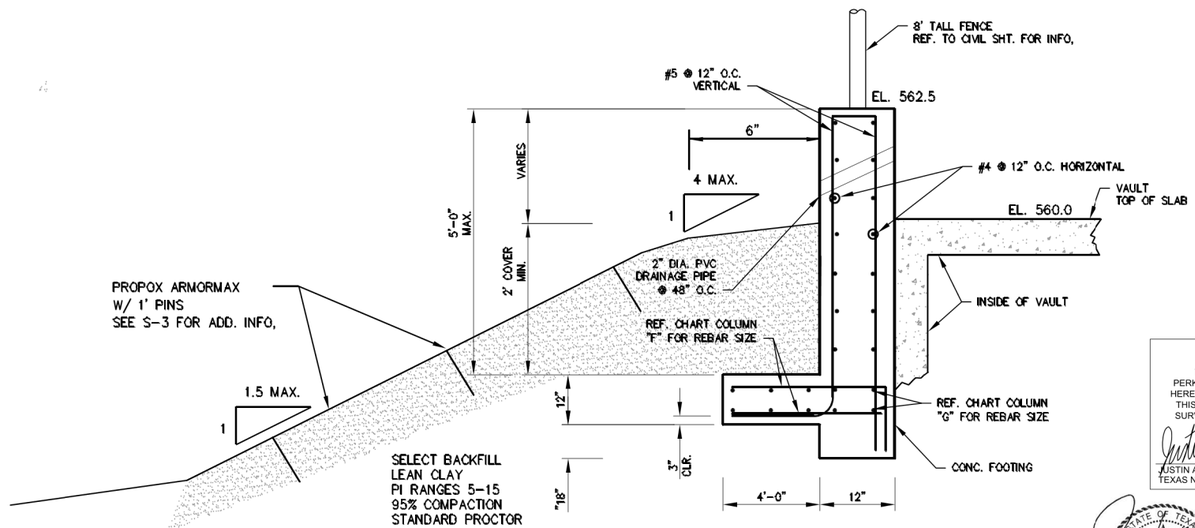
WALL CONTRACTION JOINT (C.J.)



WALL EXPANSION JOINT (E.J.)



LIFT STATION WALL TYPICAL



LIFT STATION WALL AGAINST VALVE VAULT

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

10/20/2022

JUSTIN A. ANGEL, P.E. — DATE
TEXAS NO. 129386

STATE OF TEXAS — JUSTIN ANGEL — 97440 — LICENSED PROFESSIONAL ENGINEER — 4/12/21

JAKAN ENGINEERING, PLLC
Texas Registered
Engineering Firm F-13414

JAKAN ENGINEERING
P.O. BOX 391
FRISCO, TX 75034
TBPE No. P13174
PHONE 817-659-7030

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

ONE INCH

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY
1	4/12/21	ADD ODOR PAD	SN

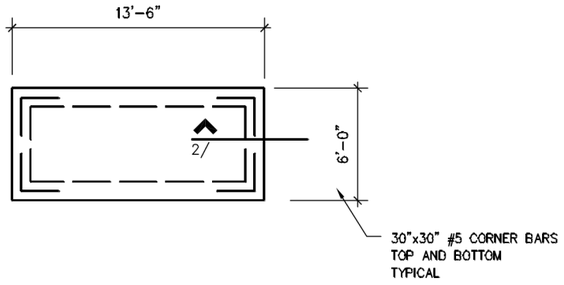
RETAINING WALL AND SLOPE PROTECTION DETAILS

ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSION

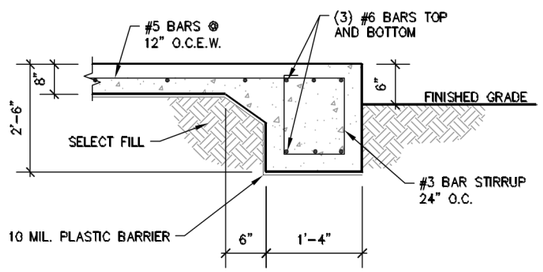
Date: NOVEMBER 2019
Designed:
Drawn:
Reviewed:
PEC Proj. No. ECD 18-004
SEQ. of

SHEET NO.
S-1.0

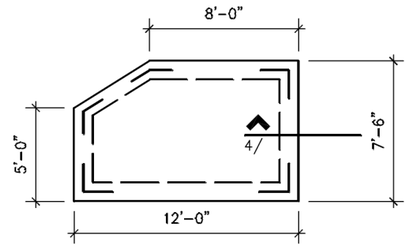


NOTE:
8" THK. CONC. SLAB REINF.
W/ #5 @ 12" O.C., E.W.
PLACE & HOLD @
MID-DEPTH SLAB (TYP.)

1 S2.0 GENERATOR PAD FOUNDATION PLAN

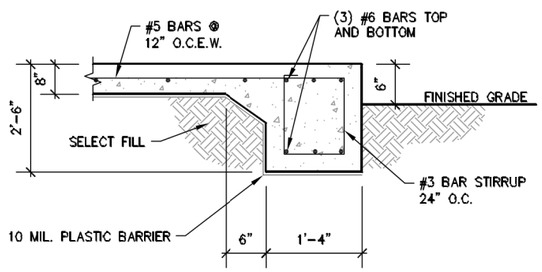


2 S2.0 GENERATOR PAD EDGE BEAM



NOTE:
8" THK. CONC. SLAB REINF.
W/ #5 @ 12" O.C., E.W.
PLACE & HOLD @
MID-DEPTH SLAB (TYP.)

3 S2.0 ODOR PAD FOUNDATION PLAN



4 S2.0 ODOR PAD EDGE BEAM

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

JUSTIN A. ANGEL, P.E. TEXAS NO. 129386 — DATE 10/20/2022

GENERAL NOTES:

1. Concrete f'c = 3600 psi at 28 days
2. Provide 48"x bar diameter min. lap splice length.
3. All reinforcing steel be grade 60, unless otherwise specified.
4. Provide 2" reinforcement clear cover u.n.o.
5. Refer to sheet E-3 for generator information.

STATE OF TEXAS — SON H. NGO — 97440 — LICENSED PROFESSIONAL ENGINEER — 4/12/21

JAKAN ENGINEERING, PLLC
Texas Registered
Engineering Firm F-13414

JAKAN ENGINEERING
P.O. BOX 391
FRISCO, TX 75034
TBPE No. FM13414
PHONE 817-459-7030

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

ONE INCH

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY
1	4/12/21	ADD ODOR PAD	SN

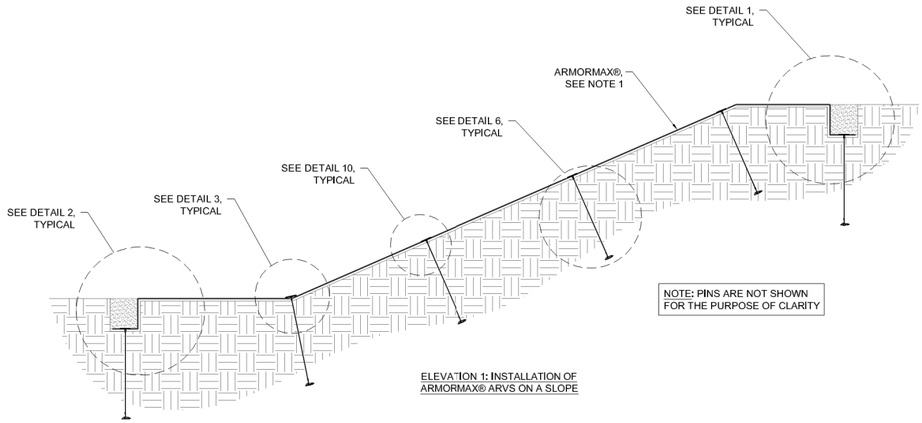
GENERATOR PAD PLAN

ENGINEERING CONCEPTS AND DESIGN

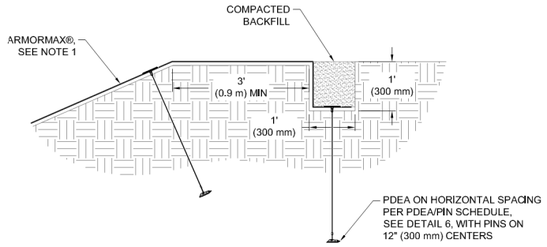
TIMBER CREEK LIFT STATION EXPANSION

Date: NOVEMBER 2019
Designed:
Drawn:
Reviewed:
PEC Proj. No. ECD 18-004
SEQ. of

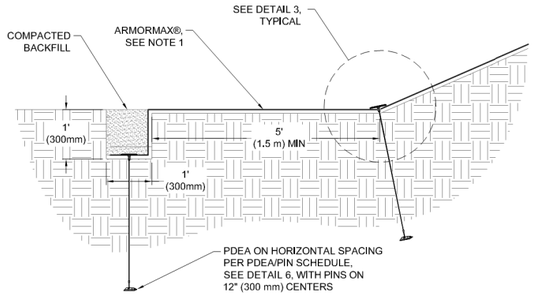
SHEET NO.
S-2.0



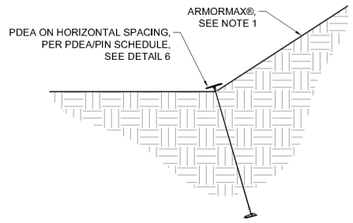
ELEVATION 1: INSTALLATION OF ARMORMAX® ARVS ON A SLOPE



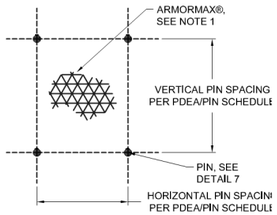
DETAIL 1: CREST OF SLOPE (COS) TRENCH



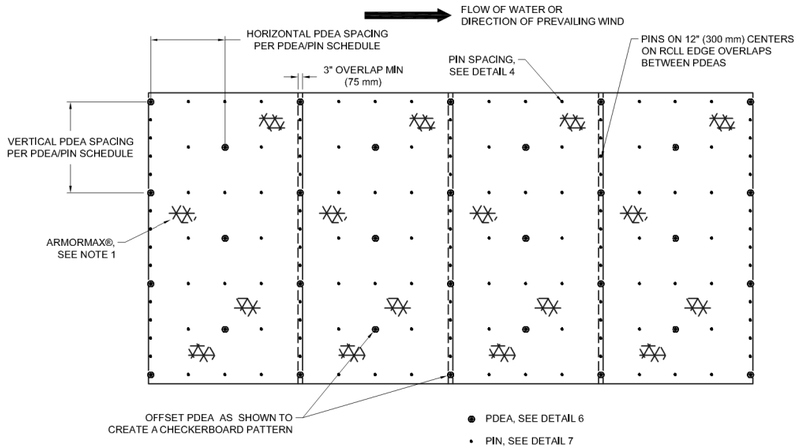
DETAIL 2: TOE OF SLOPE (TOS) TRENCH



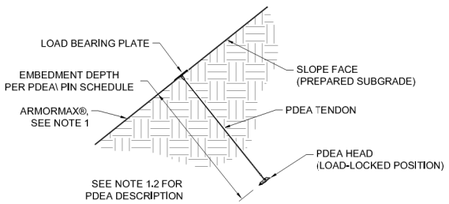
DETAIL 3: BREAK IN SLOPE INTERFACE



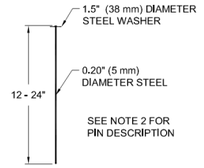
DETAIL 4: PIN PATTERN



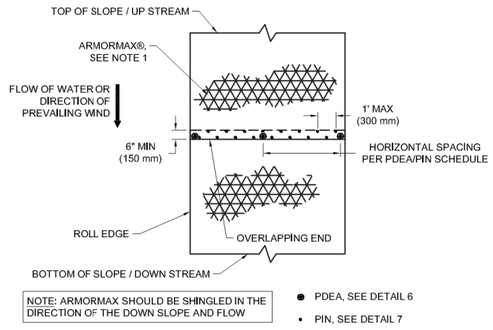
DETAIL 5: PDEA / PIN PATTERN



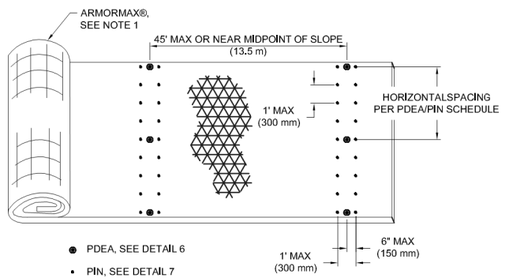
DETAIL 6: PERCUSSION DRIVEN EARTH ANCHOR (PDEA)



