Early Notice and Public Review of a Proposed Activity in a 100-Year Floodplain

To: All interested Agencies, Groups, and Individuals

This is to give notice that the City of Tucson Housing & Community Development Department (COT-HCDD) as Responsible Entity under 24 CFR Part 58 has determined that the following proposed action under the HUD Community Development Block Grant (CDBG) and Choice Neighborhoods Planning Grant programs is located in the 100-year ("regulatory") floodplain, and COT-HCDD will be identifying and evaluating practicable alternatives to locating the action in the floodplain and the potential impacts on the floodplain from the proposed action, as required by Executive Order 11988, in accordance with HUD regulations at 24 CFR 55.20 Subpart C Procedures for Making Determinations on Floodplain Management and Protection of Wetlands.

The Esquer Park Dog Parks and Park Improvement Project includes design and construction of two dog parks in portions of the existing park and reconstruction of a stormwater detention basin, construction of new concrete walking paths circling the dog parks, disturbance of the Bronx Wash for utilities to provide lighting for the dog parks and walking paths, design and construction of a new pedestrian bridge over the Bronx Wash providing connectivity to the existing walkway south of Bronx Wash, installation of a public art sculpture, and rainwater harvesting and landscape and irrigation improvements. Construction of the dog parks and park improvements will be conducted in the north and central areas of the existing park. Site preparation includes clearing the site and removing debris and other materials within the construction area. Subgrade preparation will be conducted for the basin reconstruction and beneath the curbs and walking path.

The Francisco Elias Esquer Park is approximately 4.88 acres of City-owned property. The site is in FEMA Flood Zone AE, FIRM panel 04019C 2276L, effective 6/16/2011. The Bronx Wash is a designated riverine according to the National Wetlands Inventory. The US Fish and Wildlife Service has determined the Bronx Wash is an ephemeral wash and not a wetland. The Bronx Wash within the park area is designated by the City of Tucson's Master Plan Tucson Stormwater Management Study (TSMS) as a TSMS Xeroriparian Intermediate Habitat.

The project location is: 1415 North 14th Avenue, Tucson, Pima County, AZ 85705, Pima County Assessor Parcel Numbers 115-18-007F and 115-18-171A. The site is in the Barrio Blue Moon Neighborhood, northeast of Interstate 10 and West Speedway Boulevard.

Total Estimated Project Cost: $952,809. Estimated Funding: $330,469 in Community Development Block Grant (CDBG) and $54,000 in Choice Neighborhoods Planning Grant funds through the City of Tucson Housing & Community Development Department, $318,340 in Tucson voter-approved Proposition 407 bond funds through the City of Tucson Parks and Recreation Department, and $250,000 in American Rescue Plan Act funding.

Most of the floodwater runoff in the project area is conveyed from the existing storm drain system located at the northeast side of the park through the site to the southwestern portion of the park where it combines with additional urban runoff before continuing west. A drainage analysis including project specific, Bronx Wash modeling was performed for the proposed park improvements, including the pedestrian bridge design (Final Drainage Memorandum, Kimley Horn, 8/19/2022, revised 2/5/2024). The park site is almost entirely located within a regulatory floodplain which also inundates portions of parcels adjacent to the park in existing conditions. The proposed bridge is designed as a single span across the low-flow channel portion of the Bronx Wash to have the central portion of the bridge elevated one-foot above the regulatory/100-year water surface elevation. Since the proposed bridge is a pedestrian bridge and designed to be more cost effective, a 60-foot bridge opening on spread footings is recommended. While the bridge may be susceptible to lateral migration of the wash, the bridge should not be in use during regulatory/100-year storm events since the entire area would be inundated. Smaller storm events are expected to be conveyed within the low-flow channel under the bridge.

The existing detention basin on the northside of Esquer Park will be reconstructed to facilitate increased water harvesting within the proposed dog parks with overall flow patterns remaining unchanged. The revised Final Drainage Memorandum indicates the park improvement project is impacted by the Bronx Wash, and while the Bronx Wash overbank floodplain inundates much of the site, the memorandum states the project will not adversely impact adjacent properties.

The Bronx Wash within the project limits is subject to the City of Tucson’s Watercourse Amenities, Safety, Habitat (WASH) regulations. Proposed infrastructure improvements within the WASH limits are the bridge and at-grade pathways connecting the proposed amenities north of the Bronx Wash to existing pathways to the south. Plantings and other water harvesting features associated with the project are proposed within the WASH limits.

The City of Tucson's Floodplain Ordinance does not allow for unnecessary alteration of the riparian floodplain; however, the Tucson City Code does allow for disturbance of the riparian floodplain for the following purposes: roadway/access, utilities, and trails. The park improvements are intended to comply with the City Floodplain Ordinance, the WASH Ordinance, and other City drainage regulations.

There are three primary purposes for this notice. First, people who may be affected by activities in floodplains and wetlands and those who have an interest in the protection of the natural environment should be given an opportunity to express their concerns and provide information about these areas. Commenters are encouraged to offer alternative sites outside of the floodplain and wetlands, alternative methods to serve the same project purpose, and methods to minimize and mitigate impacts. Second, an adequate public notice program can be an important public educational tool. The dissemination of information and request for public comment about floodplains and wetlands can facilitate and enhance Federal efforts to reduce the risks and impacts associated with

the occupancy and modification of these special areas. Third, as a matter of fairness, when the Federal government determines it will participate in actions taking place in floodplains and wetlands, it must inform those who may be put at greater or continued risk.

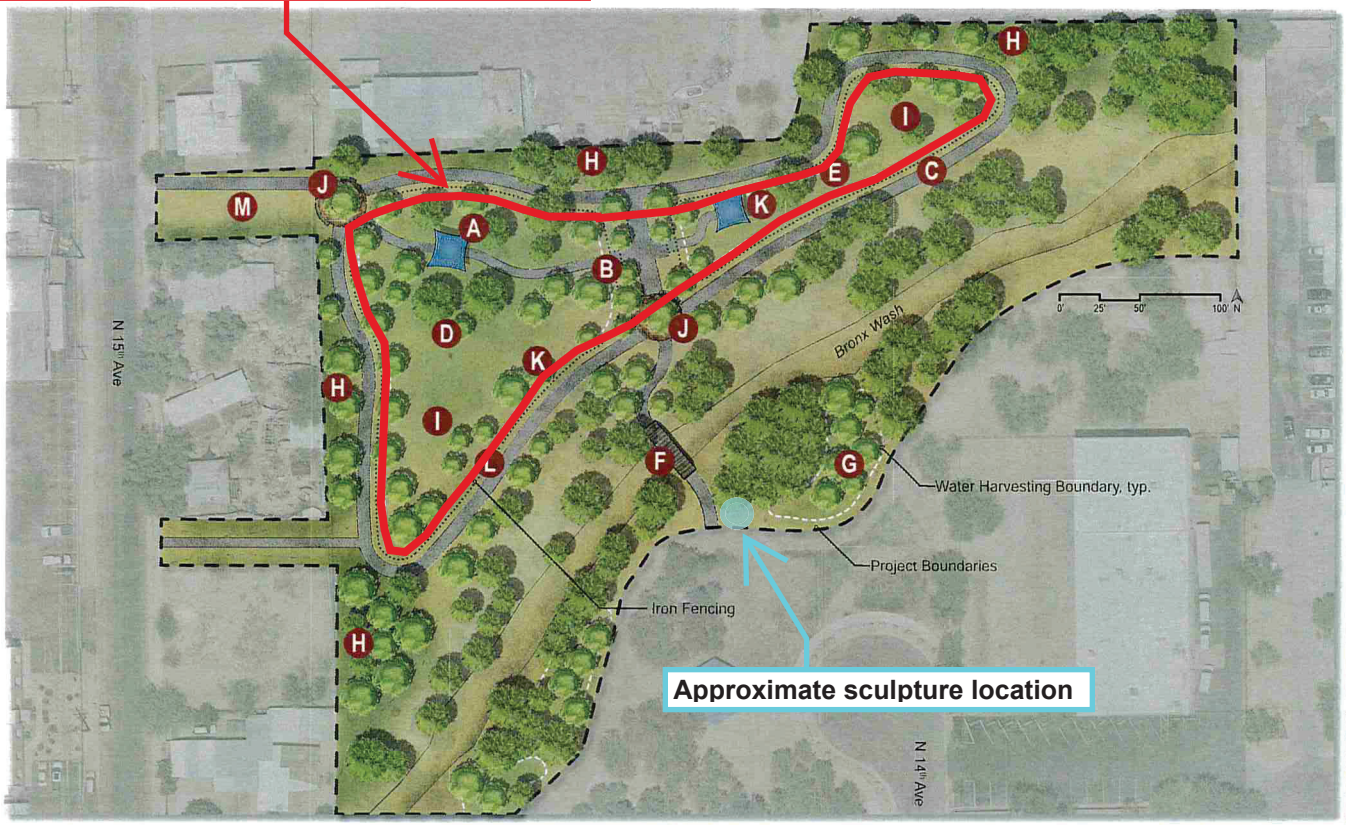
Written comments must be received by the City of Tucson Housing & Community Development Department (COT-HCDD) at the following address on or before April 23, 2024: City of Tucson Housing & Community Development Department, PO Box 27210, Tucson, AZ, 85726, Attention: Rolanda Mazeika, Environmental Project Coordinator. Comments may also be submitted via e-mail to Rolanda.Mazeika@tucsonaz.gov. A full description of the project may be reviewed weekdays, 8 AM to 4 PM at 310 N Commerce Park Loop, Tucson, AZ 85745 or can be accessed online at www.tucsonaz.gov/Departments/Housing-and-Community-Development/Documents/Environmental-Review. Questions regarding the project may be directed to Rolanda Mazeika at 520-837-5408. The Certifying Officer of the City of Tucson, the Responsible Entity under 24 CFR Part 58, is Ann Chanecka, Director of COT-HCDD.

If you require oral interpretation in a language other than English, please call (520) 791-4171. Si necesita interpretación oral en un idioma que no sea inglés, por favor llame al (520) 791-4171.

Date: April 8, 2024

LEGEND

- A — Shade Canopy, Typ.
- B — Gated Entry, Typ.
- C — .25 mi Paved Walking Loop
- D — Large Dog Area, ~.55 AC
- E — Small Dog Area, ~.20 AC
- F — Pedestrian Bridge
- G — Water Harvesting Area, Typ.
- H — Planted Buffer Zone
- I — Natural Dog Play Features
- J — Shaded Benches
- K — Water Stations
- L — Iron Fencing, min. 4' height
- M — Emergency Vehicle Pull-in



Tucson Parks and Recreation

Francisco Elias Esquer Park - Dog Park Concept Plan

TUCSON, ARIZONA

Kimley»Horn

TRIVE IN THE 05 STORY TELLING | SCULPTURE CONCEPT | COYOTE

ARTS FOUNDATION FOR TUCSON AND SOUTHERN ARIZONA

FABRICATION METHOD

- FABRICATED CORTEN (A242) STEEL 14ga
- CUSTOM ENAMEL PAINT
- SEAMS PATINAED WITH RUST
- INSTALLED ON CONCRETE FOOTING

TWENTY DIGIT DESIGN

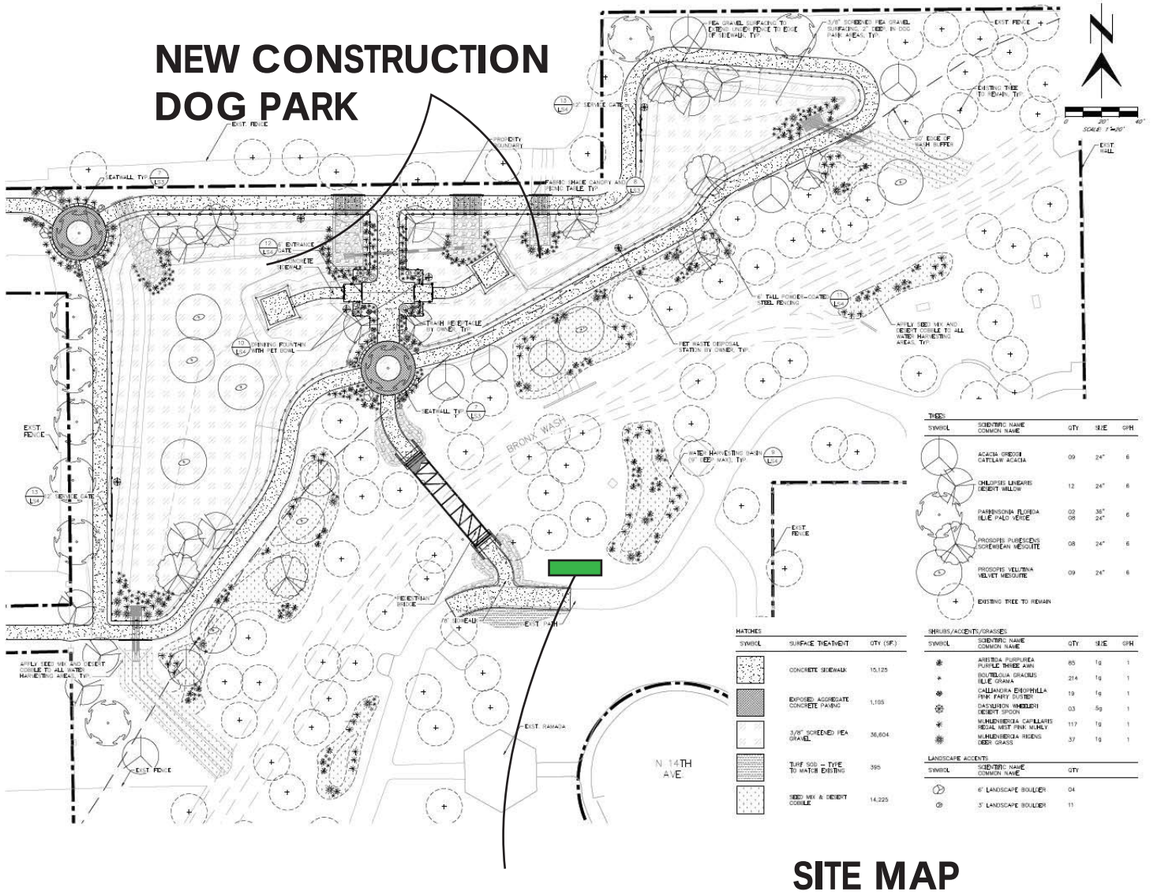
contact	client	location	date	content
Ariel@artsfoundtucson.org	City of Tucson	Tucson, AZ	01/08/24	CONCEPT

TRIVE IN THE 05 STORY TELLING | SCULPTURE CONCEPT | COYOTE

THRIVE IN THE 05 COMMUNITY BUILDING

ARTS FOUNDATION FOR TUCSON AND SOUTHERN ARIZONA

ESQUER PARK



SITE MAP

PLACEMENT APPROX
BASED ON UNDERGROUND
INFRASTRUCTURE

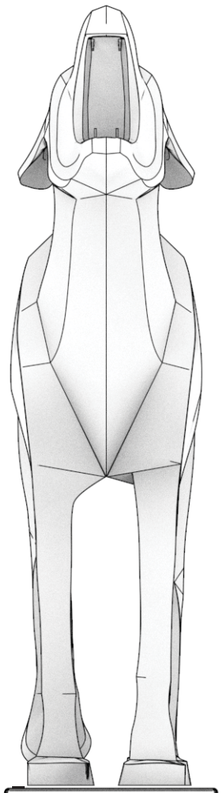
CONCEPT RENDER

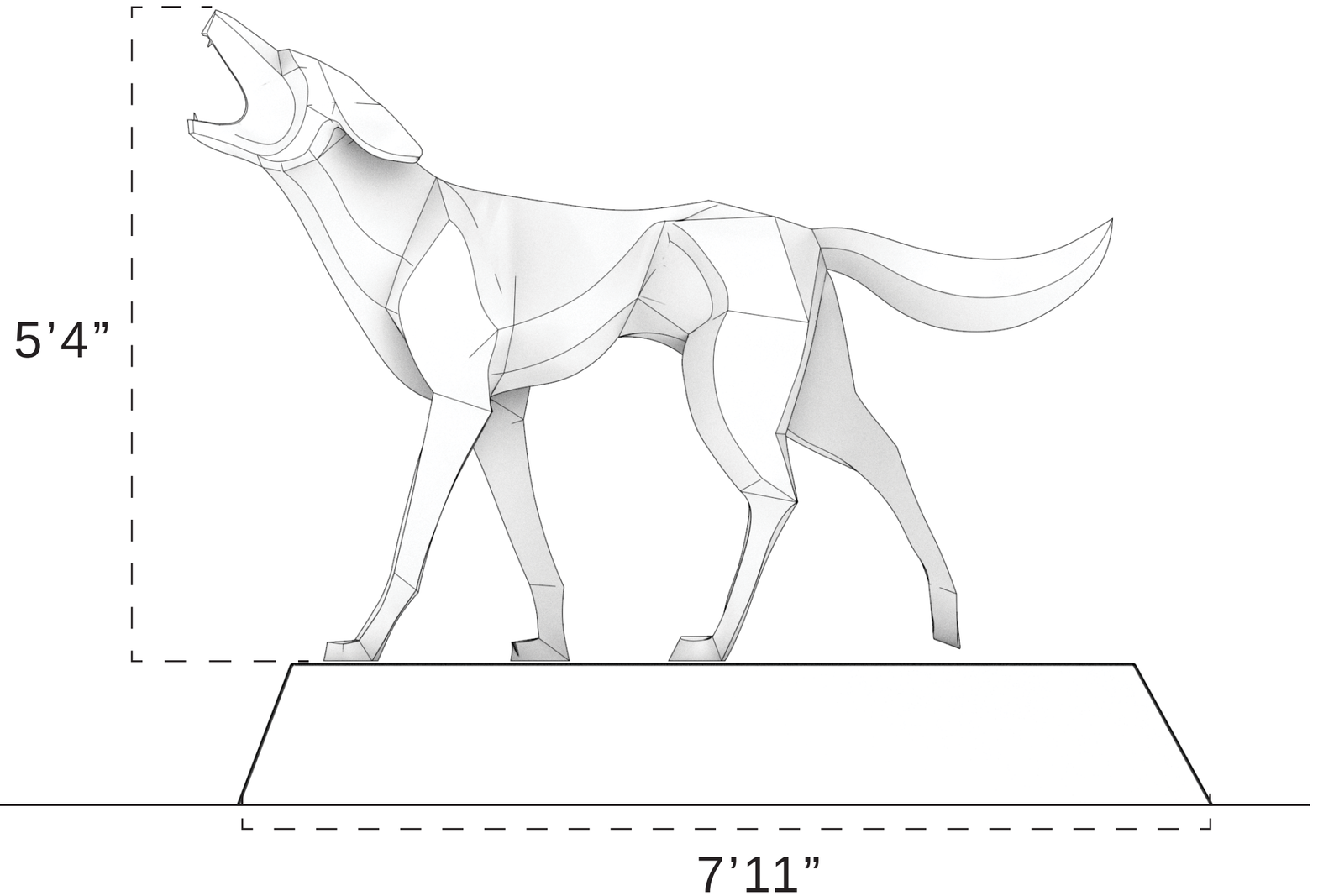
20 TWENTY DIGIT DESIGN

contact	client	location	date	content
Ariel@artsfoundtucson.org	City of Tucson	Tucson, AZ	01/08/24	LOCATION

TRIVE IN THE 05 STORY TELLING | SCULPTURE CONCEPT | COYOTE

ARTS FOUNDATION FOR TUCSON AND SOUTHERN ARIZONA





TWENTY DIGIT DESIGN

contact	client	location	date	content
Ariel@artsfoundtucson.org	City of Tucson	Tucson, AZ	01/08/24	DIMENSIONS

PROJECT DESCRIPTION

1. The Daniel Hornung – Tucson Coyote project is a freestanding exterior steel sculpture to be installed in Tucson, AZ. The sculpture consists of a concrete footing and welded steel sculpture with epoxy anchors.
2. This section is for general orientation only. The Contractor is responsible for all scope items described in the drawings and specifications as well as for all material and labor that can reasonably be inferred there from.

GENERAL APPLICATION

1. All things which, in the opinion of the Contractor, appear to be deficiencies, omissions, contradictions or ambiguities in the drawings shall be brought to the attention of the Structural Engineer. Corrections or written interpretations shall be issued before affected work may proceed.
2. The Contractor shall inform the Structural Engineer, clearly and explicitly in writing, of any deviation or substitution from requirements of the contract documents. Contractor shall not be relieved of any requirement of the contract documents by virtue of the Structural Engineer's review of shop drawings, project data, etc., unless the Contractor has clearly and explicitly informed the Structural Engineer in writing of any deviations or substitutions at time of submission.

DESIGN CRITERIA

1. Building Code: 2018 IBC with City of Tucson Amendments
2. Wind Loading:
   a. Ultimate Design Wind Speed, Risk Category II = 115 MPH
   b. Exposure Category: C
3. Seismic Loading: Seismic Response Coeff. = 0.19
4. Superimposed Gravity Loading: N/A – Sculpture Self-Weight Only.
5. Foundation Criteria:
   a. Assumed minimum allowable bearing pressure of 1500psf

CODES AND STANDARDS

1. Building Code: 2018 IBC with City of Tucson Amendments
2. "Building Code Requirements for Reinforced Concrete", ACI318, by the American Concrete Institute (ACI).
3. "Manual of Standard Practice" by the Concrete Reinforcing Steel Institute (CRSI).
4. "Specification for Structural Steel Buildings" ANSI / AISC 360-05 by American Institute of Steel Construction (AISC).
5. "AISC Code of Standard Practice" by AISC.
6. All references are latest edition unless noted otherwise.

MISCELLANEOUS NOTES

1. The Contractor is solely responsible for all safety regulations, programs and precautions related to all work on this project.
2. The Contractor is solely responsible for the protection of persons and property either on or adjacent to the project and shall protect it against injury, damage, or loss.
3. Means and methods of construction and erection of structural materials are solely the Contractor's responsibility.
4. The structure is designed to function as a unit upon completion of construction of the project and then, only to support the design loads indicated. The contractor is responsible for means, methods and sequence of construction and the adequacy of the structure to support loads occurring during construction of the project. Furnish all temporary bracing, shoring, and/or support as may be required.
5. No structural modifications, alterations, or repairs shall be made without prior review by Structural Engineer.

QUALITY CONTROL

1. The Contractor is responsible for quality control, including workmanship and materials furnished by his subcontractors and suppliers.
2. Inspection or testing by the Owner does not relieve the Contractor of his responsibility to perform the Work in accordance with the Contract Documents.
3. Workmanship: The Contractor is responsible and shall bear the cost of correcting work which does not conform to the specified requirements.
4. Correct deficient work by means acceptable to the Engineer. The cost of extra work incurred by the Engineer to approve corrective work shall be borne by the Contractor.

SPECIAL INSPECTION

1. Special inspection is required per IBC, chapter 17 for the following:
   a. Periodic Inspection of shop welds.
   b. Post-Installed Anchors
2. The Contractor shall be responsible for notifying Special Inspector 72 hours in advance of required inspections for scheduling purposes. Failure to meet observation schedules may require removal (for inspection purposes) of any finishes that have been subsequently installed. Approval by the special Inspector does not preclude observation by the Engineer of Record and approval by the EOR does not preclude the inspection process by the Special Inspector and any other code requirements for inspection. Removal and replacement of any finishes and/or framing damaged by the finish removal process or as required for corrective action shall be at the Contractor's expense, not the Owner, Engineer or Structural Observer.
3. Yetiweurks may also provide verbal instructions to field supervision personnel as needed to ensure that the observed work conforms to contract documents, and will follow up site observations with a written report of items observed with noted deficiencies.
4. Structural Observation: As a minimum, the Engineer Shall perform structural observation at the following stages of construction:
   a. At completion of fabrication of structure.
   b. At completion of installation.
6. Upon completion of work the Structural Observer shall submit a report to the Owner and the Building Official bearing his/her wet stamp and signature attesting to the visual observations made. The report shall also identify any reported deficiencies, which have not been resolved.

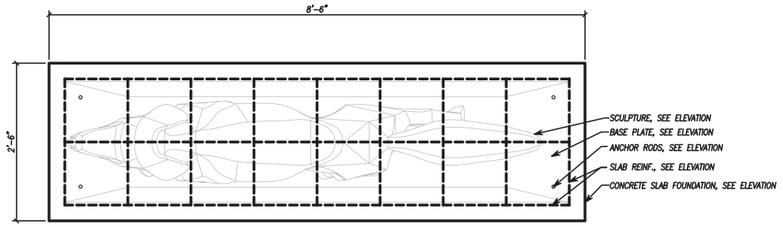
GENERAL LEGEND

GENERAL NOTATIONS

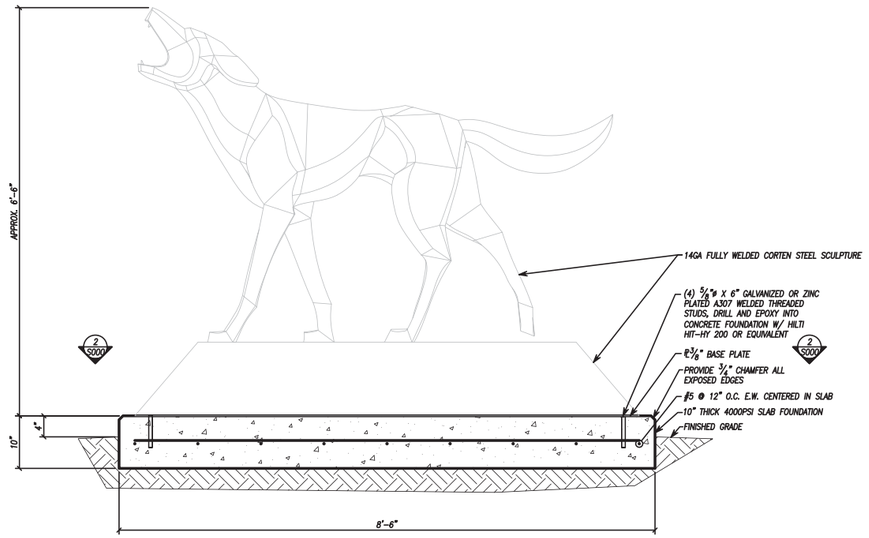
- XX/YY — ELEVATION OR BUILDING SECTION XX = DRAWING NUMBER YY = SHEET NUMBER
- XX/YY — SECTION CUT XX = DRAWING NUMBER YY = SHEET NUMBER
- XX/YY — DETAIL CALL OUT XX = DRAWING NUMBER YY = SHEET NUMBER
- B — DETAIL SECTION CUT B
- INDICATES STEPS AND SLOPES IN DECKS, ROOFS, & SLABS
- XXX'-YY" T.O. SLAB — ELEVATION CALLOUT XXX'-YY" = OBJECT ELEVATION T.O. SLAB = T.O. (OR B.O.) OBJECT
- 1 — INDICATES ADDENDUM NUMBER
- INDICATES CHANGE FROM LAST ISSUE
- XX — KEYED NOTE – SEE KEYED NOTES
- INDICATES EXTENTS

STRUCTURAL ABBREVIATIONS

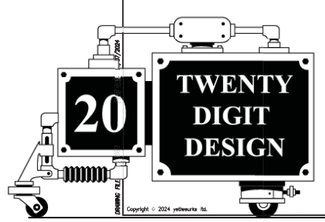
ABBREV.	DEFINITION	ABBREV.	DEFINITION
A.B.	anchor bolts	HORIZ	horizontal
ADDN'L	additional	I.F.	inside face
A.F.F.	above finished floor	INT	interior
ALT	alternate	JT	joint
ARCH	architectural	L, LEN	length
B, BOT	bottom	LAT	lateral
B.B.	bond beam	LLH	long leg horizontal
B.L.	brick ledge	LLV	long leg vertical
BLDG	building	LONG	longitudinal
BM	beam	LVL	laminated veneer lumber
BRG	bearing	MAS	masonry
BTWN	between	MAX	maximum
CJ	const./control joint	MECH	mechanical
CL,CLR	clear	MLAM	micralam
CMU	conc. masonry unit	MFR	manufacturer
COL	column	MIN	minimum
CONC	concrete	MTL	metal
CONN	connection	N.I.C.	not in contract
CONST	construction	NMWT	normal weight
CONT	continuous	NOM	nominal
CTRL	control	NS	near side
DET,DTL	detail	O.F.	outside face
DB	deck bearing	O.H.	opposite hand
DIM	dimension	OPNG	opening
DK	deck	PC	precast
DS	diagonal sheathing	PL	plate
DWGS	drawings	REINF	reinforcement
DWL	dowel	REQ'D	required
EA	each	RET	retaining
EE	extended end	RWR	rake wall rafter
EF	each face	S.A.D.	see arch. drawings
EFF	effective	S.O.G.	slab on grade
EJ	expansion joint	SC	slip critical
EL,ELEV	elevation	SCHED	schedule
EOC	edge of concrete	SECT	section
EOD	edge of deck	SIP	structural insulating panel
EOM	edge of masonry	SL	slab
EOS	edge of slab	SPA	spacing
EW	each way	SST	Simpson Strong Tie
EXIST	existing	STFNR	stiffener
EXP	expansion	STL	steel
EXT	exterior, extension	SUPPL	supplier
FDTN	foundation	SUPT	support
FF	finish floor	T	top
FL	floor	T/xx	top of xxx
FOS	face of stud	THK	thick, thickness
FP	full penetration	TJI	Wood I beam (see notes)
FS	far side	TRAN	transverse
FTG	footing	TYP	typical
GA	gauge	UNO	unless noted otherwise
GB	grade beam	U.S.C.	under seperate contract
GEN	general	VERT	vertical
GLB	glu-lam beam	V.I.F.	verify in field
HAS	headed anchor stud	W	wide, width
HK	hook	WWF	welded wire fabric



2 **SCULPTURE FOUNDATION PLAN**
SCALE : 1"=1'-0" 195507001



1 **SCULPTURE ELEVATION**
SCALE : 1"=1'-0" 195507001



THESE DRAWINGS ARE TO BE USED IN CONJUNCTION WITH THE ARCHITECTURAL DRAWINGS ON THE PROJECT TO CLEARLY DEFINE ALL OF THE REQUIREMENTS FOR CONSTRUCTION. WHERE CONFLICTS OCCUR, CONTACT THE ARCHITECT FOR CLARIFICATION.

DISCLAIMER
THE STRUCTURAL ENGINEERS SEAL ON THIS DRAWING INDICATES THAT THE INFORMATION SHOWN AND THE CALCULATIONS PERTAINING TO THAT INFORMATION HAVE BEEN PREPARED BY QUALIFIED PEOPLE UNDER THE DIRECTION OF THE ENGINEER-OF-RECORD. THE SEAL DOES NOT IMPLY RESPONSIBILITY FOR INFORMATION PREPARED BY OTHERS NOR FOR ANY INFORMATION NOT SHOWN ON THIS DRAWING AND SUCH RESPONSIBILITY IS SPECIFICALLY DISCLAIMED. ON PHASED PROJECTS, DRAWINGS THAT ARE ISSUED BUT NOT SEALED SHALL BE CONSIDERED TO BE PRELIMINARY IN NATURE AND ARE ISSUED FOR INFORMATION ONLY.

Yetiweurks ART + ENGINEERING 303.648.7553 | yetiweurks@gmail.com www.yetiweurks.com

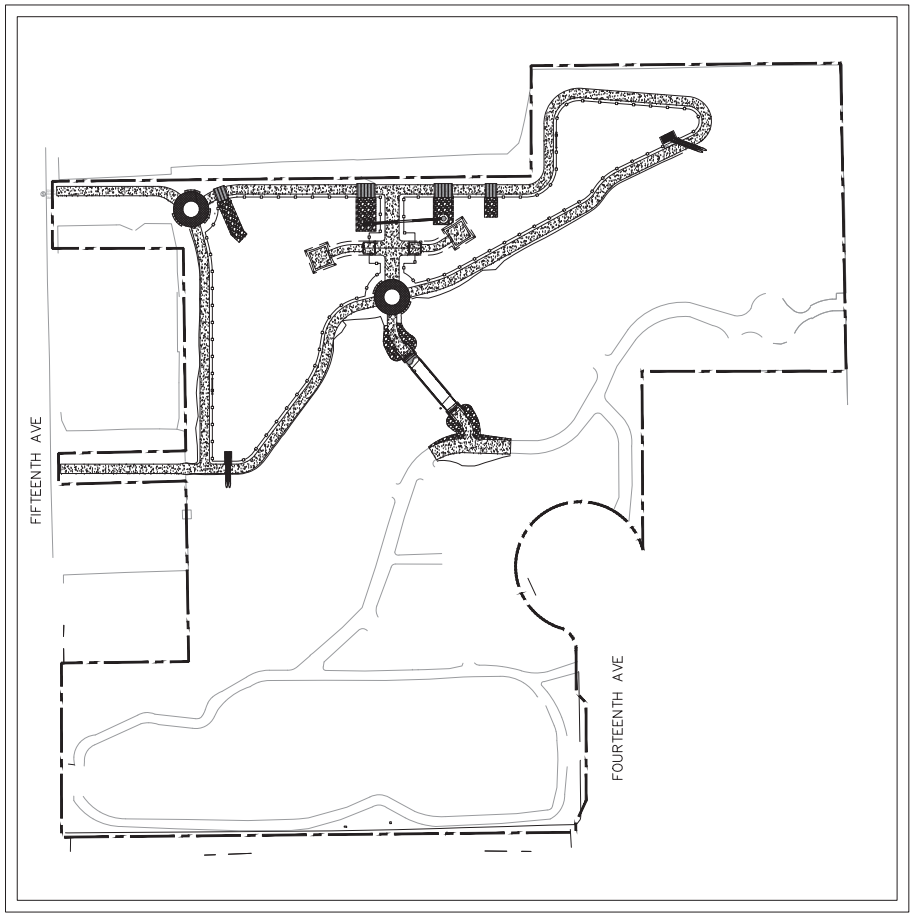
TITLE	GENERAL NOTES, SCULPTURE ELEVATION, FOUNDATION PLAN AND DETAILS
PROJECT NAME	Daniel Hornung – Tucson Coyote
DESIGN BY	NAG
SCALE	AS NOTED
	S000

contact	client	location	date	content
Ariel@artsfoundtucson.org	City of Tucson	Tucson, AZ	01/08/24	ENGINEERING

TC-COM-0523-01350

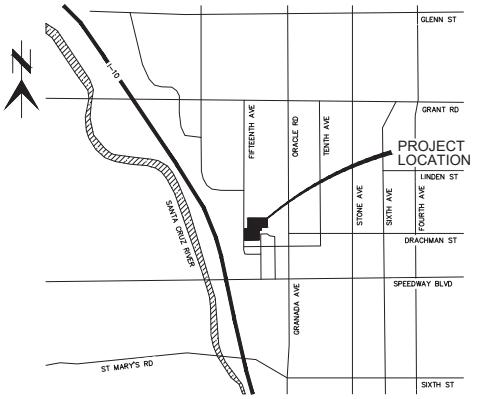
Tucson Parks and Recreation
A Nationally Accredited Agency

FRANCISCO ELIAS ESQUER PARK
DOG PARK + WATER HARVESTING



SCALE: 1"=50'

VICINITY MAP



LOCATION MAP
PIMA COUNTY, ARIZONA
SCALE: 3"= 1 MILE

Landscape Approval Site Review
JCarlto1
11/01/2023
PLANNING & DEVELOPMENT SERVICES

Reviewed for Site Engineering Code Compliance
JCarlto1
11/01/2023
CITY OF TUCSON PLANNING & DEVELOPMENT SERVICES

Zoning Approval Building Plan
NHerrer1
11/01/2023
CITY OF TUCSON PLANNING & DEVELOPMENT SERVICES

I-1, DP22-0259

Fire Reviewed for Code Compliance
JGarcia2
11/01/2023
TUCSON FIRE DEPARTMENT

REVIEWED FOR BUILDING CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

THE PREMISE OWNER OR RESPONSIBLE PERSON SHALL HAVE THE BACKFLOW PREVENTION ASSEMBLY TESTED BY A CERTIFIED BACKFLOW ASSEMBLY TESTER AT THE TIME OF INSTALLATION, REPAIR, OR RELOCATION AND AT LEAST ON AN ANNUAL SCHEDULE THEREAFTER.
PLANNING & DEVELOPMENT SERVICES

REVIEWED FOR PLUMBING CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

REVIEWED FOR ELECTRICAL CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

INDEX OF SHEETS

Kimley»Horn
323 EAST WETMORE, SUITE 260
TUCSON, AZ 85705
ph 520.615.9191

Tucson Parks and Recreation
A Nationally Accredited Agency

FRANCISCO ELIAS ESQUER PARK
DOG PARK & WATER HARVESTING
1415 N 14TH AVE
TUCSON, AZ

50732
REBECA V. FIELD
Registered Landscape Architect
ARIZONA, USA
Exp.Date 03/31/2024

Revision Record		
No.	Description	Date
1		
2		
3		

Dial 811 or click Arizona811.com

COVER SHEET

Project number:	098134081
Date:	08.21.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

CVR

Sheet Number: 01 of 23

TC-COM-0523-01350

GENERAL NOTES:

1. ALL CONSTRUCTION AND TEST METHODS SHALL BE IN CONFORMANCE WITH PIMA ASSOCIATION OF GOVERNMENTS (PAG) STANDARD SPECIFICATIONS AND DETAILS FOR PUBLIC IMPROVEMENTS, 2015 EDITION AND ANY AMENDMENTS THERETO. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH PAG STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS, 2015 EDITION, EXCEPT AS MODIFIED HEREBY.
2. CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS.
3. CONTRACTOR MUST OBTAIN ALL PERMITS REQUIRED BY GOVERNMENTAL AGENCIES BEFORE UNDERTAKING ANY GRADING OR CONSTRUCTION WORK OF ANY TYPE.
4. A SEALED AND APPROVED SET OF THESE PLANS SHALL BE KEPT IN AN EASILY ACCESSIBLE LOCATION ON THE SITE AT ALL TIMES DURING CONSTRUCTION.
5. UPON COMMENCEMENT OF WORK, TRAFFIC CONTROL DEVICES SHALL BE POSTED AND MAINTAINED BY THE CONTRACTOR UNTIL SUCH TIME AS THE WORK IS COMPLETED. ALL WARNING SIGNS, BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES 2009 (MUTCD 2009).
6. UTILITY LOCATIONS SHOWN ON THESE PLANS WERE COMPILED BASED ON PROJECT SURVEY AND MAPPING RECEIVED FROM UTILITY PROVIDERS. UTILITY LOCATIONS WHICH ARE NOT SPECIFICALLY LOCATED WITH ACTUAL HORIZONTAL AND VERTICAL CONTROLS ARE LOCATED APPROXIMATELY AND TO THE BEST AVAILABLE INFORMATION. UTILITY LOCATIONS ARE NOT INTENDED TO BE EXACT OR COMPLETE. PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES WITH THE APPROPRIATE ORGANIZATIONS. CONTACT "ARIZONA 811" AT 1-800-782-5348 TWO FULL WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION.
7. THE CONTRACTOR SHALL FIELD-VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IF ACTUAL LOCATIONS DIFFER FROM THOSE SHOWN ON THE PLANS.
8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN SAFE AND REASONABLE ACCESS FOR PEDESTRIANS. IF PEDESTRIANS MUST BE DETOURED AROUND THE CONSTRUCTION SITE, THE DETOUR SHALL BE CLEARLY IDENTIFIED AND UNDERSTANDABLE TO THE USER. IF PEDESTRIANS ARE FORCED TO CROSS A STREET BECAUSE OF A DETOUR THEY SHALL BE DIRECTED TO A LOGICAL PEDESTRIAN CROSSING. ACCESS SHALL BE APPROVED BY THE CITY REPRESENTATIVE PRIOR TO IMPLEMENTATION AND MUST COMPLY WITH THE AMERICANS WITH DISABILITY ACT (ADA).
9. SUBGRADE PREPARATION BENEATH THE CURB, SIDEWALK, AND ROADWAY SHALL BE COMPACTED TO 95% MAXIMUM DENSITY PER PAG SPECIFICATION SECTION 205.
10. THE CONTRACTOR SHALL IMPLEMENT GOOD HOUSEKEEPING FOR STORM WATER POLLUTION PREVENTION PRACTICES ON-SITE DURING THE COURSE OF CONSTRUCTION. GOOD HOUSEKEEPING PRACTICES INCLUDE, BUT ARE NOT LIMITED TO: STREET SWEEPING, PERIMETER STOCKPILE CONTROLS, SOLID WASTE MANAGEMENT, EQUIPMENT MAINTENANCE PROCEDURES, CONCRETE WASHOUTS, SPILL PREVENTION, AND STORM DRAIN INLET PROTECTION.
11. THE CITY SHALL NOT BE HELD LIABLE OR RESPONSIBLE FOR ANY ERRORS AND/OR OMISSIONS ON THESE PLANS. ITEMS NOT MEETING PAG STANDARDS SHALL BE REPAIRED OR REPLACED AT NO COST TO THE CITY.
12. ANY EXCESS EXCAVATED MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR, AND SHALL BE REMOVED FROM PROJECT SITE BY THE CONTRACTOR.
13. THE CONTRACTOR SHALL NOT DAMAGE NATURAL GROWTH WITHIN PRIVATE PROPERTY. ALL WORK SHALL BE DONE WITHIN PUBLIC PROPERTIES, EASEMENTS, ROADWAYS, AND ALLEYS.
14. REMOVAL OF ALL CACTI AND NATIVE PLANTS SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF THE "ARIZONA NATIVE PLANT LAW" A.R.S, CHAPTER 7.(ARS SECTION 3-901, ET. SEQ).
15. ALL SAW CUTTING OF EXISTING ASPHALT PAVEMENT SHALL BE CONSIDERED INCIDENTAL AND INCLUDED WITHIN THE CONSTRUCTION COSTS FOR ACCESS RAMPS, DRIVEWAY APRONS, SIDEWALKS, AND CURB. IN ALL CASES WHEN MATCHING EXISTING PAVEMENT THE CONTRACTOR SHALL SAW CUT A ONE (1) FOOT (UNLESS OTHERWISE NOTED) NEAT EDGE AND TACK THE EXISTING PAVEMENT PRIOR TO JOINING THE NEW PAVEMENT.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CARE AND MAINTENANCE OF EXISTING IMPROVEMENTS AND VEGETATION IN THE WORK AREA. PAVEMENT, CURBS, CURB ACCESS RAMPS, WALLS, SIGNS, FENCING, AND ANY OTHER IMPROVEMENTS DAMAGED DURING CONSTRUCTION ARE TO BE REPLACED BY THE CONTRACTOR AT NO COST TO THE CITY. ANY UNDERGROUND PIPES, IRRIGATION LINES, IRRIGATION CONTROLS, DRAINS, STRUCTURES, OR OBSTRUCTIONS DESIGNATED ON THE PLANS AS TO REMAIN SHALL BE MOVED, ALTERED, OR REPAIRED BY THE CONTRACTOR WHEN ENCOUNTERED, AS DIRECTED BY THE CITY'S REPRESENTATIVE, AND SHALL BE CONSIDERED INCIDENTAL. ALL REPAIR, REPLACEMENT, OR CLEANUP SHALL BE DONE TO THE SATISFACTION OF THE CITY'S REPRESENTATIVE.
17. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FURNISH, HAUL, AND APPLY ALL WATER REQUIRED FOR COMPACTION AND FOR THE CONTROL OF DUST FROM CONSTRUCTION ACTIVITY. THE COST THEREOF IS TO BE INCLUDED IN THE APPROPRIATE BID ITEM(S) PRICE(S).
18. INSPECTION BY THE CITY OR THE CITY'S REPRESENTATIVE OF THE WORK CALLED FOR ON THE PLANS SHALL NOT, IN ANY WAY, RELIEVE THE CONTRACTOR AND/OR HIS/HER SUB CONTRACTORS OF THEIR OBLIGATION TO PERFORM THE WORK IN COMPLIANCE WITH THE PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS, CODES, AND ANY OTHER APPLICABLE REGULATIONS PERTAINING THERETO.
19. THE CONTRACTOR SHALL OPERATE IN A MANNER COMPLIANT WITH ALL APPLICABLE REGULATIONS OF THE CITY, COUNTY, STATE, AND FEDERAL GOVERNMENT.
20. NOTHING CONTAINED IN THE CONTRACT DOCUMENTS SHALL CREATE, NOR SHALL BE CONSTUED TO CREATE ANY CONTRACTUAL RELATIONSHIP BETWEEN THE ENGINEER AND THE CONTRACTOR OR SUBCONTRACTOR.
21. QUANTITIES AS SHOWN ON THE BID SCHEDULE ARE ESTIMATED AND THE CONTRACTOR IS ADVISED THAT THE FINAL QUANTITIES OF MATERIALS AND WORK IN PLACE MAY DIFFER FROM THOSE INDICATED IN THE BID SCHEDULE.
22. SURVEYOR PROVIDING THE CONSTRUCTION LAYOUT TO VERIFY THE BENCHMARKS AND COMPARE THE SITE CONDITIONS WITH THE PLANS. THE CONTRACTOR SHALL NOTIFY THE CITY'S REPRESENTATIVE OF ANY DISCREPANCIES OBSERVED SHOULD ANY BENCHMARK, GRADE, OR DESIGN INDICATED ON THE PLANS BE SUSPECT. THE CITY'S REPRESENTATIVE SHALL BE NOTIFIED OF SAID BENCHMARK, GRADE, OR DESIGN PROBLEM AT LEAST TWENTY FOUR (24) HOURS BEFORE CONSTRUCTION IS SCHEDULED TO BEGIN IN THE AFFECTED AREA.
23. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS BEFORE STARTING WORK. SHOULD CONDITIONS EXIST WHICH ARE CONTRARY TO THOSE SHOWN ON THE PLANS, THE CITY'S REPRESENTATIVE SHALL BE NOTIFIED BEFORE PROCEEDING WITH THE WORK.
24. ALL ELEVATIONS, ALIGNMENTS, AND DISTANCES GIVEN SHALL BE VERIFIED BY AN ARIZONA REGISTERED LAND SURVEYOR BEFORE CONSTRUCTION.
25. AT ALL TIMES THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL DRIVEWAYS AND MAILBOXES, AND ONE THROUGH LANE IN EITHER DIRECTION.
26. THE CONTRACTOR SHALL COMPLY WITH ALL REGULATIONS AND REQUESTS BY THE ENGINEER REGARDING DUST POLLUTION.
27. WATER FACILITIES EXIST IN THE VICINITY OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PRESERVING AND PROTECTING ALL WATER FACILITIES DURING THE COURSE OF PERFORMING THE WORK. ANY DAMAGE TO WATER FACILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR AND REPLACE. THE CONTRACTOR SHALL NOTIFY TUCSON WATER AT 520-791-4133 IN THE EVENT OF DAMAGE TO TUCSON WATER FACILITIES.
28. ALL CHANGES TO THESE PLANS MUST BE CLEARED BY THE CITY OF TUCSON CITY ENGINEER'S PERMITS AND CODES SECTION, PRIOR TO CONSTRUCTION.
29. THE ENGINEER OF RECORD SHALL SUBMIT TO THE CITY FOR REVIEW ANY CHANGES TO THE APPROVED PLANS PRIOR TO CONSTRUCTION. ADDITIONALLY, THE ENGINEER OF RECORD SHALL CERTIFY ALL CHANGES MEETING ALL APPLICABLE STANDARDS, CODES, AND ORDINANCES.

GRADING & CONSTRUCTION NOTES:

1. TOPSOIL SHALL BE STORED ON SITE IN LOCATIONS APPROVED BY THE OWNER'S REPRESENTATIVE. DRAINAGE SHALL ROUTE AROUND THESE TOPSOIL STOCKPILES FOR THE DURATION OF THE GRADING OPERATIONS. EROSION CONTROL MEASURES SHALL PREVENT THE LOSS OF TOPSOIL MATERIAL.
2. CUT AND FILL AREAS SHALL BE SCARIFIED AND COMPACTED PER THE GEOTECHNICAL REPORT.
3. ELEVATIONS SHOWN ON THE PLANS ARE THE FINISHED GRADE ELEVATION.
4. GRADING SHALL BE SEQUENCED SO THAT AGGREGATE BASE IS PLACED WITHIN 10 CALENDAR DAYS OF ACHIEVING OPTIMUM SUBGRADE COMPACTION.
5. CONTRACTOR SHALL EMPLOY A QUALIFIED SOILS TESTING LABORATORY/ENGINEER TO OBSERVE THE EARTHWORK AND MAKE TESTS AS REQUIRED.
6. CONTRACTOR SHALL HAVE EARTH BORROW FILL, AGGREGATE, TOPSOIL, AND STRUCTURAL FILL TESTED AND APPROVED BY DESIGNATED LABORATORY BEFORE MOVING IT TO THE JOB SITE.
7. THE SOILS ENGINEER'S AND TESTING LABORATORY'S FEES SHALL BE PAID BY THE CONTRACTOR.
8. PRESERVATION/PROTECTION FENCING SHALL BE INSTALLED AND MAINTAINED THROUGHOUT PROJECT CONSTRUCTION.

CLEARING & GRUBBING NOTES:

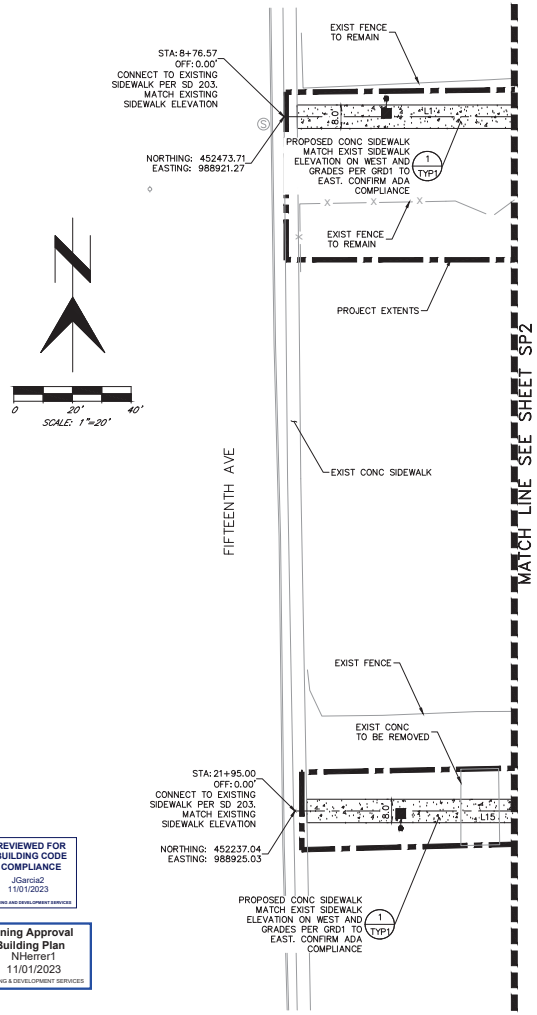
1. DO NOT EXCEED CLEARING AND GRUBBING LIMITS OF CONSTRUCTION LINES INDICATION OF THE PLANS.
2. ALL AREAS OUTSIDE THE LIMITS OF CONSTRUCTION LINE SHALL NOT BE CROSSED BY HEAVY EQUIPMENT OR USED FOR STORING HEAVY EQUIPMENT OR MATERIALS.
3. NO EQUIPMENT SHALL BE STORED UNDER THE DRIP LINE OF TREES TO REMAIN.
4. DO NOT FALL ANY TREES OR PUSH PILES OF DEBRIS AGAINST ANY TREES TO REMAIN.
5. REMOVE ALL STUMPS, ASPHALT, ABANDONED IRRIGATION, ETC AND DISPOSE OFF SITE IN ACCORDANCE WITH LOCAL, STATE & FEDERAL REGULATIONS. SALVAGE AND RE-USE ROCKS, BOULDERS, AND CONCRETE RUBBLE ON-SITE PER DIRECTION OF OWNER'S REPRESENTATIVE.
6. CONTACT ALL UTILITY AUTHORITIES WHO HAVE LINES WITHIN THE CLEARING AND GRUBBING LIMITS BEFORE STARTING WORK.
7. ALL EROSION CONTROL SEDIMENT BARRIERS, SILT FENCES, PRESERVATION FENCING, AND TREE PROTECTION DEVICES SHALL BE INSTALLED PRIOR TO STARTING CLEARING AND GRUBBING.
8. ALL CLEARING SHALL BE LIMITED TO AREAS TO BE GRADED WITHIN 15 CALENDAR DAYS.

BASIS OF BEARING: THE BASIS OF BEARING WAS ESTABLISHED BETWEEN A FOUND 2" BCSM IN CONCRETE AT THE INTERSECTION OF SPEEDWAY AND RIVERSIDE DRIVE (SAID POINT ALSO HAVING PIMA COUNTY DOT DESIGNATION E19) AND A 1-1/2" ACP ON THE SOUTHWEST CORNER OF THE ELM ST AND ORACLE RD INTERSECTION (SAID POINT ALSO HAVING PIMA COUNTY DOT DESIGNATION C21) SAID BEARING BEING: NORTH 44 DEGREES 15 MINUTES 29 SECONDS EAST, FOR A DISTANCE OF 3565.80 FEET.