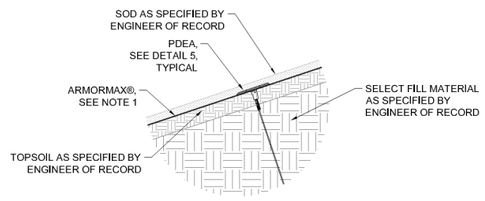
DETAIL 7: PIN



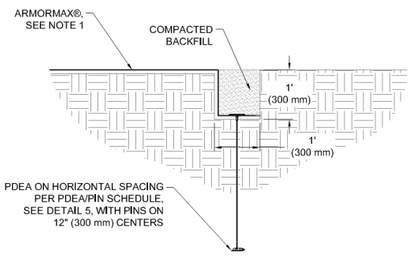
DETAIL 8: OVERLAP AT ROLL END DETAIL



DETAIL 9: SIMULATED CHECK SLOT DETAIL



DETAIL 10: VEGETATION ESTABLISHMENT



DETAIL 10: DOWNSTREAM AND UPSTREAM TERMINATION TRENCH

PDEA/PIN SCHEDULE

SECURING DEVICE	PDEA	PIN
HORIZONTAL PDEA SPACING	4' (1.20 m)	2' (0.60 m)
VERTICAL PDEA SPACING	5' (1.50 m)	2.5' (0.75 m)
EMBEDMENT DEPTH	3' (0.90 m)	12" (300 mm)

ARMORMAX® ARVS ON A SLOPE FOR EROSION CONTROL (NON-STRUCTURAL APPLICATION) GENERAL INSTALLATION GUIDELINES

GENERAL NOTES

1. The ArmorMax® Anchor Reinforced Vegetation System (ARVS) is an engineered solution used for permanent erosion protection or surficial slope stability in vegetated and unvegetated applications. It is composed of two components: Pyramat® High Performance Turf Reinforcement Mat (HPTRM) and Percussion Driven Earth Anchors (PDEAs). ArmorMax is available in green or tan to provide for an aesthetically pleasing solution with proven performance.
   1.1. Pyramat HPTRM is a three-dimensional, lofty, woven polypropylene geotextile that is available in green or tan which is specially designed for erosion control applications on steep slopes and vegetated waterways. The matrix is composed of polypropylene monofilament yarns featuring X3® technology woven into a uniform configuration of resilient pyramid-like projections. The material exhibits very high interlock and reinforcement capacity with both soil and root systems, demonstrates superior UV resistance, and enhances seedling emergence.
   1.2. The Type B1 PDEA model is used for permanent erosion protection applications and has a working load of up to 800 lbs. The Type B1 PDEA consists a die cast aluminum anchor head, zinc-aluminum coated carbon steel cable, a die cast zinc load-locking mechanism with a ceramic roller, and two aluminum ferrules. The bullet nose design of the anchor head allows the PDEA to penetrate HPTRM resulting in minimal installation damage. The Type B1 PDEA is also designed with a recessed cavity so the top of the cable can be cut below the surface being protected.
2. The 12", 18", and 24" Securing Pins are composed of a wire, mushroomed at the top. A washer is then placed on the wire and the wire is crimped or swedged about 3-1/2" below the top so the washer will not slide off. The end of the wire is cut at a 45 degree angle for easy penetration of the soil. These Pins with washers conform to industry standards for erosion control pins with washers.
3. Landlok® S2 Erosion Control Blankets consist of 100% wheat straw mechanically bound and covered on both sides by netting. The straw is homogeneously blended and evenly distributed throughout the blanket. The netting is photodegradable polypropylene with mesh openings of approximately 3/8 in. by 3/8 in. (11 mm by 11 mm). The blanket is sewn on approximately 2 in. (51 mm) centers with photodegradable polypropylene thread. This product is NTPEP approved for AASHTO standards.

BEFORE INSTALLATION BEGINS

1. Coordinate with a Propex Representative: A pre-construction meeting is suggested with the construction team and a representative from Propex. This meeting should be scheduled by the contractor with at least a two week notice.
2. Gather the Tools Needed: Tools that you will need to install ArmorMax include a pair of Industrial shears to cut Pyramat, tape measure, percussion hammer (sized appropriately for the PDEAs), ground rod driver compatible with the percussion hammer, drive steel compatible with the PDEA, setting tool to set and load-lock the PDEA, and wire cutters to cut the cable tendon of the PDEA. If PDEAs will be load tested during construction, additional testing equipment may be necessary. Consult the "Anchor Load Test Manual" from Propex for further guidance. Available for purchase from Propex are drive steel, setting tools, and wire cutters.
3. Determine how to Establish Vegetation: The method of vegetation establishment should be determined prior to the start of installation. Different vegetation establishment methods require different orders of installation. Refer to Establish Vegetation for further guidance.
4. Please consult the Propex Website for the most up to date installation guidelines.

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

10/20/2022

JUSTIN A. ANGEL, P.E. — DATE
TEXAS NO. 129386

Propex™ Geotextile Systems

EROSION CONTROL INSTALLATION DETAILS

Please note that the Information presented herein is general information only. It is for conceptual use only and not intended to be used for construction. While every effort has been made to ensure its accuracy, this information should not be used for a specific application without independent professional examination and verification of its suitability, applicability, and accuracy. This engineering drawing is protected by the Copyright Act, 17 U.S.C. §101 et sec. and may be used ONLY with the express written permission of Propex in connection with Propex products. Any copying, distributing, and/or creation of a derivative work without permission of Propex is prohibited and is subject of actual damages, statutory damages and attorney's fees under the Copyright Act.

△	1 of 1	ARMORMAX® BY PROPEX	ANCHOR REINFORCED VEGETATED SYSTEM (ARVS) ARMORMAX® INSTALLATION DETAILS FOR SLOPES	
△				
△		Date: 06/09/2015	Drawn By: N. Hamnani	Scale: NTS
Rev				*ALL DIMENSIONS ARE TO BE VERIFIED BY ENGINEER OF RECORD

S-3.0

LEGEND

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	BRANCH CIRCUIT PANEL BOARD
	CONTROL PANEL
	TELEPHONE TERMINAL BOARD
TB	TERMINAL BOARD
	CONDUIT WITH WIRE HOT NEUTRAL SWITCH LEG GROUND
	CONCEALED CONDUIT OR UG CONDUIT
	EXPOSED CONDUIT
	GROUND MAT
	CONDUIT – UP
	CONDUIT – DOWN
	CONDUIT – STUBBED AND CAPPED
—S—	SOUND SYSTEM WIRING RUN
—OE—	OVERHEAD ELECTRIC LINES
—T—	CONDUIT FOR TELEPHONE, 3/4" UNLESS OTHERWISE INDICATED
	ABANDON CONDUIT & REMOVE CONDUCTORS
LP–1,3	HOME RUN, LP INDICATES PANEL LP, 1,3 INDICATES CIRCUITS 1 & 3.
DP–1/3 DP–1/3/5	HOME RUN (208/1PH, 480V/1PH OR 3PH), DP INDICATES PANEL DP–1/3 INDICATES (2) POLE BKR, CKTS 1 & 3 DP–1/3/5 INDICATES (3) POLE BKR, CKTS 1, 3, & 5
XXX	CABLE IDENTIFICATION TAG
XXX	INST./CONTROL CABLE IDENTIFICATION TAG
XX XX	NAMEPLATE OR LEGEND PLATE, SEE SCH.
XXXXXXX	INSTRUMENT TAG NUMBER
	NOTE ON SHEET, NO. AS INDICATED
	LUMINAIRE, TYPE AS NOTED
B	LUMINAIRE, TYPE AS NOTED
A	LUMINAIRE FLUORESCENT, TYPE AS NOTED
A	LUMINAIRE AND POLE, TYPE AS NOTED
D	WALL MOUNTED LUMINAIRE, TYPE AS NOTED
	FLOODLIGHTS AIM IN DIRECTION SHOWN
E	EXIT SIGN
D	EXIT/EMERGENCY COMBO
C	EMERGENCY LIGHTING UNIT
$3	LIGHT SWITCH, '3' INDICATES 3–WAY SWITCH
$M	MOTORIZED SWITCH
MSP	MANUFACTURER SUPPLIED PACKAGE INCLUDES LOCAL COMBINATION STARTER, MOTOR AND CONTROL PANEL. NUMBER INDICATES HORSE POWER
10 M	MOTOR, SQUIRREL CAGE INDUCTION HORSEPOWER INDICATED ON ONE LINE, NUMBER INDICATES HORSEPOWER
	CONVENIENCE RECEPTACLE–DUPLEX UNLESS SPECIFIED OTHERWISE C = CLOCK HANGER CR = CORROSION RESISTANT EWC = WATER COOLER TL = TWIST LOCK WP = WEATHERPROOF GFCI = GROUND FAULT CIRCUIT INTERRUPTER
	RECEPTACLE – 240V/1PH OR 208V/1PH
	MULTI–OUTLET ASSEMBLY
	RECEPTACLE – 480V/3PH OR 208V/3PH

SYMBOL	DESCRIPTION
J	JUNCTION BOX
T	THERMOSTAT
	TELEPHONE/DATA OUTLET
	INSTRUMENT
	GROUND TEST WELL, REFER TO STANDARD DETAIL
	COPPERCLAD GROUND ROD
	GROUNDING PAD
	CIRCUIT BREAKER – THERMAL MAGNETIC 3 POLE UNLESS INDICATED OTHERWISE CONTINUOUS AMP TRIP SETTING INDICATED
100A	SWITCH – CURRENT RATING INDICATED. 3 POLE UNLESS INDICATED OTHERWISE
800AF/600AT	DRAWOUT AIR CIRCUIT BREAKER LOW VOLTAGE, FRAME SIZE AND TRIP SETTING INDICATED
1200A 52	DRAWOUT AIR OR VACUUM CIRCUIT BREAKER, (VCB) MEDIUM VOLTAGE, FRAME SIZE INDICATED
	LIGHTNING AND SURGE ARRESTOR
	FUSE, (ONE LINE DIAGRAM OR SCHEMATIC)
10	CAPACITOR – KVAR INDICATED
	GROUND, (ONE LINE DIAGRAM OR SCHEMATIC)
480V 120V	CONTROL POWER TRANSFORMER – VOLTAGES INDICATED
2000KVA	POWER DISTRIBUTION TRANSFORMER VOLTAGES AND RATING INDICATED
4160/480V	SHIELDED ISOLATED TRANSFORMER VOLTAGES AND RATING INDICATED
3	CURRENT TRANSFORMER – NUMBER INDICATES QUANTITY
1	WINDOW CURRENT TRANSFORMER ENCLOSING ALL CONDUCTORS
24" W	CABLE TRAY, LADDER TYPE, WIDTH AS INDICATED
ATS	AUTOMATIC TRANSFER SWITCH
	ELECTRICAL SERVICE METER
OR	CONTROL STATION
	PUSH–BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN
	PUSH–BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED
	PUSHBUTTON SWITCH, MAINTAINED CONTACTS, WITH MECHANICAL INTERLOCK
OFF LOCAL REMOTE POLE 1 XOO POLE 2 OOX	SELECTOR SWITCH–MAINTAINED CONTACT. CHART DEFINES OPERATION:

	POSITION		
POLE	LOCAL	OFF	REMOTE
1	X	0	0
2	0	0	X

X = CLOSED CONTACT
0 = OPEN CONTACT

	PANELBOARD
	NON FUSED DISCONNECT
	FUSED DISCONNECT
	LOCAL COMBINATION (IN FIELD) MAGNETIC STARTER WITH THERMAL OVERLOAD

SYMBOL	DESCRIPTION
	FLOW SWITCH
	LIMIT SWITCH
	PRESSURE SWITCH
	TEMPERATURE SWITCH OR THERMOSTAT
	VACUUM SWITCH
L.O. STOP	LOCKOUT STOP PUSH–BUTTON
	NORMALLY OPEN DELAY ON MAKE
	NORMALLY CLOSE DELAY ON MAKE
	NORMALLY CLOSE DELAY ON BREAK
	NORMALLY OPEN DELAY ON BREAK
	FLOAT SWITCH
A	INDICATING LIGHT – PUSH TO TEST LETTER INDICATES COLOR.
	MEDIUM VOLTAGE VACUUM INTERRUPTER
	CONTACT – NORMALLY OPEN
	CONTACT – NORMALLY CLOSED
	THERMAL OVERLOAD RELAY
*	BASIC RELAY SYMBOL * SOME RELAY FUNCTIONS: ALT = ALTERNATOR CR = CONTROL RELAY TR = TIMING RELAY M = MOTOR CONTACTOR
	TERMINALS FOR FIELD OR REMOTE WIRING CONNECTIONS. DEVICES LOCATED BETWEEN THESES SYMBOLS ARE LOCATED IN THE FIELD OR REMOTELY.
	MOTOR OR STARTER ENCLOSURE SPACE HEATER (ONE LINE DIAGRAM OR SCHEMATIC)
+ –	BATTERY
	SOLID STATE DEVICE SUCH AS RECTIFIER OR SCR DRIVE
	DEVICE LOCATED AT MOTOR OR IN FIELD
	DEVICE LOCATED AT VALVE
	DEVICE LOCATED IN MCC
	DEVICE LOCATED IN SWGR – 5KV
	DEVICE LOCATED IN CONTROL/ INSTRUMENT PANEL
	STROBE/HORN
F	MANUAL PULL STATION
	SILENCE SWITCH
	EMERGENCY STOP
M	MOTOR OPERATED