BASIS OF ELEVATION: THE BASIS OF ELEVATION WAS ESTABLISHED FROM A FOUND 1-1/2" ACP WITH PIMA COUNTY DOT DESIGNATION C19 SAID ELEVATION BEING 2334.58 FEET NAVD88

LEGEND

X X	EXISTING CHAINLINK FENCE
BASIN TOE	
C C	LIMIT OF CUT SLOPE
F F	LIMIT OF FILL SLOPE
	EXIST GRADE
	FINISHED GRADE
	EXISTING BARBED WIRE FENCE
	CONCRETE
	RIPRAP
	A.B.C
	RIP & RECOMPACT



REVIEWED FOR BUILDING CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

Zoning Approval
Building Plan
NHerrer1
11/01/2023
CITY OF TUCSON PLANNING & DEVELOPMENT SERVICES

I-1. DP22-0259

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TUCSON, AZ

REGISTERED LANDSCAPE ARCHITECT
51478
KEVIN W. PAYNE
ARIZONA, USA
Exp. Date 09/30/2022

Revision Record

No.	Description	Date
1		
2		
3		

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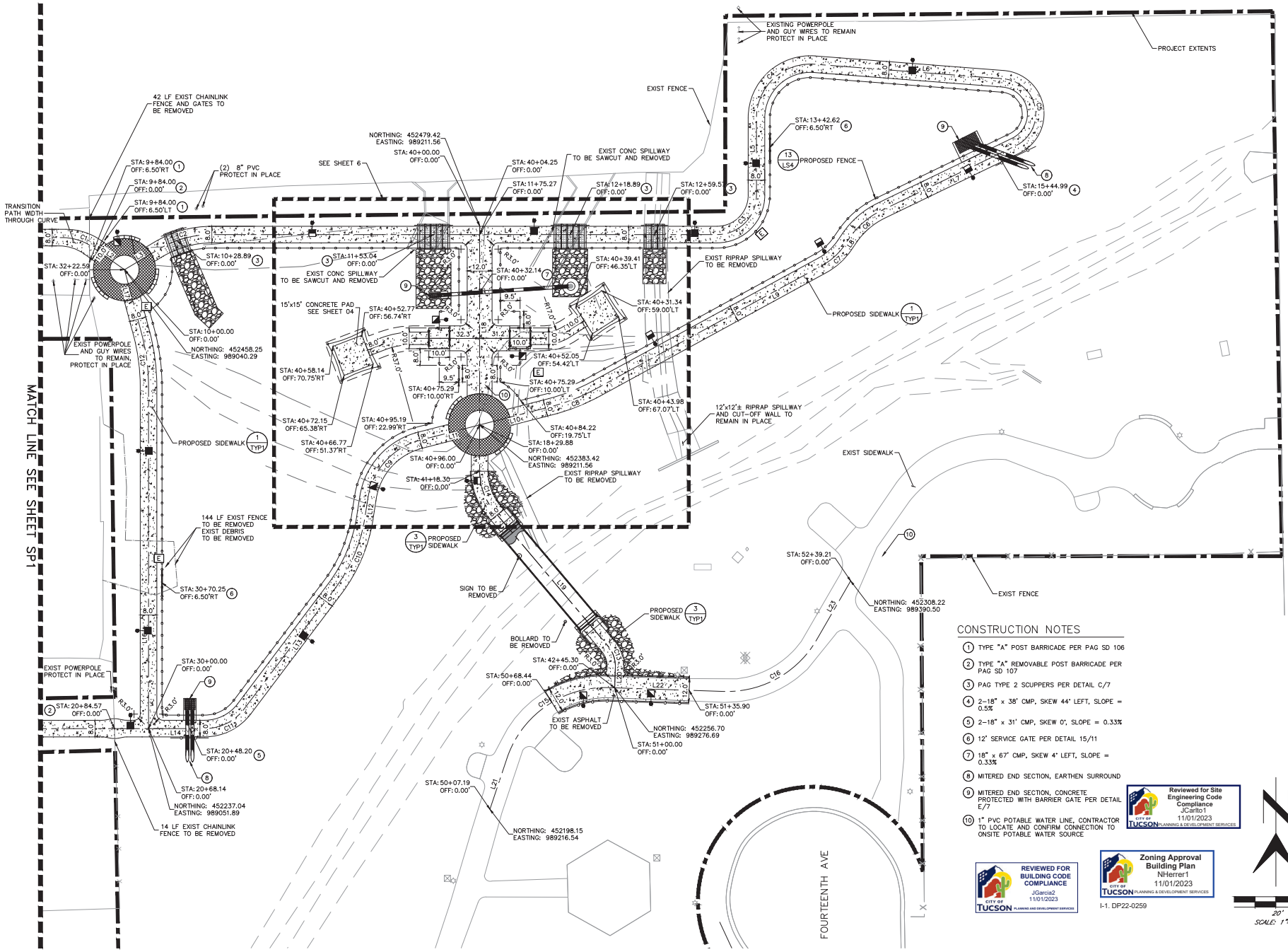
GENERAL NOTES & SITE PLAN

Project number:	098134081
Date:	08.21.2022
Designed by:	JS
Drawn by:	RJB
Checked by:	KWP

SP1

Sheet Number: 02 of 23

TC-COM-0523-01350



CONSTRUCTION NOTES

1. TYPE "A" POST BARRICADE PER PAG SD 106
2. TYPE "A" REMOVABLE POST BARRICADE PER PAG SD 107
3. PAG TYPE 2 SCUPPERS PER DETAIL C/7
4. 2–18" x 38' CMP, SKEW 44° LEFT, SLOPE = 0.5%
5. 2–18" x 31' CMP, SKEW 0°, SLOPE = 0.33%
6. 12' SERVICE GATE PER DETAIL 15/11
7. 18" x 67' CMP, SKEW 4° LEFT, SLOPE = 0.33%
8. MITERED END SECTION, EARTHEN SURROUND
9. MITERED END SECTION, CONCRETE PROTECTED WITH BARRIER GATE PER DETAIL E/7
10. 1" PVC POTABLE WATER LINE, CONTRACTOR TO LOCATE AND CONFIRM CONNECTION TO ONSITE POTABLE WATER SOURCE

Reviewed for Site Engineering Code Compliance
JCarlo1
11/01/2023
CITY OF TUCSON PLANNING & DEVELOPMENT SERVICES

REVIEWED FOR BUILDING CODE COMPLIANCE
JGarcia2
11/01/2023
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Zoning Approval Building Plan
NHerrer1
11/01/2023
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SCALE: 1"=20'

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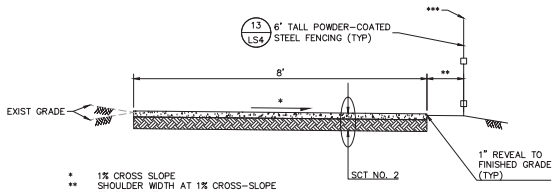
SITE PLAN

Project number:	098134081
Date:	08.21.2022
Designed by:	JS
Drawn by:	RJB
Checked by:	KWP

SP2

Sheet Number: 03 of 23

TC-COM-0523-01350



* 1% CROSS SLOPE
** SHOULDER WIDTH AT 1% CROSS-SLOPE
*** FENCE LOCATION

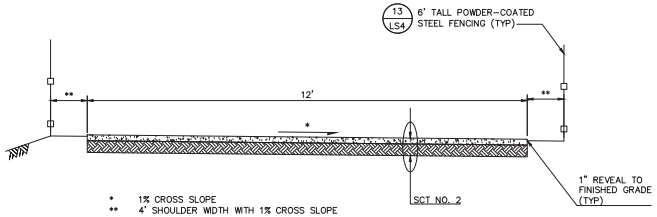
1 8' TYPICAL PATH SECTION

** SHOULDER WIDTH = 2.5'
*** FENCE RIGHT

STA 10+15.00 TO STA 18+14.88
STA 18+44.88 TO STA 20+68.14
STA 30+00.00 TO STA 32+07.59

** NO SHOULDER
*** NO FENCE

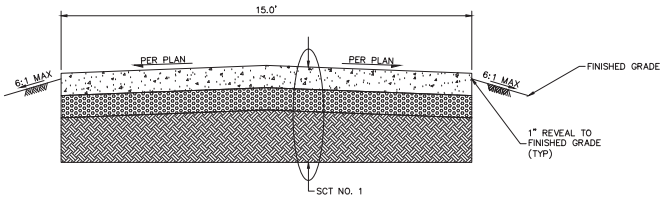
STA 8+81.00 TO STA 9+85.00
STA 20+68.14 TO STA 21+91.00



* 1% CROSS SLOPE
** 4' SHOULDER WIDTH WITH 1% CROSS SLOPE

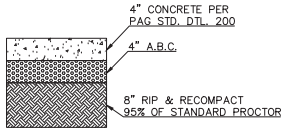
2 12' TYPICAL PATH SECTION

STA 40+08.25 TO STA 40+81.00



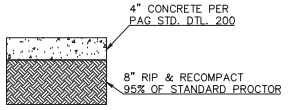
G CONCRETE RAMADA PAD

ALONG BOTH AXIS NTS



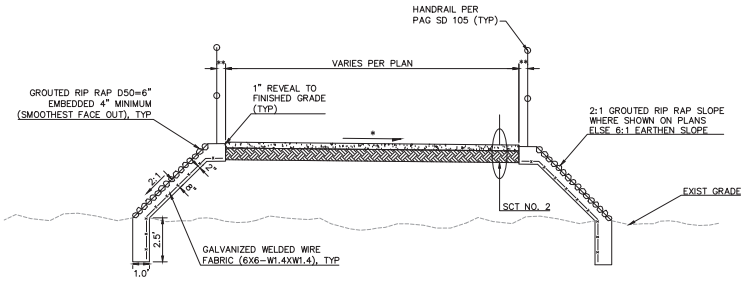
NOTE:
1. REFER TO PAG STD. DTL. 200 FOR INFORMATION NOT SHOWN.

SECTION NO. 1



NOTE:
1. REFER TO PAG STD. DTL. 200 FOR INFORMATION NOT SHOWN.

SECTION NO. 2



* 1% CROSS SLOPE
** 0.5' SHOULDER WIDTH WITH 1% CROSS SLOPE

3 VARIABLE TYPICAL PATH SECTION

STA 41+11.00 TO STA 41+48.92
STA 42+11.08 TO STA 42+39.30
STA 50+68.44 TO STA 51+35.92

REVIEWED FOR BUILDING CODE COMPLIANCE
JGarcia2
JGarlo1
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

Reviewed for Site Engineering Code Compliance
JGarcia2
JGarlo1
11/01/2023
CITY OF TUCSON PLANNING & DEVELOPMENT SERVICES

LINE TABLE		
LINE	LENGTH	BEARING
L1	89.17	N90°00'00.00"E
L2	18.89	S54°47'27.93"E
L3	19.16	N59°07'18.97"E
L4	243.66	N90°00'00.00"E
L5	37.19	N0°00'00.00"E
L6	91.26	S85°35'28.71"E
L7	72.07	S64°15'06.83"W
L8	4.31	S34°21'49.35"W
L9	124.13	S61°23'59.66"W
L10	35.24	S75°36'29.30"W
L11	29.61	S75°36'29.30"W
L12	9.98	S8°54'43.36"W
L13	72.59	S37°02'20.46"W
L14	27.00	N90°00'00.00"W
L15	126.86	N90°00'00.00"W
L16	164.78	N0°00'00.00"E
L17	31.60	N15°00'58.18"W
L18	118.30	S0°00'00.00"E
L19	85.04	S40°09'57.66"E
L20	9.92	S1°53'36.00"W
L21	25.82	N18°27'01.07"E
L22	55.41	S88°06'24.00"E
L23	32.75	N30°04'15.75"E

CURVE TABLE		
CURVE	RADIUS	LENGTH
C1	25.00'	15.36'
C2	50.00'	26.95'
C3	19.00'	29.85'
C4	26.00'	42.84'
C5	17.00'	44.46'
C6	39.00'	20.34'
C7	31.00'	14.63'
C8	96.00'	23.81'
C9	34.00'	39.58'
C10	76.00'	37.31'
C11	24.00'	22.18'
C12	100.00'	26.21'
C13	15.00'	11.01'
C14	30.00'	21.03'
C15	50.00'	64.09'
C16	50.00'	53.95'

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DOG PARK & WATER HARVESTING
1415 N 14TH AVE
TUCSON, AZ

51478
KEVIN W. PAYNE
Registered Professional Engineer
ARIZONA, U.S.A.
Exp.Date 09/30/2022

Revision Record		
No.	Description	Date
1		
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TYPICAL SECTIONS

Project number:	098134081
Date:	08.21.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

TYP1

Sheet Number: 04 of 23

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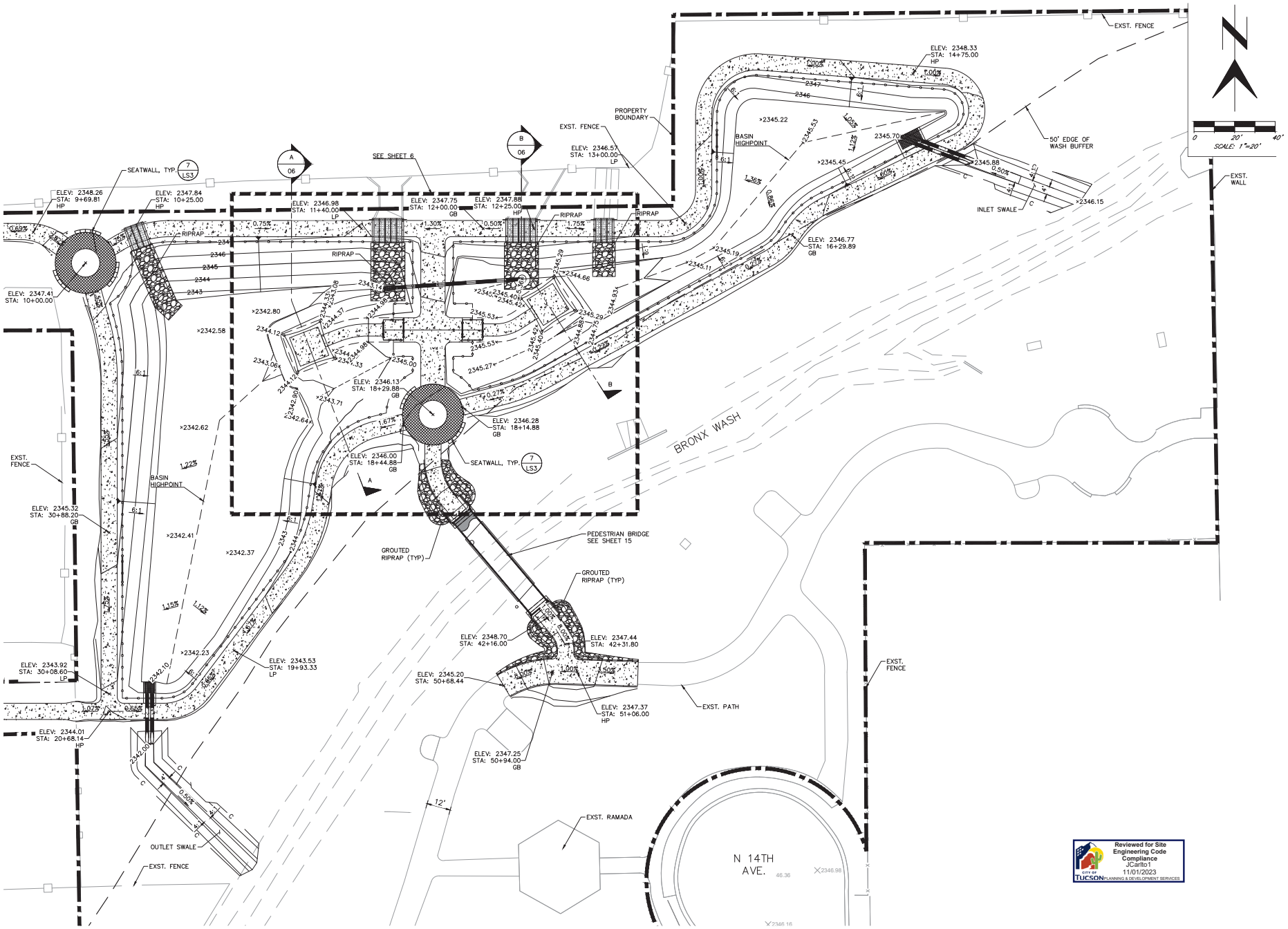

Reviewed for Site Engineering Code Compliance
JCarlto1
11/01/2023
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KEVIN W. PAYNE
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ARIZONA, U.S.A.
Exp. Date 09/30/2022

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GRADING PLANS

Project number:	098134081
Date:	08.21.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

GRD1

Sheet Number: 05 of 23

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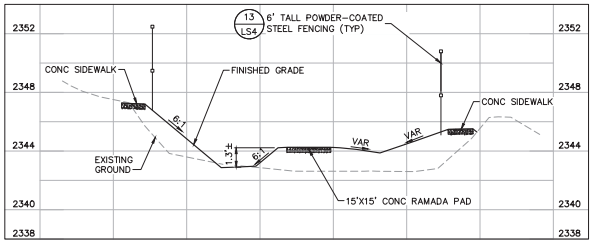
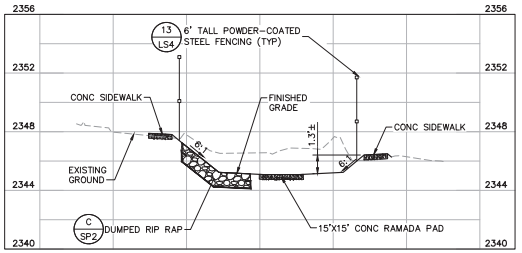


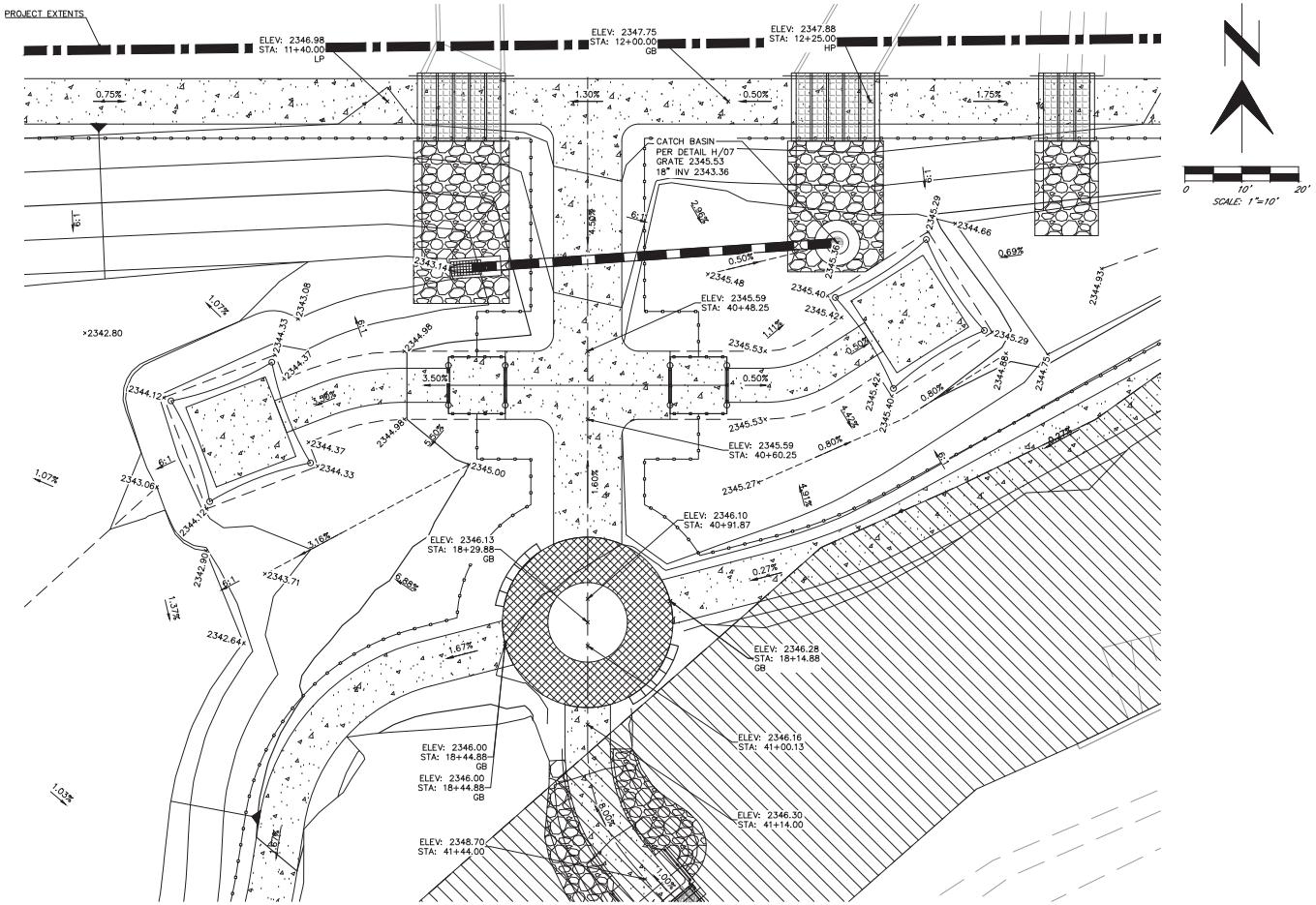
A SECTION A-A

H: 1" = 20'
V: 1" = 5'



B SECTION B-B

H: 1" = 20'
V: 1" = 5'



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JCarlito1
11/01/2023
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CIVIL DETAILS

Project number:	098134081
Date:	08.21.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

DTL1

Sheet Number: 06 of 23

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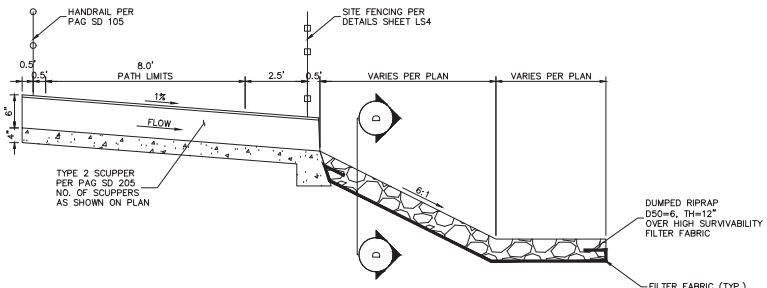
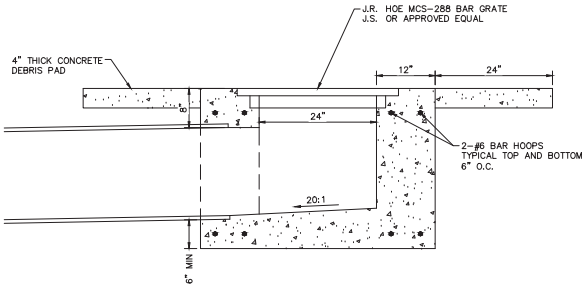


C PAG SD 205 TYPE 2 SCUPPER AND RIPRAP DETAIL

NTS

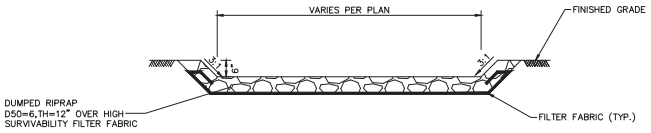


H CATCH BASIN WITH BAR GRATE

NTS

NOTES:

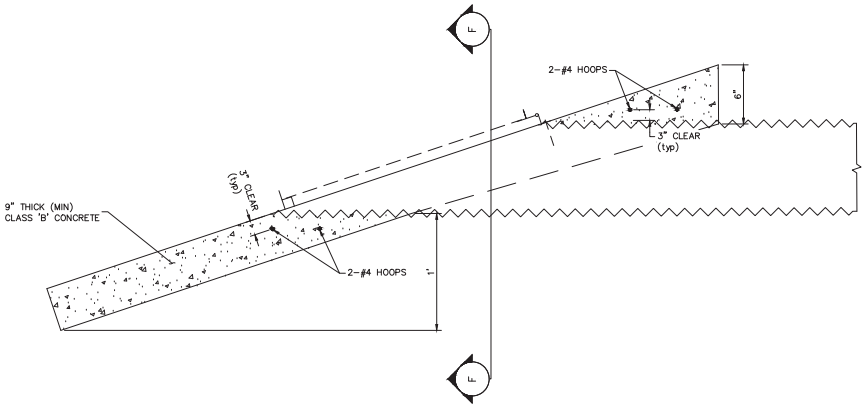
1. ALL CONCRETE SHALL BE CLASS "S", 3000 PSI.
2. INVERT AND BASE TO BE POURED AND SHAPED BY HAND TO MAKE SMOOTH TRANSITION. FINISH WITH RUBBER FLOAT.
3. REINFORCING SHALL INCLUDE #6 HOOPS AS SHOWN AND #6 VERTICAL BARS, 6" O.C., IN WALLS, AND #6 HORIZONTAL BARS, 6" O.C BOTH WAYS, IN BASE.
4. ALL REINFORCING STEEL SHALL HAVE 1-1/2" CLEARANCE ON ALL SIDES.



D-D OUTLET PROTECTION TYPICAL SECTION

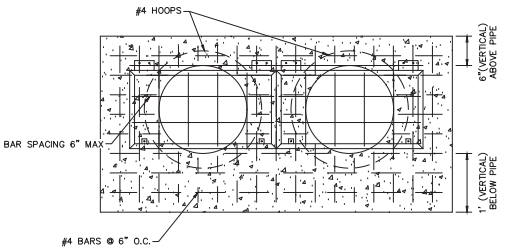
NTS

RIPRAP GRADATION CHART D_{50}=6"	
ROCK SIZE (IN)	PERCENT GRADATION SMALLER THAN (%)
10"	100
6"	50
3"	15



E CULVERT END SECTION PROTECTION WITH BARRIER GATE

NTS



F-F BARRIER GATE

NTS

NOTES:

1. REBAR AND GRATE SPACING MEASURED AT PLANE OF SLOPE (TYPICAL 6:1)
2. FOR ADDITIONAL BARRIER GATE DETAILS, SEE ADOT C-13.75

Reviewed for Site Engineering Code Compliance
JCarlto1
11/01/2023
CITY OF TUCSON PLANNING & DEVELOPMENT SERVICES

Kimley»Horn
533 EAST WETMORE, SUITE 280
TUCSON, AZ 85705
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Tucson Parks and Recreation
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FRANCISCO ELIAS ESQUER PARK
DOG PARK & WATER HARVESTING
1415 N 14TH AVE
TUCSON, AZ

51478
KEVIN W. PAYNE
Registered Professional Engineer
ARIZONA, USA
Exp. Date 09/30/2022

Revision Record		
No.	Description	Date
1		
2		
3		

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CIVIL DETAILS

Project number:	098134081
Date:	08.21.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

DTL2

Sheet Number: 07 of 23

TC-COM-0523-01350

PLANTING NOTES

1. ALL WORK SHALL BE CONFINED TO LIMITS OF CONSTRUCTION AS SHOWN ON PLANS.
2. SITE GRADING NECESSITATED BY THE WORK AS IT PROGRESSES AND NOT SPECIFICALLY CALLED OUT ON THE PLANS SHALL BE CONSIDERED INCIDENTAL WORK.
3. CONTRACTOR SHALL COORDINATE AND BE IN COMPLIANCE WITH ALL STATE AND LOCAL MUNICIPALITIES AS WARRANTED.
4. CONTRACTOR IS TO REVIEW PLANS, VERIFY SITE CONDITIONS AND PLANT QUANTITIES PRIOR TO INSTALLATION. ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND SPECIFICATIONS AND EXISTING SITE CONDITIONS OR ANY INCONSISTENCIES OR AMBIGUITIES IN DRAWINGS OR SPECIFICATIONS SHALL BE IMMEDIATELY REPORTED TO THE LANDSCAPE ARCHITECT, IN WRITING, WHO SHALL PROMPTLY ADDRESS SUCH INCONSISTENCIES OR AMBIGUITIES. WORK DONE BY THE CONTRACTOR AFTER HIS DISCOVERY OF SUCH DISCREPANCIES, INCONSISTENCIES, OR AMBIGUITIES SHALL BE DONE AT THE CONTRACTOR'S RISK.
5. DEVIATION FROM THESE PLANS AND NOTES WITHOUT THE PRIOR CONSENT OF THE OWNER OR THE LANDSCAPE ARCHITECT MAY BE CAUSE FOR THE WORK TO BE DESIGNATED UNACCEPTABLE.
6. THE CONTRACTOR ACKNOWLEDGES & AGREES THAT THE WORK IS ENTIRELY AT HIS RISK UNTIL SITE IS ACCEPTED, AND HE WILL BE HELD RESPONSIBLE FOR ITS SAFETY BY THE OWNER.
7. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE DAMAGE OR LOSS OF ANY REFERENCE POINTS AND HUBS DURING THE CONSTRUCTION OF HIS WORK, AND SHALL BEAR THE COST OF REPLACING SAME.
8. THE CONTRACTOR IS RESPONSIBLE FOR HORIZONTALLY AND VERTICALLY LOCATING AND PROTECTING ALL PUBLIC AND PRIVATE UTILITIES WHICH LIE IN OR ADJACENT TO THE CONSTRUCTION SITE AT LEAST 48 HOURS PRIOR TO ANY DEMOLITION, GRADING, OR CONSTRUCTION ACTIVITY.
9. THE CONTRACTOR SHALL SALVAGE AND PROTECT ALL EXISTING POWER POLES, SIGNS, MANHOLES, TELEPHONE RISERS, WATER VALVES, ETC., DURING ALL CONSTRUCTION PHASES UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL REPAIR, AT HIS OWN EXPENSE, ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION.
10. ANY FOREIGN ITEM FOUND DURING CONSTRUCTION IS THE PROPERTY OF THE OWNER. THIS INCLUDES, BUT IS NOT LIMITED TO, PRECIOUS METALS, COINS, PAPER CURRENCY, ARTIFACTS AND ANTIQUITIES.
11. ALL SURPLUS EXCAVATION SHALL BE TAKEN TO A SITE DESIGNATED BY OWNER, AT NO ADDITIONAL COST TO THE OWNER. IF OWNER CHOOSES, THE CONTRACTOR MAY TAKE POSSESSION OF SURPLUS EXCAVATION MATERIAL.
12. CONTRACTOR IS RESPONSIBLE FOR VERIFYING AND/OR OBTAINING ALL REQUIRED PERMITS AND APPROVALS PRIOR TO COMMENCING CONSTRUCTION.
13. CONTRACTOR IS TO MAINTAIN CONTROLLED PEDESTRIAN AND ADA ACCESS THROUGH ALL AREAS OF THE SITE THROUGHOUT CONSTRUCTION PERIOD.
14. MAINTAIN THE SITE IN A NEAT AND ORDERLY CONDITION AT ALL TIMES. DAILY, AND MORE OFTEN IF NECESSARY, INSPECT & AND PICK UP ALL SCRAP, DEBRIS, & WASTE MATERIAL.
15. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REMOVE ALL MUD, DIRT, ROCK MULCH AND OTHER MATERIALS TRACKED ONTO ANY PRIVATE OR PUBLIC STREETS OR SIDEWALKS. THE CONTRACTOR MUST CLEAN THESE DAILY, IF NECESSARY. THE CONTRACTOR MUST USE WATER OR OTHER ACCEPTABLE METHODS TO KEEP AIRBORNE DUST TO A REQUIRED MINIMUM.
16. PROVIDE PROTECTION TO ALL FINISHED WORK. MAINTAIN SURFACES CLEAN, UNMARRED, AND SUITABLY PROTECTED UNTIL ACCEPTANCE BY OWNER.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY DAMAGE RESULTING FROM CONSTRUCTION ACTIVITY TO EXISTING ELEMENTS THAT ARE TO REMAIN.
18. EROSION CONTROL MEASURES (IE: SILT FENCING AND SEDIMENT CONTROL) SHALL BE MAINTAINED BY THE CONTRACTOR PER CIVIL SPECIFICATIONS. ANY EROSION CONTROL MEASURES DAMAGED BY THE CONTRACTOR SHALL BE REPLACED PER CIVIL SPECIFICATIONS.
19. PLANT QUANTITIES LISTED IN THE PLANT LEGEND ARE FOR THE CONVENIENCE OF THE CONTRACTOR. THE CONTRACTOR SHALL DO THEIR OWN TAKE-OFFS AND BASE BID ACCORDINGLY.
20. ALL PLANT MATERIAL SHALL BE HEALTHY, VIGOROUS, WELL BRANCHED, AND DENSELY FOLIATED (WHEN IN-LEAF) AS IS TYPICAL FOR THE SPECIES. THEY SHALL HAVE HEALTHY, WELL DEVELOPED STANDARDS, AND FREE OF ANY BRUISES, CUTS OR OTHER ABNORMALITIES. PLANT MATERIAL SHALL BE SIZED IN ACCORDANCE WITH THE AMERICAN STANDARD FOR NURSERY STOCK, LATEST EDITION, PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMAN.
21. OWNERS REPRESENTATIVE RESERVES THE RIGHT TO REJECT ANY PLANT MATERIAL DEEMED UNACCEPTABLE.
22. LANDSCAPE CONTRACTOR TO TAG AND HOLD ALL PLANT MATERIAL A MINIMUM OF 30 DAYS PRIOR TO DATE OF INSTALLATION. ALL PLANT MATERIAL SUBSTITUTIONS MADE WITHIN THE 30 DAYS PRIOR TO INSTALLATION TO BE THE NEXT SIZE LARGER AT NO ADDITIONAL COST TO THE CLIENT.
23. ALL TREE LOCATIONS TO BE STAKED AND APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
24. INSTALL ALL CANOPY TREES WITH A MINIMUM OF 5 FT. SEPARATION FROM ALL UTILITIES, UNLESS A ROOT BARRIER IS UTILIZED.
25. THE LANDSCAPE CONTRACTOR SHALL MAINTAIN PLANTED AREAS BY MEANS OF CONTINUOUS WATERING, PRUNING, RAISING TREE ROOT BALLS WHICH SETTLE BELOW GRADE, APPLICATION OF SPRAYS WHICH ARE NECESSARY TO KEEP THE PLANTING FREE OF INSECTS AND DISEASES, FERTILIZING, WEEDING, MOVING, EDGING AND/OR OTHER OPERATIONS NECESSARY FOR PROPER CARE AND UPKEEP.
26. PEA GRAVEL: ALL AREAS LABELED PEA GRAVEL ON THE PLANS ARE TO BE APPROVED BY OWNER. 2" MINIMUM DEPTH THROUGHOUT ENTIRE PROJECT. FINISH GRADE IN ALL AREAS TO BE SMOOTH AND EVEN AND 1" BELOW TOP OF CURB OR SIDEWALK.
27. AREAS TO RECEIVE PEA GRAVEL SHALL BE SPRAYED AT LEAST ONCE WITH A CONTACT HERBICIDE PRIOR TO PLANTING OPERATIONS IMMEDIATELY PRIOR TO PLACEMENT OF PEA GRAVEL. CONTRACTOR TO APPLY PRE-EMERGENT PER MANUFACTURER RECOMMENDATIONS.
28. PEA GRAVEL SHALL EXTEND UNDER TREES AND SHRUBS WHERE NOTED ON PLANS. REFER ALSO TO PLANTING DETAILS.
29. CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN THE ENTIRE PROJECT FOR TWO YEARS AFTER ACCEPTANCE OF THE WORK BY OWNERS REPRESENTATIVE. UPON COMPLETION OF THE MAINTENANCE PERIOD THE OWNER WILL ASSUME ALL MAINTENANCE RESPONSIBILITY.
30. PRIOR TO INITIATING THE MAINTENANCE PERIOD, COMPLETE ANY INITIAL PUNCH-LIST ITEMS. THEN OBTAIN APPROVAL FROM OWNER'S REPRESENTATIVE OF SUBSTANTIAL COMPLETION. DETERMINE WITH THE OWNER'S REPRESENTATIVE THE START DATE FOR THE MAINTENANCE PERIOD. CONTRACTOR TO MAINTAIN LANDSCAPE WHICH MAY INCLUDE WATERING, WEEDING, PRUNING, AND REPLACEMENT OF ANY MATERIAL THAT HAS DIED OR IS SHOWING EVIDENCE OF STRESS. SUBMIT WRITTEN REQUEST FOR FINAL PUNCH-LIST ONE WEEK PRIOR TO END OF MAINTENANCE PERIOD.
31. ALL GENERAL CONDITIONS, SUPPLEMENTARY GENERAL CONDITIONS AND TECHNICAL SPECIFICATIONS OF THE CONTRACT SHALL APPLY.

PLANTING LEGEND

TREES

SYMBOL	SCIENTIFIC NAME COMMON NAME	QTY	SIZE	GPH
	ACACIA GREGGII CATCLAW ACACIA	09	24"	6
	CHILOPSIS LINEARIS DESERT WILLOW	12	24"	6
	PARKINSONIA FLORIDA BLUE PALO VERDE	02 08	36" 24"	6
	PROSOPIS PUBESCENS SCREWBEAN MESQUITE	08	24"	6
	PROSOPIS VELUTINA VELVET MESQUITE	09	24"	6
	EXISTING TREE TO REMAIN			

SHRUBS/ACCENTS/GRASSES

SYMBOL	SCIENTIFIC NAME COMMON NAME	QTY	SIZE	GPH
	ARISTIDA PURPUREA PURPLE THREE AWN	85	1g	1
	BOUTELOUA GRACILIS BLUE GRAMA	214	1g	1
	CALLIANDRA ERIOPHYLLA PINK FAIRY DUSTER	19	1g	1
	DASYLIRION WHEELERI DESERT SPOON	03	5g	1
	MUHLENBERGIA CAPILLARIS REGAL MIST PINK MUHLY	117	1g	1
	MUHLENBERGIA RIGENS DEER GRASS	37	1g	1

LANDSCAPE ACCENTS

SYMBOL	SCIENTIFIC NAME COMMON NAME	QTY
	6" LANDSCAPE BOULDER	04
	3" LANDSCAPE BOULDER	11

HATCH LEGEND

SYMBOL	SURFACE TREATMENT	QTY (SF.)
	CONCRETE SIDEWALK	15,125
	EXPOSED AGGREGATE CONCRETE PAVING	1,105
	3/8" SCREENED PEA GRAVEL	36,604
	TURF SOD - TYPE TO MATCH EXISTING	395
	SEED MIX & DESERT COBBLE	14,225

SEED MIX:

BOTANICAL NAME	COMMON NAME	PLS RATE LBS/AC
ARISTIDA PURPUREA	PURPLE THREE-AWN	2.0
AMBROSIA DELTOIDEA	TRIANGLE-LEAF BURSAGE	2.0
BAILEYA MULTIRADIATA	DESERT MARIGOLD	2.0
ENCELIA FARINOSA	BRITTLE BUSH	0.25
ESCHOLTZIA MEXICANA	MEXICAN GOLD POPPY	1.0
PENSTEMON SP.	PENSTEMON	2.0
PROSOPIS VELUTINA	VELVET MESQUITE	1.0
PSILOSTROPHE COOPERII	DESERT GLOBEMALLOW	1.0
ZINNIA ACEROSA	DESERT ZINNIA	3.0

IRRIGATION NOTES

1. THE EXISTING PARK IRRIGATION SYSTEM SHALL BE EXTENDED BY CONTRACTOR AS NEEDED TO SUPPLY WATER TO ALL NEW PLANTS. CONTRACTOR SHALL WALK THE SITE WITH CITY OF TUCSON PARKS AND RECREATION DEPARTMENT PRIOR TO BEGINNING WORK TO IDENTIFY LOCATION OF EXISTING IRRIGATION EQUIPMENT AND FIELD VERIFY WATER PRESSURE AND EXISTING FLOWS. CITY OF TUCSON PARKS AND RECREATION CONTACT: DOMINIC RULLO, IRRIGATION SUPERVISOR 520-631-9225.
2. NO PLANT SHALL BE ORDERED OR INSTALLED UNTIL IRRIGATION SYSTEM IS INSTALLED, TESTED, APPROVED, AND FULLY FUNCTIONAL.
3. ALL EXISTING IRRIGATION COMPONENTS SHALL BE MAINTAINED IN CURRENT WORKING CONDITION. ALL EXISTING PLANTS AND TURF AREAS SHALL CONTINUE RECEIVING IRRIGATION DURING CONSTRUCTION ACTIVITIES, WITH NO MORE THAN ONE (1) WEEK OF DOWN TIME DURING CONNECTIONS.
4. READ THOROUGHLY AND BECOME FAMILIAR WITH THE SPECIFICATIONS AND INSTALLATION DETAILS FOR THIS AND RELATED WORK PRIOR TO CONSTRUCTION.
5. COORDINATE UTILITY LOCATES ("CALL BEFORE YOU DIG") OF UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION.
6. DO NOT PROCEED WITH THE INSTALLATION OF THE IRRIGATION SYSTEM WHEN IT IS OBVIOUS IN THE FIELD THAT OBSTRUCTIONS OR GRADE DIFFERENCES EXIST THAT MIGHT NOT HAVE BEEN CONSIDERED IN THE ENGINEERING, OR IF DISCREPANCIES IN CONSTRUCTION DETAILS, LEGEND, NOTES, OR SPECIFICATIONS ARE DISCOVERED. BRING ALL SUCH OBSTRUCTIONS OR DISCREPANCIES TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE.
7. THE DRAWINGS ARE DIAGRAMMATIC. THEREFORE, THE FOLLOWING SHOULD BE NOTED:
   A. IRRIGATION COMPONENTS MAY BE SHOWN OUTSIDE PLANTING AREAS FOR CLARITY, AVOID CONFLICTS BETWEEN THE IRRIGATION SYSTEM, PLANTING, MATERIALS, AND ARCHITECTURAL FEATURES. INSTALL IRRIGATION PIPE AND WIRING IN LANDSCAPED AREAS WHEREVER POSSIBLE.
   B. USE ONLY STANDARD TEES AND ELBOW FITTINGS. USE OF CROSS TYPE FITTINGS IS NOT PERMITTED.
6. THE IRRIGATION CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF IRRIGATION SLEEVING. SLEEVES ARE TO BE INSTALLED FOR BOTH PIPING AND ELECTRICAL WIRING AT EACH HARDSCAPE CROSSING. COORDINATE INSTALLATION OF SLEEVING WITH OTHER TRADES. ANY PIPE OR WIRE WHICH PASSES BENEATH EXISTING HARDSCAPE WHERE SLEEVING WAS NOT INSTALLED REQUIRES HORIZONTAL BORING BY THE IRRIGATION CONTRACTOR.

IRRIGATION LEGEND

SYMBOL	EQUIPMENT	PRODUCT	SIZE
	PRESSURE REGULATOR	SENNINGER PMR35MF	1"
	DRIP REMOTE CONTROL VALVE ASSEMBLY W/ FILTER	GRISWOLD DWS-100R W/ 200 MESH AMIAD FILTER	1"
	QUICK COUPLING VALVE	HUNTER HQ-44	1"
	MAIN LINE	PVC SCH 40 (PURPLE)	1-1/2"
T T	TREE LATERAL LINE	PVC SCH 40 (PURPLE)	3/4"
S	SHRUB LATERAL LINE	PVC SCH 40 (PURPLE)	3/4"
	POTABLE WATER LINE	PVC SCH 40	1"
	SLEEVE	PVC SCH 40	4", UNLESS NOTED OTHERWISE
NOT SHOWN	DRIP EMITTERS	HUNTER MPE-XX-BR SERIES EMITTER ACCESS SLEEVE: SALCO DAS-8 PLANT EMITTER QUANTITIES: ACCENTS/SHRUBS: ONE MPE PER 6 PLANTS W/IN 6' TREES: TWO MPE, 12 OPEN OUTLETS	
	FLUSH END CAP	REFER TO DETAILS	
S1 XX GPM	VALVE NUMBER VALVE SIZE GALLONS PER MINUTE		

Landscape Approval
Site Review
JCarlto1
11/01/2023
PLANNING & DEVELOPMENT SERVICES

REVIEWED FOR PLUMBING CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

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TUCSON, AZ

50732
REBECA V. FIELD
Registered Landscape Architect
ARIZONA, U.S.A.
Exp. Date 03/31/2024

Revision Record

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Contact Arizona 811 at least two full working days before you begin excavation.
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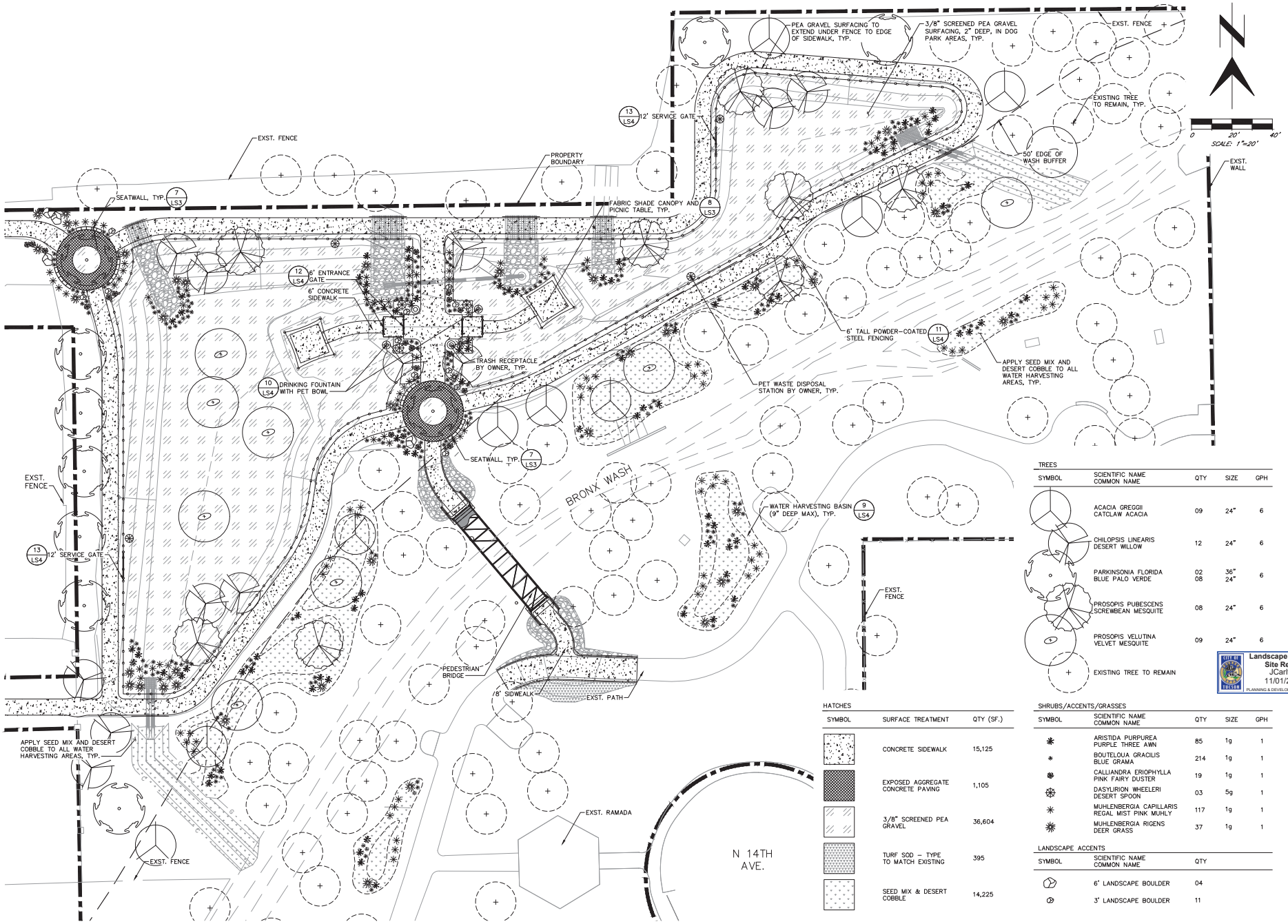
GENERAL NOTES

Project number:	098134081
Date:	08.22.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

LS1

Sheet Number: 08 of 23

TC-COM-0523-01350



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Site Review
JCarlto1
11/01/2023
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50732
REBECA V. FELIX
Registered Landscape Architect
ARIZONA, U.S.A.
Exp. Date 03/31/2024

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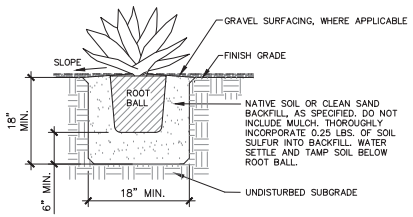
LANDSCAPE PLAN

Project number:	098134081
Date:	08.22.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

LS2

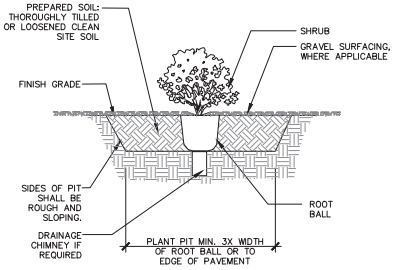
Sheet Number: 09 of 23

TC-COM-0523-01350

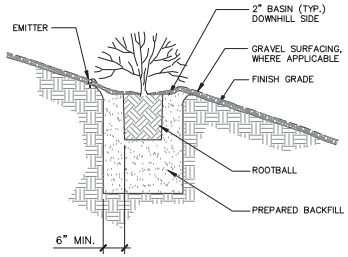


NOTES:
1. DO NOT CREATE A BASIN AT BASE OF PLANT. SLOPE BACKFILL AWAY FROM STEM.
2. SET STEM SUCCULENT SO THAT TOP OF ROOT BALL MATCHES ADJACENT GRADE.
3. THIS DETAIL APPLIES TO NURSERY GROWN STOCK OF THE GENERA DASYLIRION, OPUNTIA, HESPERALOE AND NOLINA.

1 SUCCULENT PLANTING — NTS

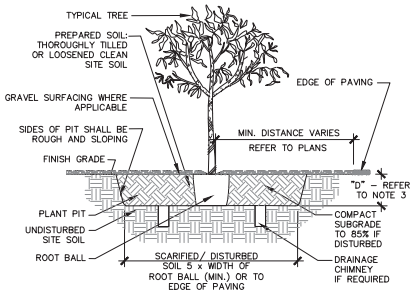


2 SHRUB PLANTING — NTS
5-GAL./1-GAL. PLANTS



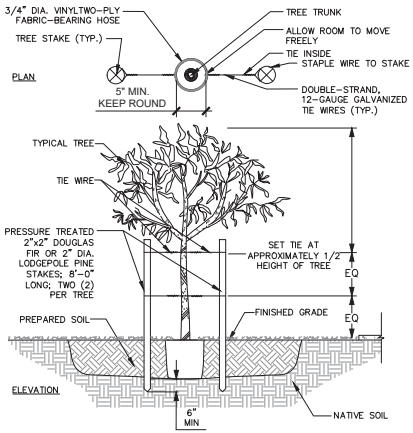
NOTES:
1. LOCATE EMITTER UP SLOPE OF PLANT.
2. FINISH GRADE 3:1 SLOPE MAX.

3 PLANTING ON SLOPES (3:1 MAX) — NTS



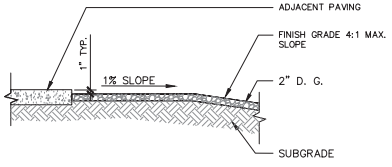
NOTES:
1. NO PLANTS SHALL BE PRUNED EXCEPT AT THE DIRECTION OF THE OWNER'S REPRESENTATIVE.
2. STAKE TREE ONLY IF NEEDED, PER DIRECTION OF OWNER'S REPRESENTATIVE. REFER TO TREE STAKING DETAIL.
3. DEPTH ("D") OF PLANT PIT TO BE EQUAL TO DEPTH OF ROOT BALL.
4. MULCH TO NOT TOUCH TRUNK OF TREE.

4 TREE PLANTING DETAIL — NTS

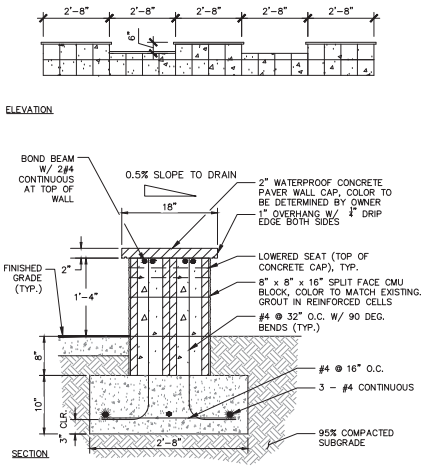


NOTES:
1. NO PLANTS SHALL BE PRUNED EXCEPT AT THE DIRECTION OF THE OWNER'S REPRESENTATIVE
2. STAKE TREES ONLY AS DIRECTED BY OWNER'S REPRESENTATIVE.
3. SET STAKES PARALLEL TO SIDEWALK AND PAVEMENT

5 TREE STAKING — NTS



6 FINISH GRADE AT PAVING
WITH DECOMPOSED GRANITE — NTS



7 SEAT WALL — NTS

NOTES:
1. SHADE STRUCTURE BY USASHADE & FABRIC STRUCTURES OR APPROVED EQUAL.
2. MODEL: PYRAMID, 16' x 16', HEIGHT: 11' MAX., 8' MIN. OPENING HEIGHT
3. POSTS: TELE-GRAY POWDERCOAT
4. CANOPY: BLUE COLOURSHADE FR FABRIC
5. SHOP DRAWINGS, INCLUDING POST FOUNDATION DETAILS, TO BE PROVIDED BY SHADE STRUCTURE MANUFACTURER FOR OWNER REVIEW AND APPROVAL.
6. PICNIC TABLE TO BE PROVIDED BY OWNER.

8 FABRIC SHADE CANOPY — NTS

Landscape Approval
Site Review
JCarlto1
11/01/2023
PLANNING & DEVELOPMENT SERVICES

Zoning Approval
Building Plan
NHerrer1
11/01/2023
PLANNING & DEVELOPMENT SERVICES

I-1. DP22-0259

REVIEWED FOR BUILDING CODE COMPLIANCE
JGarcia2
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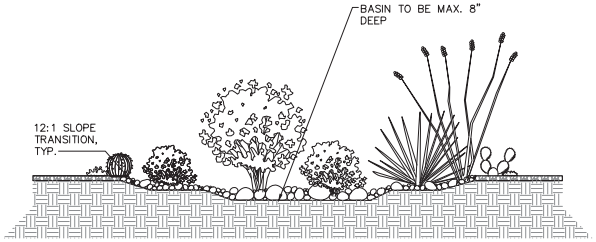
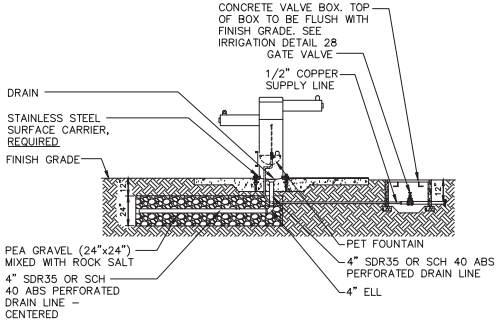


NOTES:
1. MAINTAIN FLOW-LINE FOR BASINS, NO CONTROL PROVIDED; FIELD ADJUSTMENTS MAY BE REQUIRED.
2. CONTRACTOR TO SPRAY PAINT LAYOUT OF BASINS FOR APPROVAL OF ENGINEER PRIOR TO INSTALLATION.
3. APPLY SEED MIX AND DESERT COBBLE IN ALL WATER HARVESTING BASINS. DESERT COBBLE TO BE 1"–3" ROCK, WITH 100% PASSING A 4" SIEVE SIZE AND 0–10% PASSING A 3/4" SIEVE SIZE. ROCK COLOR SHALL BE DESERT GOLD OR APPROVED EQUAL. 50% OF GROUND SURFACE TO BE COVERED WITH ROCK IN A RANDOM PATTERN. THE REMAINING 50% OF THE GROUND SURFACE IS TO REMAIN BARE. THE INTENT IS TO IMITATE A NATURAL DESERT GROUND SURFACE.

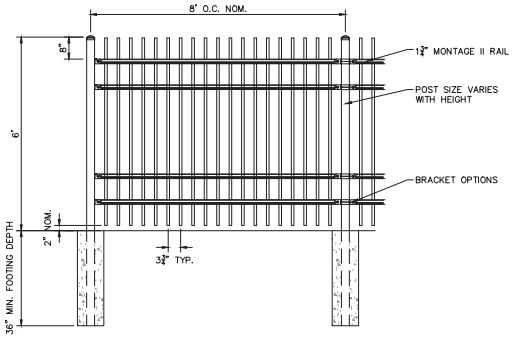
9 WATER HARVESTING BASIN
NTS



NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. DRAIN SUMP NOT TO BE PLACED 15' TO 20' FROM TREES.
3. DRAIN ROCK TO BE CLEAN PEA GRAVEL. MIXED WITH SALT PELLETS.
4. FOUNTAIN TO BE INSTALLED PER MANUFACTURERS RECOMMENDATION.
5. CONTRACTOR MUST APPLY CAULKING TO BOTTOM OF SURFACE MOUNT FLANGE.
6. PROVIDE TRACER WIRE ON SUPPLY LINE. TRACER WIRE SHALL BE #16 GREEN COATED COPPER WIRE.
7. INSTALL DETECTABLE MAGNETIC TAPE ON SUPPLY LINE AND DRAIN LINE.
8. SEAL ALL OPENINGS AND BOTTOM WITH GEOTEXTILE FABRIC.
9. COMPACT DISTURBED AREA AROUND BOX TO FINISH GRADE.
10. SEE IRRIGATION DETAIL 42 FOR VALVE BOX LID INFORMATION
11. MODEL: MDF 840 SMSS WITH PET FOUNTAIN; COLOR: CHROME

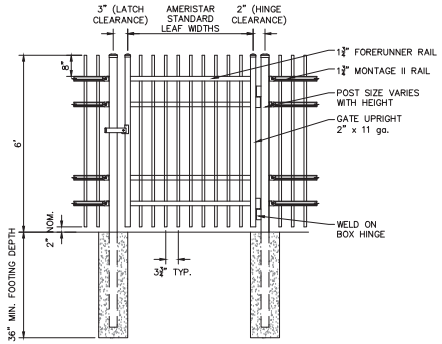
10 DRINKING FOUNTAIN WITH PET FOUNTAIN (ADA COMPLIANT)
NTS

NOTES:
1. POST SIZE DEPENDS ON FENCE HEIGHT AND WIND LOADS. SEE MONTAGE II SPECIFICATIONS FOR POST SIZING CHART AND SETTING DIMENSIONS.
2. THIRD & FOURTH RAIL OPTIONAL.
3. AVAILABLE IN FLUSH BOTTOM.



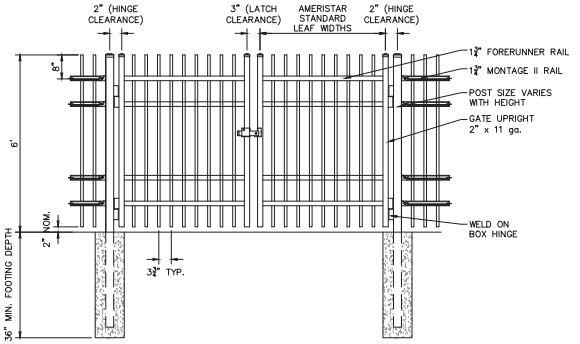
11 AMERISTAR MONTAGE II GENESIS FENCE
NTS

NOTES:
1. POST SIZE DEPENDS ON FENCE HEIGHT AND WIND LOADS. SEE MONTAGE II SPECIFICATIONS FOR POST SIZING CHART.
2. SEE AMERISTAR GATE TABLE FOR STANDARD OUT TO OUTS. CUSTOM GATE OPENINGS AVAILABLE FOR SPECIAL OUT TO OUT/LEAF WIDTHS.
3. ADDITIONAL STYLES OF GATE HARDWARE ARE AVAILABLE ON REQUEST. THIS COULD CHANGE THE LATCH & HINGE CLEARANCE.
4. THIRD & FOURTH RAIL OPTIONAL.



12 AMERISTAR MONTAGE II GENESIS SINGLE GATE
NTS

NOTES:
1. POST SIZE DEPENDS ON FENCE HEIGHT AND WIND LOADS. SEE MONTAGE II SPECIFICATIONS FOR POST SIZING CHART.
2. SEE AMERISTAR GATE TABLE FOR STANDARD OUT TO OUTS. CUSTOM GATE OPENINGS AVAILABLE FOR SPECIAL OUT TO OUT/LEAF WIDTHS.
3. ADDITIONAL STYLES OF GATE HARDWARE ARE AVAILABLE ON REQUEST. THIS COULD CHANGE THE LATCH & HINGE CLEARANCE.
4. THIRD & FOURTH RAIL OPTIONAL.



13 AMERISTAR MONTAGE II GENESIS DOUBLE GATE
NTS

REVIEWED FOR BUILDING CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

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533 EAST WETMORE, SUITE 280
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FRANCISCO ELIAS ESQUER PARK
DOG PARK & WATER HARVESTING
1415 N 14TH AVE
TUCSON, AZ

50732
REBECA V. FIELD
Registered Landscape Architect
ARIZONA, USA
Exp. Date 03/31/2024

Revision Record

No.	Description	Date
1		
2		
3		

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Call 811 or click Arizona811.com

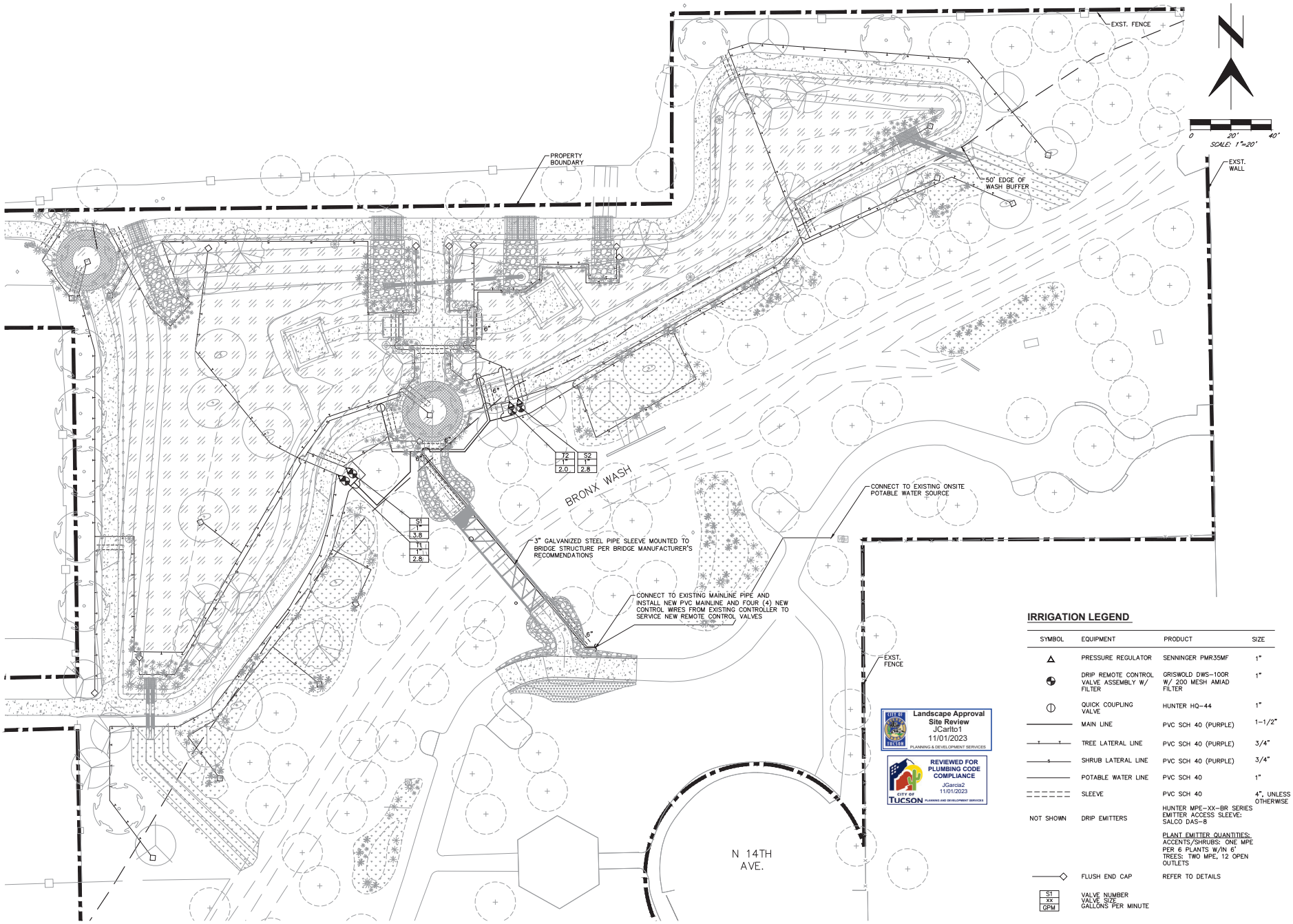
LANDSCAPE DETAILS

Project number:	098134081
Date:	08.22.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

LS4

Sheet Number: 11 of 23

TC-COM-0523-01350



Landscape Approval
Site Review
JCarlto1
11/01/2023
PLANNING & DEVELOPMENT SERVICES

REVIEWED FOR PLUMBING CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

IRRIGATION LEGEND

SYMBOL	EQUIPMENT	PRODUCT	SIZE
△	PRESSURE REGULATOR	SENNINGER PMR35MF	1"
◓	DRIP REMOTE CONTROL VALVE ASSEMBLY W/ FILTER	GRISWOLD DWS-100R W/ 200 MESH AMIAD FILTER	1"
◫	QUICK COUPLING VALVE	HUNTER HQ-44	1"
———	MAIN LINE	PVC SCH 40 (PURPLE)	1-1/2"
T T	TREE LATERAL LINE	PVC SCH 40 (PURPLE)	3/4"
S S	SHRUB LATERAL LINE	PVC SCH 40 (PURPLE)	3/4"
———	POTABLE WATER LINE	PVC SCH 40	1"
- - - -	SLEEVE	PVC SCH 40	4", UNLESS NOTED OTHERWISE
NOT SHOWN	DRIP EMITTERS	HUNTER MPE-XX-BR SERIES EMITTER ACCESS SLEEVE: SALCO DAS-8 PLANT EMITTER QUANTITIES: ACCENTS/SHRUBS: ONE MPE PER 6 PLANTS W/IN 6' TREES: TWO MPE, 12 OPEN OUTLETS	
——◇	FLUSH END CAP	REFER TO DETAILS	
S1 / XX / GPM	VALVE NUMBER VALVE SIZE GALLONS PER MINUTE		

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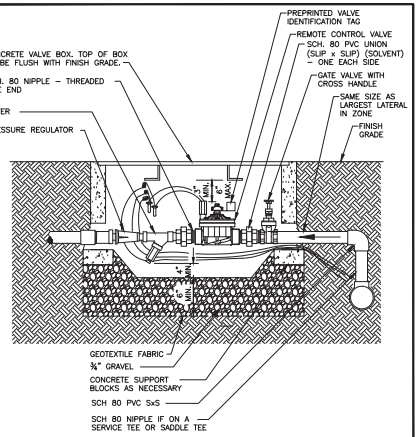
IRRIGATION PLAN

Project number:	098134081
Date:	08.22.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

IR1

Sheet Number: 12 of 23

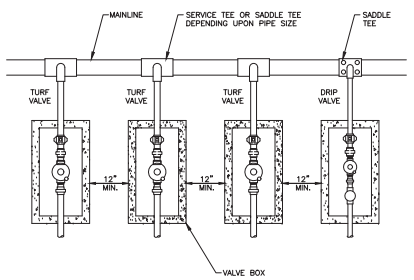
TC-COM-0523-01350



NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. SEAL ALL OPENINGS AND BOTTOM WITH GEOTEXTILE FABRIC.
3. IF REQUIRED INSTALLED REDUCER UPSTREAM OF GATE VALVE.
4. PROVIDE 2 INCH CLEARANCE AT BOX CUT OUT TO TOP OF PIPE AND 1 INCH MINIMUM CLEARANCE AT THE SIDES OF THE PIPE TO THE CONCRETE BOX.
5. GATE VALVE TO BE THE SAME SIZE AS THE REMOTE CONTROL VALVE
6. SEE DETAIL 42 FOR VALVE BOX LID INFORMATION.
7. COMPACT DISTURBED SOIL AROUND BOX.

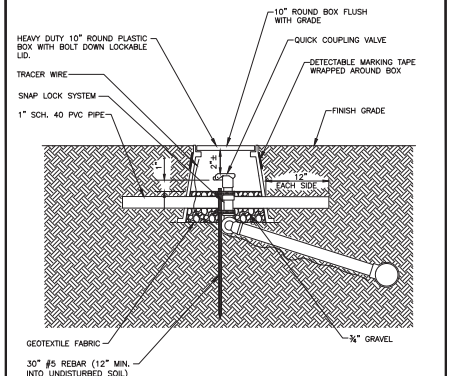
ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		REMOTE CONTROL VALVE AND FILTER - DRIP/BUBBLER FOR CONVENTIONAL WIRING	9

PLAN VIEW



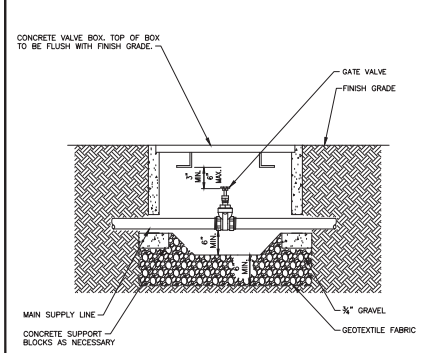
NOTES:
1. VALVES AND VALVE BOXES TO BE PARALLEL AND PERPENDICULAR TO MAINLINE OR ANY HARDSCAPE.
2. EACH VALVE TO BE CONNECTED TO MAINLINE, NO MANIFOLD.
3. SEE VALVE DETAIL FOR VALVE ASSEMBLY.
4. TURF VALVE TEES SHALL BE DUCTILE IRON RESTRAINED JOINT FOR 4 INCH AND LARGER AND SCH. 80 PVC FOR 3 INCH AND SMALLER.
5. VALVE GROUPING LOCATION TO BE STAKED IN FIELD FOR APPROVAL PRIOR TO VALVE PIT EXCAVATION
6. IF LATERAL LINE IS 3" A SADDLE TEE CAN BE USED ONLY IF THE MAINLINE IS 6" LARGER OTHERWISE DUCTILE IRON MECHANICAL JOINT TEE MUST BE USED WITH RESTRAINTS.
7. SEE DETAIL 42 FOR VALVE BOX LID INFORMATION.
8. COMPACT DISTURBED SOIL AROUND BOX.

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		REMOTE CONTROL VALVE GROUP ASSEMBLY	11



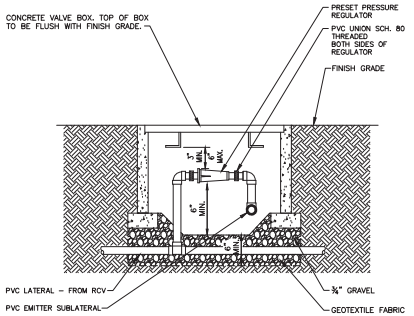
NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. SEAL ALL OPENINGS AND BOTTOM WITH GEOTEXTILE FABRIC.
3. TRACER WIRE SHALL BE #16 UF GREEN COATED COPPER WIRE.
4. COMPACT DISTURBED SOIL AROUND BOX.

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		QUICK COUPLER ASSEMBLY	12



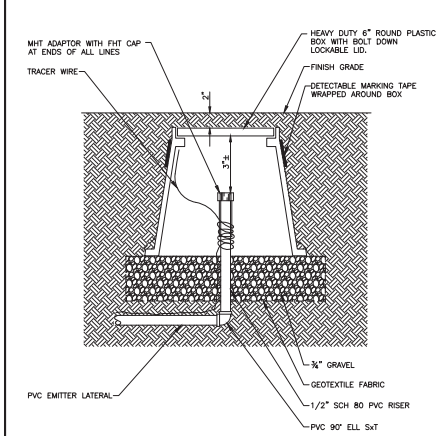
NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. SEAL ALL OPENINGS AND BOTTOM WITH GEOTEXTILE FABRIC.
3. PROVIDE 2 INCH CLEARANCE AT BOX CUT OUT TO TOP OF PIPE AND 1 INCH MINIMUM CLEARANCE AT THE SIDES OF THE PIPE TO THE CONCRETE BOX.
4. COMPACT SOIL AROUND VALVE BOX.
5. SEE DETAIL 42 FOR VALVE BOX LID INFORMATION.

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		GATE VALVE (SMALLER THAN 2")	28



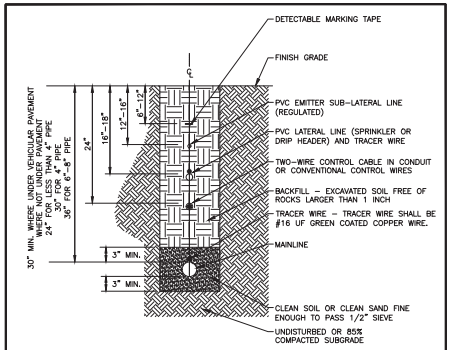
NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. SEAL ALL OPENINGS AND BOTTOM WITH GEOTEXTILE FABRIC.
3. COMPACT DISTURBED SOIL AROUND VALVE BOX.
4. IF REQUIRED INSTALLED REDUCER UPSTREAM OF GATE VALVE.
5. PROVIDE 2 INCH CLEARANCE AT BOX CUT OUT TO TOP OF PIPE AND 1 INCH MINIMUM CLEARANCE AT THE SIDES OF THE PIPE TO THE CONCRETE BOX.
6. ALL PIPE SHALL BE SCH 40 PVC. UNIONS SHALL BE SCH 80.
7. TO BE USED ONLY WITH CITY'S PROJECT MANAGER APPROVAL
8. SEE DETAIL 42 FOR VALVE BOX LID INFORMATION

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		PRESSURE REGULATOR RISER	33
			SHEET OF



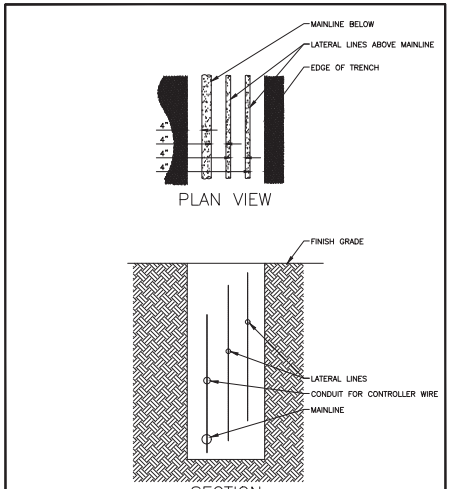
NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. SEAL ALL OPENINGS AND BOTTOM WITH GEOTEXTILE FABRIC.
3. COMPACT DISTURBED SOIL AROUND BOX.
4. USE PURPLE LID IF RECLAIMED IRRIGATION IS USED.
5. TRACER WIRE SHALL BE #16 UF GREEN COATED COPPER WIRE.
6. COIL TRACER WIRE AROUND RISER – MINIMUM 5 LOOPS

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		LATERAL END CAP	34



NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. ALL PIPE SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
3. NO PIPE OR WIRE SHALL BE INSTALLED UNDER PAVING UNLESS IT IS SLEEVED.
4. SLEEVES UNDER PAVEMENT SHALL BE SCHEDULE 40 PVC AND EXTEND 2 FEET BEYOND PAVEMENT EDGE.
5. PROTECT COPPER PIPE FROM CONCRETE WITH PLUMBERS TAPE (10 MIL. MIN.) OR PLASTIC SLEEVING.
6. CONVENTIONAL CONTROL WIRE TO BE BUNDLED AND TAPED EVERY 10 FEET.
7. DETECTABLE MARKING TAPE TO BE COLORED PER PIPE TYPE.
8. DETECTABLE MARKING TAPE AND TRACER WIRE TO BE CENTERED ON PIPE.
9. LOOP TRACER WIRE AND DETECTABLE MARKING TAPE IN ALL VALVE BOXES, PULL BOXES AND ENDS OF SLEEVES.
10. BACKFILL TO BE COMPACTED 85% TO 95%.
11. THIS DETAIL FOR DEPTH OF PIPE ONLY. IT IS NOT FOR HORIZONTAL PLACEMENT OF PIPE.
12. CONTRACTOR TO COMPACT BACKFILL IN 12" LIFTS TO PREVENT TRENCH SETTLING THROUGH MECHANICAL OR WATER MEANS.
13. PIPE LABELING SHALL BE INSTALLED FACING UP.
14. ALL IRRIGATION PVC PIPE SHALL BE PURPLE.
15. TRACER WIRE SHALL BE PROVIDED ON ALL IRRIGATION LATERAL AND MAINLINE PIPES.

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		IRRIGATION TRENCHING DEPTH	38



NOTES:
1. FOR DEPTH OF PIPE AND BACKFILL MATERIAL SEE DETAIL 38

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		IRRIGATION TRENCHING MULTIPLE LINES IN COMMON TRENCH	39

REVIEWED FOR PLUMBING CODE COMPLIANCE
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11/01/2023
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ARIZONA, USA
Exp.Date 03/31/2024

Revision Record			
No.	Description	Date
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2		
3		

Standard Arizona 811 at least two full working days before you begin excavation
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IRRIGATION DETAILS

Project number:	098134081
Date:	08.22.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

IR2

Sheet Number: 13 of 23

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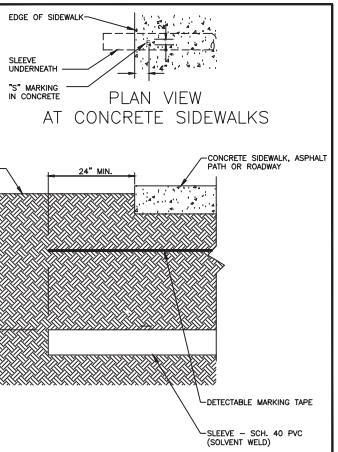
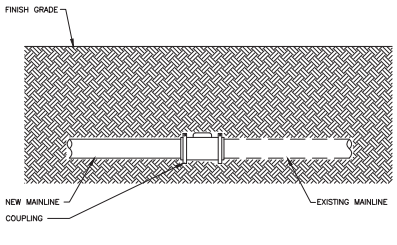


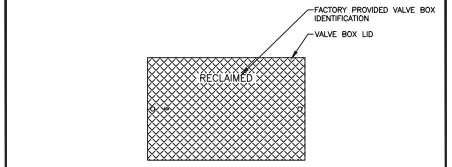
NOTES:
1. ALL SLEEVES SHALL BE CAPPED AND KEPT CLEAN OF DIRT AND DEBRIS.

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		SLEEVING	40



NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		COUPLING NEW TO EXISTING	41

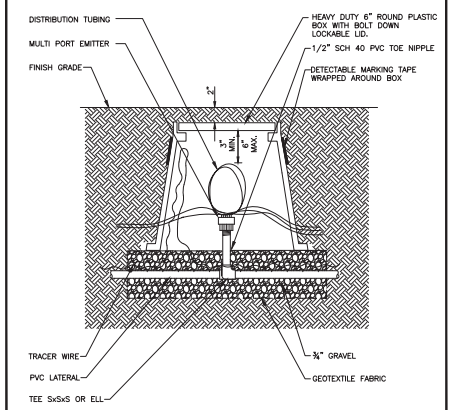


FACTORY PROVIDED VALVE BOX IDENTIFICATION

TYPE OF BOX		LABEL
GATE VALVES	=	ISO
RECLAIMED REMOTE CONTROL VALVE	=	RECLAIMED
RECLAIMED MASTER VALVE	=	RECLAIMED
RECLAIMED FLOW SENSOR	=	RECLAIMED
POTABLE REMOTE CONTROL VALVE	=	IRRI
POTABLE MASTER VALVE	=	IRRI
POTABLE FLOW SENSOR	=	IRRI
PULL BOXES	=	LV IRRI
DRINKING FOUNTAIN	=	DF ISO

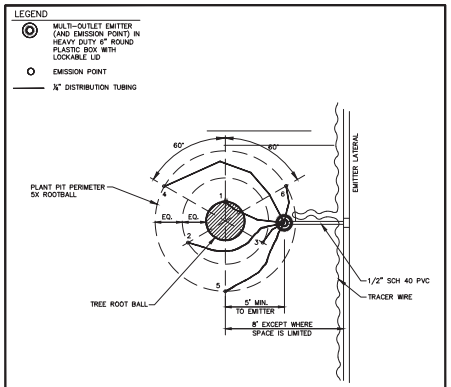
NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. ON RECLAIMED SYSTEMS — UNFINISHED STEEL LID SHALL BE PROVIDED BY MANUFACTURER. UNFINISHED STEEL LID SHALL BE POWDER COATED WITH RECLAIMED PURPLE COLOR BY CONTRACTOR.

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		VALVE BOX LID	42



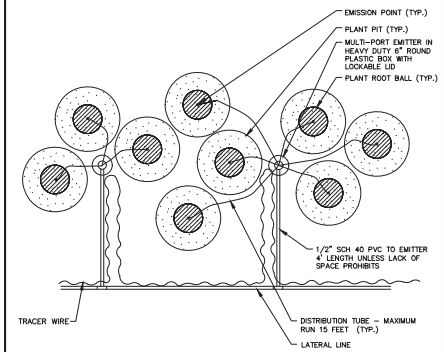
NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. COIL DISTRIBUTION TUBING LOOSELY AROUND RISER ONE TIME BEFORE EXISTING BOX.
3. TRACER WIRE SHALL BE #16 UF GREEN COATED COPPER WIRE.
4. COMPACT DISTURBED SOIL AROUND BOX
5. USE PURPLE LID IF RECLAIMED IRRIGATION IS USED.

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		MULTI-OUTLET EMITTER ASSEMBLY	44



NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. MAXIMUM LENGTH OF ONE DISTRIBUTION TUBE SHALL BE 15 FEET.
3. EMISSION POINTS ARE NUMBERED IN ORDER OF PLACEMENT (1–6).
4. IF ONLY ONE EMITTER IS USED PLACE UPHILL OF TREE IN ON SLOPE.
5. TRACER WIRE SHALL BE #16 UF GREEN COATED COPPER WIRE

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		EMITTER LOCATION TREES	45



NOTES:
1. SEE APPROVED IRRIGATION MATERIALS LIST FOR MANUFACTURERS AND MODELS, LATEST EDITION.
2. MORE THAN ONE SHRUB MAY BE WATERED FROM A SINGLE MULTI-PORT EMITTER.
3. MAXIMUM LENGTH OF ONE DISTRIBUTION TUBE SHALL BE 15 FEET.
4. IF ONLY ONE DISTRIBUTION TUBE PER PLANT IS REQUIRED, PLACE EMISSION POINT ON TOP OF ROOT BALL OR UPHILL OF PLANT.
5. IF MORE THAN ONE DISTRIBUTION TUBE PER SHRUB IS REQUIRED, SPACE EMISSION POINTS EVENLY WITHIN PLANT PIT.
6. TRACER WIRE SHALL BE #16 UF GREEN COATED COPPER WIRE.

ISSUED:		STANDARD DETAIL	DETAIL NO.
REVISED:		EMITTER LOCATION SHRUBS	47

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11/01/2023
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Call 811 or Click Arizona811.com

IRRIGATION DETAILS

Project number:	098134081
Date:	08.22.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

IR3

Sheet Number: 14 of 23

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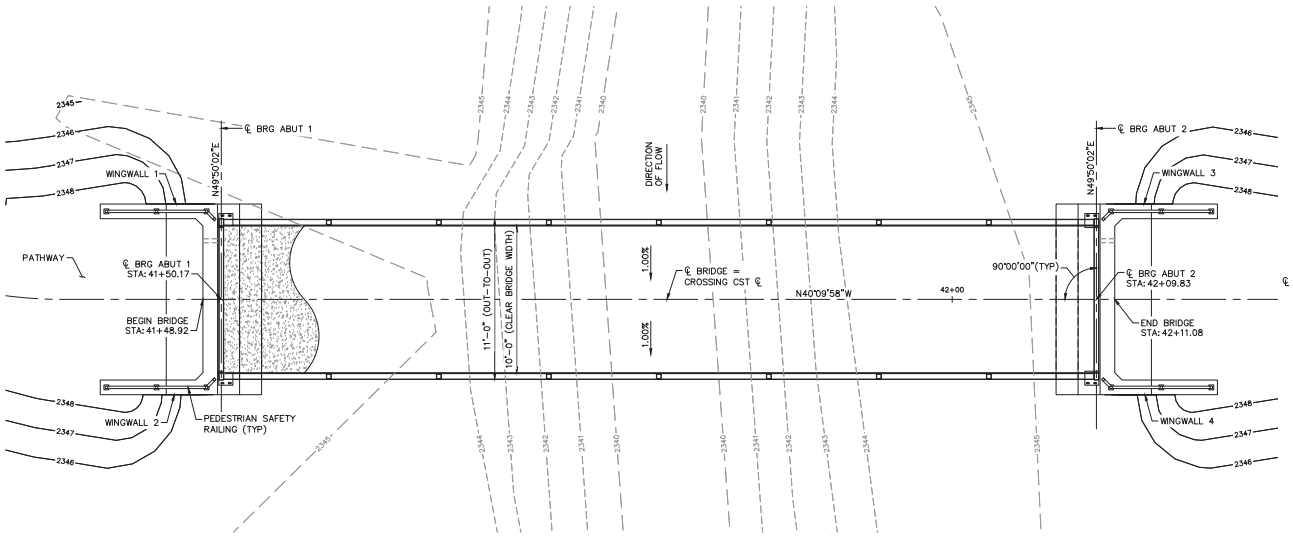
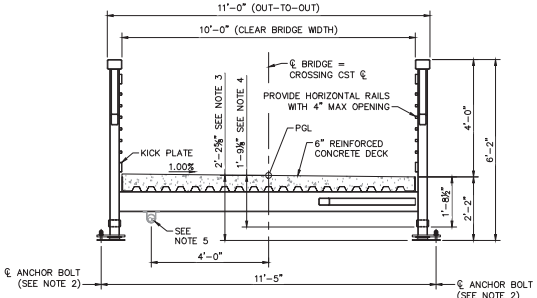


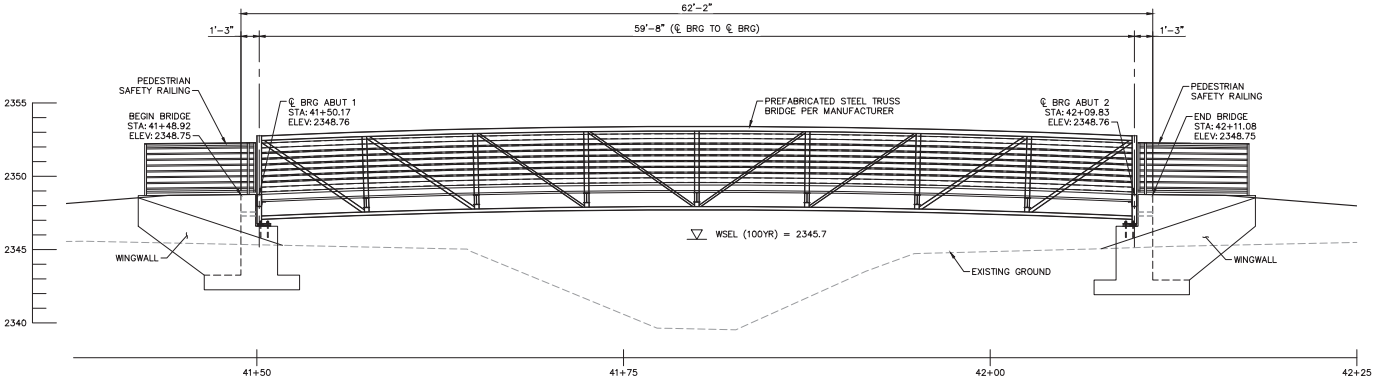
PLAN
SCALE: ¼" = 1'-0"
NEW PREFABRICATED STEEL TRUSS BRIDGE
SKEW 00°00'00"



1 TYPICAL SECTION
SCALE: ½" = 1'-0"
LOOKING AHEAD STATION

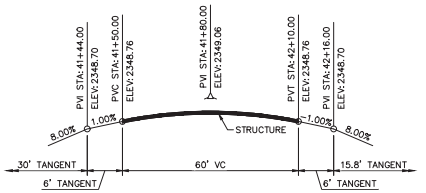
NOTES:

1. TYPICAL SECTION PROVIDES GENERAL TRUSS CONFIGURATION AND DESIGN REQUIREMENTS. SEE SHEET 16 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ANCHOR BOLT LAYOUT AND DETAILS SHALL BE COORDINATED WITH PREFABRICATED STEEL TRUSS BRIDGE MANUFACTURER. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES.
3. BEARING SEAT ELEVATION AT ABUTMENTS SET BASED ON 2'-2⅝" DIMENSION FROM PROFILE GRADE LINE TO BOTTOM OF BRIDGE BEARING PLATES. CONTRACTOR SHALL COORDINATE WITH PREFABRICATED STEEL TRUSS BRIDGE MANUFACTURER AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
4. FREEBOARD IS CALCULATED BASED ON A MAXIMUM DISTANCE OF 1'-9⅛" FROM PGL TO LOWEST BRIDGE BOTTOM CHORD.
5. 3" GALVANIZED STEEL PIPE SLEEVE. LOCATION AND ATTACHMENT PER PREFABRICATED STEEL TRUSS BRIDGE MANUFACTURER.



NOTE:
* LENGTH SHOWN FROM ℄ BRG TO ℄ BRG TO BE VERIFIED BY BRIDGE MANUFACTURER PRIOR TO FABRICATION.

ELEVATION
SCALE: ¼" = 1'-0"
WSEL = WATER SURFACE ELEVATION
STATIONS, ELEVATIONS, AND DIMENSIONS ARE ALONG CL BRIDGE/CROSSING CST ℄



2 PROFILE GRADE
SCALE: NTS

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CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

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521 EAST WETMORE, SUITE 280
TUCSON, AZ 85705
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60164
NATHAN
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Date: 11/01/23

Revision Record		
No.	Description	Date
1		
2		
3		

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BRIDGE PLAN
AND ELEVATION

Project number:	098134081
Date:	08.12.2022
Designed by:	CMF
Drawn by:	CMF
Checked by:	NLM

ST1

Sheet Number: 15 of 23

TC-COM-0523-01350

STRUCTURAL NOTES:

SPECIFICATIONS:

1. DESIGN SPECIFICATIONS – AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS", 8TH EDITION AND AASHTO "LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES", 2009.
2. CONSTRUCTION SPECIFICATIONS:
   A. PIMA ASSOCIATION OF GOVERNMENTS STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENT, 2015 EDITION.
   B. ADOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2021 EDITION.
3. ALL MAJOR COMPONENTS ARE DESIGNED BY THE LOAD AND RESISTANCE FACTOR DESIGN METHOD.
4. DESIGN LIVE LOAD:
   A. 90 PSF UNIFORM LIVE LOADING IN ACCORDANCE WITH SECTION 3.1 OF AASHTO "LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES", 2009.
   B. H5 LIVE LOAD IN ACCORDANCE WITH SECTION 3.2 OF AASHTO "LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES", 2009.
5. DESIGN WIND LOAD:
   A. 35 PSF WIND LOAD ON THE FULL HEIGHT OF THE BRIDGE, AS IF ENCLOSED.
   B. 20 PSF UPWARD WIND LOAD APPLIED AT THE WINDWARD QUARTER POINT OF THE TRANSVERSE BRIDGE WIDTH (AASHTO 3.8.2)
6. MATERIAL, WORKMANSHIP, AND FABRICATION SHALL BE PERFORMED IN ACCORDANCE WITH THE ABOVE SPECIFICATIONS AND TECHNICAL SPECIFICATIONS.
7. HYDRAULIC DESIGN CRITERIA:
   A. Q100 = 744 CFS
   B. WSEL (100YR) = 2345.7
   C. MIN FREEBOARD = 1'–0"

FOUNDATIONS:

FOUNDATION DESIGN IS BASED ON THE GEOTECHNICAL EVALUATION REPORT PREPARED BY:
COMPANY: NINYO & MOORE
ADDRESS: 1991 EAST AJO WAY, SUITE 145
TUCSON, AZ 85713
01/12/2022 (PROJECT #: 606881001)

SOIL DENSITY = 120 PCF (ASSUMED)
COEFFICIENT OF FRICTION = 0.35
ACTIVE EARTH PRESSURE = 45 PCF (ASSUMED)
LATERAL BEARING PRESSURE = 360 PCF (3,600 PSF MAX) (33% INCREASE FOR WIND/SEISMIC LOADS)

BRIDGE DESIGN REACTIONS:

REACTIONS SHOWN ARE THE DESIGN REACTIONS USED IN THE DESIGN OF THE SUBSTRUCTURE (ABUTMENTS). CONTRACTOR SHALL PROVIDE ACTUAL REACTIONS IN THE CALCULATIONS/SHOP DRAWINGS FOR THE PREFABRICATED STEEL TRUSS BRIDGE. BASED ON REACTIONS, ABUTMENT DIMENSIONS MAY BE REVISED.

BRIDGE REACTIONS		+ DOWNWARD LOAD – UPWARD LOAD	
ITEM DESCRIPTION	P (LBS)	H (LBS)	L (LBS)
DEAD LOAD (DC)	12,525		
PEDESTRIAN UNIFORM LIVE (PL) (90 PSF)	13,500		
VEHICLE (LL) (H5)	5,000		
OVERTURNING WIND (WSv) (20 PSF)	WINDWARD: –4,875 LEEWARD: –1,625		
WIND (WS) (35 PSF)	±1,925	5,995	
TERMAL (TU)			1,880

*** DEAD LOAD REACTION (DC) INCLUDES WEIGHT OF CONCRETE DECK AND STAY–IN–PLACE FORMS.

"P" – VERTICAL LOAD AT EACH BASE PLATE (4 PER BRIDGE)

"H" – HORIZONTAL LOAD AT EACH FOOTING (2 PER BRIDGE)

"L" – LONGITUDINAL LOAD AT EACH BASE PLATE (4 PER BRIDGE)

BRIDGE LIFTING WEIGHT = 13,500 LBS (NOT INCLUDING WEIGHT OF CONCRETE DECK AND STAY–IN–PLACE FORMS)

ALL DIMENSIONS AND VALUES ARE SUBJECT TO CHANGE AFTER RECEIVING ACTUAL REACTIONS IN THE CALCULATIONS/SHOP DRAWINGS FOR THE PREFABRICATED STEEL TRUSS BRIDGE.

CONCRETE AND REINFORCING STEEL:

CONCRETE SHALL CONFORM TO SECTION 1006, PAG STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS.
F'c = 3,500 PSI (CLASS "S") ABUTMENTS AND WINGWALLS
F'c = 3,500 PSI (CLASS "S") BRIDGE DECK
TYPE II CEMENT
MAXIMUM WATER/CEMENT RATIO = 0.55

REINFORCING STEEL SHALL CONFORM TO SECTION 1003, PAG STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS.
Fs = 24,000 PSI
Fy = 60,000 PSI

REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.

ALL SPACING OF REINFORCING SHALL BE TO CENTER OF BARS UNLESS NOTED OTHERWISE.

ALL REINFORCING SHALL HAVE 2" COVER UNLESS NOTED OTHERWISE.

ALL BENDS AND HOOKS SHALL MEET THE REQUIREMENTS OF AASHTO 5.10.2. ALL BEND DIMENSIONS FOR REINFORCING STEEL SHALL BE OUT–TO–OUT OF BARS.

BRIDGE DECK SHALL RECEIVE A LIGHT BROOMED FINISH.

COORDINATION:

CONTRACTOR SHALL SUBMIT ORIGINAL SHOP DRAWINGS OF THE ABUTMENT LAYOUT AND GEOMETRY TO THE ENGINEER FOR REVIEW AND APPROVAL.

CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGN PER PAG SECTION 1006. THE CONTRACTOR SHALL NOT MAKE CHANGES IN MATERIALS, GRADATION, SOURCE, BRAND, OR PROPORTIONS AFTER APPROVAL.

CONTRACTOR SHALL SUBMIT ORIGINAL SHOP DRAWINGS FOR FABRICATION, BENDING, AND PLACEMENT OF CONCRETE REINFORCEMENT. PROVIDE BAR SCHEDULES, DIAGRAMS OF BENT BARS, AND ARRANGEMENT OF CONCRETE REINFORCEMENT.

CONTRACTOR SHALL SUBMIT ORIGINAL SHOP DRAWINGS FOR FABRICATION AND INSTALLATION OF SAFETY RAILING. SHOP DRAWINGS SHALL SHOW RAILING MOUNT LOCATIONS WITH BOLTS SETTING AND SPACING, RAILING LENGTHS, AND DIRECTIONS FOR INSTALLATION.

THE CONTRACTOR SHALL EXAMINE AND VERIFY, IN THE FIELD, ALL CONDITIONS AND DIMENSIONS. DIMENSIONS SHALL NOT BE SCALED FROM DRAWINGS.

THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATIONS AS TO THE TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL EXISTING UTILITIES AFFECTED BY THEIR WORK FOR THE DURATION OF THE CONTRACT.

PREFABRICATED STEEL TRUSS BRIDGE DESIGN:

1. PREFABRICATED STEEL TRUSS BRIDGE SHALL BE DESIGNED BY THE BRIDGE MANUFACTURER IN ACCORDANCE WITH THE AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS", 8TH EDITION AND AASHTO "LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES", 2009. DESIGN LOADING SHALL BE AS SPECIFIED IN THE AASHTO LRFD GUIDE SPECIFICATIONS AND THESE STRUCTURAL NOTES. CONTRACTOR SHALL SUBMIT STRUCTURAL CALCULATIONS AND SHOP DRAWINGS TO THE ENGINEER FOR REVIEW AND APPROVAL. STRUCTURAL CALCULATIONS AND SHOP DRAWINGS SHALL BE PREPARED BY AND BEAR THE SEAL OF A QUALIFIED, LICENSED PROFESSIONAL ENGINEER CURRENTLY REGISTERED IN THE STATE OF ARIZONA. THE SHOP DRAWINGS SHALL INCLUDE THE DESIGN OF THE FOLLOWING ITEMS:
   A. BRIDGE TRUSS
   B. TRUSS BEARING ASSEMBLIES, INCLUDING ANCHOR BOLT SIZE AND SPACING
   C. CONCRETE DECK WITH METAL DECK FORMS AND REINFORCING STEEL AND EXPANSION JOINTS
2. PREFABRICATED STEEL TRUSS BRIDGE SHALL BE FABRICATED FROM HIGH STRENGTH, SELF–WEATHERING, LOW ALLOY, ATMOSPHERIC CORROSION RESISTANT, ASTM A847, COLD FORMED WELDED SQUARE OR RECTANGULAR TUBING AND ASTM A588, ASTM A606, OR ASTM A242 PLATE AND STRUCTURAL SHAPES (Fy = 50,000 PSI).
3. VERTICAL DEFLECTION DUE TO SERVICE PEDESTRIAN LIVE LOAD SHALL NOT EXCEED L/360 OF THE BRIDGE SPAN. THE BRIDGE SHALL BE CAMBERED TO OFFSET DEAD LOADS.
4. BRIDGE SHALL BE DESIGNED FOR A TEMPERATURE DIFFERENCE OF ± 40°F, WITH A MEAN TEMPERATURE OF 75°F.
5. BRIDGE DECK SHALL BE NORMAL WEIGHT CONCRETE WITH REINFORCING STEEL OVER GALVANIZED METAL DECKING.
6. WELDING OF STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE–STEEL ANSI/AWS D1.1, CURRENT EDITION. ALL OTHER WELDING SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN WELDING SOCIETY, BRIDGE WELDING CODE D1.5, CURRENT EDITION.

STRUCTURAL STEEL (EXCLUDING PREFAB. STEEL BRIDGE):

1. MISCELLANEOUS STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING:
   A. TUBULAR STEEL: ASTM A847
   B. SHAPES, PLATES, AND BARS: ASTM A588 OR A242 OR A606
   C. HIGH STRENGTH BOLTS: ASTM A325 (TYPE 3) OR A449 (TYPE 3)
   D. HIGH STRENGTH THREADED RODS: ASTM A449 (TYPE 3)
   E. NUTS AND WASHERS FOR HIGH STRENGTH BOLTS: ASTM A563 (GRADE C3), F456–3
2. ANCHOR RODS SHALL BE ASTM F1554, GRADE 55 (Fy = 55,000 PSI) UNLESS NOTED OTHERWISE.
3. ALL WELDING SHALL CONFORM TO AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE, ANSI/AASHTO/AWS D1.1 CURRENT EDITION.

METAL DECKING:

METAL DECKING SHALL CONFORM TO ASTM A653, G165, SS GRADE 40. GALVANIZED COATING SHALL CONFORM TO ASTM A494. DECK GAGE SHALL BE DETERMINED BY BRIDGE MANUFACTURER BUT SHALL BE NO THINNER THAN 22 GAGE.

SHOP CLEANING NOTES:

UPON COMPLETION OF THE FABRICATION OPERATIONS IN THE SHOP, AND BEFORE SHIPMENT TO THE PROJECT SITE, ALL WEATHERED STEEL MATERIAL SHALL BE BLAST CLEANED PER SSPC–SP7.

INCLUDE CLEANING COST OF PREFABRICATED STEEL TRUSS BRIDGE IN LUMP SUM COST FOR PREFABRICATED STEEL TRUSS BRIDGE.

IDENTIFICATION MARKING STEEL MEMBERS:

ALL STEEL MILL AND FABRICATION IDENTIFICATION MARKINGS FOR STEEL PLATES, SHAPES, OR FABRICATED MEMBERS TO BE BY METAL TAGS, SOAPSTONE, OR SOME OTHER READILY REMOVABLE MATERIAL; OR TO BE MARKED IN AN AREA OF THE COMPLETED MEMBER WHICH WILL BE ENCASED OR COVERED WITH CONCRETE. DO NOT USED PAINT OR WAX BASED CRAYONS FOR MARKING.

HANDLING AND STORING STEEL MEMBERS:

1. STEEL MEMBERS SHALL NOT BE GOUGED, SCRATCHED, DENTED, OR ALLOWED TO RUB AGAINST OTHER MEMBERS THAT WOULD RESULT IN DAMAGE TO THE BLAST CLEANED SURFACE OF THE STEEL. MEMBERS SHALL BE HANDLED USING SOFTENERS AND SLINGS INSTEAD OF CHOKERS AND CHAINS.
2. STORE MEMBERS IN THE FABRICATION SHOP AND ON PROJECT SITE IN SUCH A MANNER AS TO BE KEPT CLEAN OF ALL FOREIGN SUBSTANCES SUCH AS GREASE, OIL, MORTAR, CONCRETE SPLATTER, CHALK AND CRAYON MARKS, PAINT, AND DIRT. ALL STORAGE MUST BE ABOVE GROUND AND SLOPED TO ALLOW FREE DRAINAGE OF RAINWATER AND DEW. IF STORED FOR PERIODS LONGER THAN 3 MONTHS, THE MEMBERS MUST BE PLACED ON METAL SUPPORTS. FOR PERIODS OF STORAGE UP TO 3 MONTHS, MEMBERS MAY BE PLACED ON CLEAN, UNTREATED, WOOD LUMBER OR TIMBERS. DO NOT ALLOW TREATED LUMBER OR TREATED TIMBER TO CONTACT STEEL MEMBERS.

FINAL CLEANUP OF STRUCTURAL SURFACES:

1. UPON COMPLETION OF ALL CONCRETE CURING OPERATIONS, CLEAN ALL STEEL SURFACES TO REMOVE ALL GREASE, OIL, CONCRETE RESIDUE, DIRT, AND OTHER FOREIGN SUBSTANCES TO THE SATISFACTION OF THE ENGINEER.
2. CLEANING MAY BE BY POWER OR HAND WIRE BRUSHING, OR BY BRUSH–OFF BLAST CLEANING ACCORDING SSPC–SP7. CLEANING TO BE FOLLOWED BY A CLEAN WATER RINSE TO REMOVE ALL RESIDUES OR DETERGENTS IF THEY WERE USED. ALL GREASE OR OIL MUST BE REMOVED PRIOR TO CLEAN WATER RINSE BY SOLVENT CLEANING. NO SPILLAGE INTO WATERWAY IS ALLOWED. DO NOT USE ACIDS TO REMOVE STAINS.
3. THE COST FOR FINAL CLEANUP OF STRUCTURAL STEEL SURFACES TO BE INCLUDED IN THE LUMP SUM COST OF THE PREFABRICATED STEEL TRUSS BRIDGE.