LEGEND:

- MODIFIED OR DEMOLISHED
- PROPOSED
- EXISTING

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

ONE INCH

SWITCHGEAR / MCC SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
87T	TRANSFORMER DIFFERENTIAL PROTECTIVE RELAY	T	TACHOMETER (4–20ma)
AM	AMMETER	TDR	TIME DELAY RELAY
AS	SWITCH BREAKER	VAR	VAR METER
CS	CONTROL SWITCH	VM	VOLTMETER
E	ELECTRICAL INTERLOCK	VS	VOLTMETER SWITCH
ETM	ELAPSED TIME METER	W	WATTMETER
K	KEY INTERLOCK	W/WH	WATT/WATT HOUR TRANSDUCER
PF	POWER FACTOR METER	WH	WATT–HOUR METER
RPM	RPM METER	WHD/WH	WATT HOUR DEMAND/WATT HOUR METER
SST	SOLID STATE TRIP		

ELECTRICAL ABBREVIATIONS

A	AMPERAGE	IC	INTERRUPTING CAPACITY	PR	PRESETTING RELAY (TIMER)
AC	ALTERNATING CURRENT	IGV	INLET GUIDE VANE	PSI	POUNDS PER SQUARE INCH
ACU	AIR CONDITIONING UNIT	INCAND	INCANDESCENT	PT	POTENTIAL TRANSFORMER
AIT	ANALYZER INDICATING TRANSMITTER	INST	INSTANTANEOUS	PTT	PUSH TO TEST
AJB	ANALOG JUNCTION BOX	INB	INBOARD	PVC	POLYVINYL CHLORIDE
AM	AMMETER			PWR	POWER
ANN	ANNUNCIATOR	JB	JUNCTION BOX		
ANSI	AMERICAN NATIONAL STANDARD INSTITUTE	K	KEY INTERLOCK	R	RELAY
ATS	AUTOMATIC TRANSFER SWITCH	KS	INTERLOCK KEY SWITCH	REV	REVERSE
AUTO	AUTOMATIC	KVA	KILOVOLT–AMPERE	REQD	REQUIRED
AUX	AUXILIARY	KW	KILOWATT	RGS	RIGID GALVANIZED STEEL
				RLY	RELAY
B	BELL	L, LP	LIGHTING PANEL	RS	RIGID STEEL
BFM	BLOWER FILTER MOTOR	LA	LIGHTNING ARRESTOR	RVNR	REDUCED VOLTAGE NON–REVERSING
BYZ	WINDOW CURRENT TRANSFORMER	LC	LIGHTING CONTACTOR	RVR	REDUCE VOLTAGE REVERSING
C,COND	CONDUIT	LCP	LOCAL CONTROL PANEL	RVSS	REDUCE VOLTAGE SOLID STATE
CB	CIRCUIT BREAKER	LE	LEVEL ELEMENT	RTD	RESISTANCE TEMP DETECTORS
CC	CONTROL CABLE	LIT	LEVEL INDICATING TRANSMITTER	RTU	REMOTE TERMINAL UNIT
C/C	CENTER TO CENTER	LLO	LOW LEVEL LOCKOUT		
CHH	COMMUNICATIONS HAND HOLE	LO	LOCKOUT	S, SV	SOLENOID VALVE
CJB	CONTROL JUNCTION BOX	LPU	LOCAL PROCESSING UNIT	SC	SHORT CIRCUIT
CKT	CIRCUIT	LR	LATCH RELAY	SCADA	CONTROL AND DATA ACQUISITION
CS	CONTROL SWITCH	LRC	LOCKED ROTOR CURRENT		
CT	CURRENT TRANSFORMER	LMS	LIMIT SWITCH	SCU	SPEED CONTROL UNIT SUPPLY
CTRL	CONTROL	LS	LEVEL SWITCH	SF	FAN
CU	CONDENSING UNIT	LSC	LIMIT SWITCH VALVE CLOSE	SPD	SURGE PROTECTIVE DEVICE
		LSH	LEVEL HIGH SWITCH	SRV	SURGE RELIEF VALVE
DC	DIRECT CURRENT	LSL	LEVEL LOW SWITCH	SS	STAINLESS STEEL
DF	DRINKING FOUNTAIN	LSO	LIMIT SWITCH VALVE OPEN	SW	NETWORK SWITCH
DFR	DIFFERENTIAL RELAY	LTG	LIGHTING	SWG	SWITCHGEAR
DS	DISCONNECT SWITCH	LV	LOW VOLTAGE	SWT	SWITCH
DTL	DETAIL	MCC	MOTOR CONTROL CENTER	T	THERMOSTAT
		MGB	MASTER GROUND BAR	TB	TERMINAL BOX
EC	EMPTY CONDUIT	MJB	MOTOR JUNCTION BOX	TD	TIME DELAY
EF	EXHAUST FAN	MOV	MOTOR OPERATED VALVE	TDC	TIME DELAY CLOSING
EHH	ELECTRIC HAND HOLE	MRP	MOTOR RELAY PROTECTION	TDE	TIME DELAY ENERGIZED
EXIST.	EXISTING	MAINT.	MAINTAINED	TDO	TIME DELAY OPENING
EP	EXPLOSION PROOF	MCP	MOTOR CIRCUIT PROTECTOR	TJB	TERMINAL JUNCTION BOX
ETM	ELAPSED TIME METER	MCB	MAIN CIRCUIT BREAKER	TP	TWISTED PAIR
E–STOP	EMERGENCY STOP			TSP	TWISTED SHIELDED PAIR
		N	NEUTRAL GROUNDED CONDUCTOR	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
F	FORWARD	NA	NON–AUTOMATIC		
FCV	FLOW CONTROL VALVE	NC	NORMALLY CLOSED		
FIT	FLOW INDICATING TRANSMITTER	NF	NON–FUSED	UG	UNDERGROUND
FT	FLOW TRANSMITTER	NO	NORMALLY OPEN	UH	UNIT HEATER
FLA	FULL LOAD AMPERE			UPS	UNINTERRUPTIBLE POWER SUPPLY
FLUO	FLUORESCENT	OB	OUTBOARD		
FMR	FEEDER MANAGEMENT RELAY	OC	OVERCURRENT	UV	UNDERVOLTAGE
FO	FIBER OPTIC	OHD	OVERHEAD DOOR		
FQI	FLOW INTEGRATED TOTALIZER	OL	OVERLOAD	V	VOLT
FU	FUSE	OPDU	OVERALL POWER DISTRIBUTION UNIT	VCR	VALVE CLOSE RELAY
FVNR	FULL VOLTAGE NON–REVERSING	OV	OVERVOLTAGE	VFD	VARIABLE FREQUENCY DRIVE
FVR	FULL VOLTAGE REVERSING			VM	VOLTMETER
		PB	PUSHBUTTON	VP	VAPOR PROOF
GALV	GALVANIZED	PB	PULLBOX	VOR	VALVE OPEN RELAY
GEN	GENERATOR	PBR	PUMP–BEARING RELAY		
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	PC	PHOTOCELL	W	WIRE
G,GND	GROUND	PC	PERSONAL COMPUTER	WHD	WATT HOUR DEMAND METER
		PH	PHASE	WP	WEATHER PROOF
HH	HAND HOLE	PLC	PROGRAMMABLE LOGIC CONTROLLER		
HOA	HAND OFF AUTOMATIC	PMT	PAD MOUNTED TRANSFORMER	XFMR	TRANSFORMER
HS	HAND SWITCH	PMGR	PAD MOUNTED SWITCHGEAR		
HV	HIGH VOLTAGE	PP	POWER PANEL		

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LKC-ES ENGINEERING, INC.
TBPE FIRM 13810
800 E. CAMPBELL RD, SUITE 270
RICHARDSON, TX 75081
972-677-7865

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

JUSTIN A. ANGEL, P.E. TEXAS NO. 129386 — DATE 10/20/2022

LKC-ES ENGINEERING SERVICE
800 East Campbell Rd Ste. 270 Richardson, Tx. 75081 972-677-7865
ENGINEERING SERVICE TBPE FIRM #13810

STATE OF TEXAS
TIMOTHY E. CAMPBELL
81011
LICENSED
PROFESSIONAL ENGINEER
03/16/2020

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F–8699

NO.	DATE	DESCRIPTION	BY

ELECTRICAL

ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSIOIN

Date:	NOVEMBER 2019
Designed:	JAA
Drawn:	SRG
Reviewed:	MAP
PEC Proj. No.	ECD 18–004
SEQ.	of

SHEET NO.
E-1

PRINTED: 5/14/2021 2:50 PM \\LKC-ES\Projects\PEC1802 Rockwall Lift Station – Timber Creek\Drawings\Electrical\E-1 ELECTRICAL LEGEND.dwg SAVED: 4/16/2020 4:40 PM USER: LKC

LIFT STATION NOTES:

GENERAL:

1. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICIAN IN THE STATE OF TEXAS.
2. ALL CONDUITS MUST BE RUN PLUMB AND SHALL NOT HAVE LOOSE CONNECTIONS.
3. ALL WIRING SHALL BE XHHW INSULATION WITH STRANDED COPPER CONDUCTORS.
4. ALL ABOVE GRADE CONDUIT SHALL BE RIGID ALUMINUM.
5. ALL BELOW GRADE CONDUITS SHALL BE RIGID SCHEDULE 80 PVC WITH PVC COATED STEEL ELBOWS. ELBOWS MUST BE LONG SWEEP ELBOWS.
6. ENCLOSURES SHALL BE NEMA 4X, 316 STAINLESS STEEL UNLESS SPECIFICALLY NOTED OTHERWISE.
7. ELECTRICAL INSTALLATION MUST BE PER NATIONAL ELECTRIC CODE AS AMENDED BY THE AUTHORITY HAVING JURISDICTION.
8. PROVIDE FREE STANDING PUMP CONTROL PANEL WITH PHYSICAL SEPERATION OF POWER AND CONTROL SECTIONS.
9. THE CONTROL SYSTEM SHALL BE DESIGNED TO OPERATE THE REQUIRED NUMBER OF PUMPS SPECIFIED ON THE DRAWING AT THE POWER CHARACTERISTICS SHOWN ON THE PLANS. THE CONTROL FUNCTION SHALL PROVIDE FOR THE OPERATION OF THE PUMPS IN HAND (MANUAL) AND AUTO (CONTROLLED BY PLC). SEE "24VAC REGULATOR SYSTEM" FOR FURTHER INFORMATION. THE CONTROL SHALL FUNCTION AS DESCRIBED BELOW. THE EQUIPMENT LISTED BELOW IS A GUIDE AND DOES NOT RELIEVE THE SUPPLIER FROM PROVIDING A SYSTEM THAT WILL FUNCTION AS REQUIRED.
10. ENCLOSURE: THE ENCLOSURE SHALL BE A NEMA 4X RATED STAINLESS STEEL. THE ENCLOSURE SHALL BE A WALL MOUNT TYPE WITH A MINIMUM DEPTH OF 8" SIZED TO ADEQUATELY HOUSE ALL THE COMPONENTS. THE DOOR GASKET SHALL BE RUBBER COMPOSITION WITH A RETAINER TO ASSURE A POSITIVE WEATHERPROOF SEAL. THE DOOR SHALL OPERATE WITH A SINGLE ACTION HANDLE THAT ACCEPTS A 3/8" SHAFT PADLOCK AND OPENS A MINIMUM OF 180 DEGREES.
11. INNER DEAD FRONT DOOR: A POLISHED ALUMINUM DEAD FRONT SHALL BE MOUNTED ON A CONTINUOUS AIRCRAFT TYPE HINGE, CONTAIN CUTOUTS FOR MOUNTED EQUIPMENT, AND PROVIDE PROTECTION OF PERSONNEL FROM LIVE INTERNAL WIRING. CUTOUTS FOR BREAKER HANDLES SHALL BE PROVIDED TO ALLOW OPERATION OF BREAKERS WITHOUT ENTERING THE COMPARTMENT. NO DOOR MOUNTED OPERATING MECHANISMS ALLOWED FOR BREAKER OPERATION. ALL CONTROL SWITCHES, INDICATOR PILOT LIGHTS, ONE GENERAL PURPOSE GFI DUPLEX RECEPTACLE AND OTHER OPERATIONAL DEVICES SHALL BE MOUNTED ON THE EXTERNAL SURFACE OF THE DEAD FRONT. THE DEAD FRONT SHALL OPEN A MINIMUM OF 150 DEGREES TO ALLOW ACCESS TO EQUIPMENT FOR MAINTENANCE. A ¾" BREAK SHALL BE FORMED AROUND THE PERIMETER OF THE DEAD FRONT TO PROVIDE RIGIDITY.
12. BACK PLATE: THE BACK PLATE SHALL BE MANUFACTURED OF 12-GAUGE SHEET STEEL AND BE FINISHED WITH A PRIMER COAT AND TWO (2) COATS OF BAKED ON WHITE ENAMEL. ALL DEVICES SHALL BE PERMANENTLY IDENTIFIED.
13. POWER DISTRIBUTION: THE PANEL POWER DISTRIBUTION SHALL INCLUDE ALL NECESSARY COMPONENTS AND BE WIRED WITH STRANDED COPPER CONDUCTORS RATED AT A MINIMUM OF 90 DEGREES C.
14. CIRCUIT BREAKERS: ALL CIRCUIT BREAKERS SHALL BE HEAVY-DUTY THERMAL MAGNETIC OR MOTOR CIRCUIT PROTECTORS SIMILAR AND EQUAL TO SQUARE D TYPE FAL. EACH MOTOR BREAKER SHALL BE ADEQUATELY SIZED TO MEET THE PUMP MOTOR OPERATING CHARACTERISTICS AND SHALL HAVE A MINIMUM OF 10,000 AMPS INTERRUPTING CAPACITY FOR 230 VAC AND 14,000 AMPS AT 480 VAC. THE CONTROL CIRCUIT AND THE DUPLEX RECEPTACLES SHALL BE INDIVIDUALLY CONTROLLED BY HEAVY-DUTY BREAKERS. CIRCUIT BREAKERS SHALL BE INDICATING TYPE, PROVIDING "ON-OFF-TRIP" POSITIONS OF THE OPERATING HANDLE. WHEN THE BREAKER IS TRIPPED AUTOMATICALLY, THE HANDLE SHALL ASSUME A MIDDLE POSITION INDICATING "TRIP". THERMAL MAGNETIC BREAKERS SHALL BE QUICK-MADE AND QUICK-BREAK ON BOTH MANUAL AND AUTOMATIC OPERATION AND HAVE INVERSE TIME CHARACTERISTICS SECURED THROUGH THE USE OF BIMETALLIC TRIPPING ELEMENTS SUPPLEMENTED BY A MAGNETIC TRIP. BREAKERS SHALL BE DESIGNED SO THAT AN OVERLOAD ON ONE POLE AUTOMATICALLY TRIPS AND OPENS ALL LEGS. FIELD INSTALLED HANDLED TIES SHALL NOT BE ACCEPTABLE.
15. MOTOR STARTERS: MOTOR STARTERS SHALL BE OPEN FRAME, ACROSS THE LINE; NEMA RATED WITH INDIVIDUAL OVERLOAD PROTECTION IN EACH LEG. MOTOR STARTER CONTACT AND COIL SHALL BE REPLACEABLE FROM THE FRONT OF THE STARTER WITHOUT BEING REMOVED FROM ITS MOUNTED POSITION. OVERLOAD HEATERS SHALL BE SOLID STATE MOTOR LOGIC TYPE WITH THE FOLLOWING FEATURES: 3 TO 1 ADJUSTMENT FOR TRIP CURRENT, PHASE LOSS AND UNBALANCE PROTECTION, LED POWER INDICATION, AMBIENT INSENSITIVE AND SELF-POWERED, AND SHALL HAVE AVAILABILITY OF ELECTRICAL REMOTE RESET. OVERLOADS SHALL BE SIZED FOR THE FULL LOAD AMPERAGE DRAW OF THE PUMPS. DEFINITE PURPOSE CONTACTORS, FRACTIONAL SIZE STARTERS AND HORSEPOWER RATED CONTACTORS OR RELAYS SHALL NOT BE ACCEPTABLE.
16. TRANSFORMERS: CONTROL TRANSFORMERS SHALL PROVIDE THE 120 VAC AND/OR 24 VAC FOR CONTROL CIRCUITS. TRANSFORMERS SHALL BE FUSED ON THE PRIMARY AND SECONDARY CIRCUITS. THE SECONDARY SHALL BE GROUNDED.
17. LIGHTNING-TRANSIENT PROTECTION: A LIGHTNING-TRANSIENT PROTECTOR WITH TELL-TALE WARNING LIGHTS ON EACH PHASE TO INDICATE LOSS OF PROTECTION ON THE INDIVIDUAL PHASES SHALL BE PROVIDED. THE DEVICE SHALL BE SOLID STATE WITH A RESPONSE TIME OF LESS THAN 5 NANOSECONDS WITHSTANDING SURGE CAPACITY OF 6500 AMPERES. UNIT SHALL BE INSTANT RECOVERY, LONG LIFE AND HAVE NO HOLDOVER CURRENTS.
18. PHASE MONITOR: A LINE VOLTAGE RATED, ADJUSTABLE PHASE MONITOR SHALL BE INSTALLED TO SENSE LOW VOLTAGE, LOSS OF POWER, REVERSED PHASING AND LOSS OF A PHASE. CONTROL CIRCUIT SHALL DE-ENERGIZE UPON SENSING ANY OF THE FAULTS AND SHALL AUTOMATICALLY RESTORE SERVICE UPON RETURN TO NORMAL POWER.
19. ALARM SYSTEM: THE ALARM LIGHT SHALL BE A WEATHERPROOF, SHATTERPROOF, RED LIGHT FIXTURE WITH 500 LUMENS MINIMUM TO INDICATE ALARM CONDITIONS. THE ALARM LIGHT SHALL BE TURNED ON BY THE ALARM LEVEL. THE ALARM LIGHT SHALL BE MOUNTED ON THE EXTERIOR OF THE CABINET. THE ALARM HORN SHALL PROVIDE AN AUDIO SIGNAL OF NOT LESS THAN 90 DB AT 10 FEET. AN ALARM SILENCE SWITCH SHALL BE MOUNTED ON THE EXTERIOR OF THE CABINET AND DEACTIVATE THE ALARM HORN; HOWEVER, THE ALARM LIGHT SHALL FLASH UNTIL THE ALARM CONDITION CEASES TO EXIST. AN INPUT SHALL BE PROVIDED TO PLC TO INDICATE HIGH WET WELL CONDITION.
20. 24 VAC REGULATOR SYSTEM:

GENERATOR:

1. SYSTEM SHALL BE EQUIPPED WITH AN EMERGENCY GENERATOR WITH AN AUTOMATIC TRANSFER SWITCH CAPABLE OF PROGRAMMABLE TEST DATES AND TIMES. INPUTS SHALL BE PROVIDED TO PLC TO INDICATE GENERATOR RUNNING, GENERATOR ALARM, AND GENERATOR LOW FUEL LEVEL OR A STAND ALONE MANUAL DOUBLE THROW SAFETY SWITCH TO ALLOW HARD WIRING TO A PORTABLE GENERATOR. NO DOOR MOUNTED OPERATING MECHANISMS ALLOWED FOR BREAKER OPERATION IN CONTROL PANEL. ALL CONDUCTOR TERMINATIONS SHALL BE AS RECOMMENDED BY THE DEVICE MANUFACTURER.
2. GENERATOR SHALL HAVE WEATHER PROOF SOUND ATTENUATING ENCLOSURE.
3. PROVIDE ENGINE BLOCK HEATER TO OPERATE ON 208V, SINGLE PHASE AND BATTERY CHARGER OPERATED FROM 120V SINGLE PHASE FOR THE GENERATOR.
4. GENERATOR MUST MEET EPA EMISSIONS REQUIREMENTS FOR STANDBY OPERATION.
5. GENERATOR MUST INCLUDE CIRCUIT BREAKER TO PROTECT THE ALTERNATOR. INSULATION LEVEL TO BE CLASS H.
6. ALTERNATOR SHALL HAVE COPPER WINDINGS AND PROVIDE 480/277V, WYE THREE-PHASE, FOUR-WIRE, 60 HERTZ.
7. MOUNTING FRAME SHALL BE INDEPENDENT OF CONCRETE FOUNDATION FOR SUPPORT.
8. PROVIDE VOLTAGE REGULATION FOR THE GENERATOR SET.
9. ENGINE SHALL RUN ON #2 DIESEL FUEL.
10. MUFFLER/SILENCER SHALL BE CRITICALLY RATED.
11. FUEL TANK SHALL BE DOUBLE WALLED COMPLIANT WITH EPA, AND SHALL INCLUDE A LOW FUEL LEVEL ALARM THAT WILL BE SENT TO SCADA. FUEL TANK WILL BE INTEGRAL TO THE GENERATOR.

SCADA:

1. CONTRACTOR MAY USE EXISTING ANTENNA FOR NEW TRANSMITTER
2. PLC SHALL BE MODICON M340.
3. EQUIPMENT FOR SCADA SHALL BE RLC CONTROLS PART# UM2-D32M-M6A CONSISTING OF A PLC, RADIO, ANTENNA, ETC. TO OPERATE THE SYSTEM.CONTROL CABINET COMPONENTS SHALL BE INSTALLED WHEN THE PANEL IS BUILT. ENGINEER SHALL CONTACT THE PUMP DEPARTMENT AT 972-771-7730 FOR CURRENT REQUIREMENTS FOR SCADA SYSTEM AND CONTACT FOR CITY'S CURRENT SCADA SUPPLIER.
CONTACT PHONE NUMBER FOR RLC IS 972-542-7375
PROGRAMMING SHALL BE INCLUDED IN PURCHASE PRICE OF THE ABOVE PART BY RLC CONTROLS, USING SCHNEIDER ELECTRIC UNITY PLC PROGRAMMING SOFTWARE. CHECK WITH RLC CONTROLS TO VERIFY ALL NEEDED INPUTS AND OUTPUTS FOR PLC PROGRAMING.
4. THE CONTROL SYSTEM SHALL PROVIDE FOR BOTH AUTOMATIC AND MANUAL CONTROL AND ALTERNATION OF THE PUMPS TO MAINTAIN A PUMPED DOWN CONDITION OF THE WET WELL.
5. WET WELL LEVELS SHALL BE SENSED BY A PRESSURE TRANSDUCER. FLOAT REGULATORS SHALL BE INSTALLED AS BACK UP FOR HIGH AND LOW LEVELS ONLY. THE TRANSDUCER SHALL SENSE THE "OFF", "LEAD", "LAG", AND "HIGH" LEVELS AS GIVEN ON THE PLANS. AS THE LEVEL IN THE WET WELL RAISES THE LEAD PUMP, AS DETERMINED BY THE ALTERNATOR, SHALL START AND PUMP THE STATION TO THE "OFF" POSITION. IN THE EVENT THE INCOMING FLOW EXCEEDS THE CAPACITY OF THE LEAD PUMP, THE LAG PUMP SHALL START AND BOTH PUMPS SHALL RUN TO THE OFF LEVEL. IF THE WET WELL LEVEL CONTINUES TO RISE, HIGH WELL ALARM FUNCTIONS SHALL BE ACTIVATED. THE ALTERNATOR SHALL SWITCH WHEN THE OFF LEVEL IS REACHED. ALL INPUTS AND OUTPUTS SHALL BE WIRED TO A TERMINAL STRIP AT BOTTOM OF CABINET.