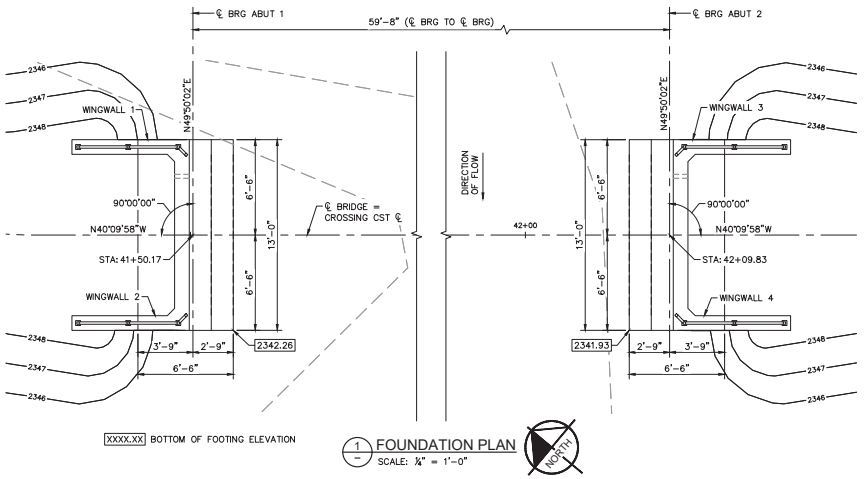
QUANTITY NOTES:

1. STRUCTURAL EXCAVATION AND BACKFILL ARE BASED ON THE DETAILS SHOWN ON THIS SHEET.
2. WINGWALLS QUANTITIES ARE INCLUDED WITH THE QUANTITIES OF THE RESPECTIVE ABUTMENTS.
3. THE QUANTITY/COST FOR STAY–IN–PLACE DECK FORMS AND REINFORCING STEEL TO BE PROVIDED IN THE REINFORCED CONCRETE DECK IS INCLUDED IN THE SQUARE FOOT COST OF THE CONCRETE DECK. THE PREFABRICATED STEEL TRUSS MANUFACTURER SHALL DESIGN AND DETERMINE THE REQUIRED REINFORCING TO BE PROVIDED IN THE REINFORCED CONCRETE DECK.
4. SEE SPECIAL PROVISIONS FOR ALL OTHER REQUIREMENTS.

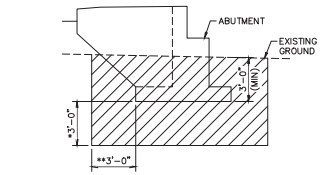
APPROXIMATE QUANTITIES					
	STRUCTURAL EXCAVATION	STRUCTURAL BACKFILL	CLASS "S" CONCRETE F'c = 3,500 PSI	REINFORCING STEEL	REINFORCED CONCRETE BRIDGE DECK
UNIT	CY	CY	CY	LB	SF
ABUTMENT 1	54	44	10	1,500	
ABUTMENT 2	55	45	11	1,420	
SUPERSTRUCTURE					600
TOTAL	109	89	21	2,920	600
AS–BUILT TOTAL					

PREFABRICATED STEEL TRUSS BRIDGE . . . . . 1 LS
PEDESTRIAN SAFETY RAILING . . . . . 33 LF

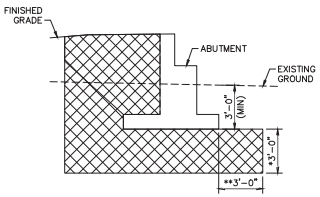
LAP SPLICE LENGTH TABLE	
BAR SIZE	LAP SPLICE LENGTH
#4	1'–9"
#5	2'–2"
#6	2'–7"



1 FOUNDATION PLAN
SCALE: 1/4" = 1'–0"



2 STRUCTURAL EXCAVATION PAY LIMITS
SCALE: NTS



3 STRUCTURAL BACKFILL LIMITS
SCALE: NTS

EARTHWORK LEGEND:

STRUCTURAL EXCAVATION

STRUCTURAL BACKFILL

* 3'–0" BELOW BOTTOM OF FOUNDATION OR 5'–0" BELOW EXISTING GROUND, WHICHEVER IS DEEPER.

** OVEREXCAVATION ZONE SHALL EXTEND A HORIZONTAL DISTANCE FROM THE EDGE OF THE FOUNDATION EQUAL TO THE DEPTH OF THE OVEREXCAVATION.

LEGEND:

DETAIL MARKER — 1 / X.XX — DETAIL NUMBER / DRAWING NUMBER

SECTION MARKER — A / X.XX — SECTION NUMBER / DRAWING NUMBER

CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES
REVIEWED FOR BUILDING CODE COMPLIANCE
JGarcia2
11/01/2023

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Registered Professional Engineer
60164
NATHAN MERRILL
11/01/23

Revision Record		
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1		
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Arizona 811 at least two full working days before you begin excavation
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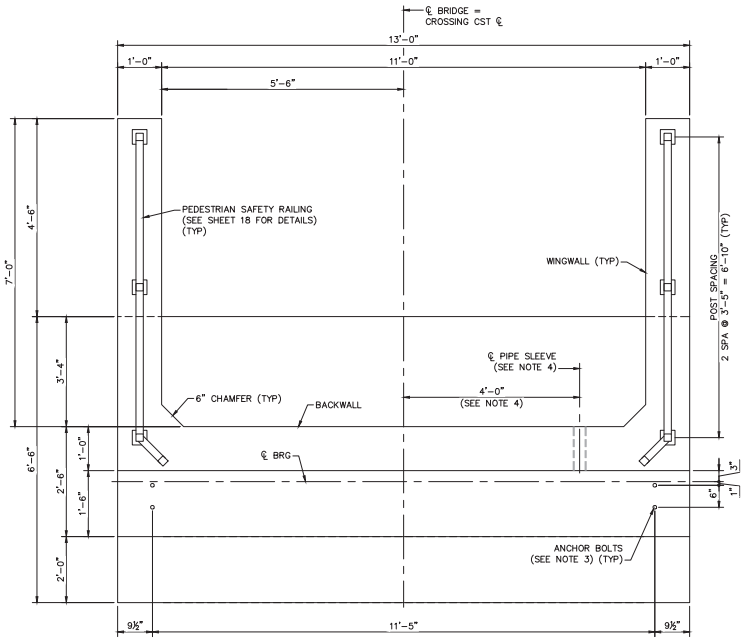
STRUCTURAL NOTES AND QUANTITIES

Project number:	098134081
Date:	08.12.2022
Designed by:	CMF
Drawn by:	CMF
Checked by:	NLM

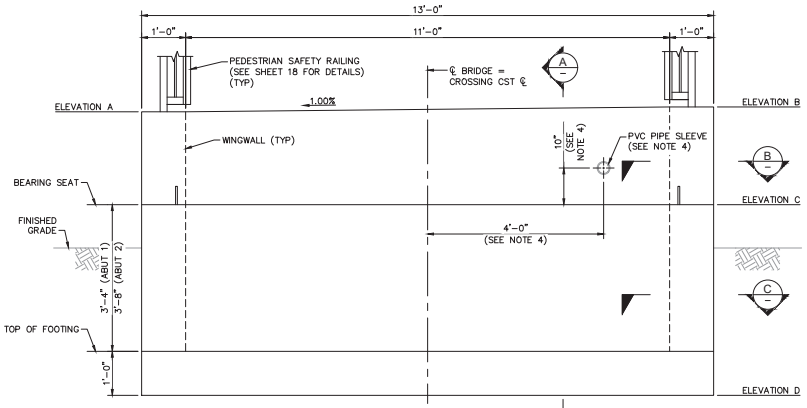
ST2

Sheet Number: 16 of 23

TC-COM-0523-01350

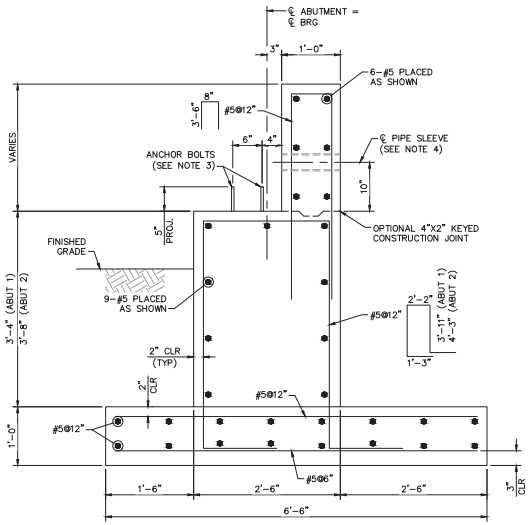


1 ABUTMENT PLAN
SCALE: ¾" = 1'-0"
ABUTMENT 1 SHOWN, ABUTMENT 2 SIMILAR.

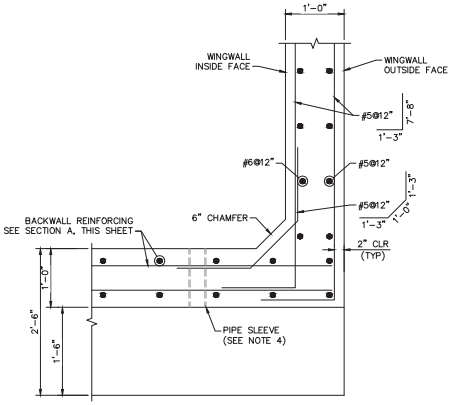


2 ABUTMENT ELEVATION
SCALE: ¾" = 1'-0"
LOOKING BACK STATION.
ABUTMENT 1 SHOWN, ABUTMENT 2 SIMILAR.

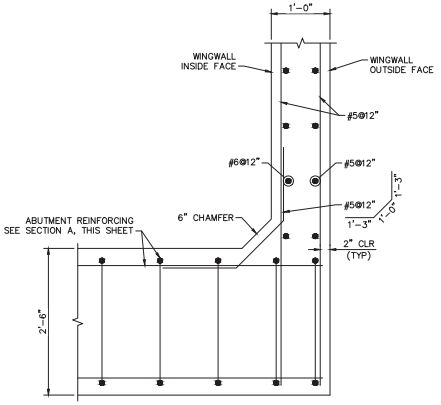
ABUTMENT ELEVATIONS		
LOCATION	ABUTMENT 1	ABUTMENT 2
ELEVATION A	2348.69	
ELEVATION B	2348.82	
ELEVATION C	2346.59	
ELEVATION D	2342.26	2341.93



A ABUTMENT SECTION
SCALE: 1" = 1'-0"



B SECTION
SCALE: 1" = 1'-0"



C SECTION
SCALE: 1" = 1'-0"

NOTES:

1. ABUTMENT BACKWALL ELEVATIONS SHOWN ARE AT FRONT OF BACKWALL.
2. COORDINATE ABUTMENT GEOMETRY AND BEARING ELEVATIONS WITH PREFABRICATED STEEL TRUSS BRIDGE MANUFACTURER PRIOR TO ABUTMENT CONSTRUCTION. NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
3. COORDINATE ANCHOR BOLT LAYOUT AND DETAILS WITH PREFABRICATED STEEL TRUSS BRIDGE MANUFACTURER PRIOR TO ABUTMENT CONSTRUCTION. NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
4. 4" PVC PIPE SLEEVE THROUGH BACKWALL FOR 3" STEEL PIPE. LOCATION MAY BE ADJUSTED, COORDINATE WITH PREFABRICATED STEEL TRUSS BRIDGE MANUFACTURER.

REVIEWED FOR BUILDING CODE COMPLIANCE
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES
JGarcia2
11/01/2023

Kimley»Horn
533 EAST WETMORE, SUITE 280
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FRANCISCO ELIAS ESQUER PARK
DOG PARK & WATER HARVESTING
1415 N 14TH AVE
TUCSON, AZ

60164
NATHAN MERRILL
Date Signed: 11/01/23

Revision Record		
No.	Description	Date
1		
2		
3		

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Call 811 or Click Arizona811.com

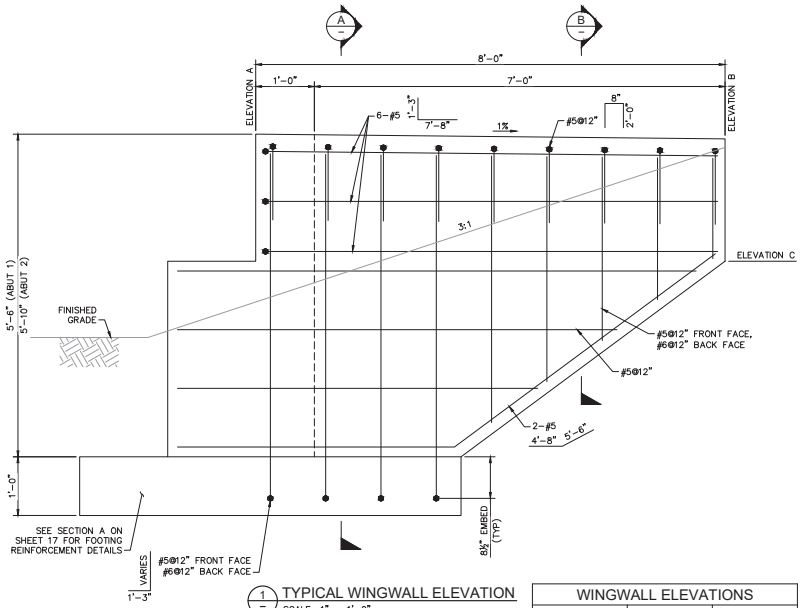
STRUCTURAL DETAILS 1

Project number:	098134081
Date:	08.12.2022
Designed by:	CMF
Drawn by:	CMF
Checked by:	NLM

ST3

Sheet Number: 17 of 23

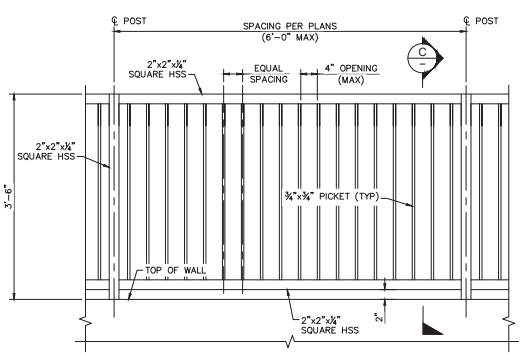
TC-COM-0523-01350



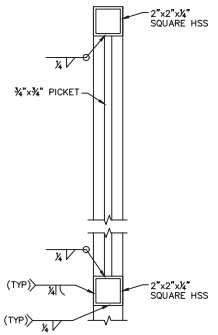
1 TYPICAL WINGWALL ELEVATION
SCALE: 1" = 1'-0"

WINGWALL 4 SHOWN, WINGWALLS 1, 2, & 3 SIMILAR.

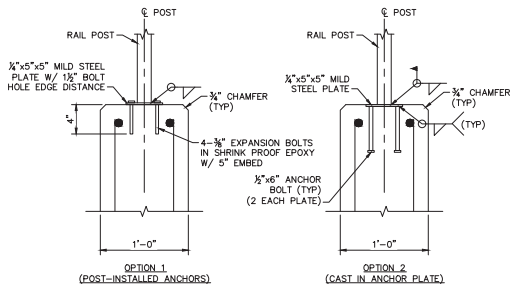
WINGWALL ELEVATIONS		
LOCATION	WINGWALL 1 & 3	WINGWALL 2 & 4
ELEVATION A	2348.82	2348.69
ELEVATION B	2348.74	2348.61
ELEVATION C	2346.59	



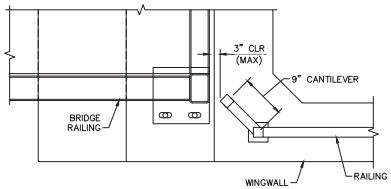
2 RAILING ELEVATION
SCALE: 1" = 1'-0"



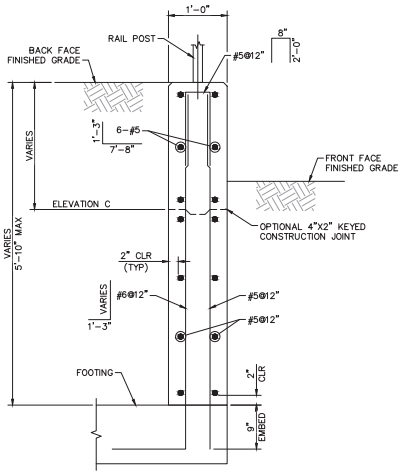
C RAILING SECTION
SCALE: 3" = 1'-0"



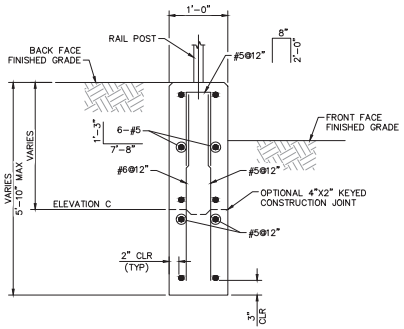
3 RAILING ANCHORAGE
SCALE: 1½" = 1'-0"



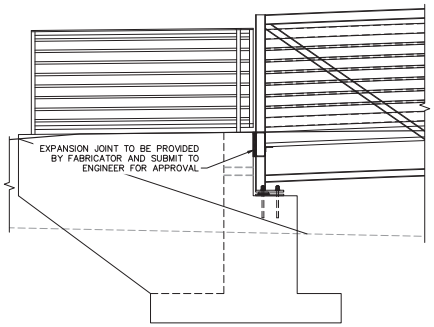
4 RAILING TERMINATION DETAIL
SCALE: ½" = 1'-0"



A WINGWALL SECTION
SCALE: 1" = 1'-0"



B WINGWALL SECTION
SCALE: 1" = 1'-0"



5 EXPANSION JOINT DETAIL
SCALE: ½" = 1'-0"

REVIEWED FOR BUILDING CODE COMPLIANCE
jGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

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60164
NATHAN MERRILL
ARIZONA U.S.A.

Revision Record		
No.	Description	Date
1		
2		
3		

Arizona Blue Stake, Inc. 811
Call 811 or click Arizona811.com

STRUCTURAL DETAILS 2

Project number:	098134081
Date:	08.12.2022
Designed by:	CMF
Drawn by:	CMF
Checked by:	NLM

ST4

Sheet Number: 18 of 23

TC-COM-0523-01350

SITE ELECTRICAL GENERAL NOTES:

1. THE SUBMISSION OF A BID BY THE CONTRACTOR IS NOTIFICATION THAT THE CONTRACTOR HAS TOTALLY FAMILIARIZED HIMSELF WITH THE CONTRACT DOCUMENTS AND EXISTING SITE CONDITIONS AND HAS AGREED TO PROVIDE THE NECESSARY LABOR AND MATERIAL FOR THE COMPLETE INSTALLATION OF EACH SYSTEM IN A NEAT AND WORKMANLIKE MANNER IN ACCORDANCE WITH THE BEST PRACTICES OF THE INDUSTRY AND IN COMPLIANCE WITH ALL AUTHORITIES HAVING JURISDICTION.

2. THESE DRAWINGS ARE PRESENTED TO THE CONTRACTOR WITH THE UNDERSTANDING THAT THE CONTRACTOR IS AN EXPERT AND COMPETENT IN THE PREPARATION OF CONTRACT BID PRICES ON THE BASIS OF INFORMATION SUCH AS IS CONTAINED IN THESE DOCUMENTS. IT IS THE INTENT OF THE DRAWINGS AND SPECIFICATIONS TO CALL FOR FINISHED WORK, TESTED AND READY FOR OPERATION AND IN COMPLETE CONFORMANCE WITH ALL APPLICABLE CODES, RULES, AND REGULATIONS. MINOR ITEMS NOT USUALLY SHOWN OR SPECIFIED, BUT MANIFESTLY NECESSARY FOR THE PROPER INSTALLATION AND OPERATION OF THE VARIOUS SYSTEMS, SHALL BE INCLUDED IN THE WORK AND IN THE PROPOSAL THE SAME AS IF SPECIFIED OR SHOWN ON THE DRAWINGS. IF ANY DEPARTURES FROM THE DRAWINGS ARE DEEMED NECESSARY, DETAILS OF SUCH DEPARTURES AND THE REASONS THEREFORE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. NO DEPARTURES SHALL BE MADE WITHOUT PRIOR APPROVAL.

3. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY ALL DIMENSIONS IN THE FIELD, AND SHALL ADVISE THE OWNER AND ENGINEER OF ANY DISCREPANCIES BEFORE PERFORMING THE WORK.

4. THE DRAWINGS INDICATE ARRANGEMENTS AND APPROXIMATE SIZES AND RELATIVE LOCATIONS OF PRINCIPAL APPARATUS, EQUIPMENT, DEVICES, AND SERVICES TO BE PROVIDED. DRAWINGS ARE DIAGRAMMATIC AND ARE A GRAPHIC REPRESENTATION OF CONTRACT REQUIREMENTS BASED ON THE INFORMATION PROVIDED BY THE MANUFACTURER IDENTIFIED IN THE EQUIPMENT SCHEDULE AT THE SCALE INDICATED.

5. LAYOUT OF EQUIPMENT INDICATED ON THE DRAWINGS SHALL BE CHECKED AND COMPARED AGAINST ALL DRAWINGS AND SPECIFICATIONS OF ALL TRADES AND EXACT LOCATIONS DETERMINED USING APPROVED SHOP DRAWINGS OF SUCH EQUIPMENT. WHERE PHYSICAL INTERFERENCES OCCUR, CONSULT WITH THE OWNER AND PREPARE DATED, DIMENSIONED DRAWINGS COORDINATED WITH ALL OTHER TRADES WORKING IN THIS AREA AND CORRECTING SUCH INTERFERENCE.

6. THE CONTRACTOR SHALL SCHEDULE THEIR WORK IN ACCORDANCE WITH THE CONSTRUCTION SCHEDULE SO THAT ALL OF THEIR WORK CAN BE INSTALLED WITHOUT DELAYING THE PROJECT. ALL WORK RELATED TO SHUTDOWN OF EXISTING SERVICES SHALL BE PERFORMED AT THE HOURS DESIGNATED BY THE OWNER WITH ALL ASSOCIATED COSTS BORNE BY THE CONTRACTOR AT NO COST TO THE OWNER. PROVIDE ANY TEMPORARY FACILITIES REQUIRED TO PERMIT OWNER'S USE OF EXISTING FACILITIES AND SYSTEMS TO REMAIN UNDISTURBED. COORDINATE ALL WORK, INCLUDING ALL SHUTDOWNS THAT AFFECT SYSTEMS AND/OR PORTIONS OF THE BUILDING THAT MUST REMAIN IN OPERATION, WITH OWNER.

7. THE CONTRACTOR SHALL SECURE AND PAY ALL FEES, LICENSES, INSPECTIONS, AND PERMITS PERTAINING TO THE CONTRACT. SUBMIT TO OWNER DUPLICATE CERTIFICATES OF INSPECTION FROM APPROVED INSPECTION AGENCY.

8. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WORKMEN'S IDENTIFICATION AND BADGING, SAFETY AND FIRE PROTECTION, BARRICADES, WARNING SIGNS, TRASH REMOVAL, CUTTING AND PATCHING.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RIGGING, HANDLING, AND PROTECTION OF MATERIALS. ALL EQUIPMENT AND MATERIALS SHALL BE NEW AND WITHOUT BLEMISH OR DEFECT. ALL EQUIPMENT INSTALLED SHALL BEAR THE LABEL OF AN APPROVED AGENCY.

11. THE CONTRACTOR SHALL PROVIDE LABOR TO RECEIVE, UNLOAD, STORE, PROTECT, AND TRANSFER TO POINT OF INSTALLATION FOR ALL FURNISHED ITEMS.

12. WHERE CONDUIT, CABLES, DUCTWORK, OR PIPING PASSES THROUGH FIRE RATED FLOORS OR WALLS, THE PENETRATION SHALL BE COMPLETELY SEALED WITH A FIRE STOP MATERIAL THAT IS UL LISTED AND ACCEPTED BY THE BUILDING DEPARTMENT AND FIRE DEPARTMENT AS BEING SUITABLE FOR THIS SERVICE. THIS MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE MANUFACTURER TO MAINTAIN THE UL LISTED FIRE RATING OF THE PENETRATED WALL OR FLOOR.

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SLAB OPENINGS, WALL OPENINGS, BEAM PENETRATIONS, AND CORING AS IT RELATES TO THEIR WORK. THE CONTRACTOR SHALL SUBMIT SIZE AND LOCATION FOR REVIEW AND APPROVAL.

14. ALL EXTERIOR WALL OPENINGS SHALL BE SLEEVED, PROPERLY CAULKED, AND SEALED WITH A HIGH QUALITY SEALANT TO PREVENT INFILTRATION OF MOISTURE AND OUTSIDE AIR.

15. THE CONTRACTOR SHALL SUBMIT SCHEDULE OF SUBMITTALS PRIOR TO SUBMITTING ANY SHOP DRAWINGS, ETC. TO BE SUBMITTED FOR THIS PROJECT, INCLUDING THE ANTICIPATED DATE OF EACH SUBMISSION. CONTRACTORS SHALL SUBMIT AN ELECTRONIC COPY OF THE COMPLETE SHOP DRAWINGS AND CATALOG CUTS, WIRING DIAGRAMS AND ASSOCIATED DATA TO THE OWNER FOR APPROVAL PRIOR TO PURCHASING EQUIPMENT OR STARTING ANY WORK. ANY WORK INSTALLED OR EQUIPMENT PURCHASED PRIOR TO RECEIPT OF OWNER APPROVED SUBMITTALS SHOP DRAWINGS THAT REQUIRES CHANGES SHALL BE REPLACED AT CONTRACTOR'S EXPENSE.

16. SUBMIT CATALOG INFORMATION, FACTORY ASSEMBLY DRAWINGS AND FIELD INSTALLATION DRAWINGS AS REQUIRED FOR A COMPLETE EXPLANATION AND DESCRIPTION OF ALL ITEMS TO BE PROVIDED. THE CONTRACTOR SHALL REVIEW AND APPROVE ALL SHOP DRAWINGS. NO SUBMISSION WILL BE ACCEPTED WITHOUT THE SIGNED APPROVAL OF THE CONTRACTOR. THE CONTRACTOR SHALL CHECK AND VERIFY ALL FIELD MEASUREMENTS.

17. UPON COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL SUPPLY THE OWNER WITH (3) COMPLETE BOUND COPIES OF ALL OWNER APPROVED SUBMITTALS AND ALL OPERATION AND MAINTENANCE MANUALS

18. ALL WORK FURNISHED UNDER THE CONTRACT SHALL BE GUARANTEED AGAINST ANY AND ALL DEFECTS IN WORKMANSHIP AND/OR MATERIALS FOR A PERIOD OF NOT LESS THAN (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE INSTALLATION, UNLESS NOTED OTHERWISE IN THE PROJECT SPECIFICATIONS, AND ANY DEFECTS OF WORKMANSHIP DEVELOPING DURING THIS PERIOD SHALL BE REMEDIED AND ANY DEFECTIVE MATERIAL REPLACED WITHOUT ADDITIONAL COST TO THE OWNER.

19. INSTALLED SYSTEMS SHALL OPERATE UNDER ALL CONDITIONS OF LOAD WITHOUT SOUND OR VIBRATION THAT IS OBJECTABLE TO THE OWNER, OBJECTABLE SOUND OR VIBRATION CONDITIONS DUE TO WORKMANSHIP SHALL BE CORRECTED IN APPROVED MANNER BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

20. THE CONTRACTOR SHALL SIMILARLY NOTIFY OWNER OF COMPLETION OF ALL WORK, INDICATING THE CONTRACTOR IS READY FOR THE OWNER TO PERFORM THE FINAL PUNCHLIST INSPECTION.

21. UPON COMPLETION OF ALL UNFINISHED OR FAULTY WORK NOTED IN THE OWNER'S FINAL PUNCH LIST, THE CONTRACTOR SHALL SUBMIT TO THE OWNER IN WRITING A LETTER OF COMPLETION CERTIFYING THAT ALL PUNCH LIST ITEMS HAVE BEEN COMPLETED AND ALL AS-BUILTS, MANUALS, ETC. HAVE BEEN SUBMITTED.

22. SHOULD A CONTRACTOR REQUIRE REMOVAL, RELOCATION, OR REROUTING OF ANOTHER TRADE'S WORK THAT IS NOT INDICATED ON DRAWINGS, THE CONTRACTOR REQUIRING SUCH WORK SHALL BE RESPONSIBLE FOR THAT WORK, AND PAY ALL REQUIRED COSTS.

23. ALL WORK INVOLVING ALTERATIONS TO EXISTING SYSTEMS, EQUIPMENT, AND MATERIALS SHALL BE REVIEWED WITH THE OWNER BEFORE BEGINNING WORK.

24. DEFINITION: UNLESS OTHERWISE NOTED, ALL WORK SPECIFIED HEREIN OR NOTED ON DRAWINGS, SHALL BE BY THE CONTRACTOR. THE TERM "PROVIDE" WHENEVER ENCOUNTERED ON DRAWINGS OR IN THESE SPECIFICATIONS, SHALL MEAN "FURNISH AND INSTALL."

25. CODES AND STANDARDS: ALL MATERIALS AND WORKMANSHIP SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE, ALL APPLICABLE CODES, SPECIFICATIONS, LOCAL ORDINANCES, INDUSTRY STANDARDS, UTILITY COMPANY REGULATIONS AND FIRE INSURANCE CARRIER'S REQUIREMENTS.

26. MATERIALS: ALL MATERIALS FURNISHED BY THIS CONTRACTOR, SHALL BE NEW AND BEAR THE LABEL OR LISTING OF A NATIONALLY RECOGNIZED INDEPENDENT TESTING LABORATORY.

27. OUTLET AND SWITCH BOXES: PROVIDE AND INSTALL OUTLET BOXES OF PROPER TYPE AND SIZE AS REQUIRED AT ALL OUTLETS WHERE SHOWN. SECURED FIRMLY IN PLACE AND SET TRUE AND SQUARE AND FLUSH WITH THE FINISHED SURFACE.

28. WIRING: WIRES SHALL BE COPPER AND RATED FOR THE LOCATIONS IN WHICH THEY ARE INSTALLED. ALL RACEWAYS ARE SHOWN DIAGRAMMATICALLY, EXACT LOCATION TO BE DETERMINED ON THE JOB. CONTRACTOR SHALL ARRANGE ALL NEW CIRCUITS IN PANELS SO AS TO BALANCE THE LOAD ON ALL PHASES.

29. A TYPED DIRECTORY CARD SHALL BE PROVIDED IN EACH PANEL WITH ADDED CIRCUITS TO INDICATE THE LOADS ACTUALLY SERVED.

30. GROUNDING: SHALL BE IN STRICT ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE ARTICLE 250. PROVIDE GROUND WIRES AS REQUIRED AND RESIZE CONDUIT IF NECESSARY.

31. DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS: UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL OBTAIN A CERTIFICATE OF APPROVAL FROM THE RESPECTIVE INSPECTION AGENCIES. CONTRACTOR SHALL NOTIFY AND MAKE ALL THE NECESSARY ARRANGEMENTS WITH THE INSPECTING AGENCY AND LOCAL AUTHORITIES SO THAT INSPECTION MAY BE CARRIED OUT AT THE PROPER TIME.

ABBREVIATIONS:

AFG	ABOVE FINISHED GRADE
AIC	AMPS INTERRUPTING CURRENT
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AWG	AMERICAN WIRE GAUGE
DIA	DIAMETER
ENT	ELECTRICAL NON-METALLIC TUBING
FM	FLOW METER
FVNR	FULL VOLTAGE NON-REVERSING STARTER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
HP	HORSEPOWER
IEEE	INSTITUTE FOR ELECTRICAL AND ELECTRONIC ENGINEERS
KW	KILOWATT
KVA	KILOVOLT AMPERES
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MCC	MOTOR CONTROL CENTER
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
PIT	PRESSURE INDICATING TRANSMITTER
PLC	PROGRAMMABLE LOGIC CONTROLLER
PRV	PRESSURE RELIEF VALVE
PVC	POLYVINYL CHLORIDE
RTU	REMOTE TELEMETRY UNIT
SCCR	SHORT CIRCUIT CURRENT RATING
SES	SERVICE ENTRANCE SECTION
SS	STAINLESS STEEL
TEP	TUCSON ELECTRICAL POWER
TSP	TWISTED SHIELDED PAIR
UBC	UNIFORM BUILDING CODE
UL	UNDERWRITERS LABORATORY
VFD	VARIABLE FREQUENCY DRIVE
W	WATTS, WIRE
WP	WEATHERPROOF
WWTP	WASTE WATER TREATMENT PLANT
XFMR	TRANSFORMER
3P	THREE PHASE

LEGEND

	ELECTRICAL PULLBOX
	ELECTRICAL CONDUIT
	(1) 92W TYPE 3 LED FIXTURE WITH HOUSE SIDE SHIELD
	(1) 92W TYPE 3 LED FIXTURE
	(1) 92W TYPE 4 LED FIXTURE

REVIEWED FOR ELECTRICAL CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

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Tucson Parks and Recreation
A Nationally Accredited Agency

FRANCISCO ELIAS ESQUER PARK
DOG PARK & WATER HARVESTING
1415 N 14TH AVE
TUCSON, AZ

Registered Professional Engineer
CERTIFICATE NO. 50368
Colombo
Expires 09/30/2024
ARIZONA, U.S.A.

Revision Record

No.	Description	Date
1		
2		
3		

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Dial 811 or ARIZONA811
Call 811 or click Arizona811.com

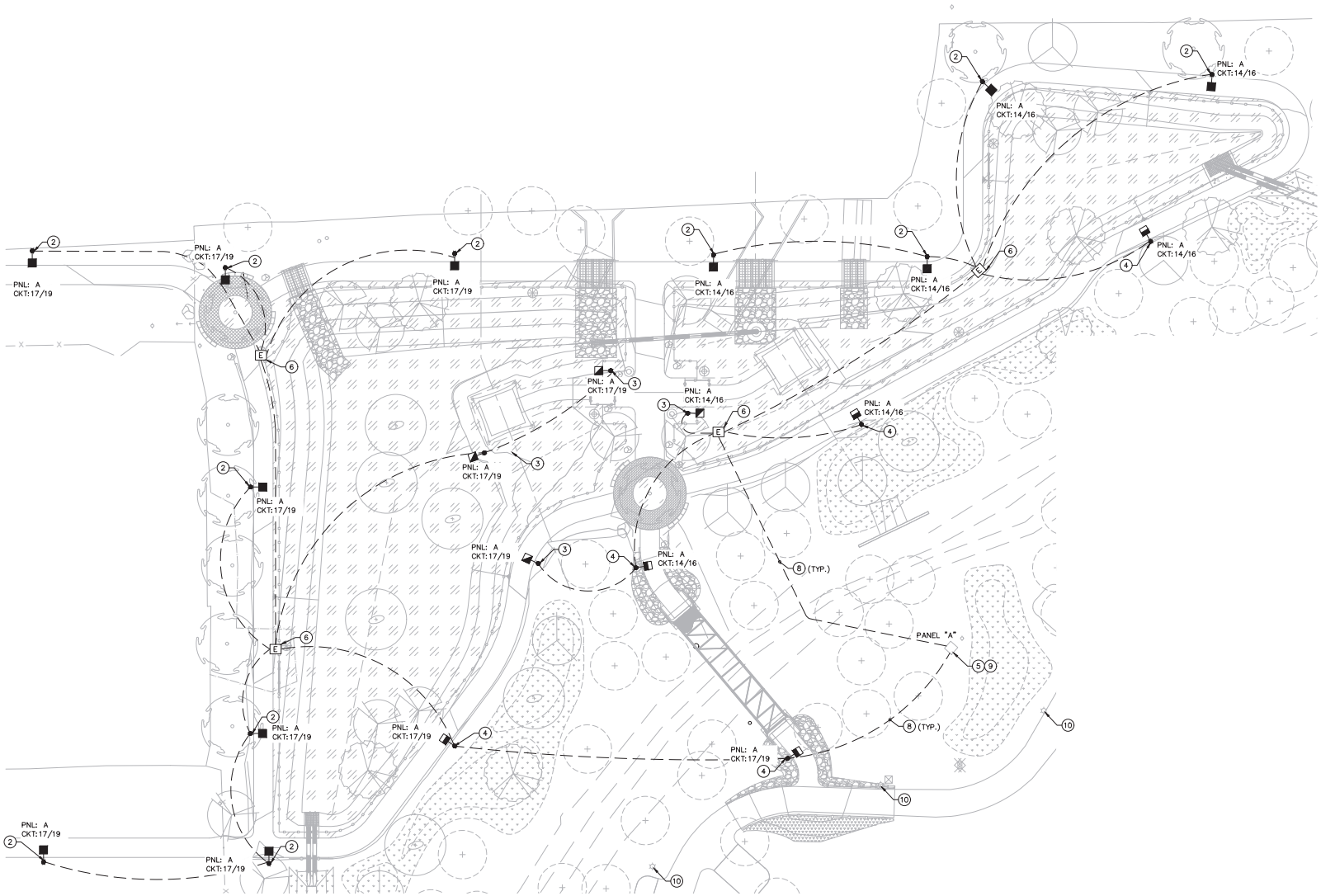
ELECTRICAL GENERAL NOTES AND LEGEND

Project number:	098134081
Date:	09.25.2023
Designed by:	EAE
Drawn by:	EAE
Checked by:	MAC

EL00

Sheet Number: 19 of 23

TC-COM-0523-01350



CONSTRUCTION NOTES

(2) PROPOSED LIGHT POLE AND 92W LED FIXTURE. MODEL NUMBER DSX0-LED-P4-30K-T3M-MVOLT-HS. POLE PER DETAIL E ON SHEET EL02.

(3) PROPOSED LIGHT POLE AND 92W LED FIXTURE. MODEL NUMBER DSX0-LED-P4-30K-T4M-MVOLT. POLE PER DETAIL E ON SHEET EL02

(4) PROPOSED LIGHT POLE AND 92W LED FIXTURE. MODEL NUMEBR DSX0-LED-P4-30K-T3M-MVOLT. POLE PER DETAIL E ON SHEET EL02.

(5) CONTRACTOR TO CONNECT ADDITIONAL LIGHTING CIRCUITS TO EXISTING LIGHTING CONTROL SYSTEM IN PANEL 'A'. REPLACE AND INSTALL LARGER CONTACTOR IF REQUIRED. SEE DETAIL "F" ON SHEET EL02 FOR TOTAL NUMBER OF CONTACTOR POLES.

(6) PROPOSED PULLBOX. SEE DETAIL A ON SHEET EL02 FOR MORE INFORMATION.

(8) INSTALL (2) #8 AWG CONDUCTORS AND (1) #8 AWG GROUND IN (1) 1" SCHEDULE 40 PVC CONDUIT.

(9) EXTEND CONDUITS AND CONDUCTORS TO EXISTING PANEL 'A' AND CONNECT FOR A COMPLETE SYSTEM. INSTALL (2) 2 POLE 20A BREAKERS TO THE AVAILABLE SPACES AND MATCH EXISTING AIC RATINGS.

(10) EXISTING LIGHT TO REMAIN. PROTECT IN PLACE.

REVIEWED FOR ELECTRICAL CODE COMPLIANCE
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11/01/2023
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TUCSON, AZ

Registered Professional Engineer
50368
Colombo
ARIZONA USA

Revision Record

No.	Description	Date
1		
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3		

Arizona Blue Stake, Inc. 811
ARIZONA811

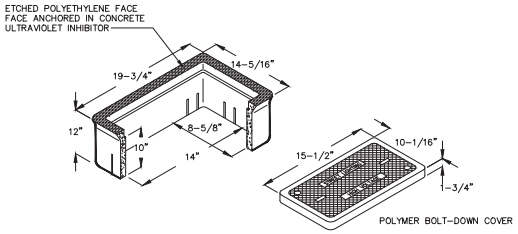
ELECTRICAL PLAN

Project number:	098134081
Date:	09.25.2023
Designed by:	EAE
Drawn by:	EAE
Checked by:	MAC

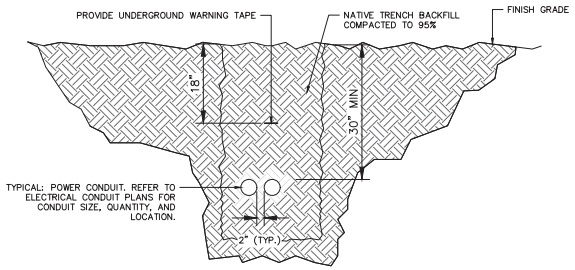
EL01

Sheet Number: 20 of 23

TC-COM-0523-01350



A PULL BOX DETAIL
SCALE: N.T.S.



B TRENCH DETAIL
SCALE: N.T.S.

LIGHT FIXTURE SCHEDULE

SYMBOL	TYPE	LUMENS	WATTAGE	COLOR TEMP	MANUFACTURER	MODEL
	POLE	7715	92	3000K	LITHONIA	DSXO-LED-P4-30K-T3M-MVOLT-HS
	POLE	9807	92	3000K	LITHONIA	DSXO-LED-P4-30K-T3M-MVOLT
	POLE	9594	92	3000K	LITHONIA	DSXO-LED-P4-30K-T4M-MVOLT

C LIGHT FIXTURE SCHEDULE
SCALE: N.T.S.

PANEL: "A"

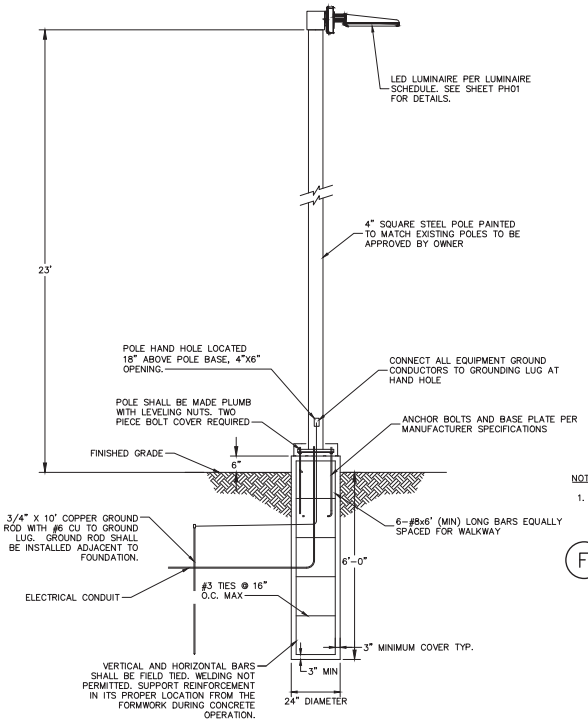
VOLTAGE: 120/240 — PANEL BUS: 100 AMPS
PHASE, WIRES: 1ø, 3W — MAIN: 100 BREAKER
SCCR (AMPS): 22,000
SOURCE: METER 422

DESCRIPTION	VA	CB	CKT	A	B	CKT	CB	VA	DESCRIPTION
SERVICE DISCONNECT		20/1	1	0.0		2	20/1		LIGHTING FIXTURE (5, 6, 7)
SERVICE DISCONNECT		20/1	3		0.0	4	20/1		LIGHTING FIXTURE RAMADA
LIGHTING FIXTURE (1,2,3,4)		20/1	5	0.0		6	20/1		RECEPTS RAMADA
LIGHTING FIXTURE (8, 9, 10)		20/1	7		0.0	8	20/1		SPARE
RECEPTS RAMADA		20/1	9	0.0		10	20/1		SPARE
SPARE		20/1	11		1.5	12	20/1	180	*LIGHTING CONTROL PANEL
SPARE		20/1	13	3.5		14	20/2	422	**LIGHTING FIXTURE
SPARE		20/1	15		3.5	16		422	(13,14,15,16,17,18,19,20,21)
**LIGHTING FIXTURE	562	20/2	17	4.7		18			SPACE
(1,2,3,4,5,6,7,8,9,10,11,12)	562		19		4.7	20			SPACE
			TOTALS	8.2	9.7	AMPS			

LOAD CALCULATIONS:
SUBTOTAL (VA): 2148
+25% PER NEC (VA): 537
TOTAL (VA): 2685 @ 240V, 1Ø = 11.2 AMPS

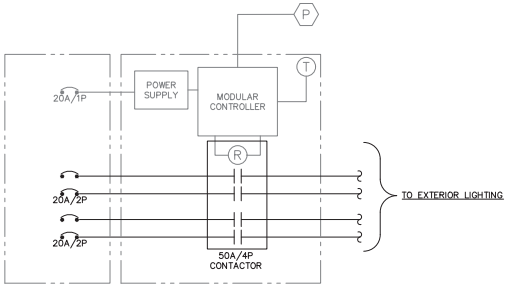
*PRIOR TO COMMENCING ANY WORK, CONTRACTOR SHALL FIELD VERIFY SPARE 20A BREAKER EXISTS IN PANEL 'A' FOR LIGHTING CONTROL PANEL.
**CONTRACTOR TO INSTALL (2) 20A, 2 POLE BREAKERS PRIOR TO INSTALLING LIGHTING FIXTURES.
***ALL CONNECTED LOAD INFORMATION IS UNKNOWN. CONTRACTOR SHALL PERFORM 30 DAY LOAD STUDY TO TO ENSURE PANEL HAS ADEQUATE CAPACITY FOR NEW LOADS. CONTRACTOR TO NOTIFY ENGINEER PRIOR TO COMMENCING ANY WORK IF PANEL DOES NOT HAVE SUFFICIENT ELECTRICAL CAPACITY FOR NEW LOADS.

D EXISTING PANEL 'A'
SCALE: N.T.S.



NOTES:
1. 4000 PSI MIN. 28 DAY COMPRESSIVE STRENGTH CONCRETE WITH GRADE 60 REINFORCING STEEL
2. IF WATER IS PRESENT IN HOLE, REMOVE BEFORE POURING CONCRETE.
3. FOUNDATION EXCAVATION SHALL BE BY 24" AUGER IN UNDISTURBED OR PROPERLY COMPACTED FILL PER SPECIFICATIONS.
4. FOUNDATION SHALL HAVE A MINIMUM ALLOWABLE BEARING OF 1500 PSF.
5. FOUNDATION HAS BEEN DESIGNED FOR A MINIMUM ALLOWABLE LATERAL SOIL PRESSURE OF 100 PCF.

E LIGHT POLE DETAIL
SCALE: N.T.S.



NOTES:
1. CONTRACTOR SHALL VERIFY ALL CIRCUIT INFORMATION AND CONFIRM LOADS ON PANEL, PRIOR TO CONNECTING CIRCUITS. PROVIDE AND INSTALL NEW CABLING TO NEW EQUIPMENT AND PROVIDE UPDATED PANEL SCHEDULE AS NECESSARY. SEE BUILDING AS-BUILT PLANS FOR ADDITIONAL INFORMATION.

F EXISTING LIGHTING CONTROL SCHEMATIC DIAGRAM
SCALE: N.T.S.

Point	Point Name	Source* Point	Source Amps	Conduit Type	Conductor Type	Wire Size/Quantity			Load (A)	Distance	Voltage	Phase	**% Vdrop
1	120 / 240 1 ph 25	12175	12,175										
2	CKT 17/19: LIGHT 1	1	12,175	NM	Copper	1	Set of	8	4.68	100	240	1	0.27%
3	LIGHT 2	2	2,861	NM	Copper	1	Set of	8	4.29	75	240	1	0.45%
4	PULLBOX 1	3	1,818	NM	Copper	1	Set of	8	3.9	250	240	1	1.01%
5	LIGHT 3	4	821	NM	Copper	1	Set of	8	0.78	125	240	1	1.07%
6	LIGHT 4	5	644	NM	Copper	1	Set of	8	0.39	125	240	1	1.10%
7	LIGHT 5	4	821	NM	Copper	1	Set of	8	0.39	250	240	1	1.07%
8	PULLBOX 2	4	821	NM	Copper	1	Set of	8	1.17	150	240	1	1.12%
9	LIGHT 6	8	617	NM	Copper	1	Set of	8	0.39	125	240	1	1.14%
10	LIGHT 7	8	617	NM	Copper	1	Set of	8	0.39	75	240	1	1.13%
11	LIGHT 8	8	617	NM	Copper	1	Set of	8	0.39	150	240	1	1.15%
12	LIGHT 9	4	821	NM	Copper	1	Set of	8	0.39	100	240	1	1.04%
13	LIGHT 10	4	821	NM	Copper	1	Set of	8	1.17	75	240	1	1.07%
14	LIGHT 11	13	705	NM	Copper	1	Set of	8	0.78	75	240	1	1.10%
15	LIGHT 12	14	617	NM	Copper	1	Set of	8	0.39	100	240	1	1.12%
16	CKT 14/16 PULLBOX 3	1	12,175	NM	Copper	1	Set of	8	3.51	130	240	1	0.26%
17	LIGHT 13	16	2,327	NM	Copper	1	Set of	8	0.39	100	240	1	0.28%
18	LIGHT 14	16	2,327	NM	Copper	1	Set of	8	0.39	50	240	1	0.27%
19	PULLBOX 4	16	2,327	NM	Copper	1	Set of	8	2.34	125	240	1	0.43%
20	LIGHT 15	19	1,309	NM	Copper	1	Set of	8	0.78	50	240	1	0.45%
21	LIGHT 16	20	1,114	NM	Copper	1	Set of	8	0.39	100	240	1	0.48%
22	LIGHT 17	19	1,309	NM	Copper	1	Set of	8	0.39	75	240	1	0.45%
23	LIGHT 18	19	1,309	NM	Copper	1	Set of	8	0.39	150	240	1	0.46%
24	LIGHT 19	19	1,309	NM	Copper	1	Set of	8	0.39	150	240	1	0.46%
25	LIGHT 20	19	1,309	NM	Copper	1	Set of	8	0.39	60	240	1	0.44%
26	LIGHT 21	16	2,327	NM	Copper	1	Set of	8	0.39	225	240	1	0.31%

G PARK LIGHTING VOLTAGE DROP
SCALE: N.T.S.

REVIEWED FOR ELECTRICAL CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

Kimley»Horn
333 EAST WETMORE, SUITE 280
TUCSON, AZ 85705
(p) 520.615.9191

Tucson Parks and Recreation
A Nationally Accredited Agency

FRANCISCO ELIAS ESQUER PARK
DOG PARK & WATER HARVESTING
1415 N 14TH AVE
TUCSON, AZ

Revision Record

No.	Description	Date
1		
2		
3		

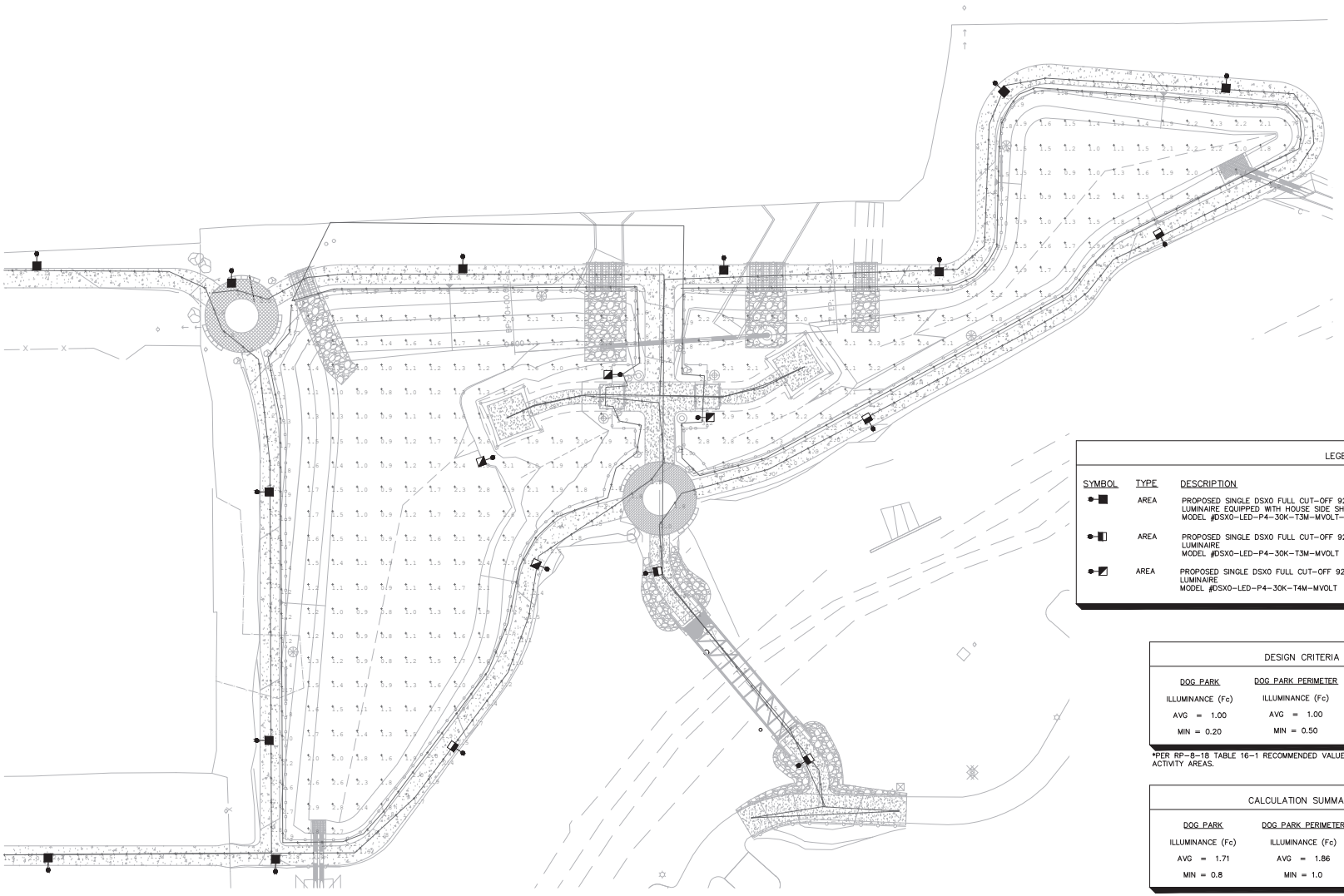
ELECTRICAL DETAILS

Project number:	098134081
Date:	09.25.2023
Designed by:	EAE
Drawn by:	EAE
Checked by:	MAC

EL02

Sheet Number: 21 of 23

TC-COM-0523-01350



LEGEND					
SYMBOL	TYPE	DESCRIPTION	LUMENS	WATTAGE	MOUNTING HEIGHT
●■	AREA	PROPOSED SINGLE DSX0 FULL CUT-OFF 92 W TYPE 3 LUMINAIRE EQUIPPED WITH HOUSE SIDE SHIELD MODEL #DSX0-LED-P4-30K-T3M-MVOLT-HS	7,715	92	23
●■	AREA	PROPOSED SINGLE DSX0 FULL CUT-OFF 92 W TYPE 3 LUMINAIRE MODEL #DSX0-LED-P4-30K-T3M-MVOLT	9,807	92	23
●■	AREA	PROPOSED SINGLE DSX0 FULL CUT-OFF 92 W TYPE 4 LUMINAIRE MODEL #DSX0-LED-P4-30K-T4M-MVOLT	9,594	92	23

DESIGN CRITERIA		
DOG PARK	DOG PARK PERIMETER	BRIDGE\PATHWAYS*
ILLUMINANCE (Fc)	ILLUMINANCE (Fc)	ILLUMINANCE (Fc)
AVG = 1.00	AVG = 1.00	AVG/MIN = 4:1
MIN = 0.20	MIN = 0.50	MIN = 1.00

*PER RP-8-18 TABLE 16-1 RECOMMENDED VALUES FOR HIGH PEDESTRIAN ACTIVITY AREAS.