ANCILLARY EQUIPMENT:

1. HOA SWITCHES: A THREE POSITION HOA SWITCH SHALL BE PROVIDED ON THE INNER DEAD FRONT FOR EACH PUMP. INPUTS SHALL BE PROVIDED TO PLC TO INDICATE POSITION OF HOA.
2. RUN INDICATORS: A RUN PILOT INDICATOR SHALL BE PROVIDED ON THE INNER DEAD FRONT. ALL INDICATOR LIGHTS SHALL BE PUSH TO TEST. INPUTS SHALL BE PROVIDED TO PLC TO INDICATE PUMP RUNNING.
3. ELAPSED TIME: ELAPSE TIME METER SHALL BE MOUNTED ON THE DEAD FRONT DOOR.
4. CABINET TEMPERATURE CONTROL: THE CABINET SHALL BE EQUIPPED WITH A PANEL HEATER CONTROLLED BY A THERMOSTAT AND A VENT FAN CONTROLLED BY A THERMOSTAT.
5. RECEPTACLES: ONE DUPLEX RECEPTACLE LOCATED ON INNER DEAD FRONT DOOR FOR GENERAL PURPOSE USE. THIS RECEPTACLE SHALL BE OF THE GROUND FAULT TYPE, 120VOLT, AND PROTECTED BY A 20 AMP BREAKER. A SECOND SINGLE RECEPTACLE SHALL BE LOCATED ON THE BACK PANEL TO PROVIDE POWER FOR UPS BACK UP SYSTEM. THIS RECEPTACLE SHALL BE 120 VOLT AND PROTECTED BY A SEPARATE 20 AMP BREAKER.
6. UPS BACK UP SYSTEM: WILL PROVIDED 120 VOLT POWER TO SCADA COMMUNICATION EQUIPMENT AND ALL LOW VOLTAGE POWER TRANSFORMERS. THIS MUST BE INSTALLED IN THE CONTROL PANEL. UPS SHALL BE APC 650VA 120 VOLT OR EQUIVALENT.
7. THE SYSTEM MUST BE ABLE TO TRANSMIT ALL ALARMS AND WET WELL LEVELS WHEN ON BACKUP POWER.
8. MOTOR PROTECTION: A CONTROL AND STATUS MODULE SHALL SENSE EITHER MOTOR OVER TEMPERATURE OR SEAL LEAKAGE, AND SHALL TURN OFF THE PUMP, LOCK OUT THE PUMP, AND SEND AN ALARM. INPUTS SHALL BE PROVIDED TO PLC TO INDICATE PUMP FAIL, SEAL FAIL AND TEMP FAIL INDIVIDUALLY FOR EACH PUMP.

MISCELLANEOUS:

1. PANEL RACKS: POSTS SUPPORTING RACKS SHALL BE 3" MINIMUM RIGID CONDUIT CAPPED AND BOLTED DIRECTLY TO CHANNEL FRAMEWORK SUPPORTING THE PANELS.
2. PANELS SHALL HAVE A "RAIN SHIELD" STRUCTURE USING¼" MINIMUM ALUMINUM PLATING PROVIDING A SOLID BACK PLATE BEHIND PANELS CONTINUOUS TO OVERHEAD PLATE TO PROTECT PANEL FROM RAIN. PROVIDE LED LIGHTING MOUNTED ON STRUCTURE WITH SWITCH MOUNTED ON EXTERIOR OF PANEL TO LIGHT UP PANEL AREA.
CONTACT CITY OF ROCKWALL AT 972-771-7730 FOR LOCATION OF EXISTING TYPE STRUCTURE.
EACH PUMP MUST HAVE ITS OWN CONDUIT FOR POWER CORD AND A SEPARATE CONDUIT FOR ALL FLOAT WIRES.
3. WET WELLS: WET WELL SHALL HAVE METAL SAFETY GRATES. ALL HATCHES SHALL HAVE ACCOMMODATIONS FOR LOCKING ABOVE GRADE WITH 3/8" SHAFT PADLOCKS PROVIDED BY THE CITY. CHECK VALVES SHALL BE OF THE SPRING TYPE. LEVEL CONTROL SYSTEM SHALL USE A PRESSURE TRANSDUCER WITH BUILT IN SURGE PROTECTION FOR PUMP OPERATION WITH OFF AND HIGH LEVEL FLOATS AS BACK-UP IN CASE TRANSDUCER FAILS.
4. DRAWINGS: CONTROL PANEL SCHEMATIC DRAWINGS SHALL BE SUBMITTED FOR APPROVAL WITH THE SUBMITTAL PLANS. FINAL CONTROL PANEL WIRE SCHEMATIC DRAWINGS INCLUDING A LIST OF ALL LEGENDS (2 SETS TOTAL) SHALL BE PROVIDED. ONE SET SHALL BE ENCAPSULATED IN MYLAR AND ATTACHED TO THE INSIDE OF THE FRONT DOOR OF THE CONTROL CABINET. A SECOND SET SHALL BE DELIVERED TO THE CITY OF ROCKWALL WASTEWATER DEPARTMENT.
5. PANEL MARKINGS: ALL COMPONENT PARTS IN THE CONTROL PANEL SHALL BE PERMANENTLY MARKED AND IDENTIFIED AS THEY ARE INDICATED ON THE DRAWING. MARKING SHALL BE ON THE BACK PLATE ADJACENT TO THE COMPONENT. ALL CONTROL CONDUCTORS SHALL BE IDENTIFIED WITH WIRE MARKERS AS CLOSE AS PRACTICAL TO EACH END OF CONDUCTORS.
6. PANEL WIRING: ALL WIRING IN PANEL SHALL MAINTAIN A MINIMUM OF 1 1/2" SPACING BETWEEN COMPONENTS AND WIRE WAYS.
7. TESTING: ALL PANELS SHALL BE TESTED TO THE POWER REQUIREMENTS AS SHOWN ON THE PLANS TO ASSURE PROPER OPERATION OF ALL THE COMPONENTS. EACH CONTROL FUNCTION SHALL BE ACTIVATED TO CHECK FOR PROPER OPERATION AND INDICATION.
8. GUARANTEE: ALL EQUIPMENT SHALL BE GUARANTEED FOR A PERIOD OF THREE (3) YEARS FROM DATE OF ACCEPTANCE. THE GUARANTEE IS EFFECTIVE AGAINST ALL DEFECTS IN WORKMANSHIP AND/OR DEFECTIVE COMPONENTS. THE WARRANTY IS LIMITED TO REPLACEMENT OR REPAIR OF THE DEFECTIVE EQUIPMENT.

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10/20/2022

JUSTIN A. ANGEL, P.E. — DATE
TEXAS NO. 129386

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INPUT OUTPUT LIST	
POINT	DESCRIPTION
DI-01	LEVEL SWITCH LOW ALARM
DI-02	LOW LEVEL SWITCH LSL-01 ALL PUMPS OFF
DI-03	LEVEL SWITCH HIGH LSH-01 RUN 1 PUMP
DI-04	LEVEL SWITCH HIGH LSH-02 RUN 2 PUMPS
DI-05	LEVEL SWITCH HIGH LSH-03 HIGH LEVEL ALARM
DI-06	PUMP 1 FAIL
DI-07	PUMP 1 RUNNING
DI-08	REMOTE ENABLED
DI-09	PUMP 2 FAIL
DI-10	PUMP 2 RUNNING
DI-11	REMOTE-HAND
DI-12	GENERATOR FAIL
DI-13	GENERATOR LOW FUEL
DI-14	SOURCE UTILITY POWER
DI-15	SOURCE BACKUP POWER
DI-16	INTRUSION SWITCH
DI-17	UPS ON BACKUP POWER
DO-01	PUMP 1 RUN
DO-02	PUMP 2 RUN
AI-01	WET WELL LEVEL LIT-01

LKC-ES ENGINEERING SERVICE
800 East Campbell Rd Ste. 270 Richardson, Tx 75081 972-677-7865
ENGINEERING SERVICE TBPE FIRM #13810

STATE OF TEXAS — TIMOTHY E. CAMPBELL — 81011 — LICENSED PROFESSIONAL ENGINEER
03/16/2020

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ONE INCH

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY

ELECTRICAL

GENERAL NOTES

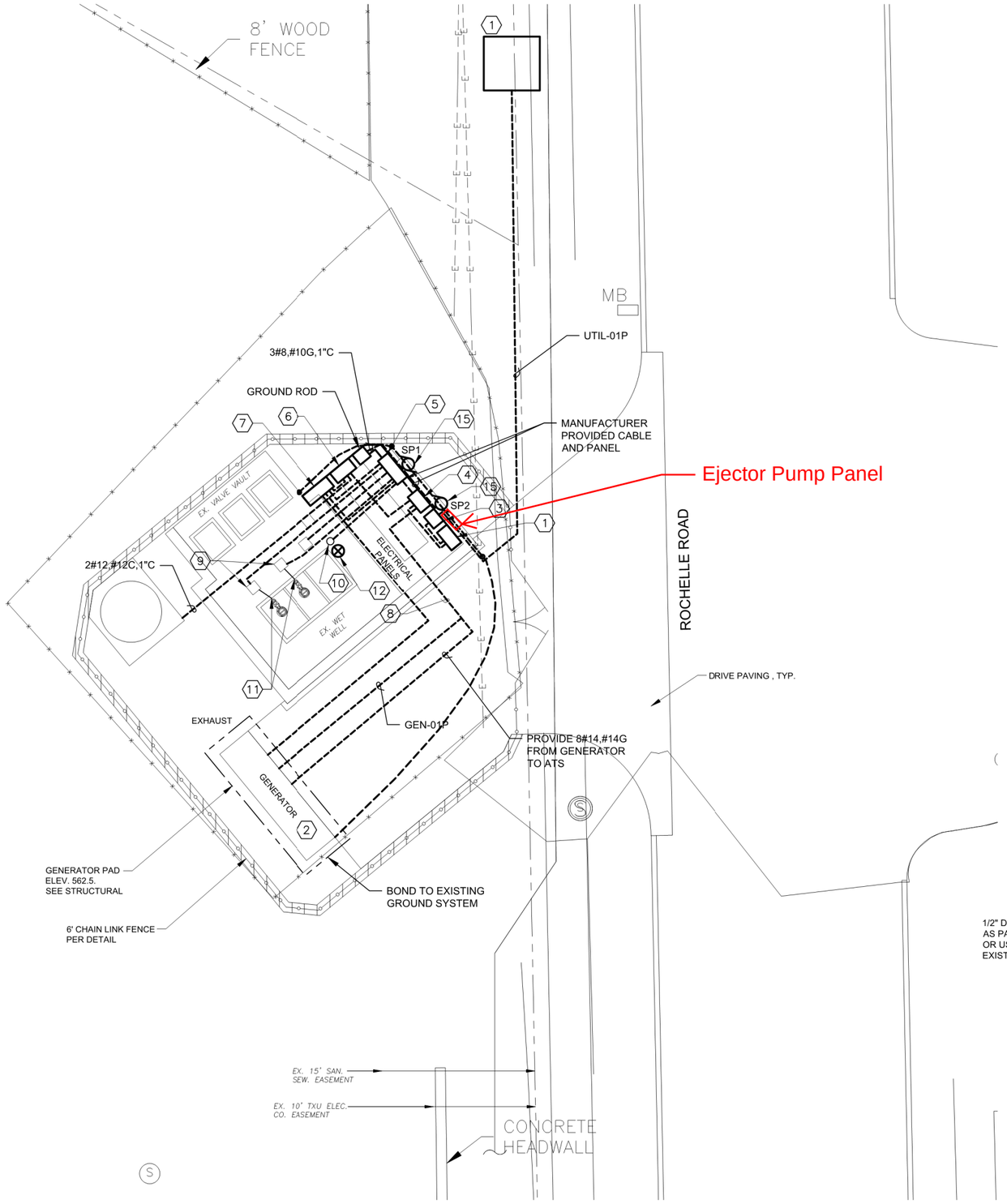
ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSIOIN

Date:	NOVEMBER 2019
Designed:	JAA
Drawn:	SRG
Reviewed:	MAP
PEC Proj. No.	ECD 18-004
SEQ.	of

SHEET NO.
E-2

PRINTED: 5/14/2021 2:50 PM \\LKC-ES\Projects\PEC1802 Rockwall Lift Station - Timber Creek\Drawings\Electrical\E-2 GENERAL NOTES.dwg SAVED: 4/16/2020 4:41 PM USER: LKC



SITE PLAN
SCALE: 1" = 6'-0"

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.