CALCULATION SUMMARY		
DOG PARK	DOG PARK PERIMETER	BRIDGE\PATHWAYS
ILLUMINANCE (Fc)	ILLUMINANCE (Fc)	ILLUMINANCE (Fc)
AVG = 1.71	AVG = 1.86	AVG/MIN = 1.78
MIN = 0.8	MIN = 1.0	MIN = 1.00

LUMENS/ACRE CALCULATION

FULL SITE

ILLUMINANCE (Fc)

LUMENS/ACRE = 250,000*

ACRES = 4.8

TOTAL ALLOWED LUMENS = 1,200,000

TOTAL PROPOSED SHIELDED LUMENS USED = 172,276
TOTAL EXISTING SHIELDED LUMENS USED = 47,500
TOTAL UNSHIELDED LUMENS USED = 0
TOTAL PROPOSED LUMENS = 219,776

SITE IS CLASSIFIED AS A RECREATIONAL FACILITY AND PER LIGHTING CODE SECTION 106.2.2 REQUIRES A SPECIAL INSPECTION

*LUMENS ALLOWANCE PER TABLE 401.1 IN CITY OF TUCSON/PIMA COUNTY'S OUTDOOR LIGHTING CODE. SITE IS PART OF OPTION 2, 'E3 COMMERCIAL AND INDUSTRIAL' LIGHTING AREA

REVIEWED FOR ELECTRICAL CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

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TUCSON, AZ 85705
(p) 520.615.9191

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FRANCISCO ELIAS ESQUER PARK
DOG PARK & WATER HARVESTING
1415 N 14TH AVE
TUCSON, AZ

50368
CERTIFICATE NO.
Columbo
REGISTERED
PROFESSIONAL ENGINEER
ARIZONA U.S.A.

Revision Record

No.	Description	Date
1		
2		
3		

Before you dig, call 811 at least two full working days before you begin excavation
Arizona811
AZ811.com

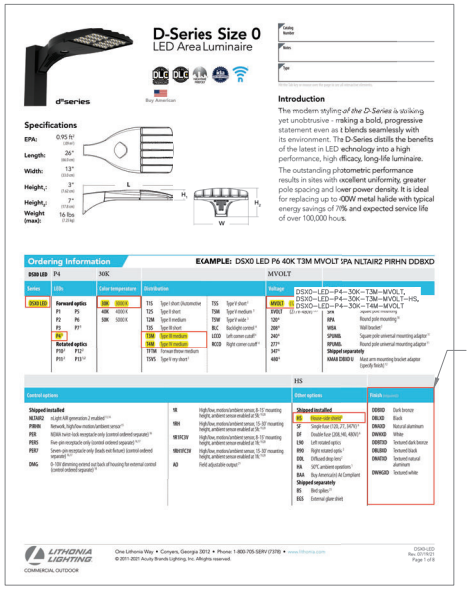
PHOTOMETRIC PLAN

Project number:	098134081
Date:	09.26.2023
Designed by:	EAE
Drawn by:	EAE
Checked by:	MAC

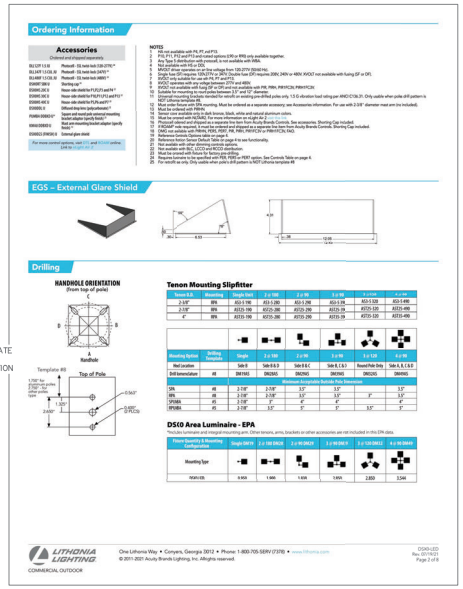
PH00

Sheet Number: 22 of 23

TC-COM-0523-01350



CONTRACTOR TO COORDINATE FIXTURE FINISH PRIOR TO PURCHASE AND INSTALLATION



A LIGHTING CUTSHEET
SCALE: N.T.S.

COMcheck Software Version COMcheckWeb

Exterior Lighting Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title: Francisco Elias Esquer Dog Park
Project Type: New Construction
Exterior Lighting Zone 3 (Other (LZ3))

Construction Site: Owner/Agent: Designer/Contractor:

Allowed Exterior Lighting Power

Area/Surface Category	B Quantity	C Allowed Watts /	D Tradable Wattage	E Allowed Watts (B x C)
Dog Park (Landscaping)	209000 ft2	0.04	Yes	8360
		Total Tradable Watts (a) =		8360
		Total Allowed Watts =		8360
		Total Allowed Supplemental Watts (b) =		500

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.
(b) A supplemental allowance equal to 500 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
Dog Park (Landscaping, 209000 ft2): Tradable Wattage				
LED: Proposed LED: LED Roadway-Parking Unit 94W.	1	20	92	1840
HID: Existing HPS: High Pressure Sodium: Standard	1	5	100	500
		Total Tradable Proposed Watts =		2340

Exterior Lighting PASSES: Design 7% better than code

Exterior Lighting Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 2018 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Michael Colombo, Engineer
Name - Title

Signature

9/25/2023
Date

Project Title: Francisco Elias Esquer Dog Park
Data filename:
Report date: 09/25/23
Page 1 of 4

COMcheck Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2018 IECC

Requirements: 100.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req. ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR8][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408 [PR9][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Project Title: Francisco Elias Esquer Dog Park
Data filename:
Report date: 09/25/23
Page 2 of 4

Section # & Req. ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.5 [EL28][2]	Manual controls required by the energy code are in a location with ready access to occupants and located where the controlled lights are visible, or identify the area served and their status.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. **Location on plans/spec:** Detail F, Sheet E-02
C405.2.6 [EL30][2]	Automatic lighting controls for exterior lighting installed. Controls will be daylight controlled, set based on business operation time-of-day, or reduce connected lighting > 30%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. **Location on plans/spec:** Detail F, Sheet E-02
C405.6 [EL26][2]	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.7 [EL27][2]	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.8.2, C405.8.2.1 [EL28][2]	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.9 [EL29][2]	Total voltage drop across the combination of feeders and branch circuits <= 5%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. **Location on plans/spec:** Detail G, Sheet E-02

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Project Title: Francisco Elias Esquer Dog Park
Data filename:
Report date: 09/25/23
Page 3 of 4

Section # & Req. ID	Final Inspection	Complies?	Comments/Assumptions
C405.5.1 [FI19][2]	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Exterior Lighting fixture schedule for values.*
C408.1.1 [FI57][1]	Building operations and maintenance documents will be providedto the owner. Documents will cover manufacturers' information specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to beinstalled, maintained, and operated.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Project Title: Francisco Elias Esquer Dog Park
Data filename:
Report date: 09/25/23
Page 4 of 4

B COMCHECK FORMS
SCALE: N.T.S.

REVIEWED FOR ELECTRICAL CODE COMPLIANCE
JGarcia2
11/01/2023
CITY OF TUCSON PLANNING AND DEVELOPMENT SERVICES

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TUCSON, AZ 85705
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FRANCISCO ELIAS ESQUER PARK
DOG PARK & WATER HARVESTING
1415 N 14TH AVE
TUCSON, AZ

Professional Engineer Certificate No. 50368 Michael Colombo Civil Arizona USA

Revision Record		
No.	Description	Date
1		
2		
3		

Contact Arizona 811 at least two full working days before you begin excavation
Dial 811 ARIZONA811
Call 811 or click Arizona811.com

LIGHTING CUTSHEETS

Project number:	098134081
Date:	09.25.2023
Designed by:	EAE
Drawn by:	EAE
Checked by:	MAC

PH01

Sheet Number: 23 of 23

FINAL DRAINAGE MEMORANDUM

To: Greg Jackson, City of Tucson

From: Kevin Payne, P.E., CFM, Kimley-Horn

Date: August 19, 2022
Revised: February 5, 2024

Subject: Final Drainage Memorandum
Francisco Elias Esquer Park
KHA Job #098134081

This memo summarizes the drainage analysis that was completed in support of the proposed improvements at Francisco Elias Esquer Park. The project is located within the southeast quadrant of Section 2 of Township 14 South, Range 13 East, Gila and Salt River Meridian. More specifically, the project is located within Francisco Elias Esquer Park near the northeastern corner of 15th Ave and Mabel St within City of Tucson limits. The project consists of a pedestrian bridge over the Bronx Wash, a dog park, walking paths, and landscape improvements.

Two dimensional (2-D) hydrologic and hydraulic modeling was previously completed by Kimley-Horn for the Bronx Wash watershed. The 2-D Bronx Wash modeling shows the site is significantly impacted by overland flow from the north, northeast, and southeast. An existing storm drain system conveys flow generated east of Main Ave through the Tucson House parking lot and outlets to the Bronx Wash channel at the eastern boundary of the park. The site is mapped as a Zone AE floodplain on FEMA Flood Insurance Rate Map (FIRM) panel 04019C2276L, effective June 16, 2011. A CLOMR/LOMR based on the Bronx Wash modeling is not anticipated and is not included as part of this project. A FEMA Firmette is attached for reference.

The 100-yr peak discharge of 744 cfs obtained from the 2-D watershed model was utilized for bridge design. TSMS Node DC-N0025 is along the Bronx Wash, downstream of the park, at 15th Ave. The TSMS node reports a 100-yr discharge of 1,011 cfs. There is significant inflow from the southeast between TSMS Node DC-N0025 and the project. The 100-yr discharge at 15th Ave from the Bronx Wash study is 1,245 cfs. An excerpt of the Hydrologic/Hydraulic Workmap from the Bronx Wash study (**Figure 1**) is provided in the Appendix. The location of the TSMS node has been added to the Bronx Wash Workmap for clarity. The closest published 100-yr FIS discharge of 1,573 is at the Union Pacific Railroad is approximately 500-ft downstream of the project. Depending on whether the FIS discharge is located upstream or downstream of the railroad, there is at least one undersized drainage structure between the published FIS discharge and the project. Due to the distance between the FIS discharge and the project, the dynamic nature of urban flow with 2-D modeling, along with flow splits and

attenuation caused by undersized structures, it is difficult to correlate the design discharge for this project and the FIS discharge.

Project specific HEC-RAS modeling was performed to design the pedestrian bridge. HEC-RAS modeling was performed using 2015 PAG LiDAR data to evaluate bridge alternatives. The existing conditions HEC-RAS analysis shows that overbank flow from the Bronx Wash inundates much of the park. The model shows that overbank flows are generally shallow with low velocities, resulting in minimal flow conveyance outside of the main channel. The bridge was designed as a single span across the Bronx Wash and to provide 1-ft of freeboard above the 100-yr water surface elevation. Proposed bridge openings of 40-ft and 60-ft were evaluated within HEC-RAS. Both bridge opening sizes would meet freeboard requirements and prevent adverse impacts to adjacent property owners.

To determine the impact that clogging of the proposed dog park fence would have on conveyance, the area within the proposed fencing limits was modeled as ineffective flow in the hydraulic model.

Additionally, an art sculpture is proposed in the south overbank near the south ped bridge abutment. A blocked obstruction has been added to the HEC-RAS model for the art sculpture.

Results of the HEC-RAS analysis at the upstream bridge cross section (XS 463) are provided in **Table 1**. These results are used to define the low-chord of the bridge with 1-ft of freeboard.

Table 1 – HEC-RAS Water Surface Elevations

HEC-RAS Model	WSEL [ft]
Existing	2345.47
Proposed 40-ft Bridge Opening	2345.62
Proposed 60-ft Bridge Opening	2345.66
Proposed 60-ft Bridge Opening with Fence and Sculpture	2345.66

Model results show that impacts from the bridge, site fencing, and art sculpture meet COT Floodplain Ordinance requirements, with rises either less than 0.1’ or contained on-site (at the upstream bridge face). Floodplain extents were delineated for existing and proposed conditions. Hydraulic cross sections, the proposed bridge location, and the 100-yr floodplain delineations are shown on **Figure 2**. Existing and proposed conditions HEC-RAS outputs are attached.

Review of the FEMA FIRM, along with project modeling, shows that the floodplain extents will be largely unchanged by the project improvements and that 100-year WSEL are lower than those defined on the FIRM. Based on these finding, a CLOMR is not warranted for this project.

City of Tucson (COT) scour calculations were performed at the proposed bridge location under the assumption that the abutments would scour, and the bridge supports would be exposed. Scour depth

was found to be 12-ft, primarily resulting from local pier scour. Due to the proximity of the abutments to the banks of the wash, drilled shafts would be recommended for the 40-ft bridge opening. The 60-ft bridge opening would place the abutments further from the wash and could be designed using spread footings. Since it is a pedestrian bridge and to be more cost effective, the 60' bridge opening on spread footings is recommended. While the bridge may be susceptible to lateral migration of the wash, the bridge should not be in use during the design storm since the entire area would be inundated. In addition, the project HEC-RAS and Bronx Wash FLO-2D modeling both show 100-yr velocities outside the main channel to be less than 3 fps which is considered non-erosive and additional justification for the spread footing design approach. Structural details in the plans provide for the design of the abutments using spread footings, with overexcavation and structural backfill to support the spread footings. The disturbed areas near the abutments along with the bridge approaches shall be protected with grouted riprap. Scour calculations are attached. The bridge design and the associated risk was reviewed in a meeting with City Parks staff and City Engineering staff and agreed that the risk to the pedestrian bridge is minimal, and acceptable.

The project was design in coordination with the City's Storm to Shade program with the objective of using the dog park of large scale water harvesing. Runoff within the Bronx Wash will continue to be conveyed within the channel during low-flow events. A 4-ft wide earthen trapezoidal swale with 4:1 side slope shall be graded to convey flow to two (2) 18-inch corrugated metal pipes (CMPs) that shall be installed near the northeastern corner of the project. These CMPs will help convey a portion of larger flows under the pathway to the depressed areas and water harvesting basins within the dog park. The dog park shall be graded to provide positive drainage to two (2) 18-inch CMPs at the southwestern corner of the project that will convey flow under the pathway. A 4-ft wide earthen trapezoidal swale with 4:1 side slope shall be graded from this culvert outlet to the Bronx Wash. The inlet and outlet CMPs are intended to meter inflow into the dog park and outflow back to the Bronx Wash.

There are four (4) scupper locations that shall be installed along the northern section of the pathway to convey runoff generated north of the project to the dog park. The scuppers were sized to match existing inflow patterns. Scupper outlets shall be protected with D_{50} = 6-in riprap. In addition, an 18" CMP shall be installed as an equalizer pipe between the two (2) larger scupper spillway outlets near the center of the project. Drainage improvements are shown on the attached grading plan.

The section of the Bronx Wash within the project limits is a WASH watercourse. The only infrastructure improvements proposed within the WASH limits are the bridge and the at-grade pathway connecting the proposed amenities north of the Bronx Wash to the existing pathway to the south. There will be significant planting and water harvesting associated with the project, including within the WASH limits. The Bronx Wash channel will not be impacted.

Based on the 2023 Supreme Court ruling on Section 404 of the Clean Water Act, the Bronx Wash is not a relatively permanent body of water, therefore shall not be considered a Water of the US. Despite this ruling, the project has been designed to avoid disturbance to the primary channel. As discussed above, the bridge is designed as a single span, completely spanning the Bronx Wash channel. Minimal grading is proposed within the overbanks to assist with water harvesting but these areas do not impact the "sandy bottom" of the wash. To summarize, there will not be any project components, including

bridge abutments and/or piers, in the wash. As a result, the project has been determined to be non-jurisdictional and a 404 compliance statement is attached.

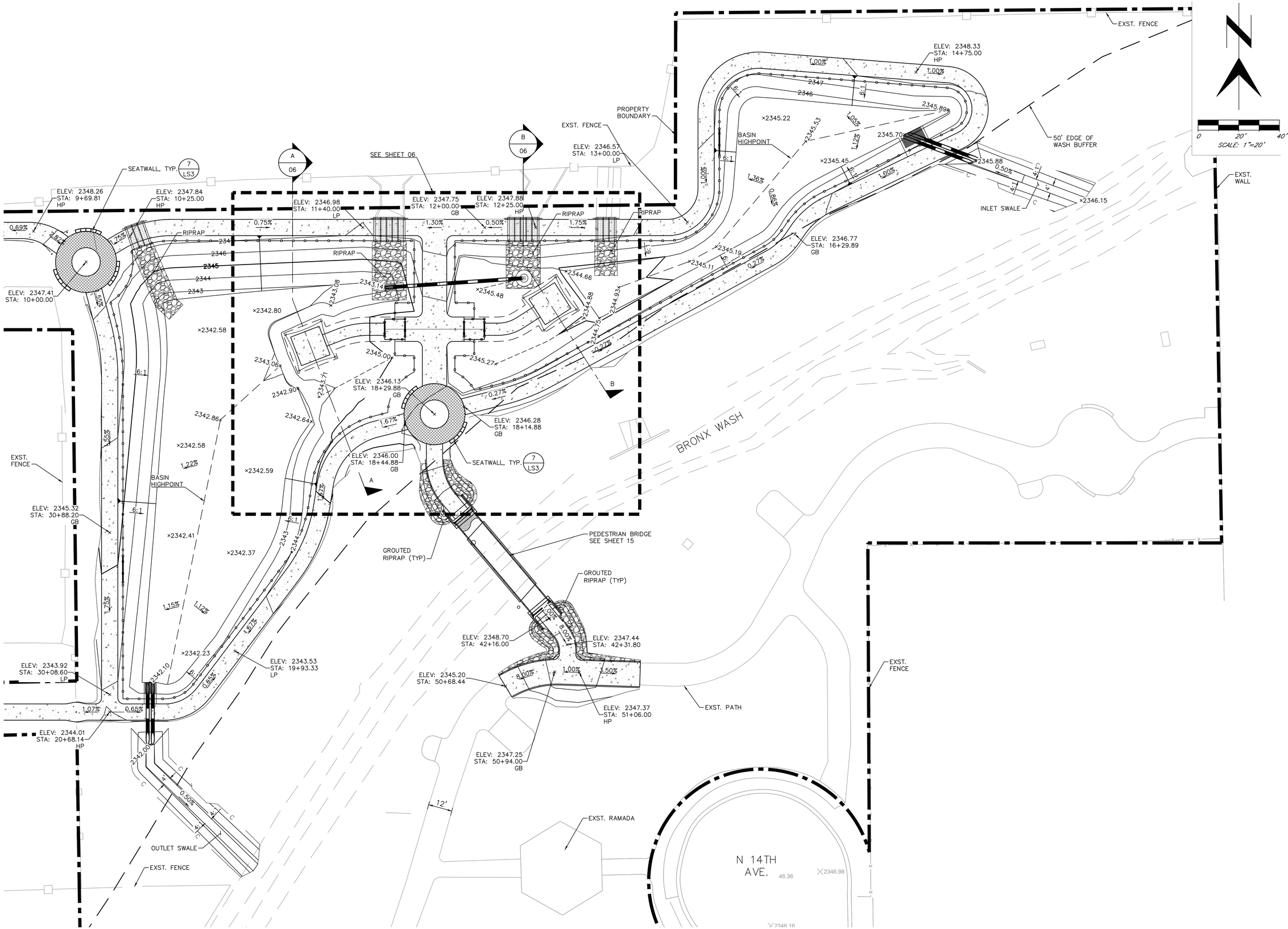
Increased imperviousness resulting from the project is considered negligible. Existing topography within the project limits is depressed, relative to adjacent grades, and provides floodplain storage. The project includes grading that will enhance the volume of the naturally depressed area and provide additional floodplain storage. The depressed area shall be inspected and maintained regularly to promote its function as a detention basin. The inspection process should include:

- An evaluation of erosion or sedimentation around the inlet spillways, inlet and outlet pipes, and basin slopes
- Spillway and pipe inlet/outlet obstructions
- Vegetation growth
- Bank failure

Routine maintenance is expected to include mowing, trash removal, and other minor items as needed to allow the basin to function effectively. Additional maintenance may be required after storm events. A detention basin inspection maintenance checklist is attached.

In summary, the project is impacted by the Bronx Wash. While the Bronx Wash inundates much of the site, the project will not adversely impact adjacent properties. The FEMA Floodplain limits will remain unchanged therefore a CLOMR is not included in this project. The project improvements were designed in collaboration with the COT Storm to Shade program. The existing depressed area within the park will be regraded to facilitate increased water harvesting within the proposed dog park. Overall flow patterns remain unchanged. Local offsite overland runoff from the north is conveyed through the park, into the Bronx Wash. The Bronx Wash discharges onto the site near the northeast corner of the park via a large underground storm drain system and is conveyed through the site to the southwest corner of the park where it combines with additional urban runoff before continuing west.

Attachments



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FRANCISCO ELIAS ESQUER PARK
DOG PARK & WATER HARVESTING
1415 N 14TH AVE
TUCSON, AZ

Registered Professional Engineer
CHRISTOPHER J. KO
51478
KEVIN W. PAYNE
Date Signed 08/19/22
ARIZONA USA
Exp. Date 09/30/2022

Revision Record

No.	Description	Date
1		
2		
3		

Contact Arizona 811 at least two full working days before you begin excavation
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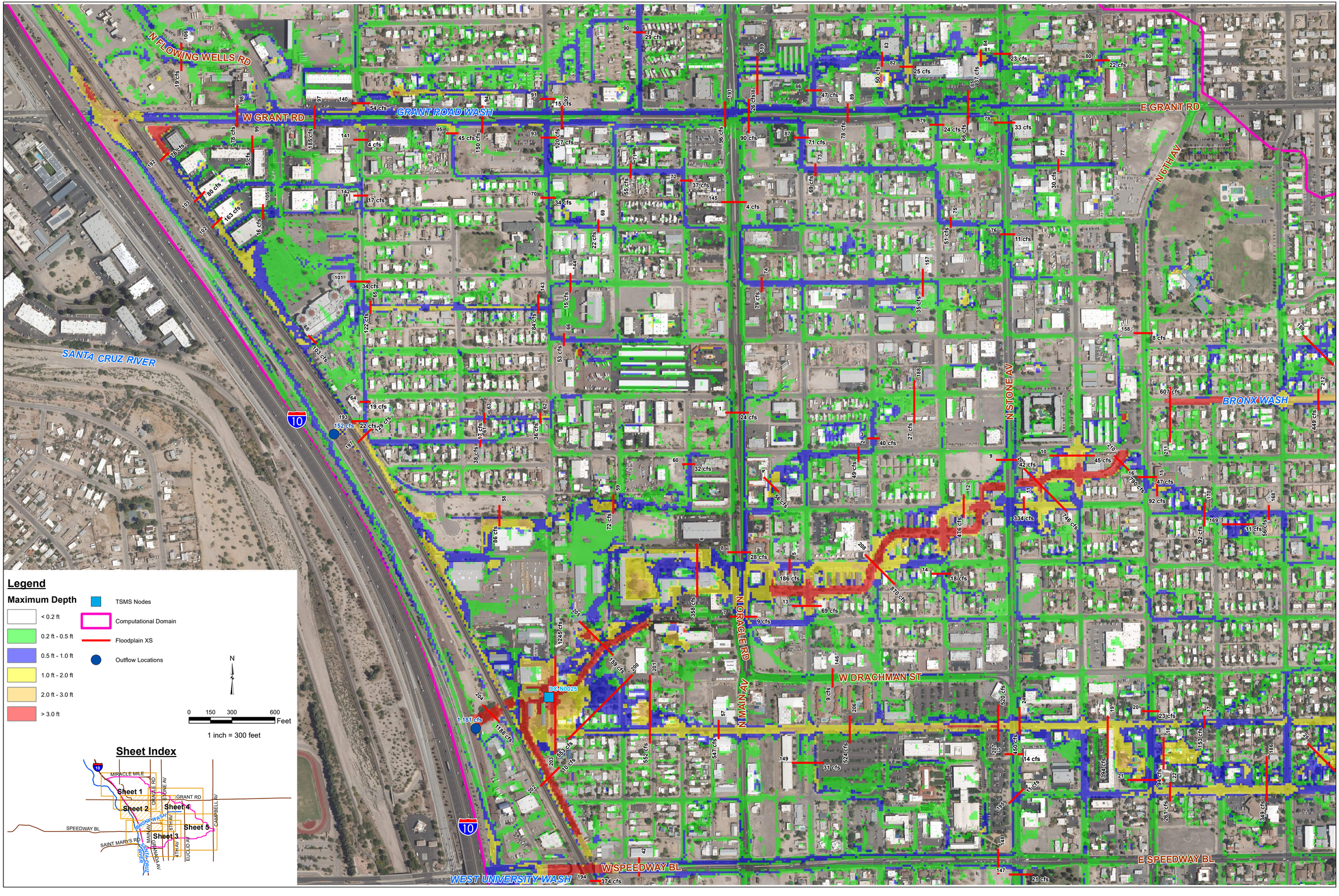
Call 811 or click Arizona811.com

GRADING PLANS

Project number:	098134081
Date:	08.19.2022
Designed by:	JS
Drawn by:	JS
Checked by:	RF

GRD1

Sheet Number: 05 of 23



Legend

Maximum Depth

- < 0.2 ft
- 0.2 ft - 0.5 ft
- 0.5 ft - 1.0 ft
- 1.0 ft - 2.0 ft
- 2.0 ft - 3.0 ft
- > 3.0 ft

- TSMS Nodes
- Computational Domain
- Floodplain XS
- Outflow Locations

N

0 150 300 600 Feet

1 inch = 300 feet

Sheet Index

201 N. Stone Ave. 9th Floor
Tucson, AZ 85701

PIMA COUNTY
FLOOD CONTROL

Kimley»Horn

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333 East Wetmore Rd. Suite 280
Engineering, Planning and
Environmental Consultants
Tucson, Arizona 85705 (520) 615-9191

SCALE(H):1"=	SHOWN
SCALE(V):	NONE
DESIGNED BY:	BY
DRAWN BY:	BY
CHECKED BY:	KWP
DATE:	DEC 2021

EXHIBIT 9A - FLOW DEPTH WITH SWMM
100-YR, 3-HR STORM
BRONX WASH

PROJECT NO.
098022069

DRAWING NAME
DEPTH_SWMM

Legend

- Hydraulic Cross Sections
- Francisco Elias Esquer Park
- 100-Yr Floodplain Delineation (Proposed)
- 100-Floodplain Delineation (Existing)

FIGURE 2

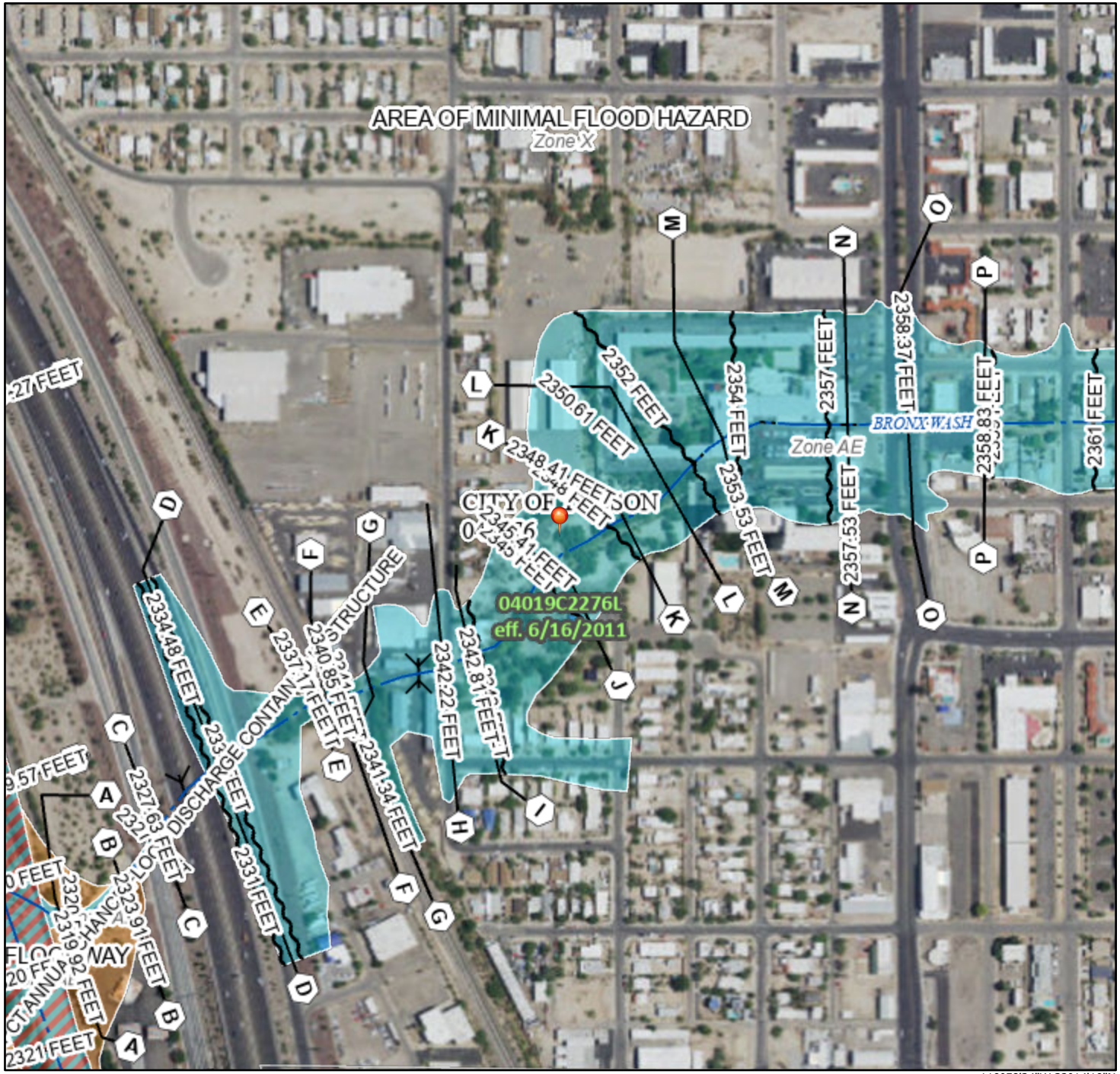
0 50 100 200 Feet

N

National Flood Hazard Layer FIRMette

FEMA

110°59'11"W 32°14'40"N



110°58'34"W 32°14'10"N

Feet

0 250 500 1,000 1,500 2,000

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 — Cross Sections with 1% Annual Chance
- 17.5 — Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

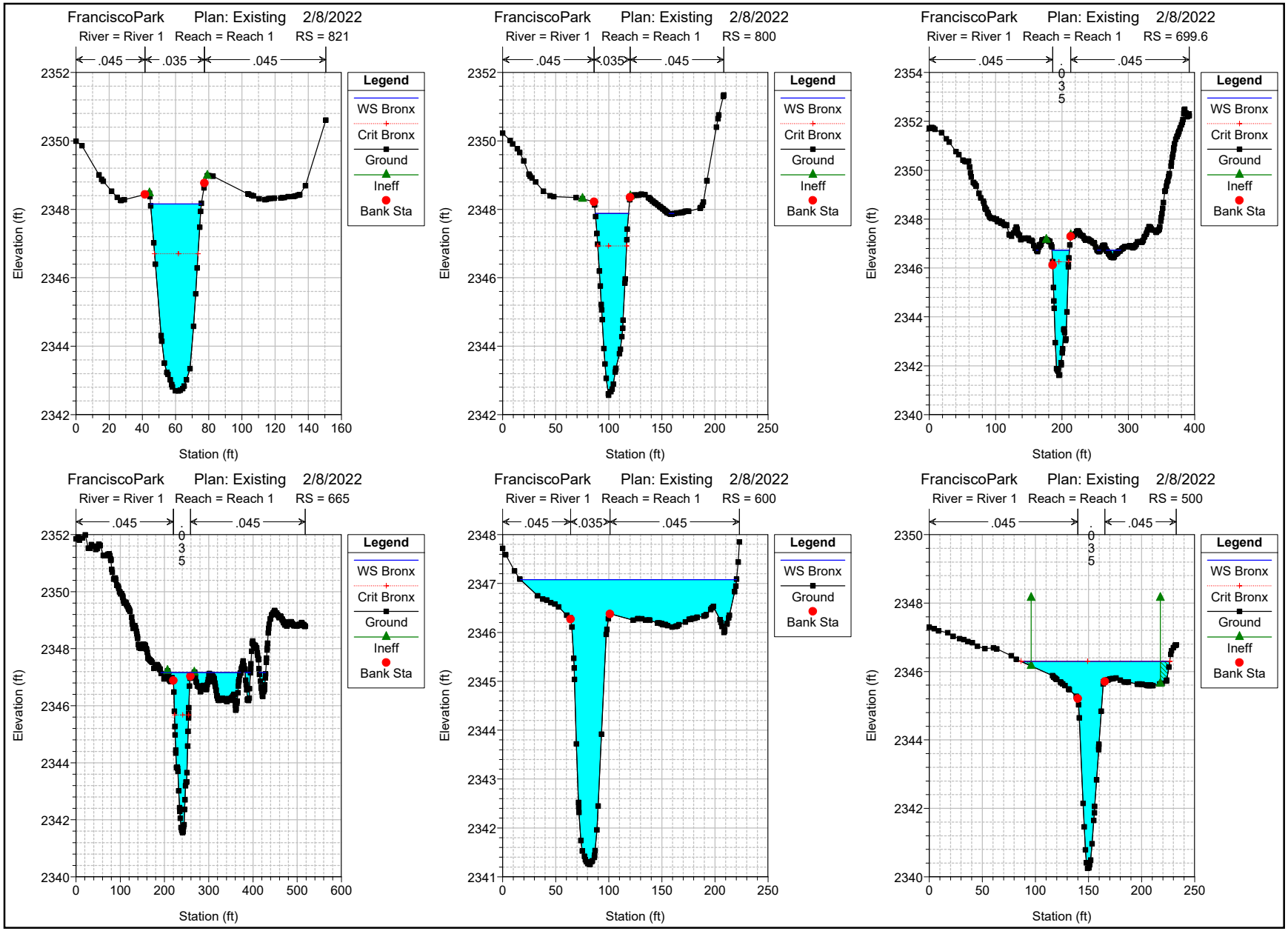
N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/23/2021 at 3:28 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.


FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 821
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 800
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 699.6
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 665
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 600
.045 .035 .045
Legend
WS Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 500
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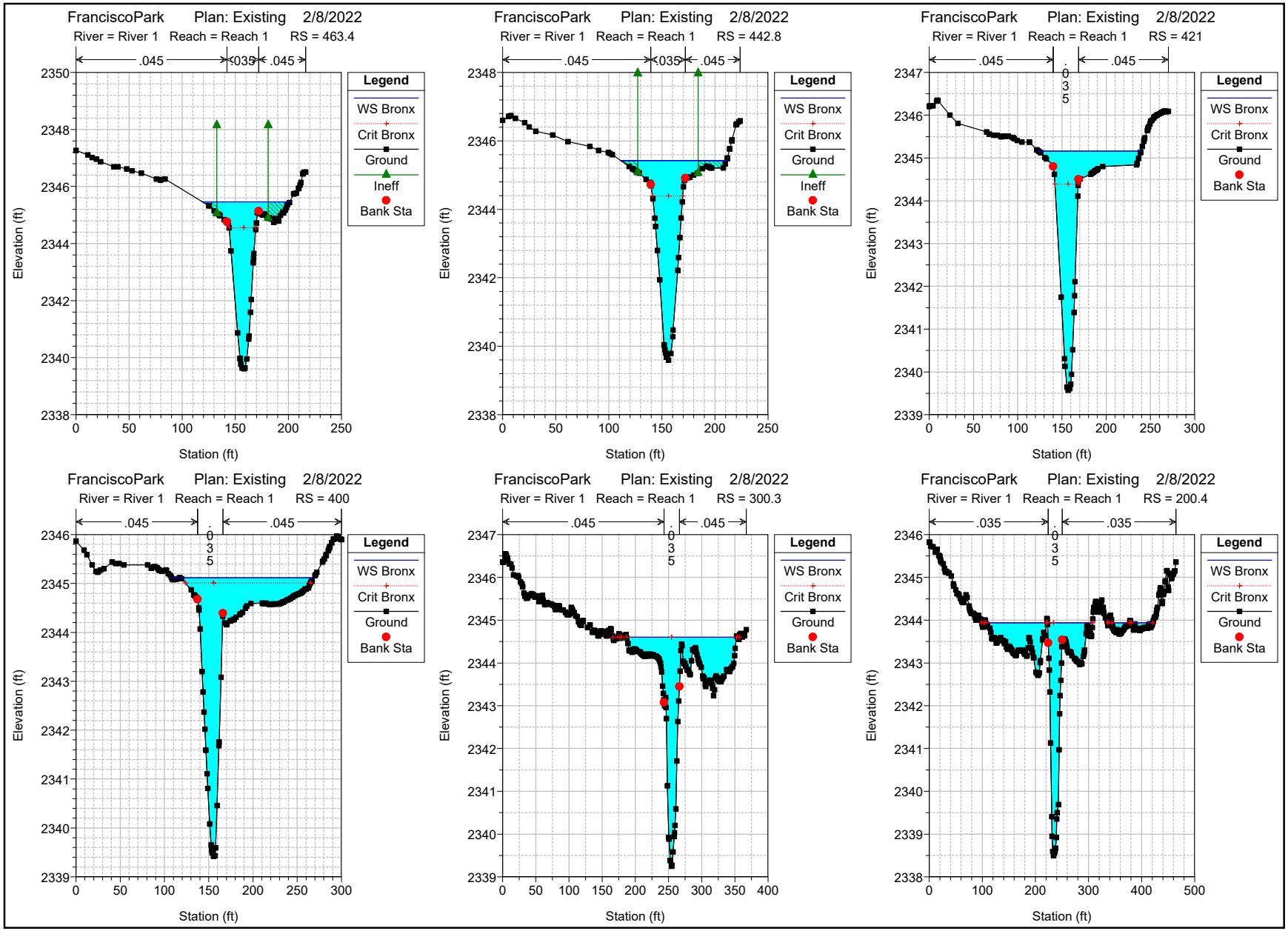
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 463.4
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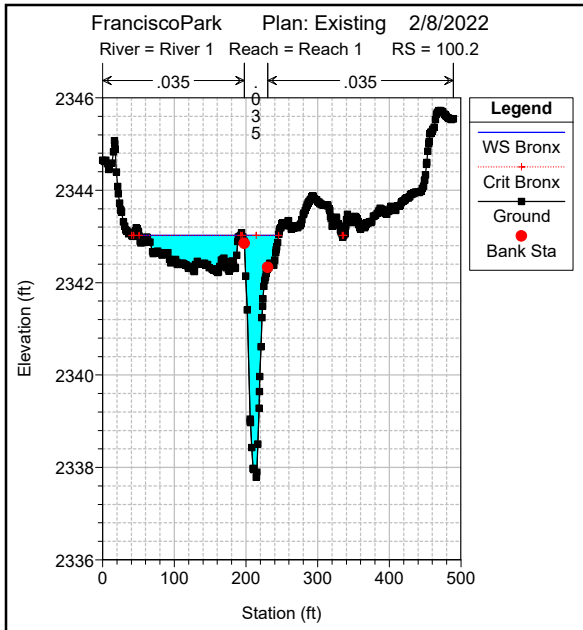
.035
.045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 442.8
.045
.035
.045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 421
.045
.035
.045
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 400
.045
.035
.045
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 300.3
.045
.035
.045
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Existing 2/8/2022
River = River 1 Reach = Reach 1 RS = 200.4
.035
.035
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)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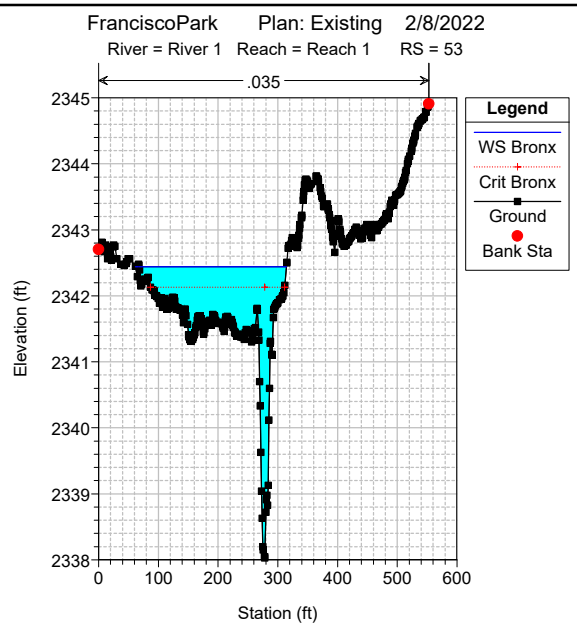
.035
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)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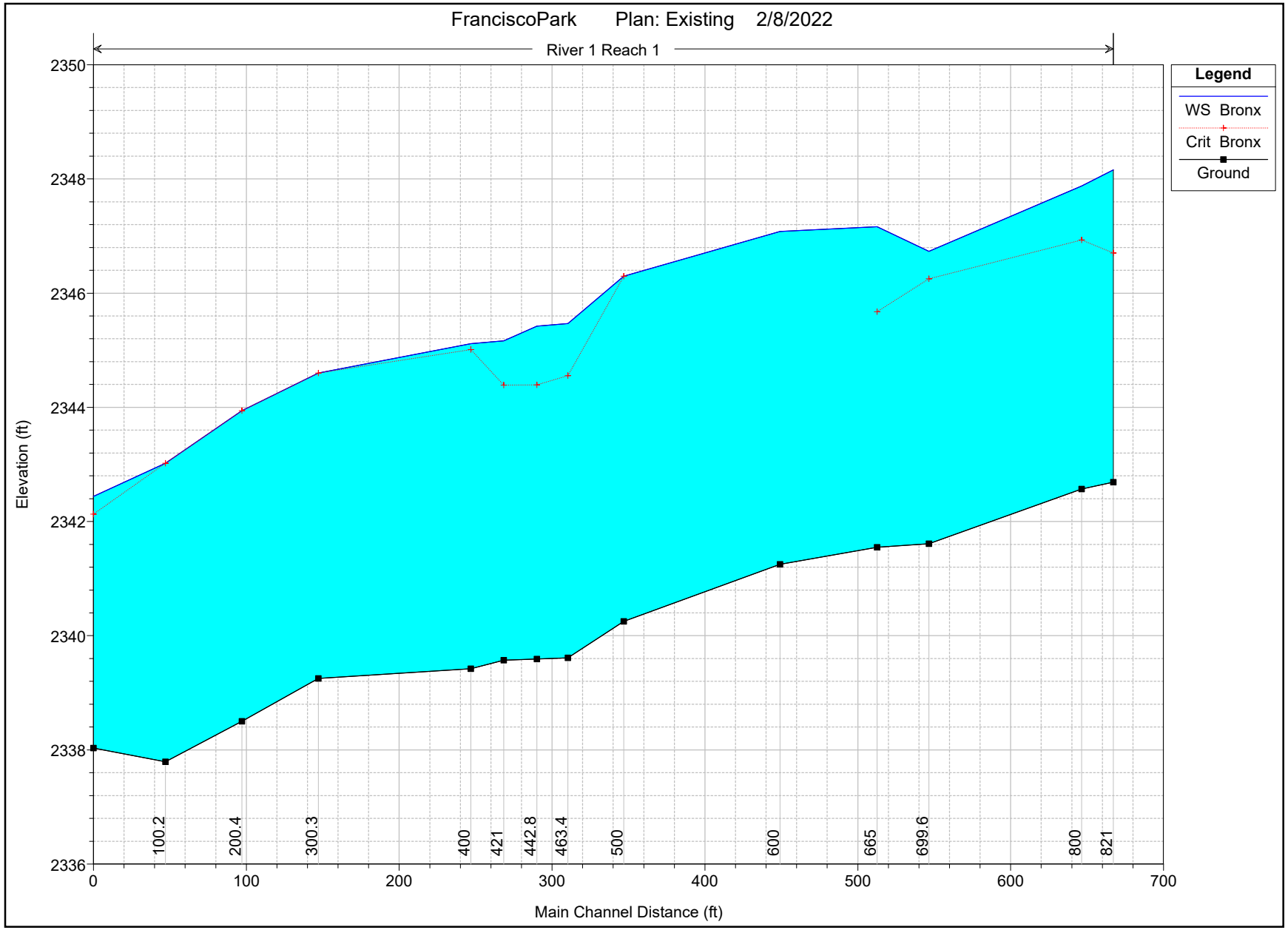
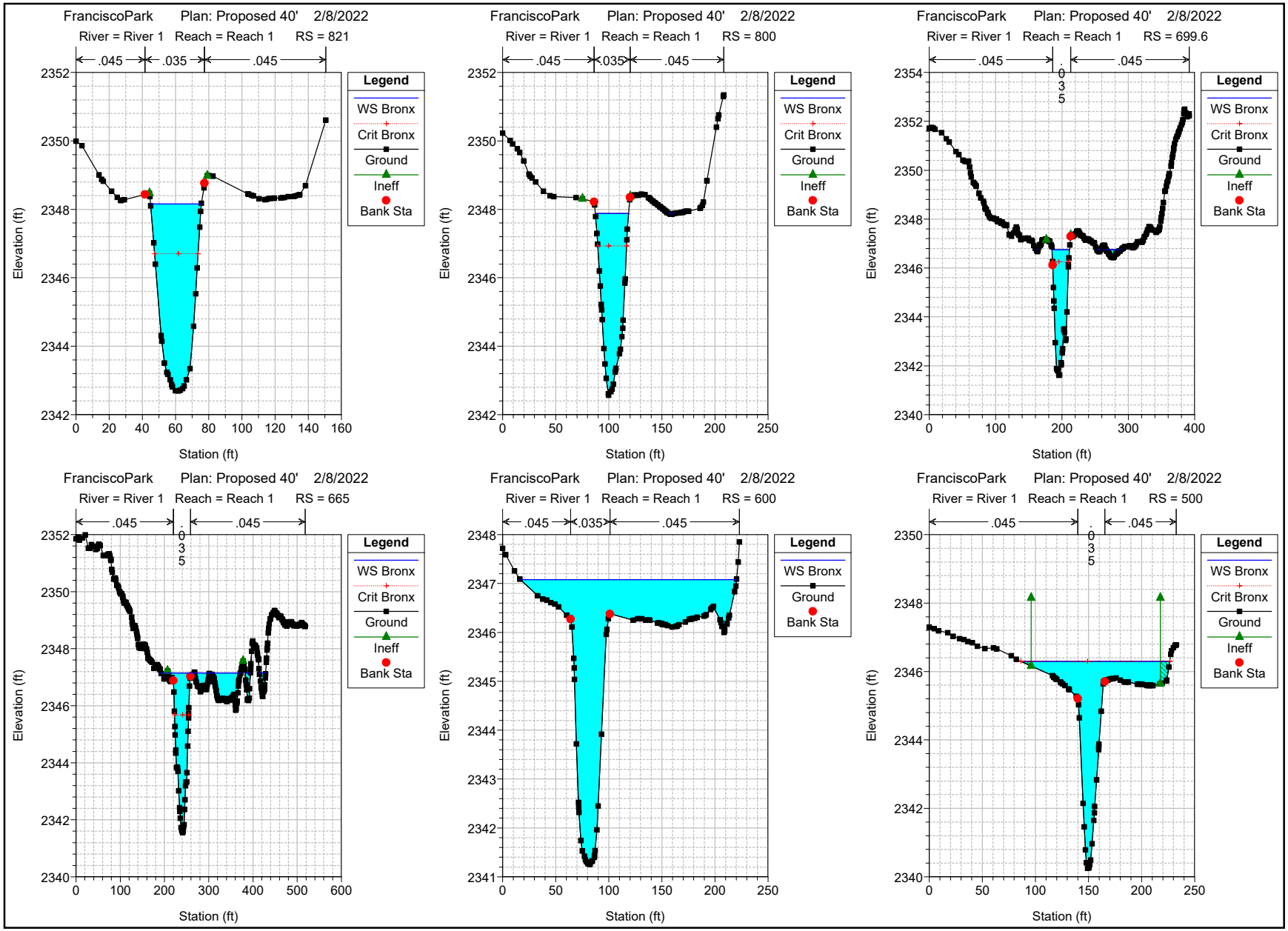
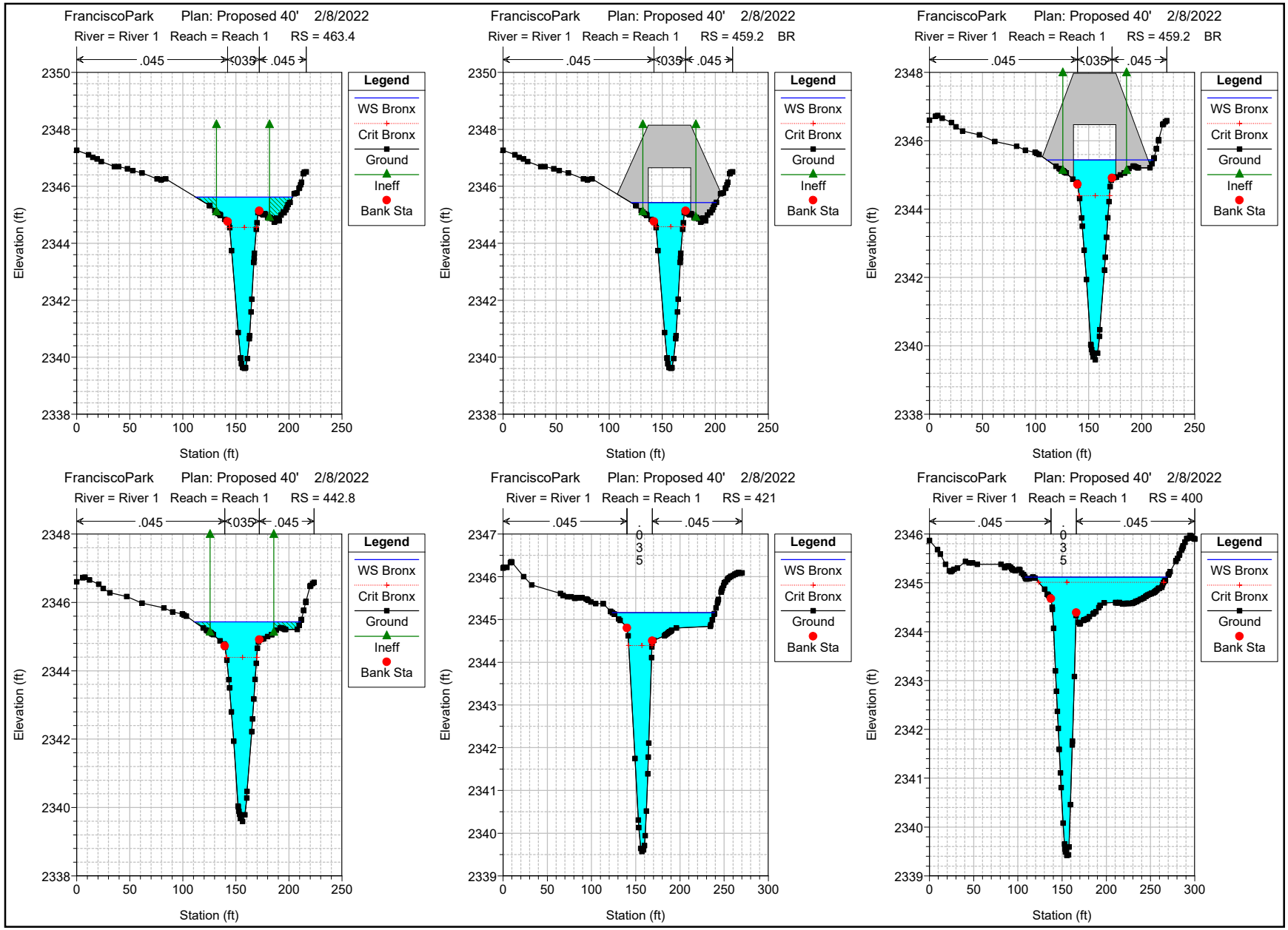
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)