ONE INCH

GENERAL NOTES:

1. PUMP STATION MUST MAINTAIN ONE PUMP IN SERVICE UNLESS CONTRACTOR IS BYPASS PUMPING THIS INCLUDES WHILE PUMP CONTROL PANEL IS BEING CHANGED.
2. FINAL CONSTRUCTION FOR LIFT STATION IS 2 PUMP. SLOT FOR 3RD PUMP TO BE ABANDONED.
3. EQUIPMENT THAT NEEDS TO REMAIN SHALL BE PROTECTED AND MAINTAINED BY THE CONTRACTOR DURING DEMOLITION & INSTALLATION.
4. COORDINATE WITH THE CITY TO DETERMINE WHAT TO DO WITH DEMO/REMOVED EQUIPMENT.
5. BOND GROUNDING EQUIPMENTS CABINETS TO GROUNDING SYSTEM.
6. COORDINATE WITH UTILITY COMPANY (FARMERS ELECTRIC COOPERATIVE, FRANK SPATARO 903-461-2452) FOR POWER DELIVERY TO THE SITE.

NOTES BY SYMBOL: "⬡"

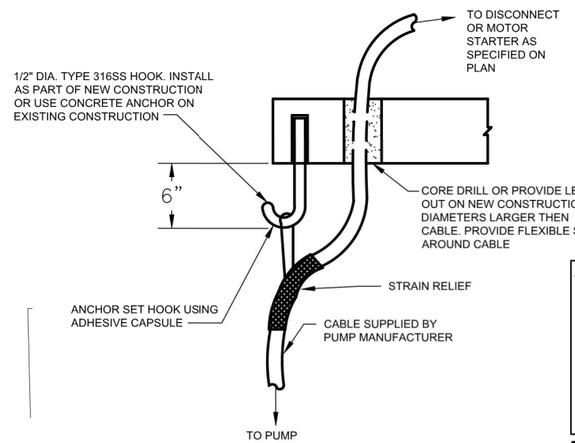
1. 400A 3P DISCONNECT SWITCH.
2. 175KW GENERATOR 480/277 WITH 24HR FUEL IN DOUBLE WALLED BASE. PROVIDE SOUND ATTENUATION ENCLOSURE.
3. METER PER ONCOR REQUIREMENTS.
4. 200A, ATS.
5. PUMP CONTROLLER. TO BE PROVIDED IN LOCATION OF EXISTING PUMP CONTROLLER.
6. PROVIDE MINI POWER ZONE 30KVA 480V-208/120.
7. PROVIDE TELEMETRY PANEL WITH THE FOLLOWING POINTS:
   - NORMAL POWER
   - PUMP 1 RUN
   - GENERATOR POWER
   - PUMP 2 RUN
   - PUMP 1 FAIL
   - PUMP 2 FAIL
   - HIGH LEVEL ALARM
   - LOW GENERATOR FUEL ALARM
   - WET WELL LEVEL
8. PROVIDE 2#10,#10G,3/4"C TO GENERATOR FOR HEATER AND 2#12,#12G,3/4"C FOR BATTERY CHARGER.
9. USE EXISTING TERMINATION BOX FOR SUBMERSIBLE PUMP.
10. PROVIDE LEVEL SWITCH FOR:
    - LOW LEVEL ALARM
    - LEAD PUMP ON
    - LAG PUMP ON
    - PUMP OFF
    - HIGH LEVEL ALARM
    - PROVIDE 10#14,#14G,1"C TO PUMP CONTROL PANEL.
11. PROVIDE MANUFACTURER SUPPLIED SUBMERSIBLE CABLES.
12. PROVIDE LEVEL TRANSDUCER WITH LIGHTNING ARRESTER.
13. PROVIDE CONNECTION TO EXISTING ODOR CONTROL PANEL AND 2#12#12C TO MPZ-6.
14. PROVIDE PRESSURE TYPE LEVEL TRANSMITTER.
15. PROVIDE AND INSTALL 2 SEWAGE EJECTOR PUMP WITH ASSOCIATED APPURTENANCES AND SUPPORT. PROVIDE HIGH LEVEL ALARM CONNECTION TO SCADA.

RECORD DRAWING

TO THE BEST OF OUR KNOWLEDGE PERKINS ENGINEERING CONSULTANTS, INC., HEREBY STATES THAT THIS PLAN IS AS-BUILT. THIS INFORMATION PROVIDED IS BASED ON SURVEYING AT THE SITE AND INFORMATION PROVIDED BY THE CONTRACTOR.

10/20/2022

JUSTIN A. ANGEL, P.E. — DATE
TEXAS NO. 129386



CABLE MOUNTING DETAIL
N.T.S.

RECORD DRAWING

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LKC-ES ENGINEERING, INC.
TBPE FIRM 13810
800 E. CAMPBELLRD, SUITE 270
RICHARDSON, TX 75081
972-677-7865

LKC-ES ENGINEERING SERVICE
800 East Campbell Rd Ste. 270 Richardson, TX 75081 972-677-7865
ENGINEERING SERVICE TBPE FIRM #13810

STATE OF TEXAS
TIMOTHY E. CAMPBELL
81011
LICENSED PROFESSIONAL ENGINEER
03/16/2020

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY

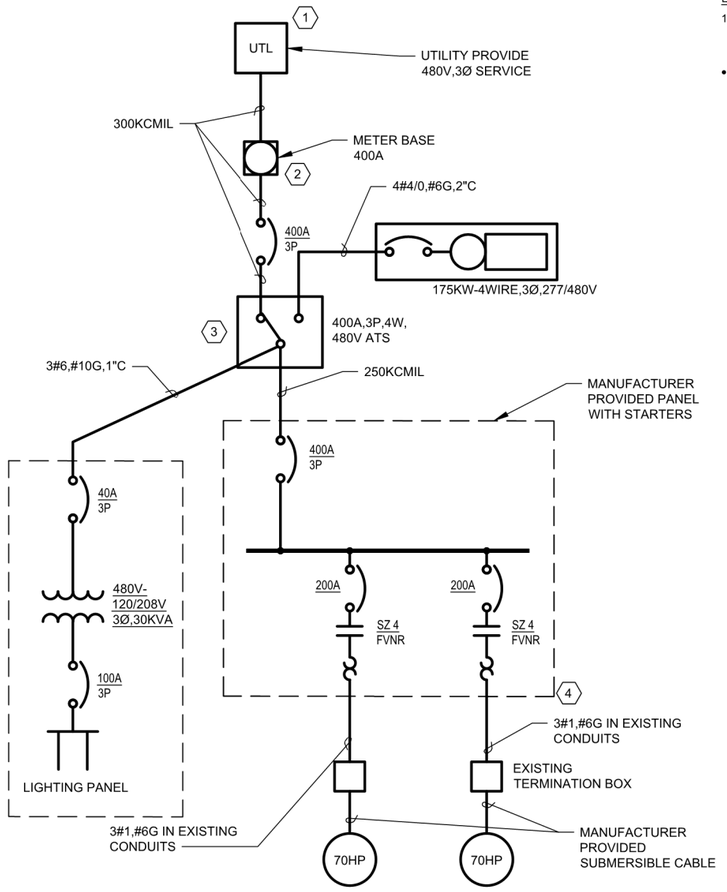
ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSIOIN

SITE PLAN

Date:	NOVEMBER 2019	JAA
Designed:		SRG
Drawn:		MAP
Reviewed:	PEC Proj. No.	ECD 18-004
	SEQ.	of

SHEET NO.
E-3



TIMBER CREEK LIFT STATION
ONE-LINE DIAGRAM

LIFT STATION NOTES:

1. PUMP CONTROL PANEL TO PROVIDE THE POINTS TO TELEMETRY PANEL.

- COMPLETE LIST OF I/O POINTS SHOULD BE OBTAINED FROM THE SCADA SYSTEM INTEGRATOR.

NOTES BY SYMBOL "⬡":

1. COORDINATE WITH UTILITY COMPANY (FARMERS ELECTRIC COOPERATIVE, FRANK SPATARO 903-461-2452) FOR POWER DELIVERY TO THE SITE
2. COORDINATE METER SOCKET WITH ELECTRIC UTILITY.
3. 400A, 3P AUTOMATIC TRANSFER SWITCH.
4. MANUFACTURER PROVIDED CABLES TO INCLUDE OVER TEMPERATURE AND LEAK DETECTION.

LIGHTING PANEL MPZ (IN MCC)

LOCATION: ELECTRICAL RACK
MOUNTING: RACK MOUNTED
22K AIC

CKT	DESCRIPTION	POLES	LOAD A	LOAD B	LOAD C	A B C	VOLT AMPS A	VOLT AMPS B	VOLT AMPS C	BRKR	LOAD SERVED	CKT
1	RECEPTACLES	20/1	360				500			20/1	RTU TELEMETRY	2
3	LIGHTING	20/1		150				500		20/1	LEVEL TRANSMITTER	4
5	GENERATOR HEATER	20			500				-	20/1	ODOR CONTROL	6
7	GENERATOR HEATER	2	500				-			20		8
9	GENERATOR BATTERY CHARGER	20/1		500				-		1	SURGE PROTECTION DEVICE	10
11	STORM WATER SUMP PUMP	30/1			700				-			12
13	GENERATOR BATTERY CHARGER	20/1	-				-					14
15	SPARE	20/1		-				-				16
17	SPARE	20/1			-				-			18

RECORD DRAWING

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10/20/2022
JUSTIN A. ANGEL, P.E. — DATE
TEXAS NO. 129386

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LKC-ES ENGINEERING SERVICE
800 East Campbell Rd Ste. 270 Richardson, TX 75081 972-677-7865
ENGINEERING SERVICE TBPE FIRM-#13810

STATE OF TEXAS
TIMOTHY E. CAMPBELL
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LICENSED
PROFESSIONAL ENGINEER
03/16/2020