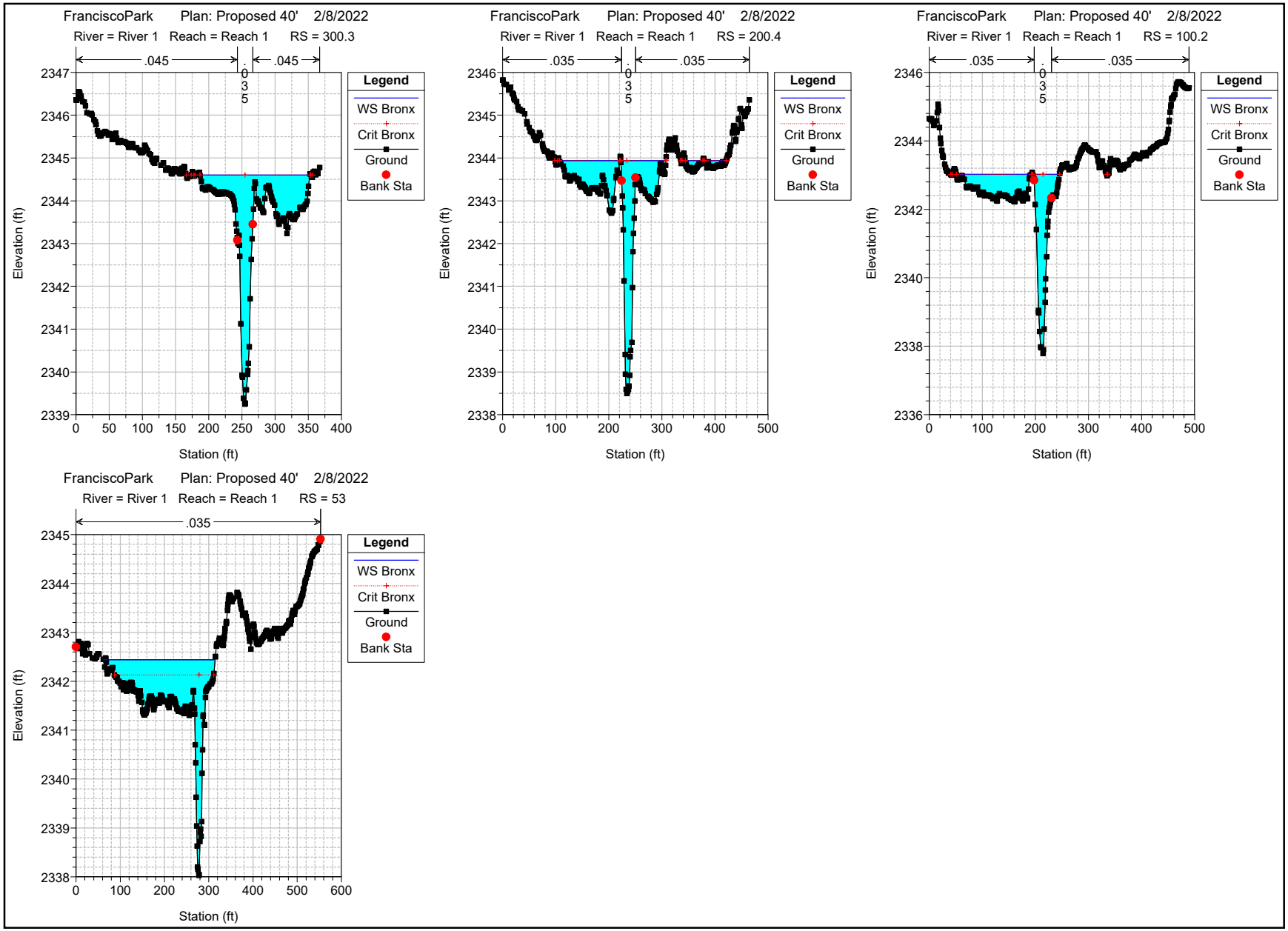

FranciscoPark Plan: Existing 2/8/2022
River 1 Reach 1
Legend
WS Bronx
Crit Bronx
Ground
Elevation (ft)
2350
2348
2346
2344
2342
2340
2338
2336
0
100
200
300
400
500
600
700
Main Channel Distance (ft)
100.2
200.4
300.3
400
421
442.8
463.4
500
600
665
699.6
800
821

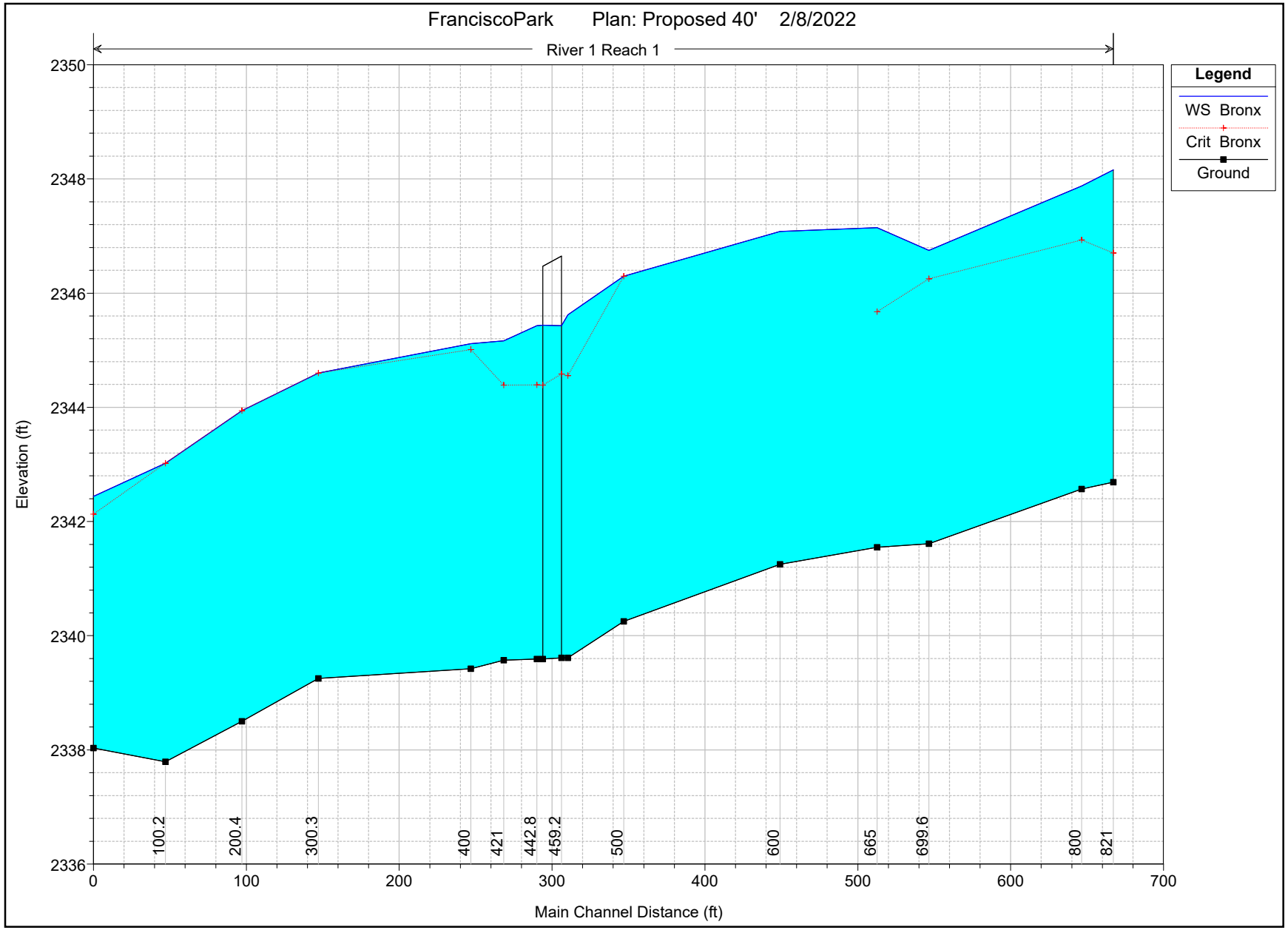
HEC-RAS Plan: Existing River: River 1 Reach: Reach 1 Profile: Bronx

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	821	Bronx	744.00	2342.69	2348.16	2346.70	2348.77	0.004063	6.28	118.48	30.65	0.56
Reach 1	800	Bronx	744.00	2342.57	2347.88	2346.93	2348.65	0.006022	7.06	105.41	36.11	0.68
Reach 1	699.6	Bronx	744.00	2341.61	2346.73	2346.25	2347.88	0.009232	8.59	86.81	55.58	0.82
Reach 1	665	Bronx	744.00	2341.55	2347.16	2345.68	2347.48	0.002645	4.81	217.91	205.02	0.46
Reach 1	600	Bronx	744.00	2341.25	2347.08		2347.32	0.001775	4.27	258.28	203.51	0.38
Reach 1	500	Bronx	744.00	2340.25	2346.30	2346.30	2346.98	0.005606	7.04	147.48	140.15	0.65
Reach 1	463.4	Bronx	744.00	2339.61	2345.47	2344.56	2346.25	0.006222	7.18	110.81	82.62	0.69
Reach 1	442.8	Bronx	744.00	2339.59	2345.42	2344.39	2346.07	0.004949	6.54	122.80	99.34	0.62
Reach 1	421	Bronx	744.00	2339.57	2345.16	2344.39	2345.92	0.006051	7.17	129.15	115.86	0.68
Reach 1	400	Bronx	744.00	2339.42	2345.12	2345.01	2345.73	0.005184	6.66	157.02	159.11	0.63
Reach 1	300.3	Bronx	744.00	2339.25	2344.60	2344.60	2345.19	0.005473	6.93	173.84	177.17	0.65
Reach 1	200.4	Bronx	744.00	2338.50	2343.94	2343.94	2344.37	0.004473	6.03	198.93	280.55	0.57
Reach 1	100.2	Bronx	744.00	2337.79	2343.02	2343.02	2343.50	0.005708	6.21	173.72	197.78	0.65
Reach 1	53	Bronx	744.00	2338.03	2342.44	2342.13	2342.61	0.006999	3.29	226.03	251.42	0.61


FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 821
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 800
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 699.6
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 665
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 600
.045 .035 .045
Legend
WS Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 500
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

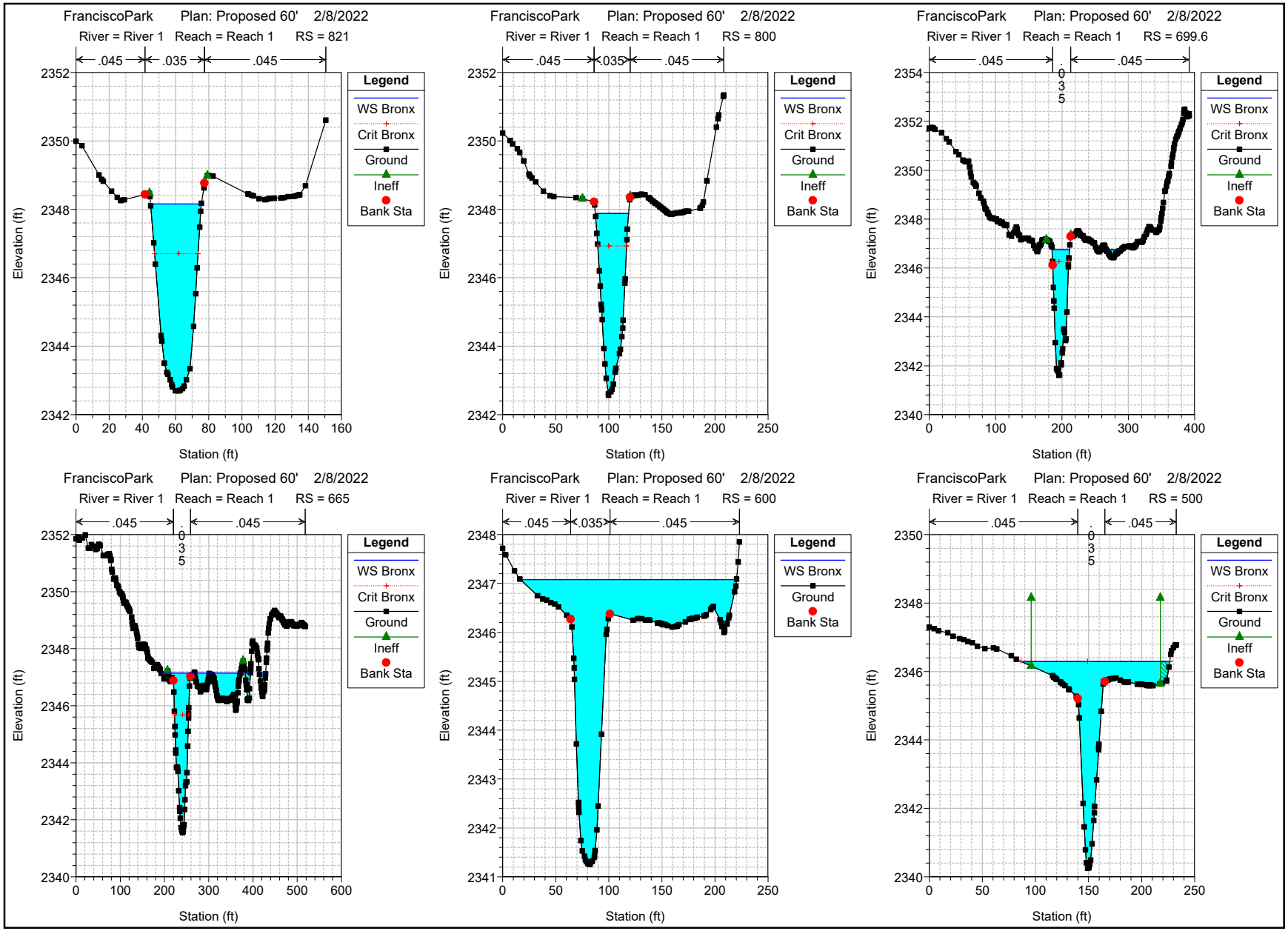

FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 463.4
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 459.2 BR
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 459.2 BR
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 442.8
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 421
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 400
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)


FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 300.3
.045
.035
.045
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 200.4
.035
.035
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 100.2
.035
.035
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 40' 2/8/2022
River = River 1 Reach = Reach 1 RS = 53
.035
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)


FranciscoPark Plan: Proposed 40' 2/8/2022
River 1 Reach 1
Legend
WS Bronx
Crit Bronx
Ground
Elevation (ft)
2350
2348
2346
2344
2342
2340
2338
2336
0
100
200
300
400
500
600
700
Main Channel Distance (ft)
100.2
200.4
300.3
400
421
442.8
459.2
500
600
665
699.6
800
821

HEC-RAS Plan: Proposed 40' River: River 1 Reach: Reach 1 Profile: Bronx

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	821	Bronx	744.00	2342.69	2348.16	2346.70	2348.77	0.004062	6.28	118.49	30.65	0.56
Reach 1	800	Bronx	744.00	2342.57	2347.88	2346.93	2348.65	0.006023	7.06	105.40	36.07	0.68
Reach 1	699.6	Bronx	744.00	2341.61	2346.75	2346.25	2347.89	0.009093	8.55	87.28	57.68	0.81
Reach 1	665	Bronx	744.00	2341.55	2347.15	2345.68	2347.49	0.002818	4.95	201.12	202.16	0.47
Reach 1	600	Bronx	744.00	2341.25	2347.08		2347.32	0.001775	4.27	258.28	203.51	0.38
Reach 1	500	Bronx	744.00	2340.25	2346.30	2346.30	2346.98	0.005606	7.04	147.48	140.15	0.65
Reach 1	463.4	Bronx	744.00	2339.61	2345.62	2344.56	2346.32	0.005240	6.79	119.27	91.34	0.64
Reach 1	459.2		Bridge									
Reach 1	442.8	Bronx	744.00	2339.59	2345.43	2344.39	2346.07	0.004880	6.50	124.44	99.93	0.62
Reach 1	421	Bronx	744.00	2339.57	2345.16	2344.39	2345.92	0.006051	7.17	129.15	115.86	0.68
Reach 1	400	Bronx	744.00	2339.42	2345.12	2345.01	2345.73	0.005184	6.66	157.02	159.11	0.63
Reach 1	300.3	Bronx	744.00	2339.25	2344.60	2344.60	2345.19	0.005473	6.93	173.84	177.17	0.65
Reach 1	200.4	Bronx	744.00	2338.50	2343.94	2343.94	2344.37	0.004473	6.03	198.93	280.55	0.57
Reach 1	100.2	Bronx	744.00	2337.79	2343.02	2343.02	2343.50	0.005708	6.21	173.72	197.78	0.65
Reach 1	53	Bronx	744.00	2338.03	2342.44	2342.13	2342.61	0.006999	3.29	226.03	251.42	0.61


FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 821
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 800
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 699.6
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 665
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 600
.045 .035 .045
Legend
WS Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 500
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Legend
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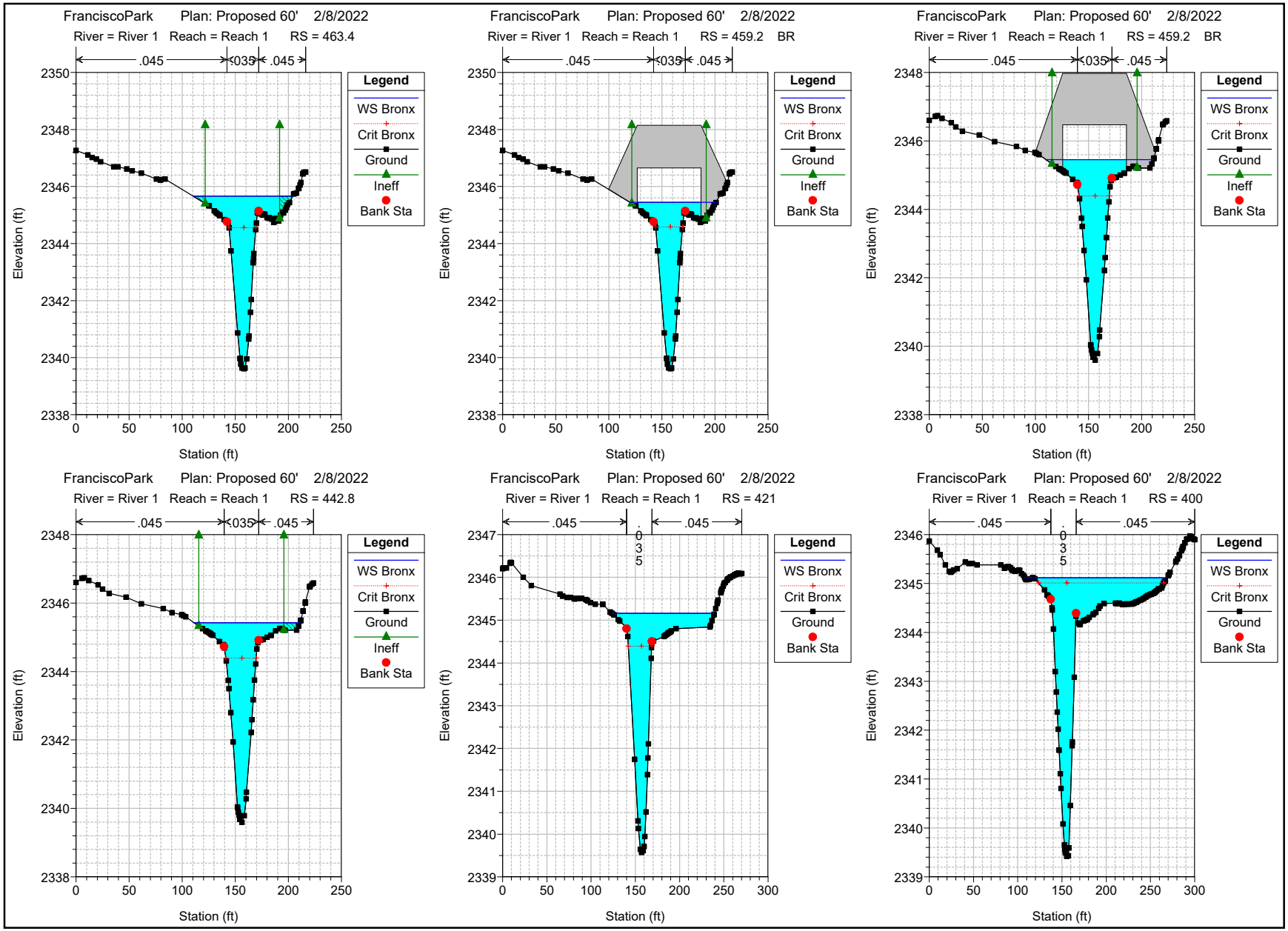
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 463.4
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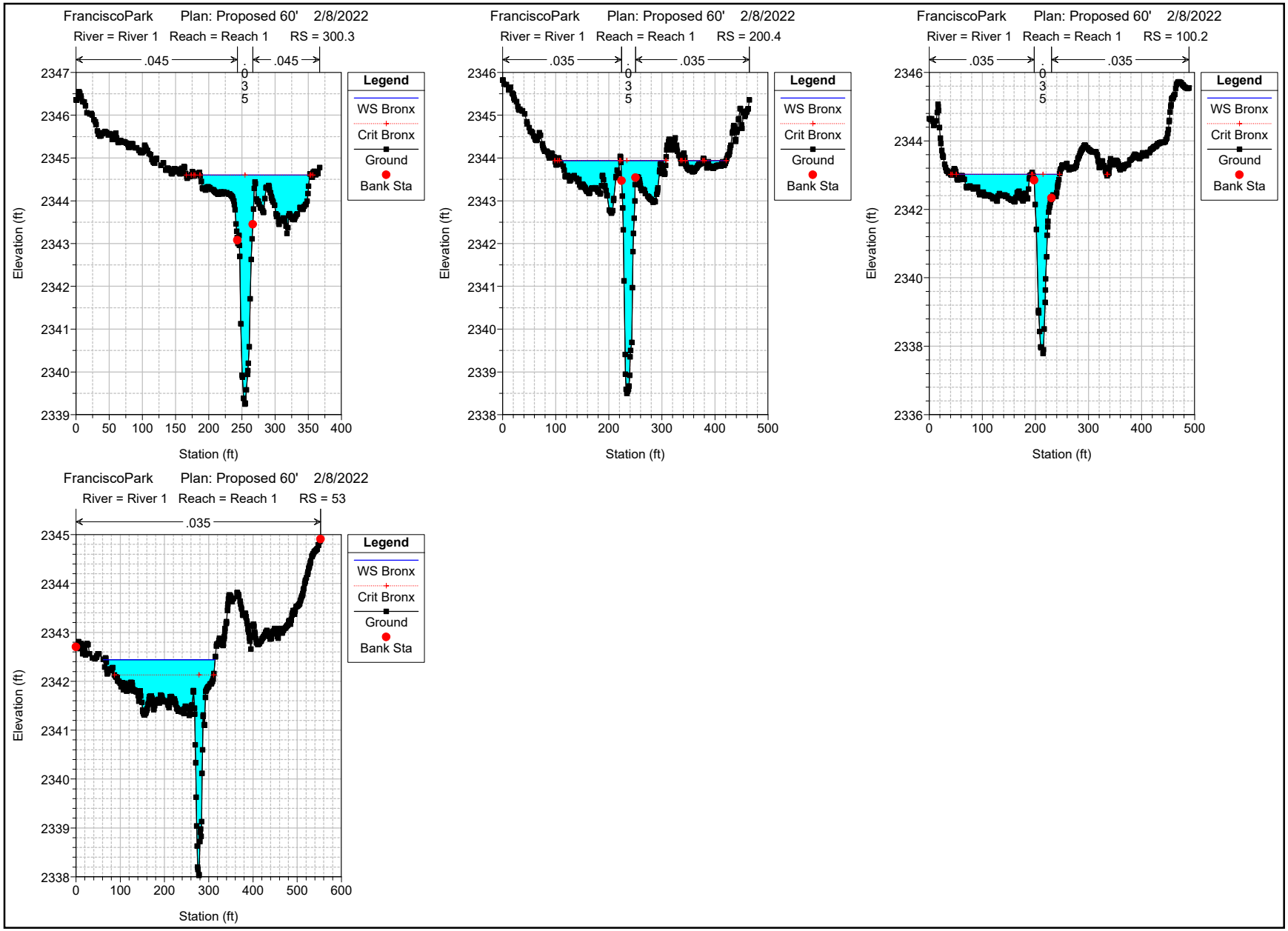
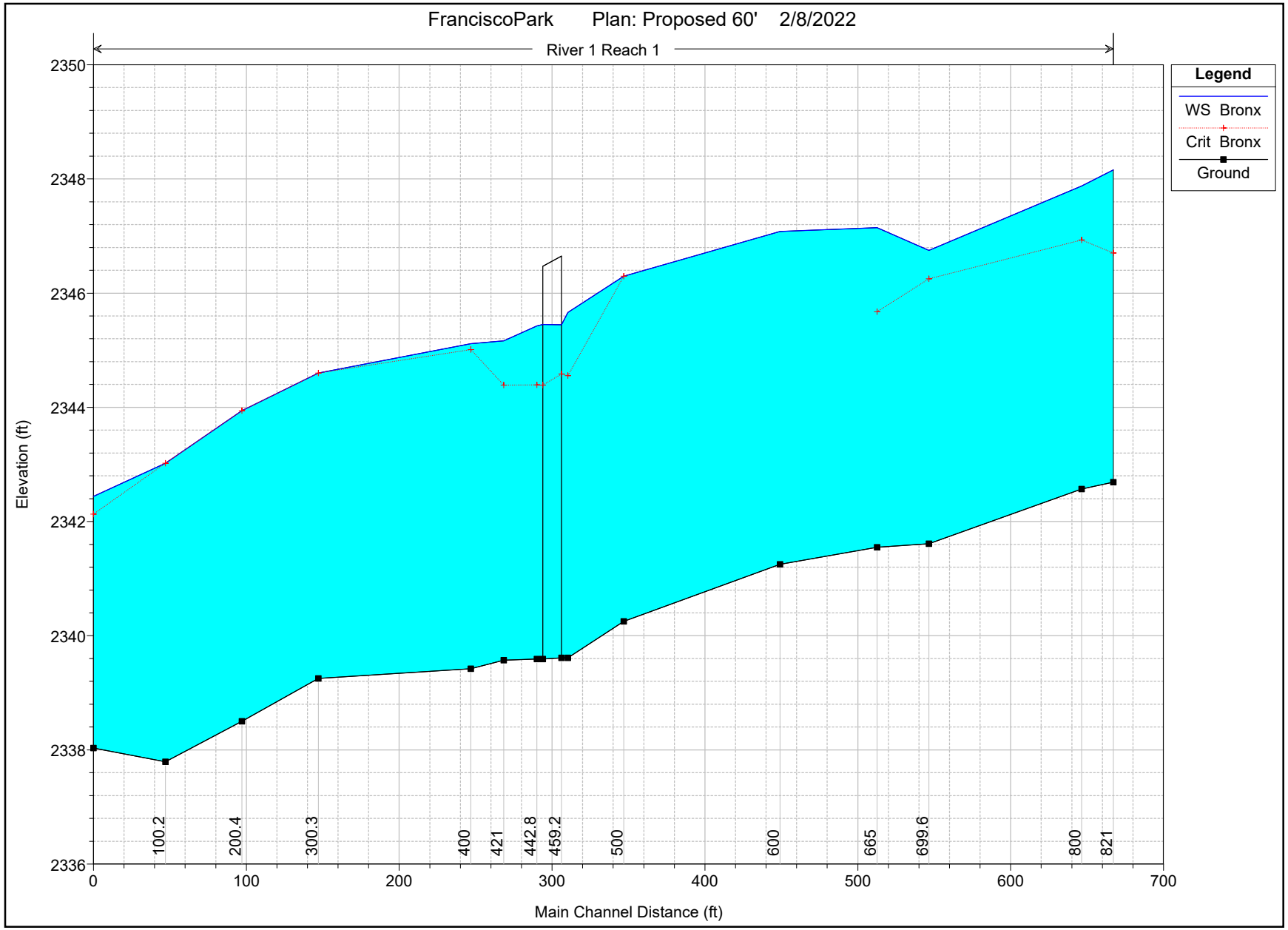
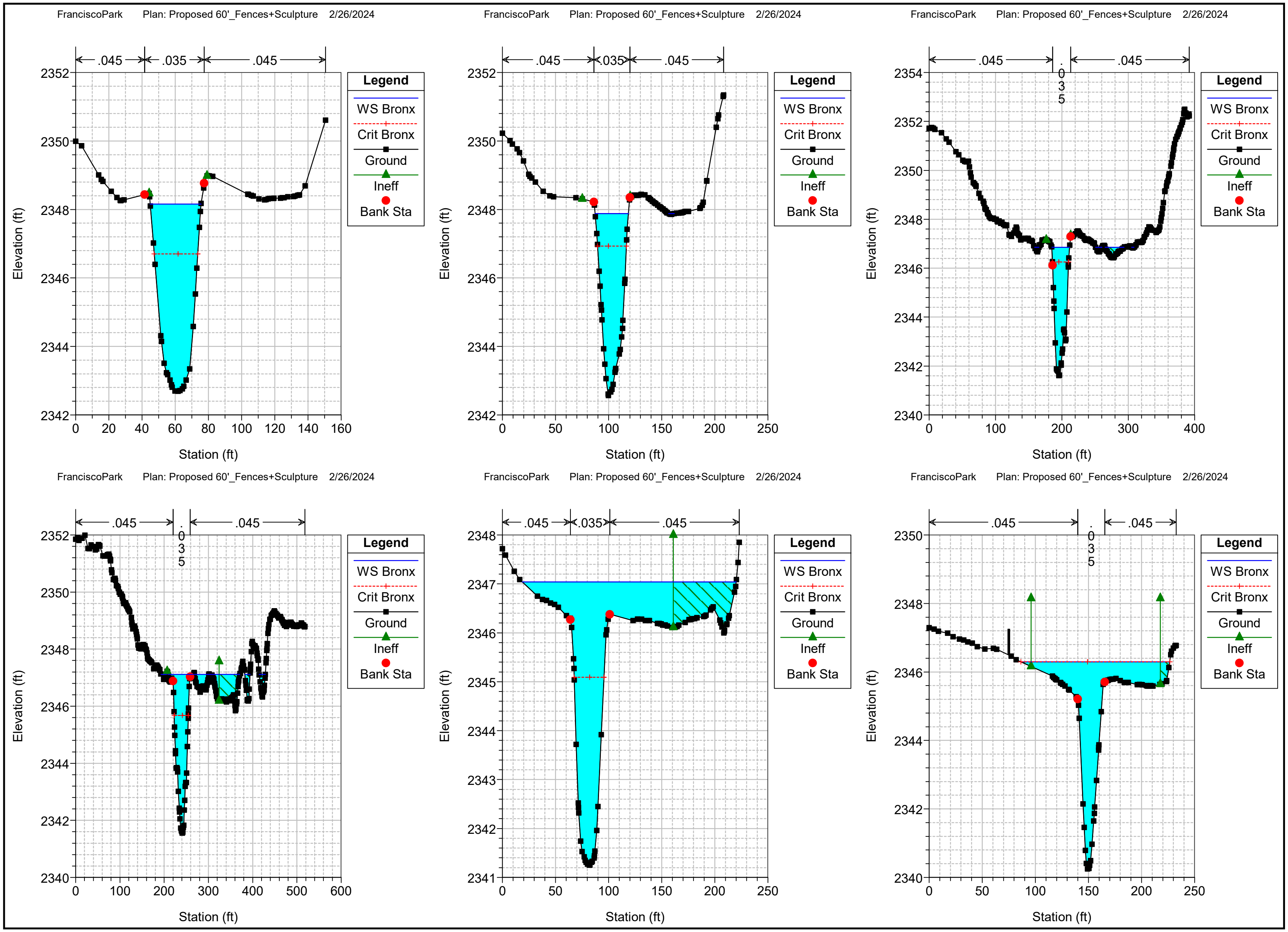
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 459.2 BR
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 459.2 BR
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 442.8
.045 .035 .045
Legend
WS Bronx
Crit Bronx
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 421
.045 .045
.035
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 400
.045 .045
.035
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)


FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 300.3
.045
.035
.045
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 200.4
.035
.035
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 100.2
.035
.035
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)
FranciscoPark Plan: Proposed 60' 2/8/2022
River = River 1 Reach = Reach 1 RS = 53
.035
Legend
WS Bronx
Crit Bronx
Ground
Bank Sta
Elevation (ft)
Station (ft)


FranciscoPark Plan: Proposed 60' 2/8/2022
River 1 Reach 1
Legend
WS Bronx
Crit Bronx
Ground
Elevation (ft)
2350
2348
2346
2344
2342
2340
2338
2336
0
100
200
300
400
500
600
700
Main Channel Distance (ft)
100.2
200.4
300.3
400
421
442.8
459.2
500
600
665
699.6
800
821

HEC-RAS Plan: Prop 60' River: River 1 Reach: Reach 1 Profile: Bronx

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	821	Bronx	744.00	2342.69	2348.16	2346.70	2348.77	0.004062	6.28	118.49	30.65	0.56
Reach 1	800	Bronx	744.00	2342.57	2347.88	2346.93	2348.65	0.006023	7.06	105.40	36.07	0.68
Reach 1	699.6	Bronx	744.00	2341.61	2346.75	2346.25	2347.89	0.009093	8.55	87.28	57.68	0.81
Reach 1	665	Bronx	744.00	2341.55	2347.15	2345.68	2347.49	0.002818	4.95	201.12	202.16	0.47
Reach 1	600	Bronx	744.00	2341.25	2347.08		2347.32	0.001775	4.27	258.28	203.51	0.38
Reach 1	500	Bronx	744.00	2340.25	2346.30	2346.30	2346.98	0.005606	7.04	147.48	140.15	0.65
Reach 1	463.4	Bronx	744.00	2339.61	2345.66	2344.56	2346.28	0.004729	6.50	133.77	93.80	0.61
Reach 1	459.2		Bridge									
Reach 1	442.8	Bronx	744.00	2339.59	2345.43	2344.39	2346.07	0.004894	6.50	128.12	99.50	0.62
Reach 1	421	Bronx	744.00	2339.57	2345.16	2344.39	2345.92	0.006051	7.17	129.15	115.86	0.68
Reach 1	400	Bronx	744.00	2339.42	2345.12	2345.01	2345.73	0.005184	6.66	157.02	159.11	0.63
Reach 1	300.3	Bronx	744.00	2339.25	2344.60	2344.60	2345.19	0.005473	6.93	173.84	177.17	0.65
Reach 1	200.4	Bronx	744.00	2338.50	2343.94	2343.94	2344.37	0.004473	6.03	198.93	280.55	0.57
Reach 1	100.2	Bronx	744.00	2337.79	2343.02	2343.02	2343.50	0.005708	6.21	173.72	197.78	0.65
Reach 1	53	Bronx	744.00	2338.03	2342.44	2342.13	2342.61	0.006999	3.29	226.03	251.42	0.61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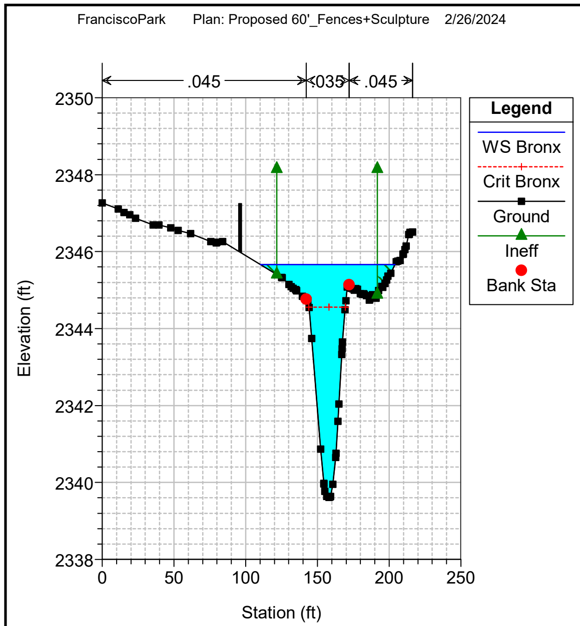
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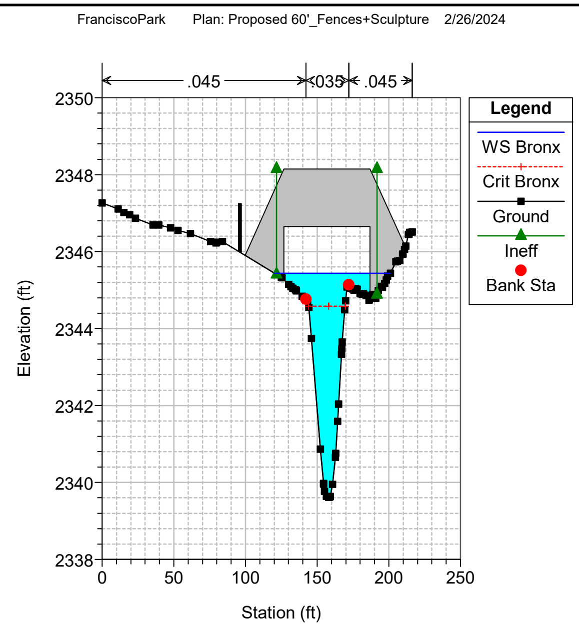
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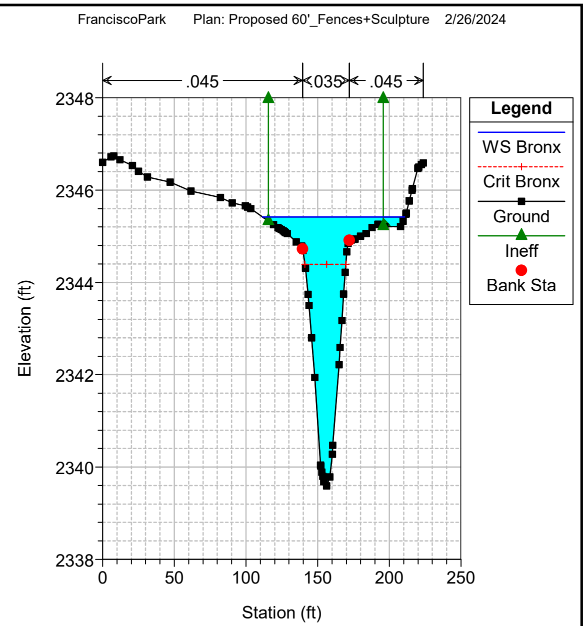
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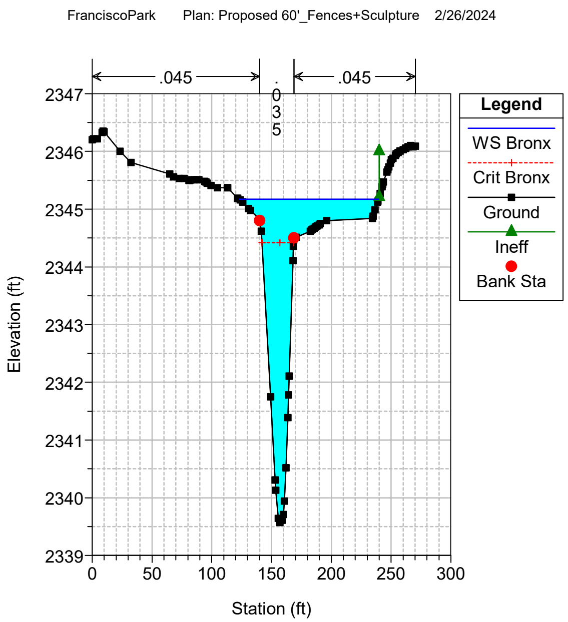
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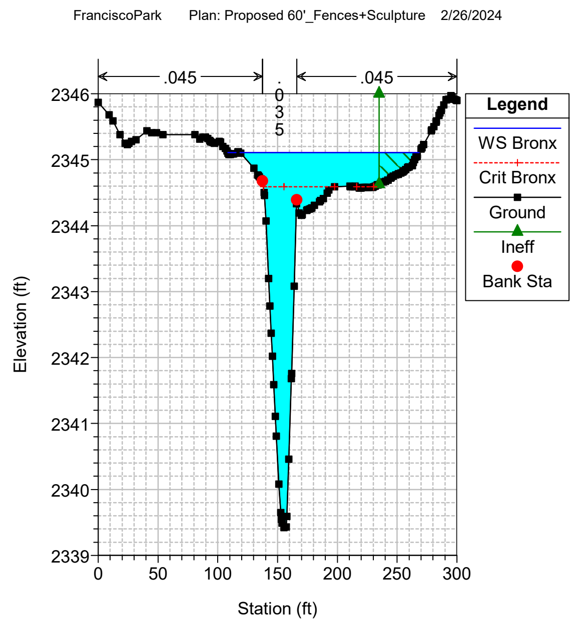
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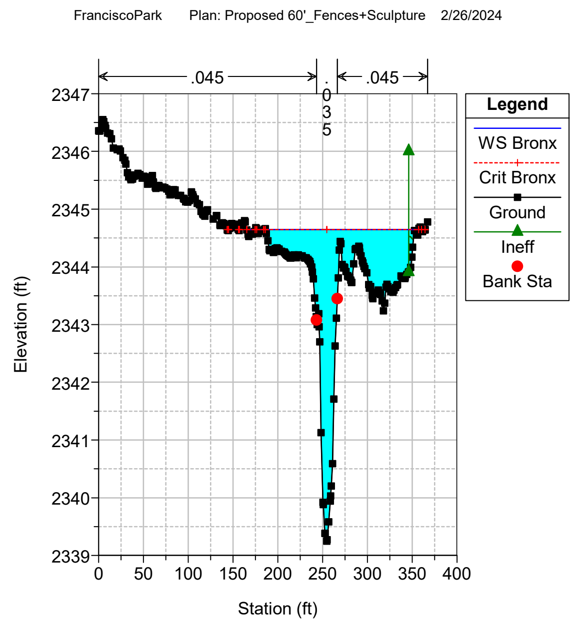
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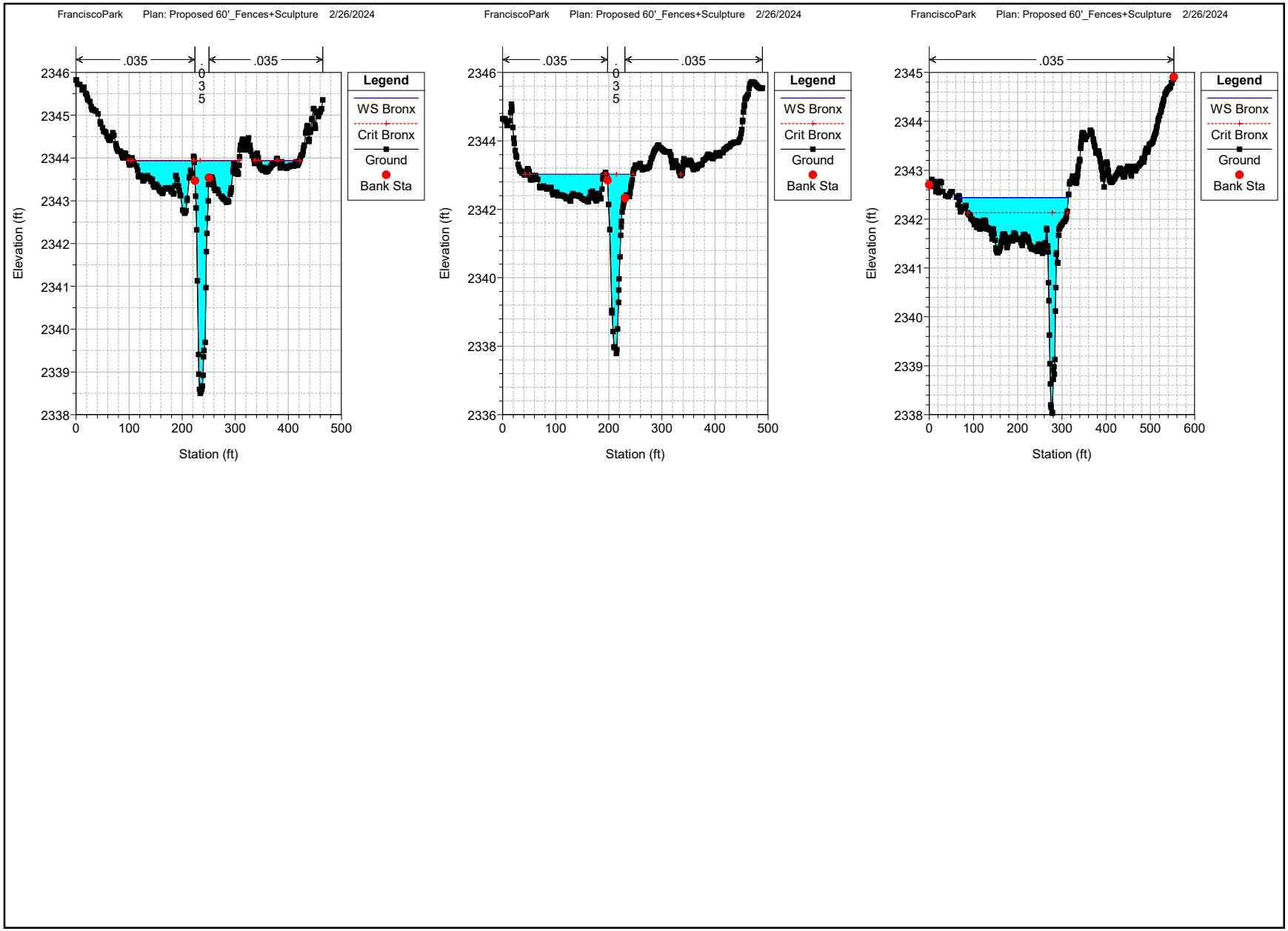
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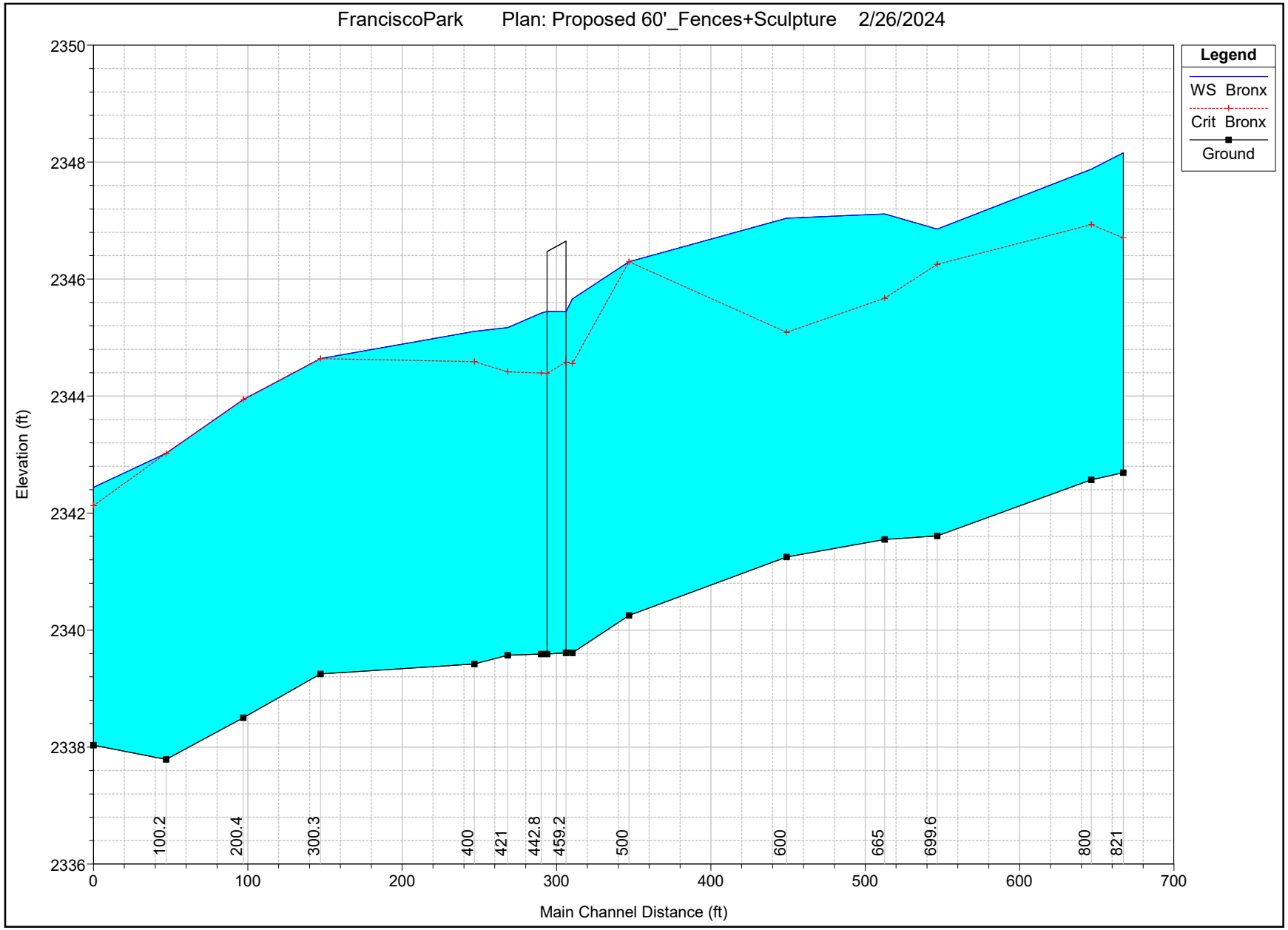
FranciscoPark Plan: Proposed 60'_Fences+Sculpture 2/26/2024
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300
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500
600
700
Main Channel Distance (ft)
100.2
200.4
300.3
400
421
442.8
459.2
500
600
665
699.6
800
821

HEC-RAS Plan: 60'+Fences+Sculpture River: River 1 Reach: Reach 1 Profile: Bronx

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach 1	821	Bronx	744.00	2342.69	2348.16	2346.70	2348.77	0.004058	6.28	118.53	30.66	0.56
Reach 1	800	Bronx	744.00	2342.57	2347.88	2346.93	2348.65	0.006012	7.05	105.48	36.61	0.68
Reach 1	699.6	Bronx	744.00	2341.61	2346.86	2346.25	2347.92	0.008313	8.29	90.12	75.34	0.78
Reach 1	665	Bronx	744.00	2341.55	2347.11	2345.68	2347.56	0.003467	5.46	156.56	197.82	0.52
Reach 1	600	Bronx	744.00	2341.25	2347.04	2345.09	2347.35	0.002150	4.67	207.88	201.50	0.42
Reach 1	500	Bronx	744.00	2340.25	2346.30	2346.30	2346.98	0.005606	7.04	147.48	140.15	0.65
Reach 1	463.4	Bronx	744.00	2339.61	2345.66	2344.56	2346.28	0.004747	6.51	133.55	93.62	0.61
Reach 1	459.2		Bridge									
Reach 1	442.8	Bronx	744.00	2339.59	2345.42	2344.39	2346.06	0.004921	6.51	127.75	99.23	0.62
Reach 1	421	Bronx	744.00	2339.57	2345.17	2344.42	2345.92	0.005980	7.14	130.15	116.58	0.68
Reach 1	400	Bronx	744.00	2339.42	2345.11	2344.59	2345.75	0.005350	6.75	145.64	156.71	0.64
Reach 1	300.3	Bronx	744.00	2339.25	2344.64	2344.64	2345.20	0.005119	6.76	178.07	194.70	0.63
Reach 1	200.4	Bronx	744.00	2338.50	2343.94	2343.94	2344.37	0.004473	6.03	198.93	280.55	0.57
Reach 1	100.2	Bronx	744.00	2337.79	2343.02	2343.02	2343.50	0.005708	6.21	173.72	197.78	0.65
Reach 1	53	Bronx	744.00	2338.03	2342.44	2342.13	2342.61	0.006999	3.29	226.03	251.42	0.61

EQUATION 6.3, Standards Manual for Drainage Design and Floodplain Management

Francisco Park - XS 463

Z_t = Design scour depth, excluding long-term aggradation/degradation, in feet;
Z_{gs} = General scour depth, in feet;
Z_a = Anti-dune trough depth, in feet;
Z_{ls} = Local scour depth, in feet;
Z_{bs} = Bend scour depth, in feet;
Z_{lft} = Low-flow thalweg depth, in feet;
1.3 = Factor of safety to account for non-uniform flow distribution

$Z_t = 1.3(Z_{gs} + 1/2Z_a + Z_{ls} + Z_{bs} + Z_{lft})$

Z_{gs} = 0.33 ft
Z_a = 0.58 ft
Z_{ls} = 7.40 ft
Z_{bs} = 0.00 ft
Z_{lft} = 1.00 ft

Z_t = 11.73 ft

EQUATION 6.4, Standards Manual for Drainage Design and Floodplain Management

Z_{gs} = General scour depth, in feet;
V_m = Average velocity of flow, in feet per second;
Y_{max} = Maximum depth of flow, in feet;
Y_h = Hydraulic depth of flow, in feet;
S_e = Energy slope (or bed slope for uniform-flow conditions), in feet per foot

$$Z_{gs} = \left[(0.0685 V_m^{0.8} / Y_h^{0.4} S_e^{0.3}) - 1\right]$$

V_m =	6.51	fps	
Y_{max} =	6.05	ft	
Y_h =	3.58	ft	**Z_{gs} =** 0.333 ft
S_e =	0.004747	ft/ft	

EQUATION 6.5, Standards Manual for Drainage Design and Floodplain Management

Z_a = Anti-dune trough depth, in feet;
V_m = Average velocity of flow, in feet per second;
g = Acceleration due to gravity, in feet per second squared;

Z_a = **$0.5(0.14)2¶V_m^2/g = 0.0137V_m^2$**

V_m = 6.51 fps
g = 32.2 ft/sec^2

Z_a = 0.58 ft

Section 6.6.3, Standards Manual for Drainage Design and Floodplain Management

Z_{lft} = Low flow thalweg depth, in feet;
Y = Flow depth; in feet;
W = Flow width; in feet;
V_m = Average Velocity of flow, in feet per second;

Z_{lft} = **1' when W/Y>1.15V_m**

V_m =	6.51	fps	
W =	94	ft	**Z_{lft} =** 1.00 ft
Y =	6.05	ft	
W/Y =	15.5		
1.15V_m =	7.5		

Section 6.6.5, Standards Manual for Drainage Design and Floodplain Management

Z_{lsp} = Local scour due to piers, in feet
Y = Flow depth, in feet
b_p = Pier width normal to flow direction, in feet
F_u = Upstream Froude number
R_f = Reduction Factor (Table 6.1)

Z_{lsp} = $\mathbf{2.2\ R_f\ Y\ [(b_p/Y)^{0.65}]\ F_u^{0.43}}$

b_{pe} = Effective pier width, in feet
L = Length of pier wall, in feet
$\emptyset_p$ = Angle of approach flow in relationship to pier wall, in degrees

b_{pe} = $\mathbf{L \sin \emptyset_p + b_p \cos \emptyset_p}$

Y =	6.05	ft
b_p =	4	ft
F_u =	0.61	
R_f =	0.9	
b_{pe} =	4.00	
L =	4	
$\emptyset_p$ =	0	degrees
$\emptyset_p$ =	0.00	radians

Z_{lsp} = 7.40 ft

404 COMPLIANCE STATEMENT

Francisco Elias Esquer Park is a development project on 1.5 acres in Section 2 Township 14 South Range 13 East of the Gila and Salt River Base and Meridian in Pima County Arizona.

I Kevin Payne, am a Registered Professional Civil Engineer in the State of Arizona and am responsible for the preparation of the report for the above-referenced project. I attest to the following statement:

This project has been determined to be non-jurisdictional pursuant to Section 404 of the Federal Water Pollution Control Act amendments of 1972, 33 USC 1334.

Place Engineer's Seal and Signature in the space above.

Detention Basin Inspection and Maintenance Checklist

Date:		Basin Name/Location:
Inspector:	Title:	Affiliation:
Type of Inspection: ☐ Annual ☐ After a Significant Storm Event		

General Requirements

- Basins shall be maintained to perform as designed for the life of the project and shall not be converted to a different use without a Floodplain Use Permit. A Floodplain Use Permit is not required for maintenance activities.
- Basins shall be inspected annually and after significant storm events.
- The purpose of the inspection is to evaluate whether as-built characteristics are maintained.

Basin Component	Inspection Item	Requires Maintenance	If maintenance is required, describe corrective action
Inlet	As-built grades and elevations	☐	
	Presence of obstructions	☐	
	Evidence of material damage	☐	
Outlet	As-built grades and elevations	☐	
	Presence of obstructions	☐	
	Evidence of material damage	☐	
Slopes	As-built grades and elevations	☐	
	Invasive non-native plants	☐	
	Slope treatment	☐	
Depth	As-built grades and elevations	☐	
	Sediment accumulation >10% of design volume	☐	
Floor	As-built grades and elevations	☐	
	Presence of ponding	☐	
	Evidence of oil, grease, chemicals or trash	☐	
	Presence of invasive non-native plants	☐	
Security Barrier	Presence of damage or instability	☐	
Access	Presence of obstruction	☐	
Landscaping	Presence of overgrown vegetation	☐	

Detention Basin Inspection and Maintenance Checklist (Continued)

Date:	Basin Name/Location:

Basin Component	Inspection Item	Requires Maintenance	If maintenance is required, describe corrective action
	Presence of invasive non-native plants	☐	
	Damage to basin due to landscape elements	☐	
Other			

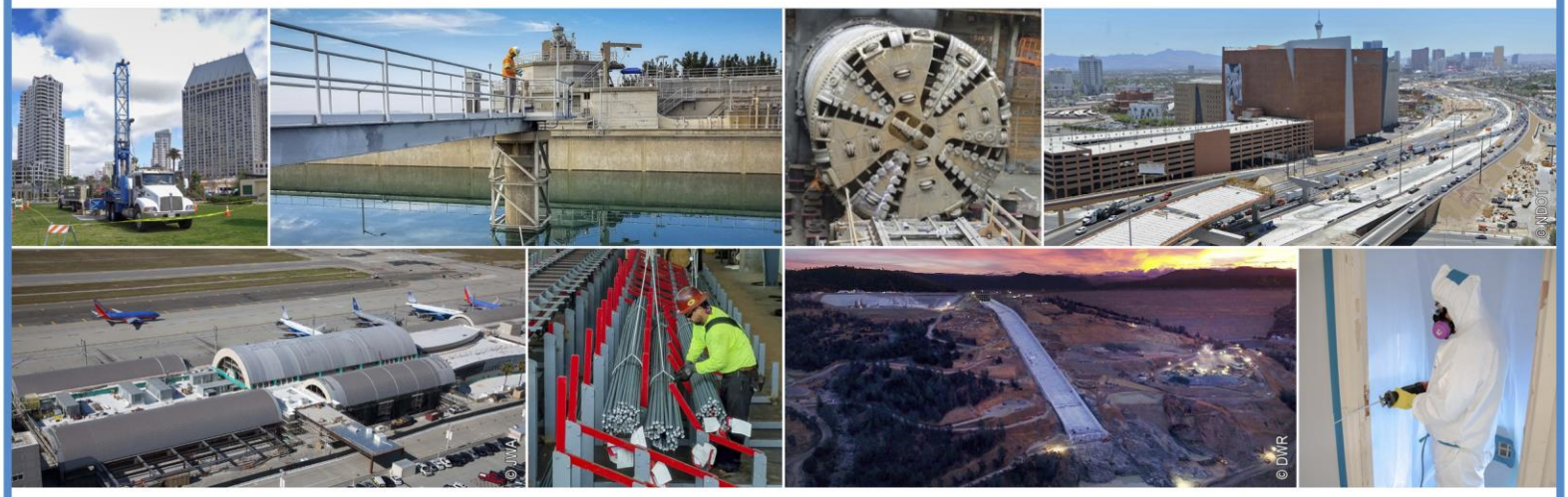
Geotechnical Evaluation

Francisco Elias Esquer Park Improvements

Tucson, Arizona

Kimley-Horn & Associates, Inc.
333 East Wetmore Road, Suite 280 | Tucson, Arizona 85705

January 12, 2022 | Project No. 606881001



Geotechnical | Environmental | Construction Inspection & Testing | Forensic Engineering & Expert Witness

Geophysics | Engineering Geology | Laboratory Testing | Industrial Hygiene | Occupational Safety | Air Quality | GIS

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

Ninyo & Moore
Geotechnical & Environmental Sciences Consultants

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Geotechnical Evaluation
Francisco Elias Esquer Park Improvements
Tucson, Arizona

Ms. Rebeca Field, PLA
Kimley-Horn & Associates, Inc.
333 East Wetmore Road, Suite 280 | Tucson, Arizona 85705

January 12, 2022 | Project No. 606881001

Marek J. Kasztalski, PE
Senior Geotechnical Engineer

Fred F. Narcaroti
Principal/Tucson Office Manager

MJK/SDN/FFN/jom

CONTENTS

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

In accordance with our proposals dated April 29 and November 24, 2021 and your authorization, we have performed a geotechnical evaluation for the design and construction of new improvements at the Francisco Elias Esquer Park in Tucson, Arizona (Figure 1). The purpose of our evaluation was to assess the subsurface conditions at the project site in order to provide geotechnical recommendations for design and construction. This report presents the results of our evaluation and our geotechnical conclusions and recommendations regarding the proposed construction.

2 SCOPE OF SERVICES

The scope of our services for this project generally included:

- Reviewing available topographic information, soil surveys, and geologic literature for the project area.
- Conducting a visual reconnaissance of the project area and marking out the boring locations.
- Notifying Arizona 811 of the proposed exploration locations prior to conducting our field work.
- Evaluating the presence of underground utilities at our boring locations using the services of a private utility locator.
- Exploring the subsurface soils by drilling, logging, and sampling three exploratory soil borings to an approximate depth of 5 and 50 feet below ground surface (bgs). The boring logs are presented in Appendix A.
- Performing laboratory tests on selected samples collected from our borings to evaluate the in-situ moisture content and dry density, gradation, Atterberg limits, consolidation, and corrosivity characteristics (including pH, minimum electrical resistivity, soluble sulfate and chloride contents). The results of the laboratory tests are included in Appendix B.
- Preparing this report presenting our findings, conclusions, and recommendations regarding the proposed design and construction.

Our scope of services did not include environmental consulting services such as hazardous waste sampling or analytical testing at the site. A detailed scope of services and estimated fee for such services can be provided upon request.

3 SITE DESCRIPTION

The site is located at 1415 North 14th Avenue in Tucson, Arizona. At the time of our evaluation, the site was occupied by an existing recreational park, including small structures (ramadas), walking paths, and asphaltic concrete (AC) paved driveways and parking areas. The park was bisected by the Bronx Wash with earthen, partly vegetated slopes. The park has unorganized vegetation, which is particularly dense along the Wash. The Santa Cruz River Wash was located approximately 1,500 feet to the west of the site. The site is situated west of the Interstate 10 (I-10) and the Union Pacific Rail Road (UPRR) corridor.

4 TOPOGRAPHIC MAP AND AERIAL PHOTOGRAPH REVIEW

According to the Tucson, Arizona, Pima County, 7.5-Minute United States Geological Survey (USGS) Topographic Quadrangle Map (2018), the average site elevation is approximately 2,350 feet relative to mean sea level (MSL). The topography of the site is relatively flat and slopes gently from east to west, toward the Santa Cruz River.

Several historical aerial photographs from Historicaerials.com (Nationwide Environmental Title Research [NETR]) and from Google Earth™ were reviewed for this project. Aerial images dated 1958 through 1972 depicted the Park site as an undeveloped parcel. Images dated 1980 through 1996 depicted some changes within the Park area indicating increasing use a recreational facility. An image dated 2002 and later images depicted the project site and its vicinity as being similar to their current condition.

5 PROPOSED CONSTRUCTION

We understand that the City of Tucson (COT) Parks and Recreation plans to design and construct improvements to the Park, which will generally include:

- A pedestrian bridge across the Bronx Wash;
- Walking trails and paths;
- Shaded canopies and benches
- Dog park;
- Water stations;
- Iron fencing;

- Emergency vehicle pull-in, and
- Other small improvements.

We further understand that the new bridge will be a 40-foot long single-span structure supported on shallow foundations (spread footings) or, alternatively, drilled shafts. The preliminary anchor bolt reactions for the bridge abutments are summarized below:

- Vertical dead load: 100,000 pounds (lbs.); and
- Vertical live load: 25,000 lbs.;

Other reactions due to wind and seismic events were not available as of the date of this report. It is estimated that with the 40-foot long bridge span, the design scour depth will extend about 12 feet below the bottom of the channel.

Other improvements such as shades canopies will be supported on slabs on grade.

Engineering plans for the proposed improvements were not available for our review. However, we understand that the new construction will not include any major grading operations.

6 FIELD EXPLORATION AND LABORATORY TESTING

On October 28 and December 29, 2021, Ninyo & Moore conducted a subsurface exploration in order to evaluate the subsurface conditions and to collect soil samples for laboratory testing. Our evaluation consisted of drilling, logging, and sampling three exploratory borings using a CME-75 drill rig equipped with hollow-stem augers. The borings extended to approximate depths of 5 and 50 feet bgs. Bulk and relatively undisturbed soil samples were collected at selected depth intervals in our borings.

Ninyo & Moore personnel logged the borings in general accordance with the Unified Soil Classification System (USCS) and American Society for Testing and Materials (ASTM) D 2488 by observing cuttings and drive samples. Collected ring samples were trimmed in the field, wrapped in plastic bags, and placed in cylindrical plastic containers to retain in-place moisture conditions. Similarly, Standard Penetration Test (SPT) and bulk samples were sealed in plastic bags to retain their approximate in-place moisture. Detailed descriptions of the soils encountered are presented on the boring logs in Appendix A. The approximate locations of the borings are depicted on Figure 2.

The soil samples collected from our exploratory activities were transported to the Ninyo & Moore laboratory in Tucson, Arizona for geotechnical laboratory testing. The tests included in-situ moisture content and dry density, gradation, Atterberg limits, consolidation, and corrosivity characteristics (including pH, minimum electrical resistivity, and soluble sulfate and chloride contents). The results of the in-situ moisture content and dry density testing are presented on the boring logs in Appendix A. A description of each laboratory test method and the remainder of the test results are presented in Appendix B.

7 GEOLOGY AND SUBSURFACE CONDITIONS

The project site is located in the Sonoran Desert Section of the Basin and Range physiographic province, which is typified by broad alluvial valleys separated by steep, discontinuous, subparallel mountain ranges. The mountain ranges generally trend north-south and northwest-southeast. The basin floors consist of alluvium with thickness extending to several thousands of feet.

The basins and surrounding mountains were formed approximately 18 million years ago during the mid- to late-Tertiary age. Extensional tectonics resulted in the formation of horsts (mountains) and grabens (basins) with vertical displacement along high-angle normal faults. Intermittent volcanic activity also occurred during this time. The surrounding basins were filled with alluvium from the erosion of the surrounding mountains as well as from deposition from rivers. Coarser-grained alluvial material was deposited at the margins of the basins near the mountains.

The surficial geology of the area within the project site consists of geologic units described as being Holocene-age (<10,000 years) active stream channels, low stream terraces, and relatively undissected alluvial fans. (McKittrick, M.A., 1988). The alluvial deposit units include Quaternary-age floodplains and low river terrace deposits flanking the main channel system along the Santa Cruz River consisting of weakly to unconsolidated sand, silt and clay.

According to the United States Department of Agriculture (USDA), Natural Resource Conservation Service (NRCS) online Web Soil Survey, the proposed alignment crosses areas of various soil types. The predominant soil types are described in Table 1 below.

Table 1- NRCS Soil Units

Soil Map Unit Name	Description of Soil Units
Cave gravelly loam	Gravelly loam, gravelly loamy coarse sand, cemented material
Mohave loam	Loam, clay loam

Notes:
Loam is an agricultural soil classification that refers to a soil comprised of a mixture of clay, silt, and sand

7.1 Subsurface Conditions

Our knowledge of the subsurface conditions at the project site is based on our field exploration, laboratory testing, and our general understanding of the geology of the area. The following paragraph provides a generalized description of the materials encountered. More detailed stratigraphic information is presented on the boring logs in Appendix A. The boring logs contain our field and laboratory test results, as well as our interpretation of conditions believed to exist between actual samples retrieved. Therefore, these boring logs contain both factual and interpretive information. Lines delineating subsurface strata on the boring logs are intended to group soils having similar engineering properties and characteristics. They should be considered approximate, as the actual transition between soil types (strata) may be gradual. A key to the soil symbols and terms used on the boring logs is provided in Appendix A.

Native alluvial soil deposits were encountered at the surface of our borings and extended to the boring termination depths. In general, the alluvium consisted of medium dense to dense silty sand, silty clayey sand, and clayey sand with variable percentages of gravel and zones of caliche cementation in our borings.

7.2 Groundwater

Groundwater was not encountered in our exploratory borings. Based on well data provided by the Arizona Department of Water Resources (ADWR), groundwater has been historically measured at depths on the order of 30 feet bgs. However, it should be noted that groundwater levels near the site can fluctuate due to seasonal variations, flows in the Bronx Wash, irrigation, groundwater withdrawal or injection, and other factors.

8 GEOLOGIC HAZARDS

The following section provides a discussion regarding potential geologic hazards such as land subsidence and earth fissures, and faulting and seismicity.

8.1 Land Subsidence and Earth Fissures

Groundwater depletion, due to groundwater pumping, has caused land subsidence and earth fissures in numerous alluvial basins in Arizona. It has been estimated that subsidence has affected more than 3,000 square miles and has caused damage to a variety of engineered structures and agricultural land (Schumann and Genualdi, 1986). From 1948 to 1983, excessive groundwater withdrawal has been documented in several alluvial valleys where groundwater levels have been reportedly lowered by up to about 500 feet. With such large depletions of groundwater, the alluvium has undergone consolidation resulting in large areas of land subsidence.

In Arizona, earth fissures are generally associated with land subsidence and pose an on-going geologic hazard. Earth fissures generally form near the margins of geomorphic basins where significant amounts of groundwater depletion have occurred. Reportedly, earth fissures have also formed due to tensional stress caused by differential subsidence of the unconsolidated alluvial materials over buried bedrock ridges and irregular bedrock surfaces (Schumann and Genualdi, 1986).

Based on our field reconnaissance and review of the referenced material, there are no known earth fissures at the surface of the subject site. Based on fissure maps published by the Arizona Geological Survey (AZGS, 2014), the closest reported unconfirmed earth fissures to the site are located approximately 16 miles to the northwest. Continued groundwater withdrawal in the area may result in subsidence and the formation of new fissures or the extension of existing fissures. While the future occurrence of land subsidence and earth fissures cannot accurately be predicted, these phenomena are not expected to be a constraint to the construction of this project.

8.2 Faulting and Seismicity

The site lies within the Sonoran zone, which is a relatively stable tectonic region located in southwestern Arizona, southeastern California, southern Nevada, and northern Mexico (Euge et al., 1992). This zone is characterized by sparse seismicity and few Quaternary faults. Based on our field observations and on our review of readily available published geologic maps and literature, there are no known active faults underlying the subject site or adjacent areas. The closest known Quaternary fault to the site is the Santa Rita Fault Zone, located approximately 23.5 miles southeast of the site. The Santa Rita Fault Zone is situated along the western piedmont of the Santa Rita Mountains. The fault zone is a series of northeast-striking normal faults that dip to the northwest. The most recent movement along this fault was approximately

130,000 years ago during the Middle to Late Pleistocene epoch. The slip-rate category of this fault is less than 0.2 millimeters per year (Pearthree, 1998). Seismic parameters recommended for the design of the proposed improvements are presented in Section 10.2.

9 CONCLUSIONS

Based on the results of our subsurface evaluation, laboratory testing, and data analysis, the proposed construction is feasible from a geotechnical standpoint, provided the recommendations of this report are incorporated into the design of the project, as appropriate. Geotechnical considerations include the following:

- The near-surface soils should generally be excavatable to planned depths using heavy-duty earthmoving construction equipment. However, zones of gravel and carbonate cementation (caliche) should be anticipated which may result in difficult and/or slower excavation rates.
- Shallow spread or continuous foundations may be used to support the project's small structures. Shallow spread or continuous foundations or drilled cast-in-place shaft foundations may be used to support the project's pedestrian bridge structure.
- Shallow spread or continuous foundations should bear on a zone of engineered fill.
- Drilled cast-in-place shaft excavation holes may not stay stable in near-surface, relatively low cohesion soils encountered in our borings. The contractor should anticipate using cased excavations and/or drilling fluids to stabilize the drilled shaft excavation holes. In addition, the shaft installing contractor should be aware of possible gravel, caliche cementation filaments and pockets of very dense gravel/cobble/boulder deposits
- Soils of variable relative densities encountered near the ground surface in our borings are sensitive to moisture content fluctuations.
- Imported soils and soils generated from on-site excavation activities that exhibit a relatively low plasticity index (PI) can generally be used for engineered fill. Many of the near-surface on-site soils will meet these requirements.
- Groundwater was not observed in our borings. Based on ADWR well data, the regional groundwater table has been historically measured at depths on the order of 30 feet bgs. In general, groundwater is not expected to be a constraint to the design and construction of this project.
- No documented geologic hazards are present underlying or immediately adjacent to the site.
- Corrosivity test results indicate that on-site soils may be corrosive to ferrous materials and the sulfate content of the soils presents a negligible sulfate exposure to concrete.

10 RECOMMENDATIONS

The following sections present our geotechnical recommendations for the project design and construction. If the proposed construction is changed from that discussed in this report, Ninyo & Moore should be contacted for additional recommendations.

10.1 Earthwork

The following sections provide our earthwork recommendations for this project. In general, the earthwork specifications contained in the *Pima Association of Governments (PAG) Standard Specifications for Public Improvements (Standard Specifications)* are expected to apply unless specifically noted.

10.1.1 Site Preparation

Construction areas should be cleared of deleterious materials, if any are present, construction debris, vegetation, and any other material that might interfere with the performance or progress of the work. These materials should be disposed of at a legal dumpsite. Existing features that call for relocation or removal and extend below finish grade, if present, should be removed, and the resulting excavations backfilled with compacted engineered fill as discussed in this report.

10.1.2 Excavations

Our evaluation of the excavation characteristics of the on-site soils is based on the results of our exploratory borings, site observations, and experience with similar soils. The site near-surface soils can generally be excavated or ripped using heavy-duty earthmoving or excavation equipment. However, zones of gravel and caliche cementation should be anticipated, which may be more difficult to excavate and/or slow the excavation rate. The contractor should be prepared for such conditions.

For drilled shafts, the excavation holes may not stay stable in the near-surface, relatively low cohesion soils encountered in our borings. The contractor should anticipate using cased excavations and/or drilling fluids to stabilize the drilled shaft excavation holes.

Sidewalls for temporary excavations (utility trenches) should not be anticipated to stand near-vertical without sloughing. Therefore, the contractor should provide safely sloped excavations or an adequately constructed and braced shoring system, in compliance with Occupational Safety and Health Administration (OSHA) regulations, for employees working in an excavation that may expose them to the danger of moving ground. For planning

purposes and according to OSHA soil classifications, a "Type C" soil should be considered for this project. This corresponds to a temporary slope inclination no steeper than 1.5:1 (horizontal to vertical [H:V]). During excavation, soil classification and excavation performance should be evaluated in the field by Ninyo & Moore in accordance with the OSHA regulations.

10.1.3 Fill Materials and Reuse of On-site Soils

On-site and imported soils that exhibit relatively low plasticity indices and very low to low expansive potential are generally suitable for re-use as engineered fill. Relatively low plasticity indices are defined as a PI value of 15, or less, as evaluated by ASTM D 4318. Very low to low expansive potential soils are defined as having an Expansion Index (evaluated in accordance with ASTM D 4829) of 50 or less. Based on laboratory test results, the near-surface on-site soils are characterized by PI values of 7 to 13. We anticipate that many of the near-surface on-site soils will be suitable for re-use as general engineered fill during construction. The Contractor should perform additional testing prior to or during construction to better delineate the soil conditions at the site.

In addition, clay lumps, construction debris and rock particles should not be larger than 4 inches in dimension. In addition, we recommend that the soils in the upper 6 inches be not used as engineered fill under foundations. This material should be disposed of off-site or in non-structural areas.

Engineered fill materials in contact with ferrous metals should also have low corrosion potential (minimum resistivity more than 2,000 ohm-cm, chloride content less than 25 parts per million [ppm]). Engineered fill material in contact with concrete should have a soluble sulfate content of less than 0.1 percent.

10.1.4 Subgrade Preparation

As stated previously, our borings disclosed near-surface fill and alluvial materials generally consisting of loose to medium dense clayey sand with variable percentages of gravel. Our laboratory test results indicate significant collapse potential of some on-site soils. Accordingly, we recommend that the new foundations be supported on a zone of engineered fill that extends 3 feet below the bottom of the foundation or 5 feet below existing grade, whichever is deeper. The engineered fill should be placed as discussed in Section 10.1.5 below. This overexcavation zone should extend a horizontal distance from the edge of the new foundation that is equal to the depth of the overexcavation.

In addition, we recommend that the new slabs-on-grade, pavements, and flatwork be supported on 8 inches of moisture-conditioned and compacted engineered fill. This can be achieved by overexcavation or in-place scarification. The fill thickness should be measured from the bottom of the aggregate base (AB) layer, where applicable. This subgrade improvement should extend laterally 1 foot beyond the slab footprint.

After the overexcavation described above is finished and prior to the placement of engineered fill, exposed surfaces from excavations should be carefully evaluated by Ninyo & Moore for the presence of soft, loose, or wet soils that were not removed as part of the improvement process. This evaluation should consist of probing and visual observation of the excavation bottom. Based on this evaluation, additional remediation may be needed. This could include further scarification of the exposed surface. This additional remediation, if needed, should be addressed by the geotechnical consultant during the earthwork operations.

10.1.5 Engineered Fill Placement and Compaction

Engineered fill soils should be moisture-conditioned within the moisture range shown below in Table 2 and mechanically compacted to the percent compaction shown. Engineered fill should generally be placed in 8-inch-thick loose lifts such that each lift is firm and non-yielding under the weight of construction equipment.

Table 2 – Compaction Recommendations

Engineered Fill Description	Percent Compaction per ASTM D698	Moisture Content
Below footings, slabs-on-grade, pavements, and flatwork	95 percent	0 to +3 percent of optimum
Aggregate Base (AB)	100 percent	±2 percent of optimum
Trench Backfill – within 2 feet below pavements	100 percent	±2 percent of optimum
Trench Backfill – deeper than 2 feet below pavement	95 percent	±2 percent of optimum
Pipe Bedding/Pipe Zone	95 percent	±2 percent of optimum

An earthwork (shrinkage) factor of 10 to 20 percent is estimated. This shrinkage factor range represents an average of the material tested and assumes that materials excavated from the site will be placed as fill. Potential bidders should consider this in preparing estimates and should review the available data to make their own conclusions regarding excavation conditions.

10.1.6 Pipe Bedding

We recommend that new pipelines be supported on 6 inches or more of graded granular bedding material meeting the Standard Specifications. This bedding/pipe-zone backfill should extend 1 foot above the pipe crown. Care should be taken not to allow voids to form beneath the pipe (i.e., the pipe haunches should be continuously supported) to avoid damaging the pipeline. This may involve fill placement by hand or small compaction equipment. When backfilling, care should be taken to fill voids with compacted material so that excessive settlement of the backfill will not occur.

The bedding/pipe-zone should be placed in lifts of approximately 8 inches in loose thickness and compacted as detailed in Section 10.1.5 above.

10.1.7 Trench Backfill

Trench backfill should be mechanically compacted as discussed in Section 10.1.5 above. Lift thickness for backfill will be dependent upon the type of compaction equipment utilized, but should generally be placed in lifts not exceeding 8 inches in loose thickness. Special care should be exercised to avoid damaging the pipe or other structures during the compaction of the backfill. In addition, the underside (or haunches) of the buried pipe should be supported on a well-graded, compacted bedding material. This area may need placement by hand or small-scale compaction equipment.

If the utility is to be installed near or beneath the foundation of an existing structure or utility, the existing structure or utility should be supported or underpinned to reduce construction-related damage, and, if needed, the proposed pipeline encased in concrete to accommodate imposed structural loads.

10.2 Seismic Design Considerations

Design of the proposed improvements should be performed in accordance with the requirements of the governing jurisdictions and applicable building codes. Table 3 presents the seismic design parameters for the site in accordance with International Building Code (IBC) guidelines and adjusted maximum considered earthquake (MCE) spectral response acceleration parameters evaluated using the California's Office of Statewide Health Planning and Development (OSHPD) Seismic Design Maps (web based).

Table 3 – International Building Code Seismic Design Criteria	
Site Coefficients and Spectral Response Acceleration Parameters	**Values**
Site Class	D
Site Coefficient, F_a	1.584
Site Coefficient, F_v	2.4
Mapped Spectral Response Acceleration at 0.2-second Period, S_s	0.270 g
Mapped Spectral Response Acceleration at 1.0-second Period, S_1	0.083 g
Spectral Response Acceleration at 0.2-second Period Adjusted for Site Class, S_{MS}	0.428 g
Spectral Response Acceleration at 1.0-second Period Adjusted for Site Class, S_{M1}	0.200 g
Design Spectral Response Acceleration at 0.2-second Period, S_{DS}	0.286 g
Design Spectral Response Acceleration at 1.0-second Period, S_{D1}	0.133 g

10.3 Foundations

Based upon our review of field exploration and laboratory test results, we are providing recommendations for shallow spread or continuous foundations for the pedestrian bridge and other small structures, and, as an alternative, drilled shaft foundations for the bridge structure abutments.

The geotechnical recommendations presented below are based on the following assumptions:

- Footings are constructed at a depth of 18 inches or more below finished grade of the adjacent area;
- Footings are placed on engineered fill in accordance with recommendations presented in Section 10.1.4; and
- Scour is not a design concern for the bridge footings and a 12-foot design scour is accounted for the drilled shafts.

10.3.1 Shallow Foundations

Shallow foundations (spread or continuous footings) may be designed using the allowable net bearing pressure of 2,000 pounds per square foot (psf) for static conditions. The allowable soil bearing pressure may be increased by one-third when considering total loads including loads of short duration such as wind or seismic forces.

Total and differential settlement of 1-inch and 1/2-inch over a horizontal distance of 30 feet, respectively, may occur. These settlement estimates are based on the estimated loading conditions, the available soil boring information, and our experience with similar soils.

These settlements are contingent on the preparation of soils underlying the footings in accordance with the recommendations contained in Section 10.1.4 and 10.1.5 of this report.

Foundations bearing on engineered fill and subject to lateral loadings may be designed using an ultimate coefficient of friction of 0.35 (total frictional resistance equals the coefficient of friction multiplied by the dead load). An ultimate passive resistance value of 360 psf per foot of depth may be used up to a value of 3,600 psf. The ultimate lateral resistance can be taken as the sum of the frictional resistance and passive resistance, provided that the passive resistance does not exceed one-half of the total allowable resistance. The passive resistance may be increased by one-third when considering loads of short duration such as wind or seismic forces. The foundations should preferably be proportioned such that the resultant force from lateral loadings falls within its kern (i.e., middle one-third).

10.3.2 Drilled Shaft Foundations

Drilled shafts are proposed as an alternative foundation type for the pedestrian bridge structure. Drilled shafts are commonly used in Arizona, and there are a number of qualified contractors with local experience. Based on our discussions with some local drillers and previous construction history within the project area, we recommend that the drilled shafts be of 4-foot diameter or larger. We recommend that the drilled shafts be constructed and installed according to PAG Standard Specification 609 and the recommendations outlined in this report.

Drilled Shaft Axial Capacities

Axial drilled shaft capacities were calculated using side friction resistance and end bearing resistance in accordance with the methods outlined in AASHTO LRFD Bridge Design Specifications (8th Edition - 2017), Section 10.8. We have assumed that the bridge supports will be constructed at or slightly below existing grades. In addition, based on information obtained from the project design team, we understand that the design scour will on the order of 12 feet below the bottom of the wash. We recommend that the shaft tips extend to elevation 2,316 ft MSL or deeper. The idealized soil profile is presented in Table 4.

Table 4 - Idealized Soil Profile

Approximate Depth bgs (ft)[1]	Soil Type		Effective Unit Weight (pcf)	Average N_{60} (Blows/ft)[2]
	Density	Soil Classification		
0 - 8	Medium Dense to Very Dense	Silty Sand and Clayey Sand	110	14
8 - 30	Dense to Very Dense	Silty Sand and Clayey Sand	110	68
Below 30	Very Dense	Clayey Sand	115	75

Note:
1. Approximate depth bgs 0 corresponds to approximate elevation 2,346 ft.
2. N_{60} is energy-corrected Standard Penetration Test N-value.

Drilled shaft Factored Nominal Axial Resistance Charts (Strength Limit State) are presented on Figure 3. These charts are for a redundant shaft in a group spaced with center-to-center spacing of 4 diameters or more. In accordance with AASHTO (2017) Section 10.8, Table 10.8.3.6.3-1 drilled shafts in a single row group may be considered to act individually when the center-to-center (CTC) spacing is more than 3 diameters. For a drilled shaft in a group with center-to-center spacing of 2D (where D is the diameter of the shaft in question), the strength limit resistances should be reduced by multiplying the strength limit chart capacity by an efficiency factor, $\eta = 0.90$. This reduction factor should linearly increase until a spacing of 3B is achieved, at which point the reduction factor is not applied ($\eta = 1.0$). For intermediate spacing, the reduction factor may be evaluated by linear interpolation.

For a single, non-redundant drilled shaft foundation (such as a single shaft supporting a bridge abutment), the strength limit chart resistances should be reduced by 20 percent to account for a reduction in resistance factors for this case. Similarly, for a group of five or more shafts, the strength limit chart resistances may be increased by 20 percent to account for an increase in resistance factors due to increased redundancy.

Service Limit Downward Axial Resistance Charts for drilled shafts are attached for selected values of settlement at the top of the drilled shaft (Figures 4A through 4F). These charts are for the case of a single shaft and are also applicable for a shaft in a group consisting of a single row of shafts. The charts were prepared using methods found in O'Neill and Reese (1999) using normalized load-transfer vs. settlement curves. For our analyses, we included the effects of elastic shortening of the shaft due to the axial loads. When using the charts, the weight of the shaft does not need to be accounted for.

Recommended Soil Parameters for Lateral Load Analysis

We understand that lateral load analysis of drilled shafts will be performed by others. The recommended soil parameters to be used for lateral load analysis of drilled shafts using computer program LPILE are included in Table 5 below.

Table 5 – Soil Parameters for Lateral Load Analysis

Average Depth (ft)	Soil Type to be used in Lateral Load Analysis	Effective Unit Weight (pcf)	Cohesion (psf)	Strain ε_{50}	Angle of Internal Friction (φ) (degrees)	$k\varphi$ (lb/in^3)
0 - 8	Medium Dense to Very Dense Sand (Reese)	110	0	-	31	60
8 - 30	Dense to Very Dense Sand (Reese)	110	0	-	35	150
Below 30	Very Dense Sand (Reese)	115	0	-	38	225

For lateral loading, piles in a group may be considered to act individually when the center-to-center spacing is more than 5B (where, B is the diameter of the pile) in the direction normal to loading and more than 8B in the direction parallel to loading. The following table presents the lateral load group reduction factors to be applied for various pile spacing for in-line loading.

Table 6 – Lateral Load Group Reduction Factors

Center-to-Center Pile Spacing for In-Line Loading	Reduction Factor*		
	Row 1	Row 2	Row 3 and higher
3B	0.80	0.40	0.3
5B	1.00	0.85	0.7

Collapse-Susceptible Soils Effect

Per ADOT's policy (Geotechnical Design Policy DS-3, Load Resistance Factor Design Analysis of Drilled Shafts Subjected to Lateral Loads based on Load and Resistance Factor Design Methodology, dated December 1, 2010), the effect of collapse-susceptible soils should be included in the lateral analysis to evaluate the potential for sudden and large vertical and lateral deformations at some time during the service life of the structure.

Based on the results of this study and other studies performed by Ninyo &, Moore in the general project area, we have estimated the y-multiplier, y_m, to be used for the lateral load

analysis for this project. We recommend that the y_m multiplier of 2.0 be used for the upper 10 feet of the soils. This multiplier does not account for group effects and consequently, the load reduction factors in Table 6 above should be applied as indicated.

Drilled Shaft Construction Considerations

Our evaluation of the excavation characteristics of the on-site materials is based on the results of our exploratory borings, site observations, and our experience with similar materials. In our opinion, excavation of the on-site materials can generally be accomplished with heavy-duty equipment. Drilled shaft diameters less than 4 feet are not recommended for this project. The contractor should anticipate encountering relatively loose and low-cohesion deposits at various depths which may cause sloughing and caving of the shaft holes. Larger diameter shafts or deeper shafts could be used if this proves to be more convenient or if they are needed due to lateral load concerns.

The drilled shafts should be observed and evaluated to check adequate bearing material has been reached and that the bearing surface has been suitably cleaned. This evaluation can typically be done from the ground surface. The concrete mix should be designed, including aggregate size and slump, so that it satisfies the requirements of Sections 609 and 1006 of the ADOT Standard Specifications.

Where possible, the drilled shafts should be constructed in the “dry” (i.e., no more than 2 inches of water covering the bottom of the shaft excavation). In such cases, the concrete may be placed by the free-fall method. This method consists of using a vertical section of concrete chute (or other means) to allow the concrete to flow out of the mixing truck in a vertical stream of concrete with a relatively small discharge diameter. The stream should be diverted to avoid hitting the sides of the drilled shaft and the reinforcing steel, which could cause concrete segregation.

If the drilled shafts are constructed in the “wet,” a tremie pipe connected either to a hopper or concrete pump should be used to displace the water in the drilled shaft excavation upwards as the concrete is placed. If this method of concrete placement is used,

Ninyo & Moore should be consulted and the shafts will need to be equipped with special casing to house equipment that can be used to evaluate the integrity of the concrete after it has been cured.

Due to the presence of sandy soils, it may be appropriate to use a temporary casing or the slurry method while installing the shafts at some locations. The contractor should be prepared to use a temporary full-length casing, if needed. The contractor's drilling means and methods should also anticipate that relatively loose cohesionless soil deposits might be encountered at various depths. Consequently, concrete overruns should be anticipated.

We recommend that the drilled shafts be constructed and foundation concrete mix designed according to ADOT Standard Specification 609 and the recommendations outlined in this report. In accordance with AASHTO, if the center-to-center spacing of drilled shafts is less than 6B, the construction sequence of drilled shaft installation should be specified in the contract documents.

10.4 Slab-On-Grade

The design of the slab-on-grade is the responsibility of the structural engineer. Placement of the reinforcement in the slab is vital for satisfactory performance. The slabs should be underlain by 4 or more inches of aggregate base material in general accordance with the Standard Specifications. We recommend that the slab-on-grade be supported on engineered fill as described in Sections 10.1.4 and 10.1.5 of this report.

The slab-on-grade should either be constructed so that it "floats" independent of the foundations or be designed to be structurally connected to the foundations. Fill soils under slabs should be maintained in a moist condition until the overlying slab is constructed. Joints should be constructed at intervals designed by the structural engineer to help reduce random cracking of the slab.

10.5 Flatwork

To reduce the potential manifestation of distress to any concrete flatwork due to movement of the underlying soil, we recommend that such flatwork (if utilized for this project) be installed with crack-control joints at appropriate spacing as designed by the structural engineer. We recommend that concrete flatwork be supported on engineered fill as described in Sections 10.1.4 and 10.1.5 of this report. Positive drainage should be established and maintained adjacent to flatwork. We also recommend that a flexible sealant be applied at the joints where flatwork abuts building foundations, as well as in control joints that exhibit post-construction cracking to reduce the introduction of moisture adjacent to the foundations. The flexible sealant should be installed and maintained in accordance with the manufacturer's recommendations.

10.6 Pavements

The new pavement sections were developed in accordance with the Pima County Roadway Design Manual, 2013 Edition with June 2016 updates (Manual). The sections below present our main design assumptions and recommended new pavement sections. We recommend that new pavements be supported on engineered fill as described in Sections 10.1.4 and 10.1.5 of this report. The service life for the new pavement sections presented below is estimated to be on the order of 20 years.

We recommend the following AC structural pavement sections:

- Parking areas: 2 ½ inches of AC over 4 inches of AB, and
- Driveways: 3 inches of AC over 6 inches of AB.

10.7 Corrosion

The corrosion potential of the on-site materials was analyzed to evaluate its potential effect on the foundations and structures. Corrosion potential was evaluated using the results of laboratory testing of soil samples obtained during our subsurface evaluation that were considered representative of soils at the subject site.

Laboratory testing consisted of pH, minimum electrical resistivity, and chloride and soluble sulfate contents. The pH and minimum electrical resistivity tests were performed in general accordance with Arizona Test 236c, while sulfate and chloride tests were performed in accordance with Arizona Test 733 and 736, respectively. The results of the corrosivity tests are presented in Appendix B.

The soil pH value of the tested sample was 6.9, which is considered to be acidic. The minimum electrical resistivity measured in the laboratory was 870 ohm-cm, which is considered to be corrosive to ferrous metals. The chloride content of the sample tested was 53 parts per million (ppm), which also represents a corrosive environment to ferrous metals. The soluble sulfate content of the soil sample tested was 0.005 percent by weight, which is considered to represent negligible sulfate exposure for concrete.

Based on the laboratory testing mentioned above and given our experience with similar, nearby projects, we recommend that special consideration should be given to the use of heavy-gauge, corrosion-protected, underground steel pipe or culverts, if any are planned. As an alternative, plastic pipe or reinforced concrete pipe could be considered. To minimize corrosion of buried metallic utilities, we recommend that topsoil, organic soils, existing fill soils, and mixtures of

sand and clay not be placed adjacent to buried metallic utilities. Rather, we suggest that sand or gravel be placed around buried metal piping. Also, buried utilities of different metallic construction or operating temperatures should be electrically isolated from each other to minimize galvanic corrosion problems. In addition, new piping should be electrically isolated from old piping, if any, so that the old metal will not increase the corrosion rate of the new metal. A corrosion specialist should be consulted for further recommendations.

10.8 Concrete

Laboratory chemical tests performed on selected soil samples of on-site soils indicated sulfate content of approximately 0.005 percent by weight. Based on American Concrete Institute (ACI), the on-site soils should be considered to represent negligible sulfate exposure to concrete.

We recommend the use of Type II cement for construction of concrete structures at this site. Due to potential uncertainties as to the use of reclaimed irrigation water, or topsoil that may contain higher sulfate contents, pozzolan or admixtures designed to increase sulfate resistance may be considered.

The concrete should have a water-cementitious materials ratio of no more than 0.50 by weight for normal weight aggregate concrete. The structural engineer should select the concrete design strength based on the project specific loading conditions. Higher strength concrete may be selected for increased durability and resistance to slab curling and shrinkage cracking.

We recommend that concrete cover over reinforcing steel for foundations be in accordance with the recommendations of the structural engineer. The structural engineer should be consulted for additional concrete specifications.

10.9 Site Drainage

Surface drainage should be provided to divert water away from the structures and off of paved surfaces. Surface water should not be permitted to drain toward the structures or to pond adjacent to footings or on flatwork or pavement areas. Positive drainage for this project is defined as a slope of 2 or more percent for a distance of 5 or more feet away from the structures.

11 PRE-CONSTRUCTION CONFERENCE

We recommend that a pre-construction conference be held. Representatives of the owner, the civil engineer, Ninyo & Moore, and the contractor should be in attendance to discuss the project

plans and schedule. Our office should be notified if the project description included herein is incorrect or if the project characteristics are significantly changed.

12 CONSTRUCTION OBSERVATION AND TESTING

During construction operations, we recommend that Ninyo & Moore perform observation and testing services for the project. These services should be performed to evaluate exposed subgrade conditions, including the extent and depth of overexcavation, to evaluate the suitability of proposed borrow materials for use as fill and to observe placement and test compaction of fill soils. Qualified subcontractors utilizing appropriate techniques and construction materials should perform construction of the proposed improvements.

13 LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

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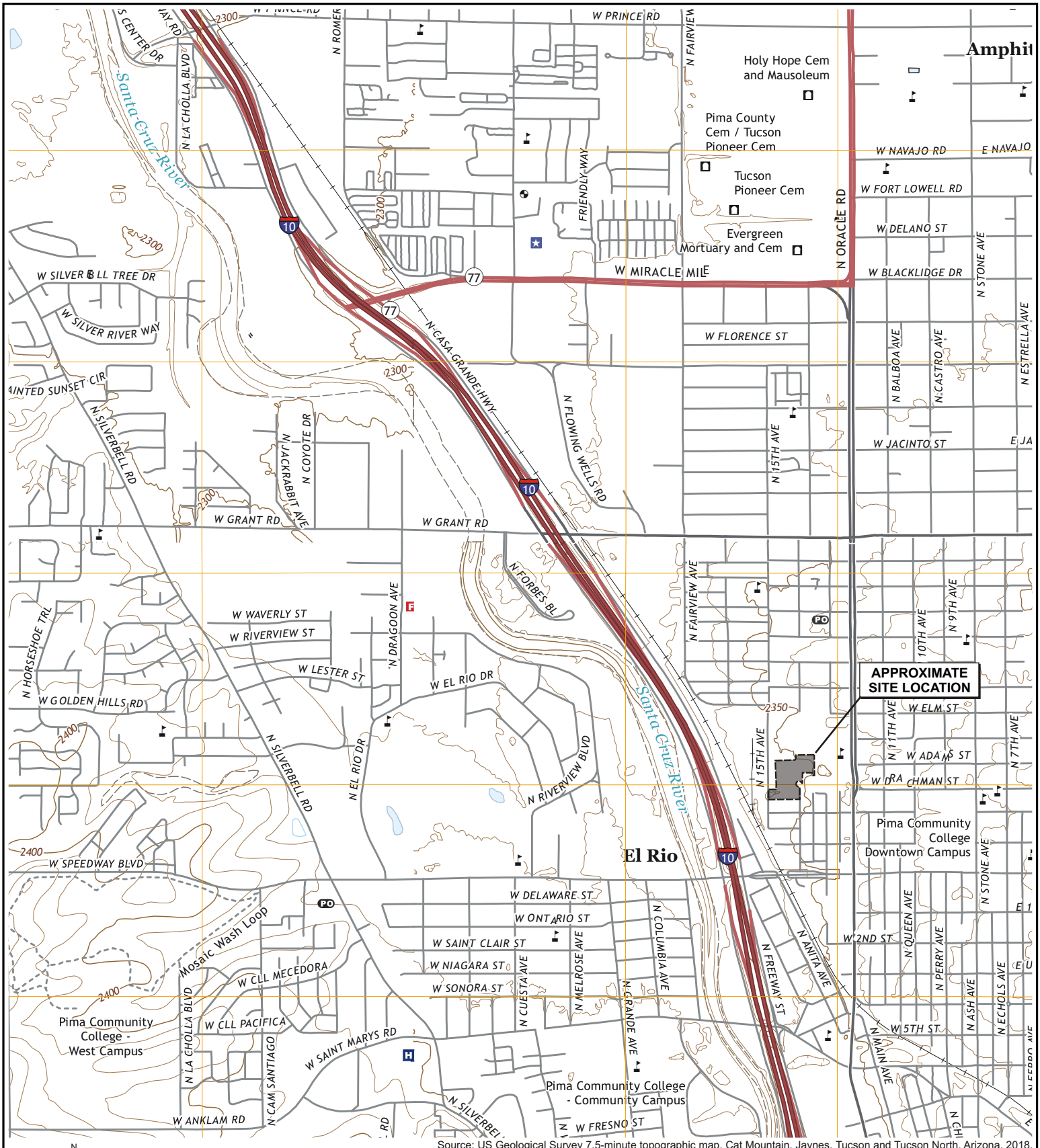
FIGURES

TC-COM-0523-01350



Source: US Geological Survey 7.5-minute topographic map, Cat Mountain, Jaynes, Tucson and Tucson North, Arizona, 2018.

N

FEET

0 2000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

FIGURE 1

SITE LOCATION

FRANCISCO ELIAS ESQUER PARK IMPROVEMENTS
TUCSON, ARIZONA

606881001 | 1/22

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elt file no: 6881vmap0122

Source: NAVTEQ, 08/18/18.