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NO.	DATE	DESCRIPTION	BY

ELECTRICAL

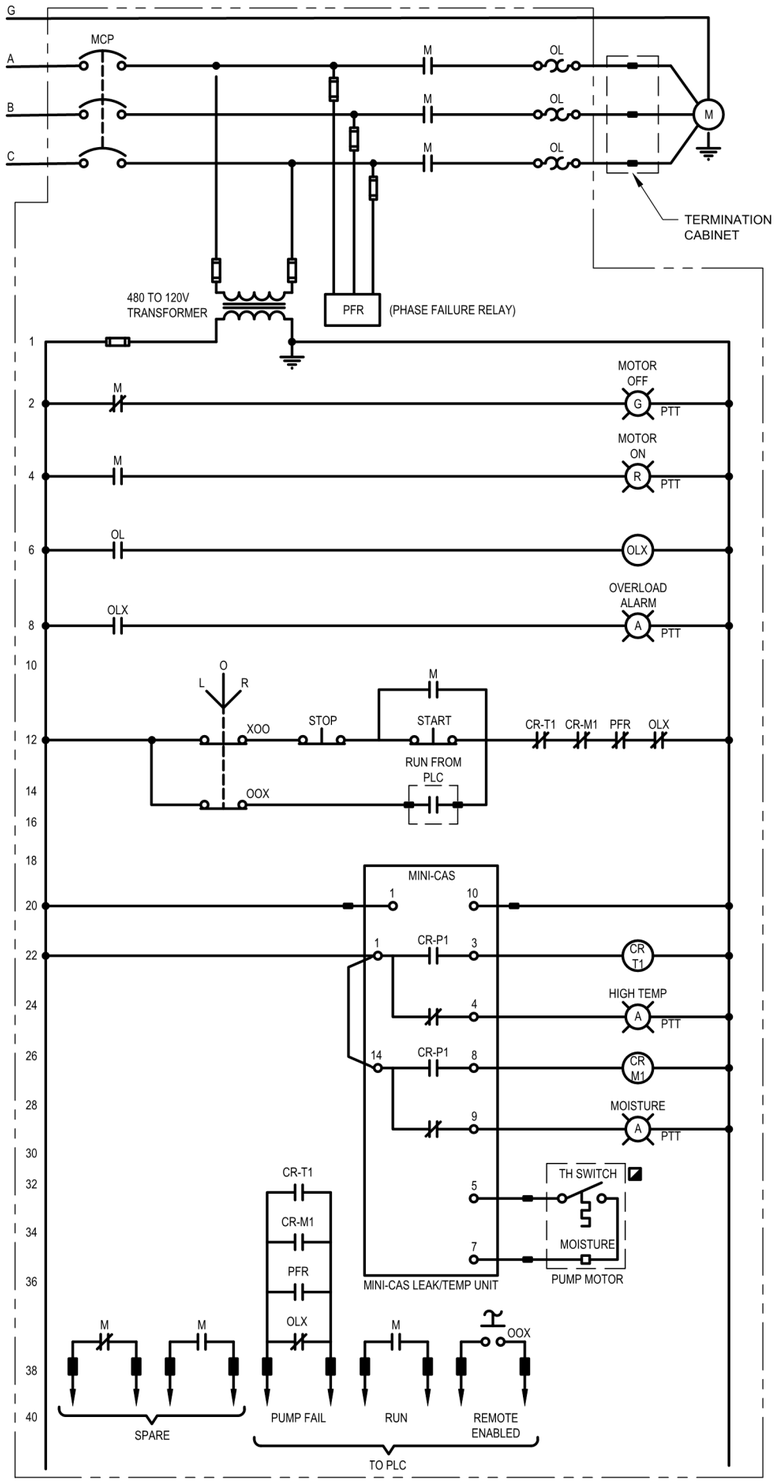
ONE-LINE DIAGRAM

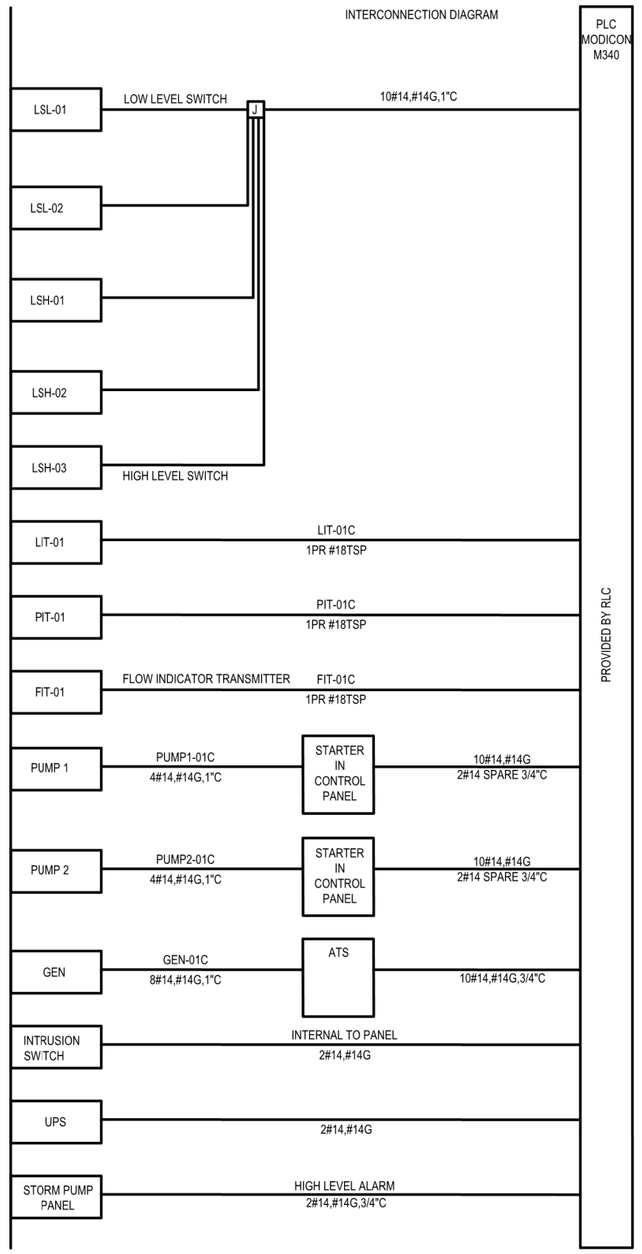
ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSIOIN

Date:	NOVEMBER 2019	PEC Proj. No.	ECD 18-004
Designed:	JAA		
Drawn:	SRG		
Reviewed:	MAP	SEQ.	of

SHEET NO.
E-4





INTERCONNECTION DIAGRAM

NTS

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ONE INCH

SCHEMATIC 1

RECORD DRAWING

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03/16/2020

LKC-ES ENGINEERING SERVICE
800 East Campbell Rd Ste. 270 Richardson, TX 75081 972-677-7865
ENGINEERING SERVICE TBPE FIRM #13810

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY

ELECTRICAL

CONTROL LOGIC

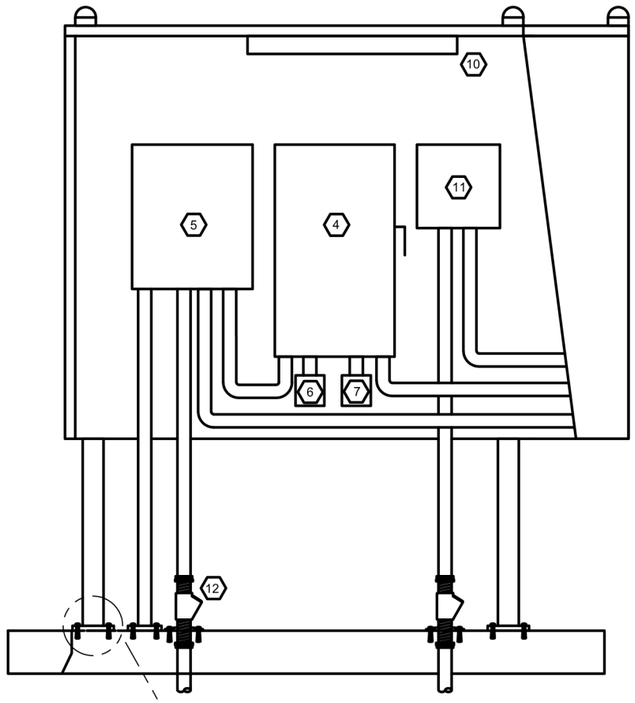
ENGINEERING CONCEPTS AND DESIGN

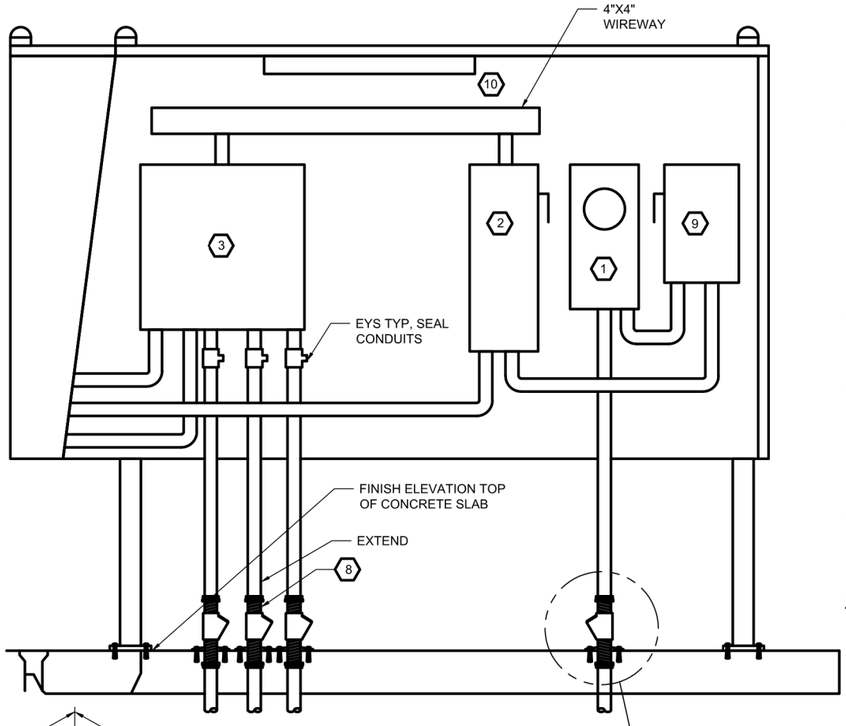
TIMBER CREEK LIFT STATION EXPANSIOIN

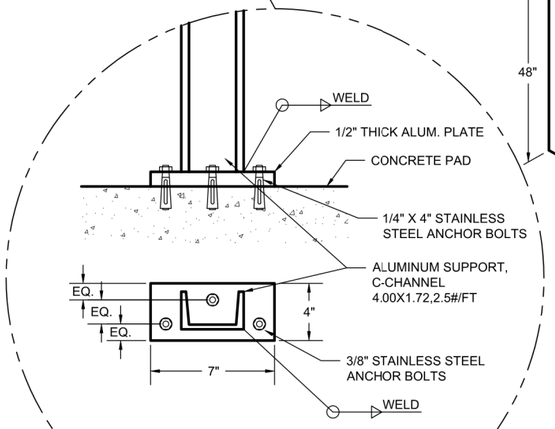
Date:	NOVEMBER 2019
Designed:	JAA
Drawn:	SRG
Reviewed:	MAP
PEC Proj. No.	ECD 18-004
SEQ.	of

SHEET NO.
E-5

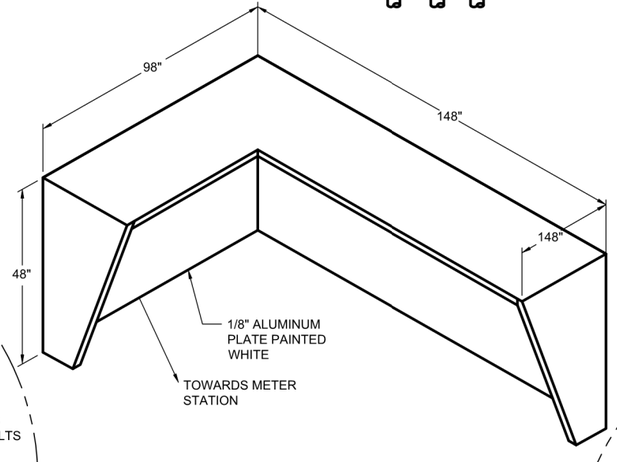
PRINTED: 5/14/2021 2:50 PM \\LKC-ES\Projects\PEC18002 Rockwall Lift Station - Timber Creek\Drawings\Electrical\E-5 CONTROL LOGIC.dwg SAVED: 4/16/2020 4:41 PM USER: LKC

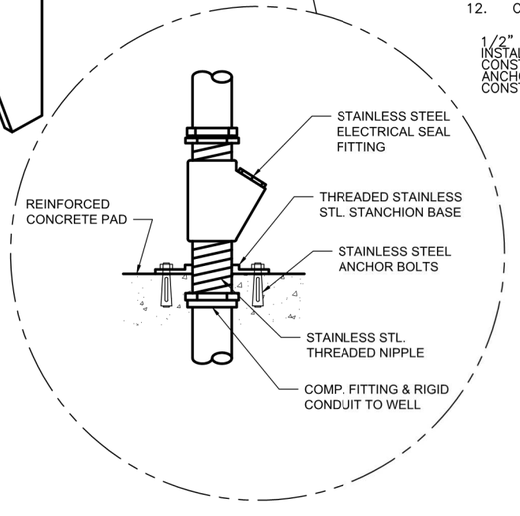






MOUNTING PLATE DETAIL





WEATHER SHIELD (TYP)

GENERAL NOTES:

1. MANUFACTURER SUPPLIED PUMP CONTROL PANEL SHALL BE DESIGNED TO OPERATE THE REQUIRED NUMBER OF PUMPS SPECIFIED ON THE DRAWINGS. THE CONTROL FUNCTION SHALL PROVIDE FOR THE OPERATION OF THE PUMPS IN HAND (MANUAL) AND AUTO (CONTROL PLC).
2. ALL EXPOSED CONDUITS AND FITTINGS TO BE TAPED RIGID ALUMINUM. ALL UNDERGROUND CONDUITS AND FITTINGS SHALL BE SCHEDULE 40 PVC WITH 4" CONCRETE CAP, DYED RED THROUGHOUT.
3. ALL POWER AND/OR CONTROL CONDUCTORS SHALL BE THWN STRANDED.
4. ENCLOSURES FOR ALL INSTRUMENTATION EQUIPMENT AND ELECTRICAL LIGHTING (LED) PANEL SHALL BE NEMA-4X 316 SS W/STAINLESS FITTINGS WITH SINGLE ACTION HANDLE THAT ACCEPTS A 3/8" SHAFT PADLOCK.
5. CALIBRATION OF INSTRUMENTS FURNISHED SHALL BE ACCOMPLISHED BY A QUALIFIED REPRESENTATIVE OF THE MANUFACTURER OF THE INSTRUMENTS WITH CITY OF ROCKWALL REPRESENTATIVES PRESENT.
6. ALL CONDUITS SHALL BE SEALED AT PANEL BOARDS, JUNCTION BOXES, CONDUITS AND TERMINATION POINTS.
7. ALL CONDUIT TERMINATIONS SHALL BE MADE WITH A MEYERS HUB. FOR CONDUITS ENTERING SIDE OR TOP OF ENCLOSURE AND SEALABLE LOCK RINGS FOR CONDUITS ENTERING BOTTOM OF ENCLOSURE.
8. WET WELL LEVEL SHALL BE SENSED BY A TRANSDUCER. FLOAT REGULATORS SHALL BE INSTALLED AS BACK-UP FOR HIGH AND LOW LEVEL ONLY. THE TRANSDUCER SHALL SENSE THE OFF, LEAD, LAG, AND HIGH LEVELS.

NOTES BY SYMBOL ⬡:

1. METER SOCKET, COORDINATE WITH ELECTRIC UTILITY.
2. 400A 3PH, 4 WIRE AUTOMATIC TRANSFER SWITCH.
3. MANUFACTURER PROVIDED PUMP CONTROL PANEL.
4. 30 KVA MINI POWER ZONE. 3ø,120/208V SECONDARY.
5. SCADA PANEL WITH UPS.
6. WP, GFCI RECEPTACLE.
7. WP LIGHT SWITCH.
8. EXTEND EXISTING CONDUITS TO NEW CONTROL PANEL.
9. 400A, 3P DISCONNECT SWITCH.
10. VAPOR-TIGHT LIGHT FIXTURE W/15W L.E.D. LAMP.
11. SUMP PUMP PANEL.
12. CONDUIT TO RTU FROM WETWELL REQUIRE CONDUIT SEAL.

RECORD DRAWING

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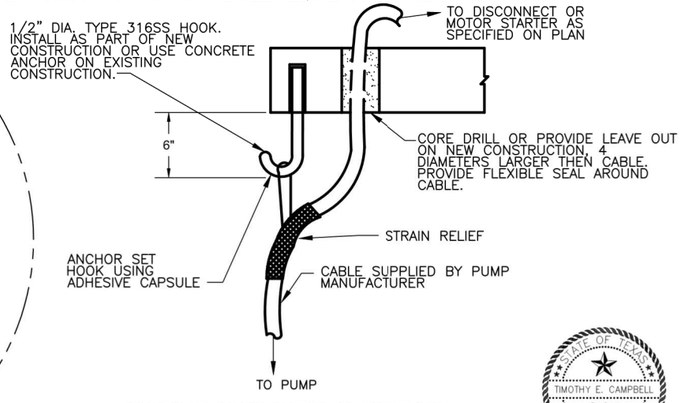

CABLE MOUNTING DETAIL

N.T.S.

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ONE INCH

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TIMOTHY E. CAMPBELL
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03/16/2020

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY

ELECTRICAL

DETAILS

ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSIOIN

Date:	NOVEMBER 2019		
Designed:	JAA		
Drawn:	SRC		
Reviewed:	MAP		
PEC Proj. No.	ECD 18-004		
SEQ.		of	

SHEET NO.
E-6

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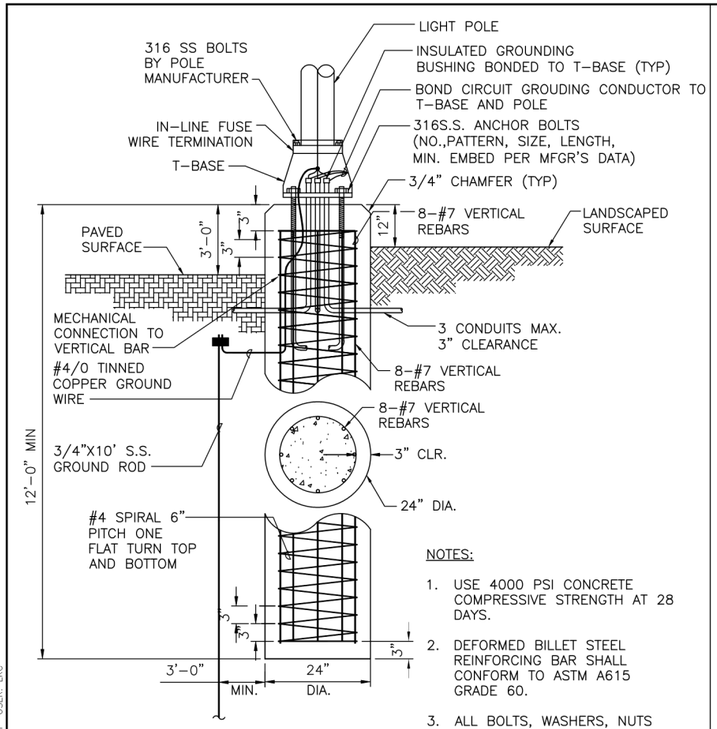
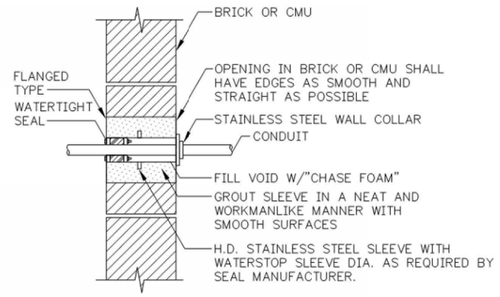


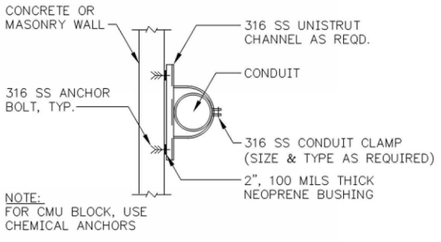
NOTES:

1. USE 4000 PSI CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS.
2. DEFORMED BILLET STEEL REINFORCING BAR SHALL CONFORM TO ASTM A615 GRADE 60.
3. ALL BOLTS, WASHERS, NUTS AND OTHER FASTENERS ARE STAINLESS STEEL 316.

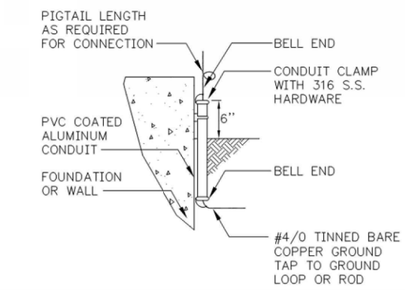
E1 DRILLED SHAFT FOR LIGHT POLE
NTS



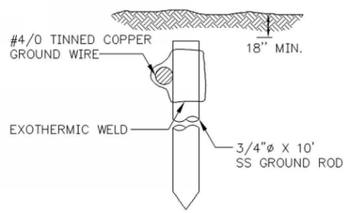
E2 CONCEALED CONDUIT INSTALLATION
NTS



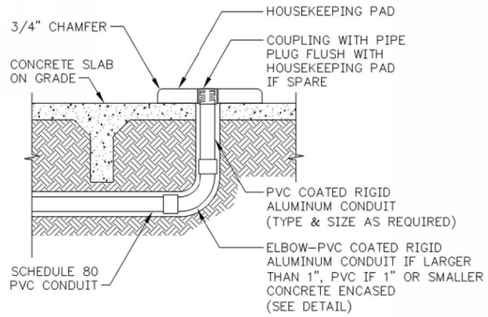
E3 CONDUIT SUPPORT
NTS



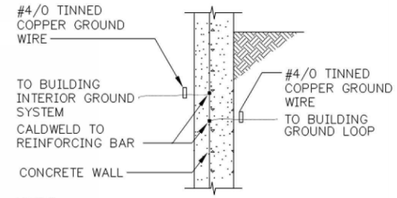
E4 GROUNDING STUB AT WALL
NTS



E5 GROUND ROD
NTS



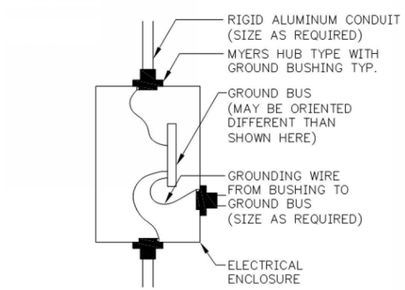
E6 UNDERGROUND CONDUIT AND CONDUIT STUB UP DETAIL
NTS



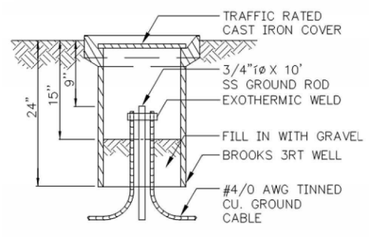
NOTES:

1. THIS DETAIL IS APPLICABLE FOR ALL GROUND CONDUCTORS ENTERING BUILDING THROUGH WALLS AND/OR FLOORS

E7 GROUNDING STEEL GROUND
NTS



E9 ENCLOSURE CONDUIT DETAIL
NTS



E10 GROUND TEST WELL
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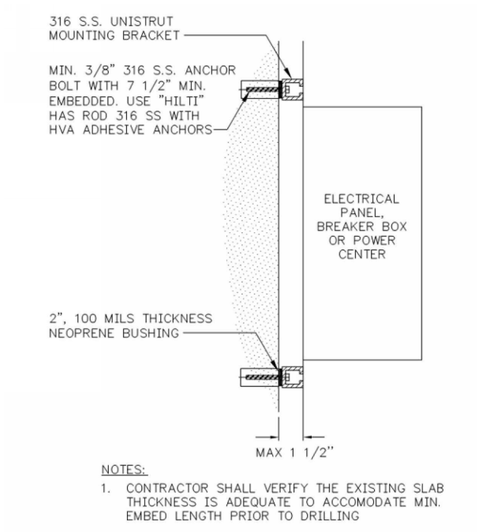
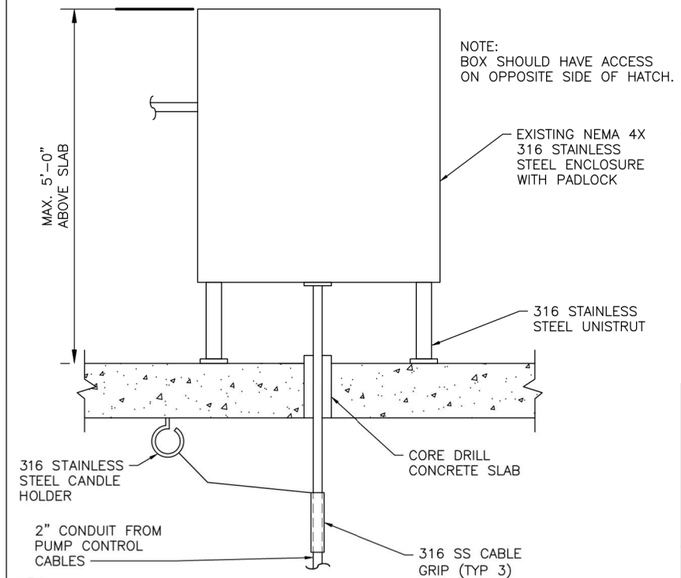


NOTES:

1. CONTRACTOR SHALL VERIFY THE EXISTING SLAB THICKNESS IS ADEQUATE TO ACCOMODATE MIN. EMBED LENGTH PRIOR TO DRILLING

E11 EQUIPMENT WALL MOUNTING DETAIL
NTS



E13 TERMINATION BOX FOR SUBMERSIBLE PUMP
NTS

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10/20/2022

JUSTIN A. ANGEL, P.E. DATE
TEXAS NO. 129386

RECORD DRAWING

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TBPE FIRM 13810
800 E. CAMPBELL RD, SUITE 270
RICHARDSON, TX 75081
972-677-7865

LKC-ES ENGINEERING SERVICE
800 East Campbell Rd Ste. 270 Richardson, TX 75081 972-677-7865
ENGINEERING SERVICE TBPE FIRM-#13810

STATE OF TEXAS
TIMOTHY E. CAMPBELL
81011
LICENSED
PROFESSIONAL ENGINEER
03/16/2020

PERKINS ENGINEERING CONSULTANTS, INC.
TBPE REGISTRATION NO. F-8699

NO.	DATE	DESCRIPTION	BY

ELECTRICAL

ELECTRICAL DETAILS

ENGINEERING CONCEPTS AND DESIGN

TIMBER CREEK LIFT STATION EXPANSIOIN

Date:	NOVEMBER 2019	
Designed:	JAA	
Drawn:	SRG	
Reviewed:	MAP	
PEC Proj. No.	ECD 18-004	
SEQ.		of

SHEET NO.
E-7

BAR IS ONE INCH IN LENGTH ON ORIGINAL DRAWING. CHECK SCALE AND ADJUST ACCORDINGLY.
ONE INCH

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