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0 120

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

FIGURE 2

BORING LOCATIONS

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elt file no: 6881blm0122

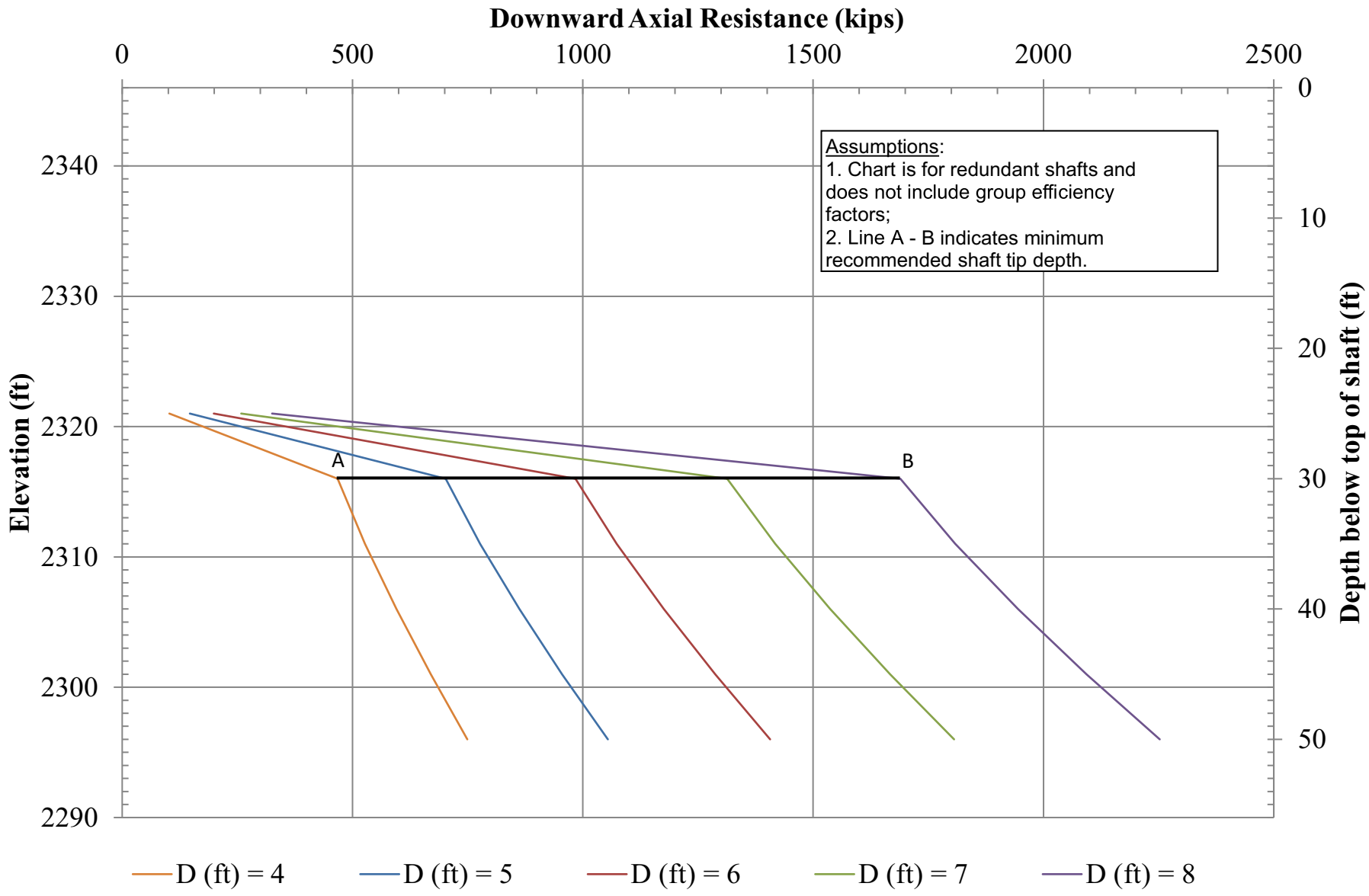

FIGURE 3

STRENGTH LIMIT DOWNWARD AXIAL RESISTANCE CHART FOR DRILLED SHAFTS

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elt file no: 6881cht0122a

Service Limit Downward Axial Resistance Chart for wt = 0.1"

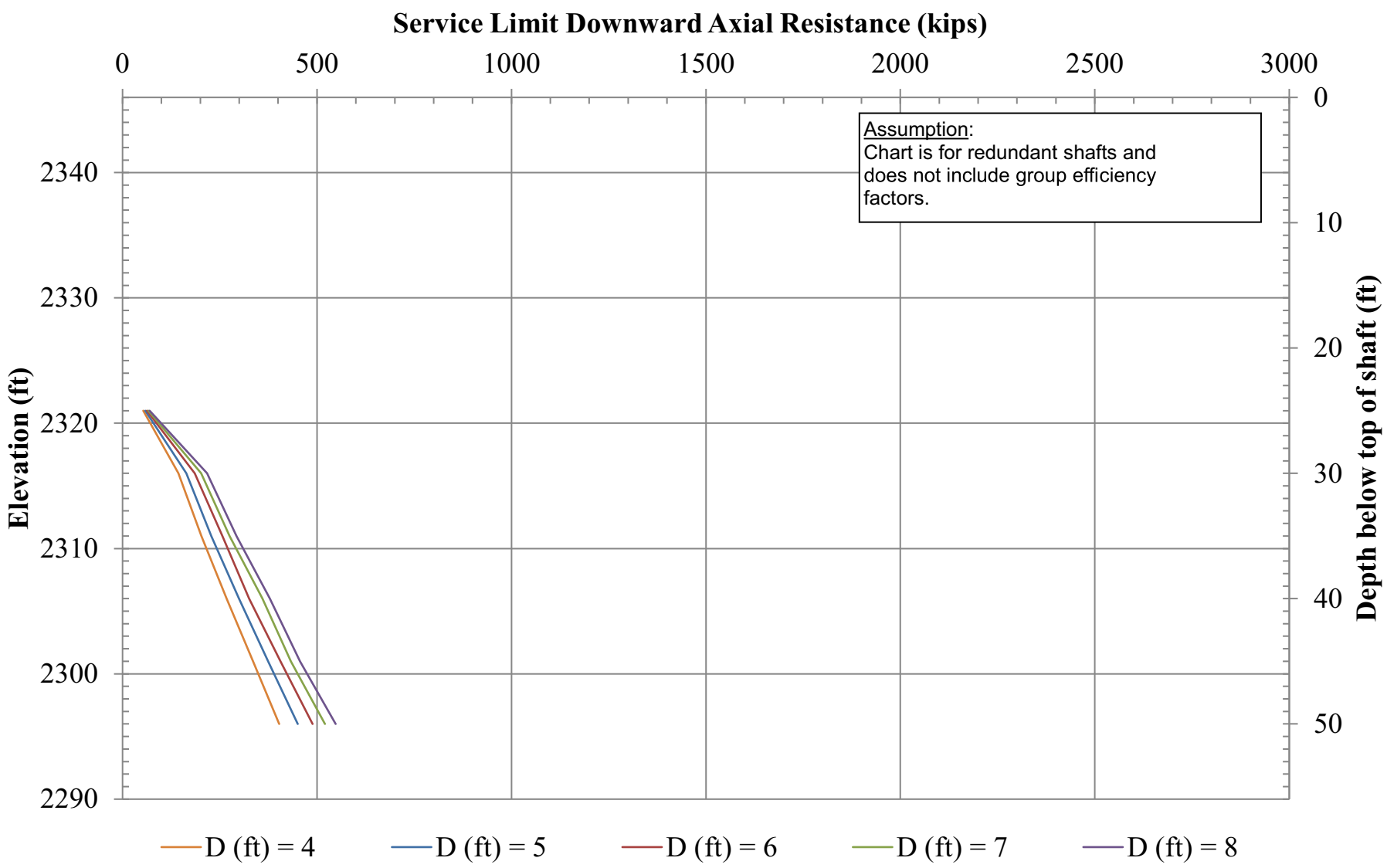

FIGURE 4A

SERVICE LIMIT DOWNWARD AXIAL RESISTANCE CHART FOR DRILLED SHAFTS

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elt file no: 6881cht0122b

Service Limit Downward Axial Resistance Chart for wt = 0.25"

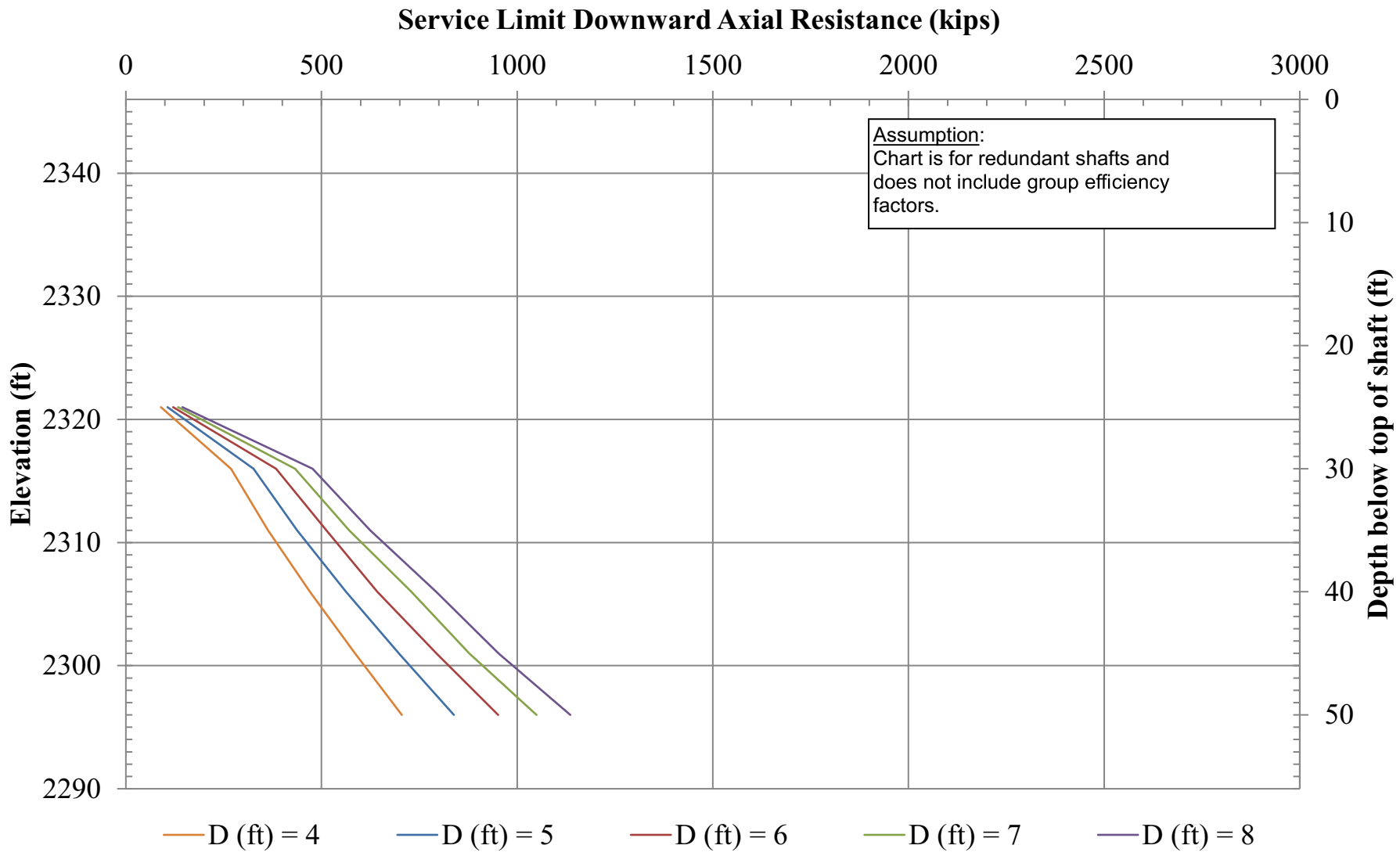

FIGURE 4B

SERVICE LIMIT DOWNWARD AXIAL RESISTANCE CHART FOR DRILLED SHAFTS

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elt file no: 6881cht0122c

Service Limit Downward Axial Resistance Chart for wt = 0.5"

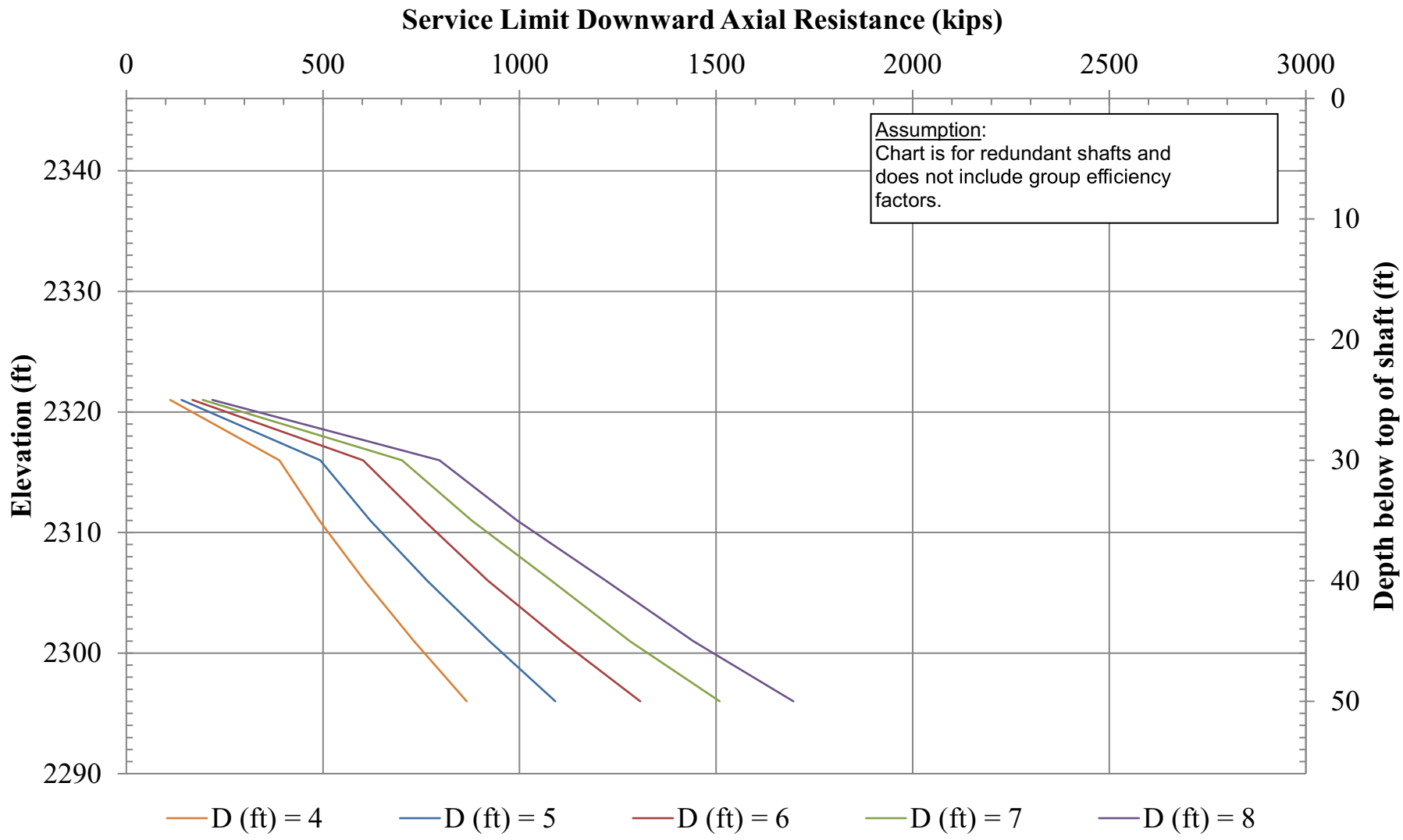

FIGURE 4C

SERVICE LIMIT DOWNWARD AXIAL RESISTANCE CHART FOR DRILLED SHAFTS

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elt file no: 6881cht0122d

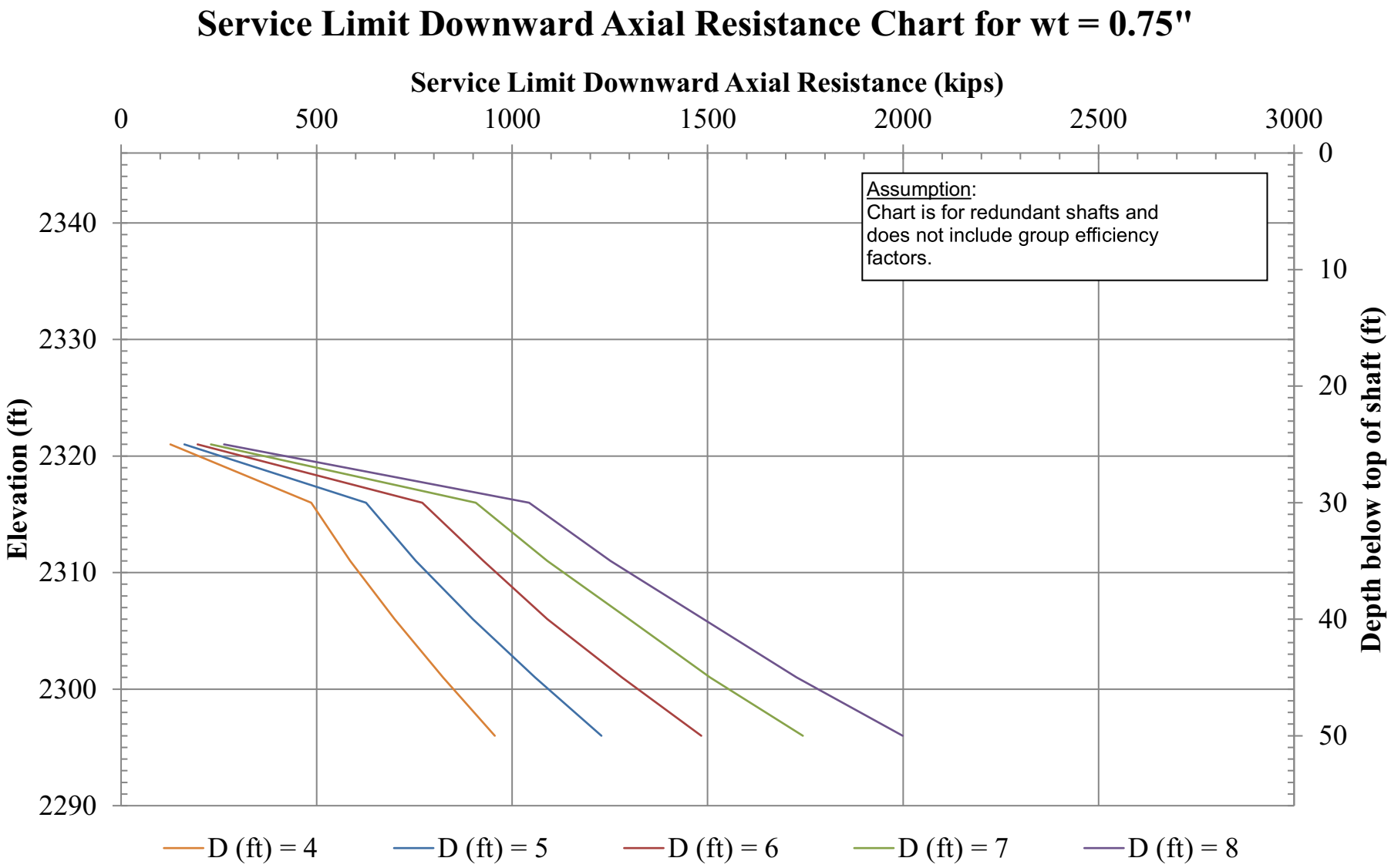

FIGURE 4D

SERVICE LIMIT DOWNWARD AXIAL RESISTANCE CHART FOR DRILLED SHAFTS

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elt file no: 6881cht0122e

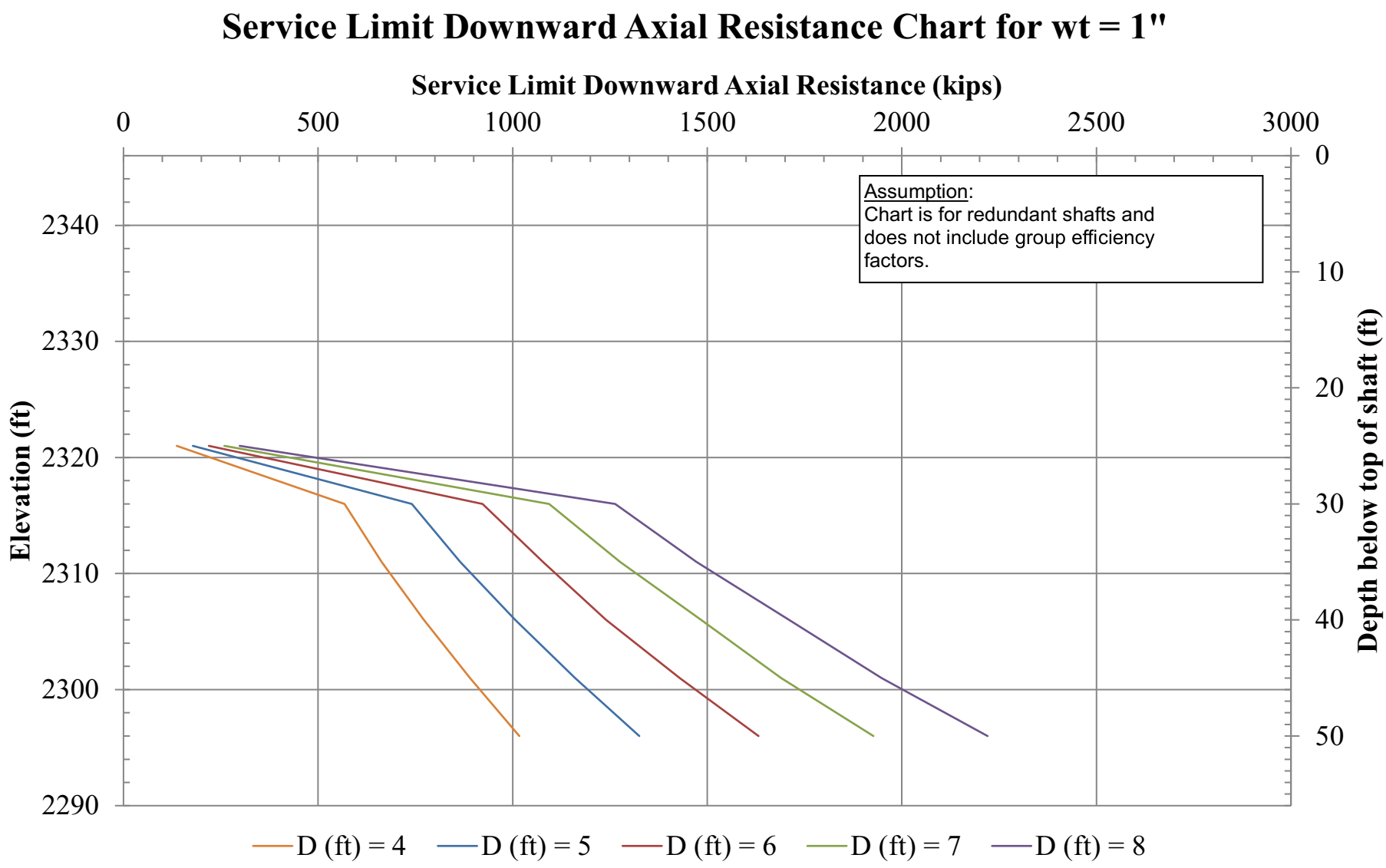

FIGURE 4E

SERVICE LIMIT DOWNWARD AXIAL RESISTANCE CHART FOR DRILLED SHAFTS

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Service Limit Downward Axial Resistance Chart for wt = 2"

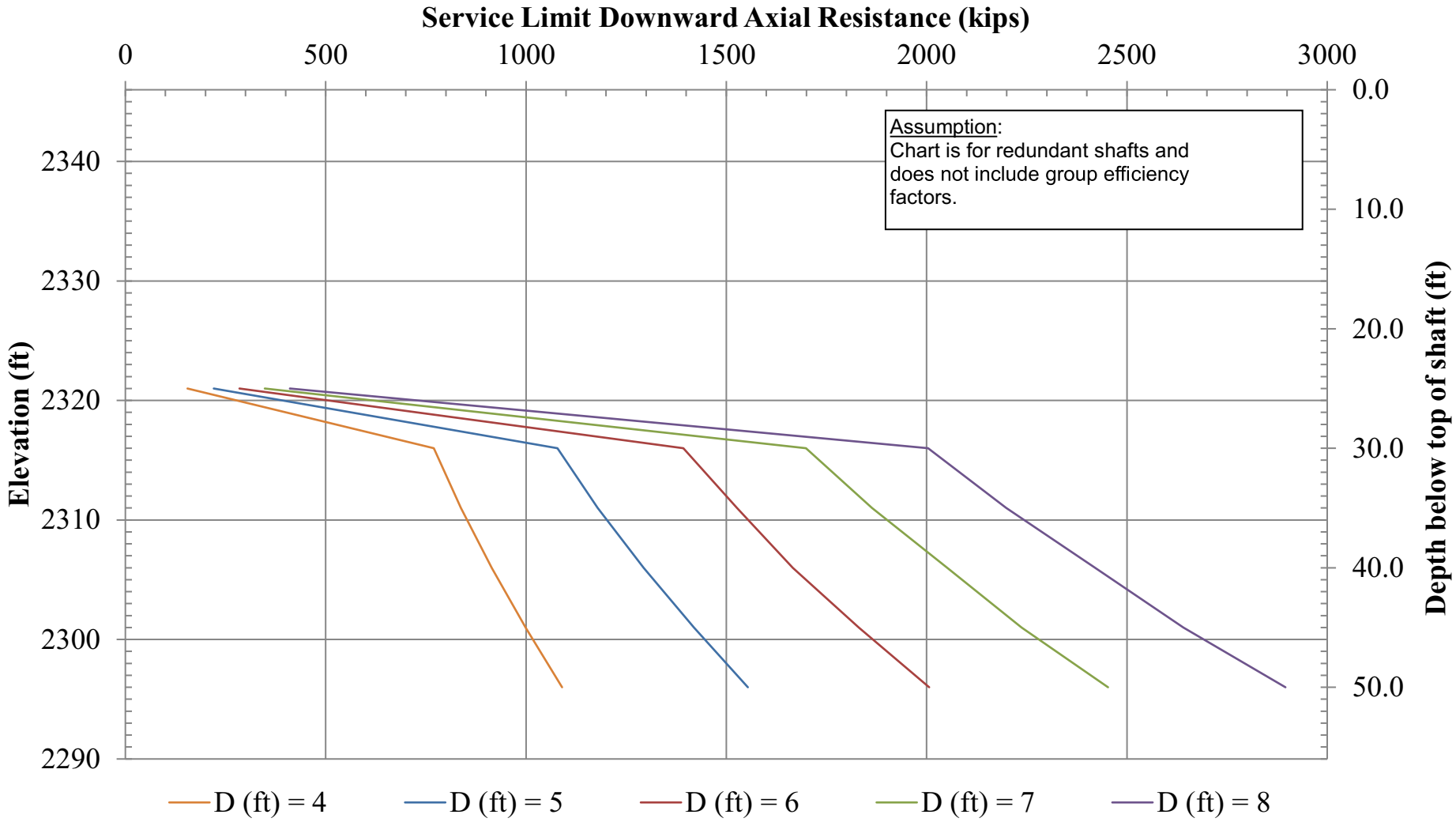

FIGURE 4F

SERVICE LIMIT DOWNWARD AXIAL RESISTANCE CHART FOR DRILLED SHAFTS

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elt file no: 6881cht0122g

APPENDIX A

Boring Logs

APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples
Disturbed soil samples were obtained in the field using the following methods.

Bulk Samples
Bulk samples of representative earth materials were obtained from the exploratory borings. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Sampler
Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. The sampler was driven into the ground 12 to 18 inches with a 140-pound hammer falling freely from a height of 30 inches in general accordance with ASTM D 1586. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the sampler, bagged, sealed and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples
Relatively undisturbed soil samples were obtained in the field using the following methods.

The Modified Split-Barrel Drive Sampler
The sampler, with an external diameter of 3.0 inches, was lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a hammer or the Kelly bar of the drill rig in general accordance with ASTM D 3550. The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer or bar, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

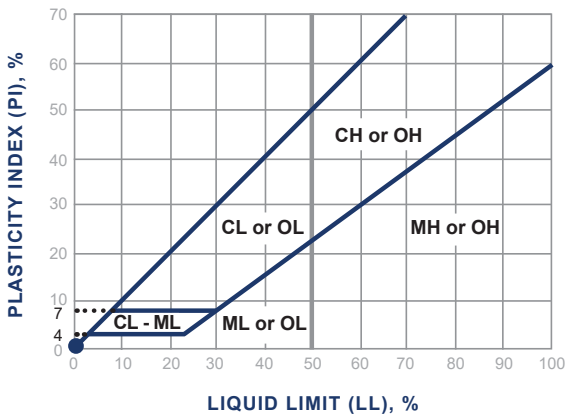
Soil Classification Chart Per ASTM D 2488

Primary Divisions			Secondary Divisions	
			Group Symbol	Group Name
COARSE-GRAINED SOILS more than 50% retained on No. 4 sieve	**GRAVEL** more than 50% of coarse fraction retained on No. 4 sieve	CLEAN GRAVEL less than 5% fines	GW	well-graded GRAVEL
			GP	poorly graded GRAVEL
		GRAVEL with DUAL CLASSIFICATIONS 5% to 12% fines	GW-GM	well-graded GRAVEL with silt
			GP-GM	poorly graded GRAVEL with silt
			GW-GC	well-graded GRAVEL with clay
			GP-GC	poorly graded GRAVEL with
		GRAVEL with FINES more than 12% fines	GM	silty GRAVEL
			GC	clayey GRAVEL
			GC-GM	silty, clayey GRAVEL
	SAND 50% or more of coarse fraction passes No. 4 sieve	CLEAN SAND less than 5% fines	SW	well-graded SAND
			SP	poorly graded SAND
		SAND with DUAL CLASSIFICATIONS 5% to 12% fines	SW-SM	well-graded SAND with silt
			SP-SM	poorly graded SAND with silt
			SW-SC	well-graded SAND with clay
			SP-SC	poorly graded SAND with clay
		SAND with FINES more than 12% fines	SM	silty SAND
			SC	clayey SAND
			SC-SM	silty, clayey SAND
FINE-GRAINED SOILS 50% or more passes No. 200 sieve	**SILT and CLAY** liquid limit less than 50%	INORGANIC	CL	lean CLAY
			ML	SILT
			CL-ML	silty CLAY
		ORGANIC	OL (PI > 4)	organic CLAY
			OL (PI < 4)	organic SILT
	SILT and CLAY liquid limit 50% or more	INORGANIC	CH	fat CLAY
			MH	elastic SILT
		ORGANIC	OH (plots on or above "A"-line)	organic CLAY
			OH (plots below "A"-line)	organic SILT
	Highly Organic Soils		PT	Peat

Grain Size

Description		Sieve Size	Grain Size	Approximate Size
Boulders		> 12"	> 12"	Larger than basketball-sized
Cobbles		3 - 12"	3 - 12"	Fist-sized to basketball-sized
Gravel	Coarse	3/4 - 3"	3/4 - 3"	Thumb-sized to fist-sized
	Fine	#4 - 3/4"	0.19 - 0.75"	Pea-sized to thumb-sized
Sand	Coarse	#10 - #4	0.079 - 0.19"	Rock-salt-sized to pea-sized
	Medium	#40 - #10	0.017 - 0.079"	Sugar-sized to rock-salt-sized
	Fine	#200 - #40	0.0029 - 0.017"	Flour-sized to sugar-sized
Fines		Passing #200	< 0.0029"	Flour-sized and smaller

Plasticity Chart



Apparent Density - Coarse-Grained Soil

Apparent Density	Spooling Cable or Cathead		Automatic Trip Hammer	
	SPT (blows/foot)	Modified Split Barrel (blows/foot)	SPT (blows/foot)	Modified Split Barrel (blows/foot)
Very Loose	≤ 4	≤ 8	≤ 3	≤ 5
Loose	5 - 10	9 - 21	4 - 7	6 - 14
Medium Dense	11 - 30	22 - 63	8 - 20	15 - 42
Dense	31 - 50	64 - 105	21 - 33	43 - 70
Very Dense	> 50	> 105	> 33	> 70

Consistency - Fine-Grained Soil

Consis-tency	Spooling Cable or Cathead		Automatic Trip Hammer	
	SPT (blows/foot)	Modified Split Barrel (blows/foot)	SPT (blows/foot)	Modified Split Barrel (blows/foot)
Very Soft	< 2	< 3	< 1	< 2
Soft	2 - 4	3 - 5	1 - 3	2 - 3
Firm	5 - 8	6 - 10	4 - 5	4 - 6
Stiff	9 - 15	11 - 20	6 - 10	7 - 13
Very Stiff	16 - 30	21 - 39	11 - 20	14 - 26
Hard	> 30	> 39	> 20	> 26

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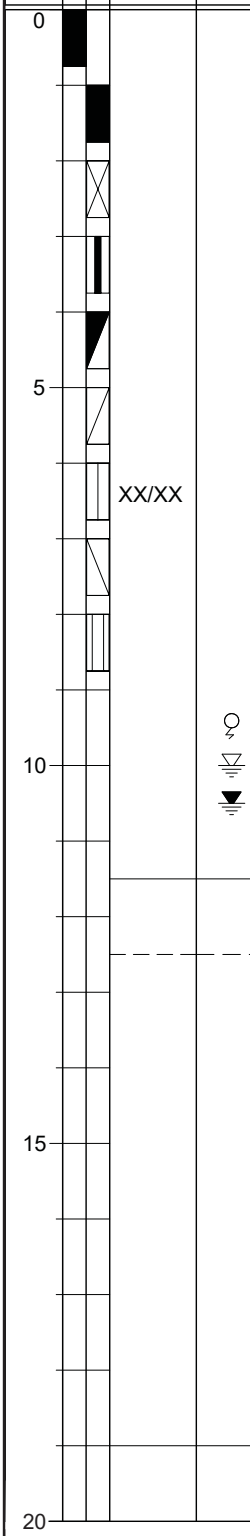
USCS METHOD OF SOIL CLASSIFICATION

BORING LOG EXPLANATION SHEET



Bulk sample.

Modified split-barrel drive sampler.

No recovery with modified split-barrel drive sampler.

Sample retained by others.

Standard Penetration Test (SPT).

No recovery with a SPT.

Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.

No recovery with Shelby tube sampler.

Continuous Push Sample.

Seepage.

Groundwater encountered during drilling.

Groundwater measured after drilling.

SM

MAJOR MATERIAL TYPE (SOIL):

Solid line denotes unit change.

CL

Dashed line denotes material change.

Attitudes: Strike/Dip
b: Bedding
c: Contact
j: Joint
f: Fracture
F: Fault
cs: Clay Seam
s: Shear
bss: Basal Slide Surface
sf: Shear Fracture
sz: Shear Zone
sbs: Shear Bedding Surface

The total depth line is a solid line that is drawn at the bottom of the boring.

DATE DRILLED 12/29/21 BORING NO. B-1

GROUND ELEVATION 2,346' ± (MSL) SHEET 1 OF 3

METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (GSI)

DRIVE WEIGHT 140 Lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY SDN

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	ALLUVIUM: Brown, dry, medium dense, silty SAND; few to little gravel.
		27	4.7	107.5			
		12					
5							
		77/10"					Very dense; scattered caliche nodules.
		48					
10							
		71					
15							
		30					Dense.
20							

FIGURE A -1

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TUCSON, ARIZONA

DATE DRILLED 12/29/21 BORING NO. B-1

GROUND ELEVATION 2,346' ± (MSL) SHEET 2 OF 3

METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (GSI)

DRIVE WEIGHT 140 Lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY SDN

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20						SC	ALLUVIUM (Conintued): Light brown, moist, loose, clayey SAND; few to little gravel.
		12	24.6	80.9			
25							
		76/11"					Very dense; partly weakly cemented.
30							
		69/10"	7.8	103.0			
35							
		42					
40							

FIGURE A -2

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FRANCISCO ELIAS ESQUER PARK IMPROVEMENTS
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DATE DRILLED 12/29/21 BORING NO. B-1

GROUND ELEVATION 2,346' ± (MSL) SHEET 3 OF 3

METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (GSI)

DRIVE WEIGHT 140 Lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY SDN

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40							SC	Light brown, moist, very dense, clayey SAND; few to little gravel; partly weakly cemented.
		■	50/5"					
45								
		◢	50/3"					
50								Total Depth = 48.8 feet. Groundwater not encountered during drilling. Backfilled on 12/29/21 shortly after completion of drilling. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
55								
60								

FIGURE A -3

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TUCSON, ARIZONA

DATE DRILLED 12/29/21 BORING NO. B-2

GROUND ELEVATION 2,346' ± (MSL) SHEET 1 OF 3

METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (GSI)

DRIVE WEIGHT 140 Lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY SDN

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0		10				SC-SM	ALLUVIUM: Brown, dry, medium dense, silty clayey SAND; few gravel.
		29	3.6	108.3		SM	Brown, dry, medium dense, silty SAND.
5		11					
		50/5"					Very dense; scattered caliche nodules.
10							
		83				SC	Brown, dry, very dense, clayey SAND; scattered caliche nodules.
15							
		50/5"					
20							

FIGURE A -4

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FRANCISCO ELIAS ESQUER PARK IMPROVEMENTS
TUCSON, ARIZONA

DATE DRILLED 12/29/21 BORING NO. B-2

GROUND ELEVATION 2,346' ± (MSL) SHEET 2 OF 3

METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (GSI)

DRIVE WEIGHT 140 Lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY SDN

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20						SC	ALLUVIUM (Continued): Light brown, moist, very dense, clayey SAND with gravel.
	Driven	50/5"					Weakly cemented.
25							
	Driven	50/4"	11.2	114.3			
30							
		54					
35							
	Driven	50/5"	8.3	113.2			
40							

FIGURE A -5

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FRANCISCO ELIAS ESQUER PARK IMPROVEMENTS
TUCSON, ARIZONA

DATE DRILLED 12/29/21 BORING NO. B-2

GROUND ELEVATION 2,346' ± (MSL) SHEET 3 OF 3

METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (GSI)

DRIVE WEIGHT 140 Lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY SDN

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40						SC	ALLUVIUM (Continued): Gray, moist, very dense, clayey SAND with gravel; weakly cemented.
		50/5"					
45							
		50/5"					
50							Total Depth = 49.4 feet. Groundwater not encountered during drilling. Backfilled on 12/29/21 shortly after completion of drilling. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
55							
60							

DATE DRILLED 10/28/21 BORING NO. B-3

GROUND ELEVATION 2,350' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING CME-75, 8" Diameter Hollow-Stem Auger (GSI)

DRIVE WEIGHT 140 Lbs. (Automatic) DROP 30"

SAMPLED BY DM LOGGED BY DM REVIEWED BY SDN

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0		46	6.9	101.4		SC	ALLUVIUM: Brown, dry, dense, clayey SAND with gravel; scattered caliche nodules.
		34					Very dense.
5							Total Depth = 5 feet. Groundwater not encountered during drilling. Backfilled on 10/28/21 shortly after completion of drilling. Notes: Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report. The ground elevation shown above is an estimation only. It is based on our interpretations of published maps and other documents reviewed for the purposes of this evaluation. It is not sufficiently accurate for preparing construction bids and design documents.
10							
15							
20							

FIGURE A -7

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FRANCISCO ELIAS ESQUER PARK IMPROVEMENTS
TUCSON, ARIZONA

APPENDIX B

Laboratory Testing

APPENDIX B

LABORATORY TESTING

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the logs of the exploratory borings in Appendix A.

In-Place Moisture and Density Tests

The moisture content and dry density of relatively undisturbed samples obtained from the exploratory borings were evaluated in general accordance with ASTM D 2937. The test results are presented on the logs of the exploratory borings in Appendix A.

Gradation Analysis

Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422. The grain-size distribution curves are shown on Figures B-1 through B-7. These test results were utilized in evaluating the soil classifications in accordance with the USCS.

Atterberg Limits

Tests were performed on selected representative fine-grained soil samples to evaluate the liquid limit, plastic limit, and plasticity index in general accordance with ASTM D 4318. These test results were utilized to evaluate the soil classification in accordance with the USCS. The test results and classifications are shown on Figure B-8.

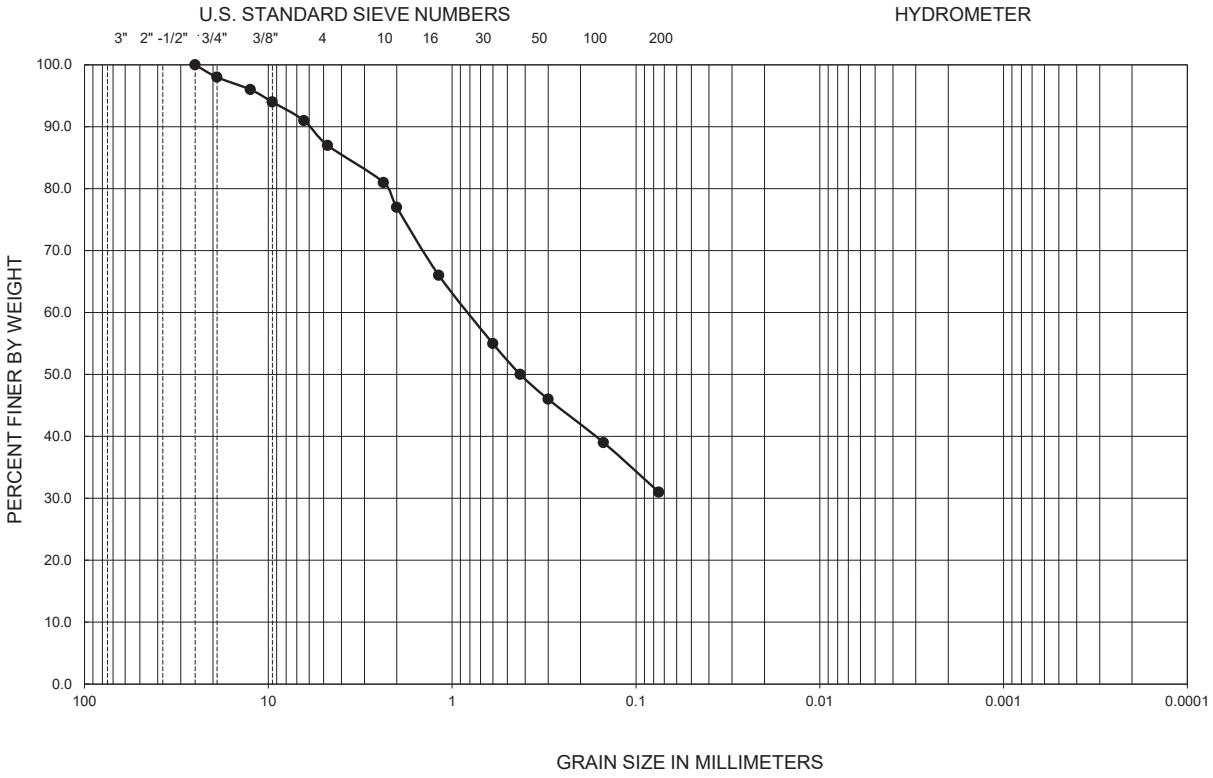
Consolidation Test

Consolidation test was performed on a selected relatively undisturbed soil sample in general accordance with ASTM D 2435. The sample was inundated during testing to represent adverse field conditions. The percent of consolidation for each load cycle was recorded as a ratio of the amount of vertical compression to the original height of the sample. The results of the test are summarized on Figure B-9.

Soil Corrosivity Tests

Soil pH, and resistivity tests were performed on representative samples in general accordance with Arizona Test Method 236c. The soluble sulfate and chloride content of the samples were evaluated in general accordance with Arizona Test Method 733 and Arizona Test Method 736, respectively. The test results are presented on Figure B-10.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-1	0.0-5.0	32	24	8	--	--	0.81	--	--	31.0	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM C136 / D422

FIGURE B-1

GRADATION TEST RESULTS

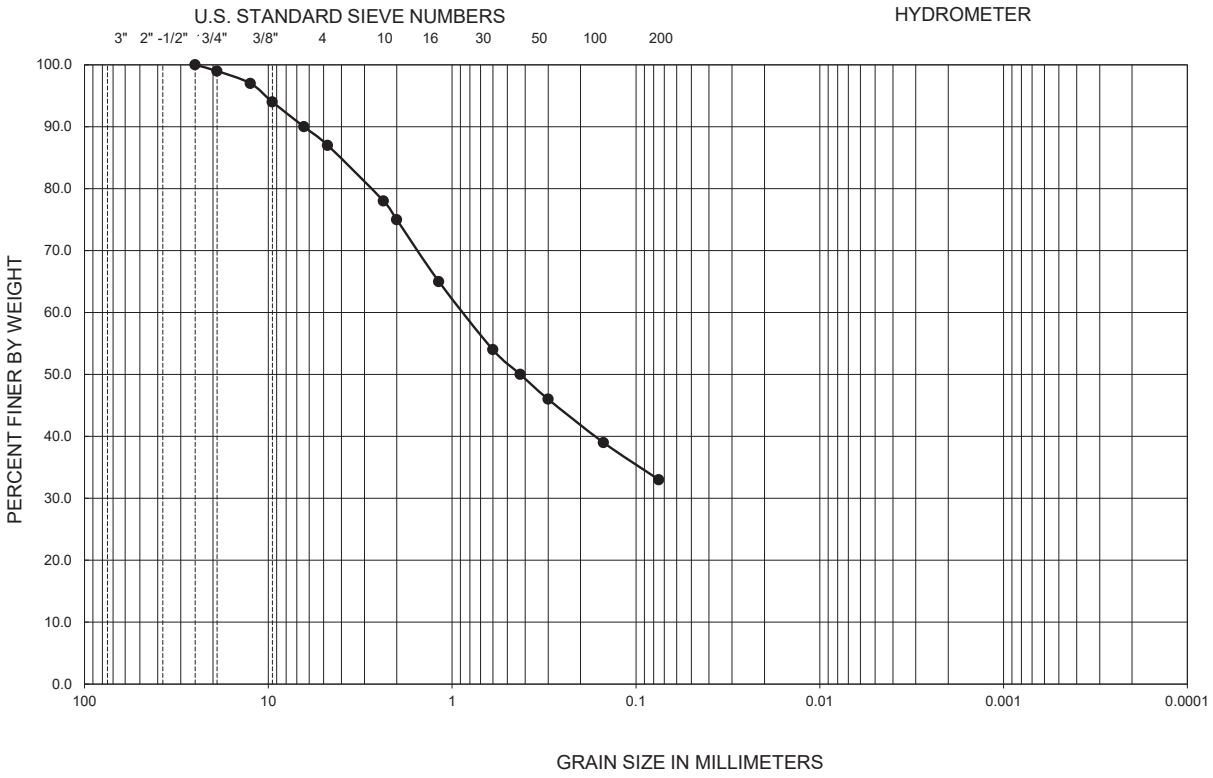
FANCISCO ELIAS ESQUER PARK IMPROVEMENTS

TUCSON, ARIZONA

Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-1	20.0-25.0	31	11	20	--	--	0.86	--	--	33.0	SC

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FIGURE B-2

GRADATION TEST RESULTS

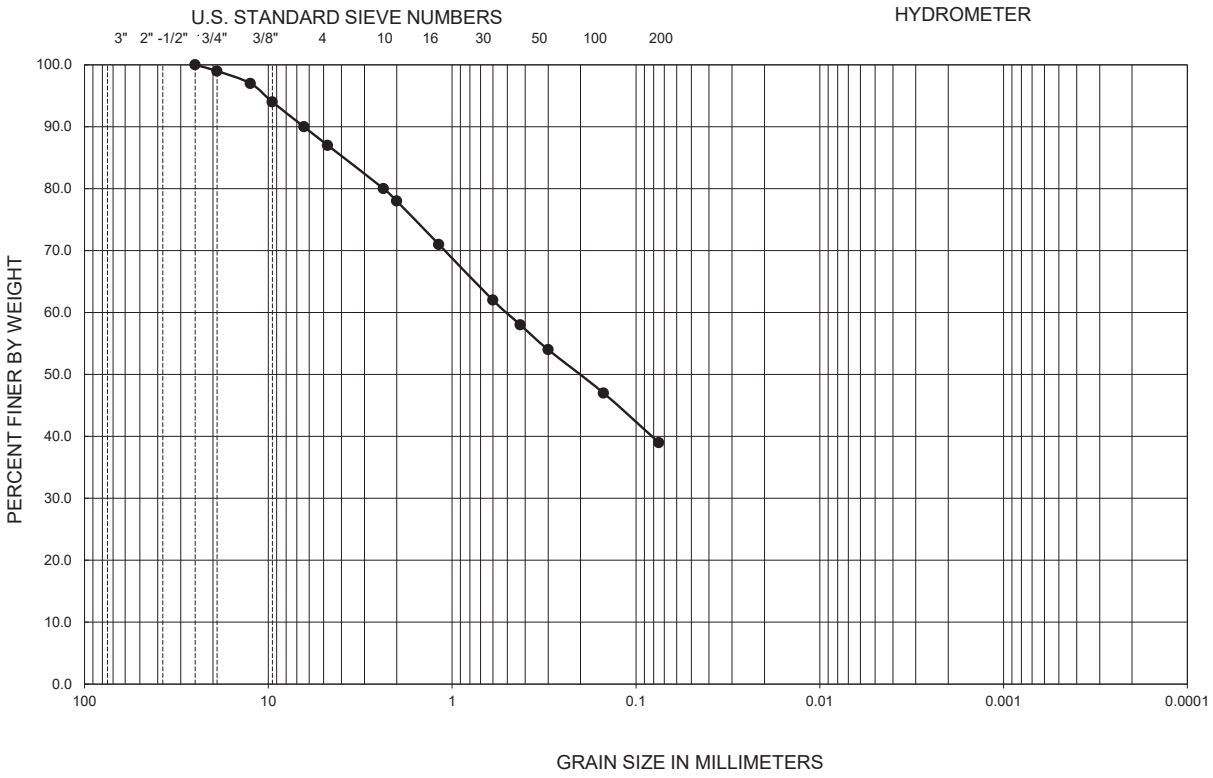
FRANCISCO ELIAS PARK DEVELOPMENT

TUCSON, ARIZONA

Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-1	35.0-40.0	43	14	29	--	--	0.50	--	--	39.0	SC

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FIGURE B-3

GRADATION TEST RESULTS

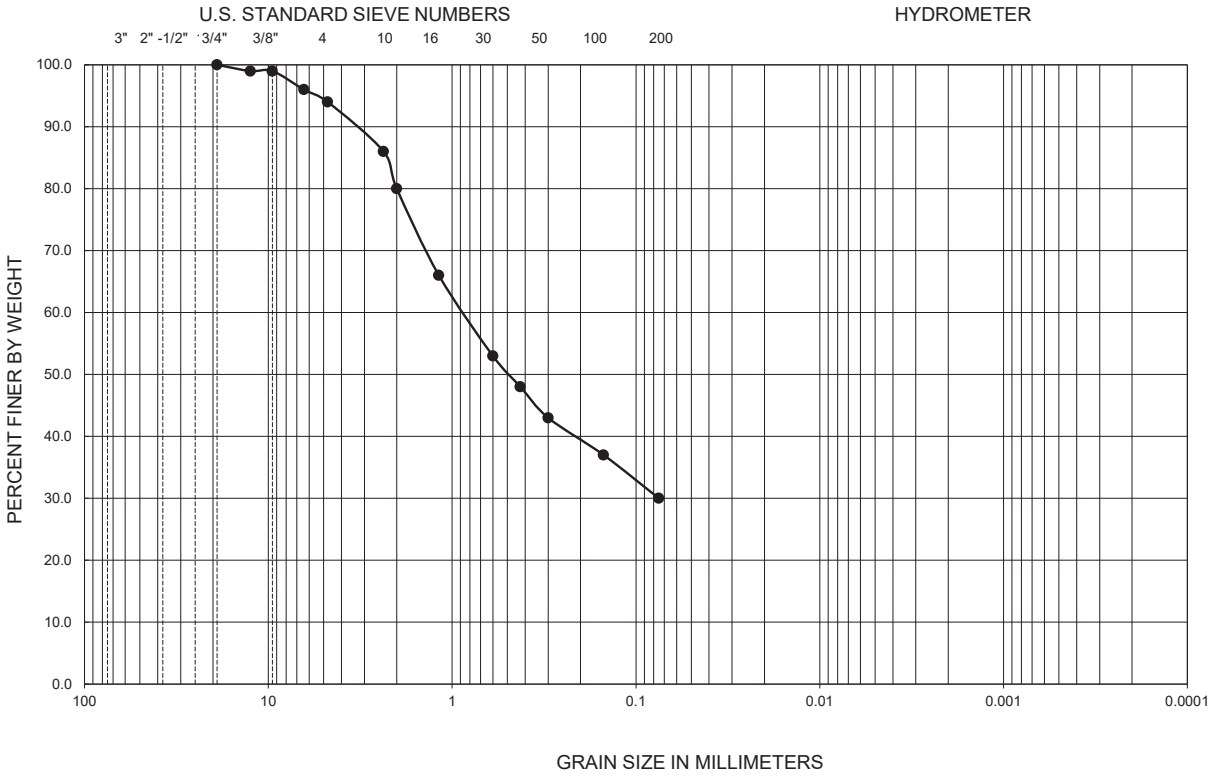
FRANCISCO ELIAS PARK DEVELOPMENT

TUCSON, ARIZONA

Ninyo & Moore

Geotechnical & Environmental Sciences Consultants

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-2	0.0-5.0	27	20	7	--	0.074	0.86	--	--	30.0	SC-SM

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FIGURE B-4

GRADATION TEST RESULTS

FANCISCO ELIAS ESQUER PARK IMPROVEMENTS

TUCSON, ARIZONA

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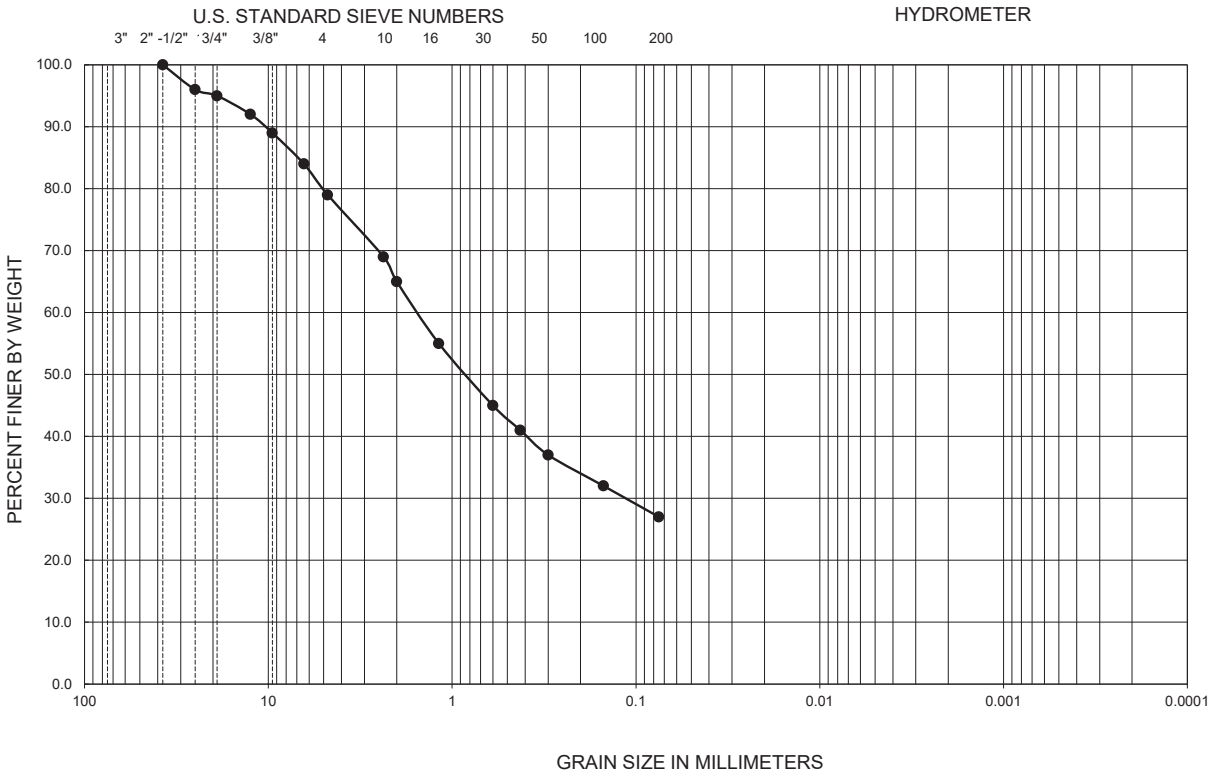
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-2	30.0-35.0	35	19	16	--	0.113	1.55	--	--	27.0	SC

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FIGURE B-5

GRADATION TEST RESULTS

FRANCISCO ELIAS PARK DEVELOPMENT

TUCSON, ARIZONA

Ninyo & Moore

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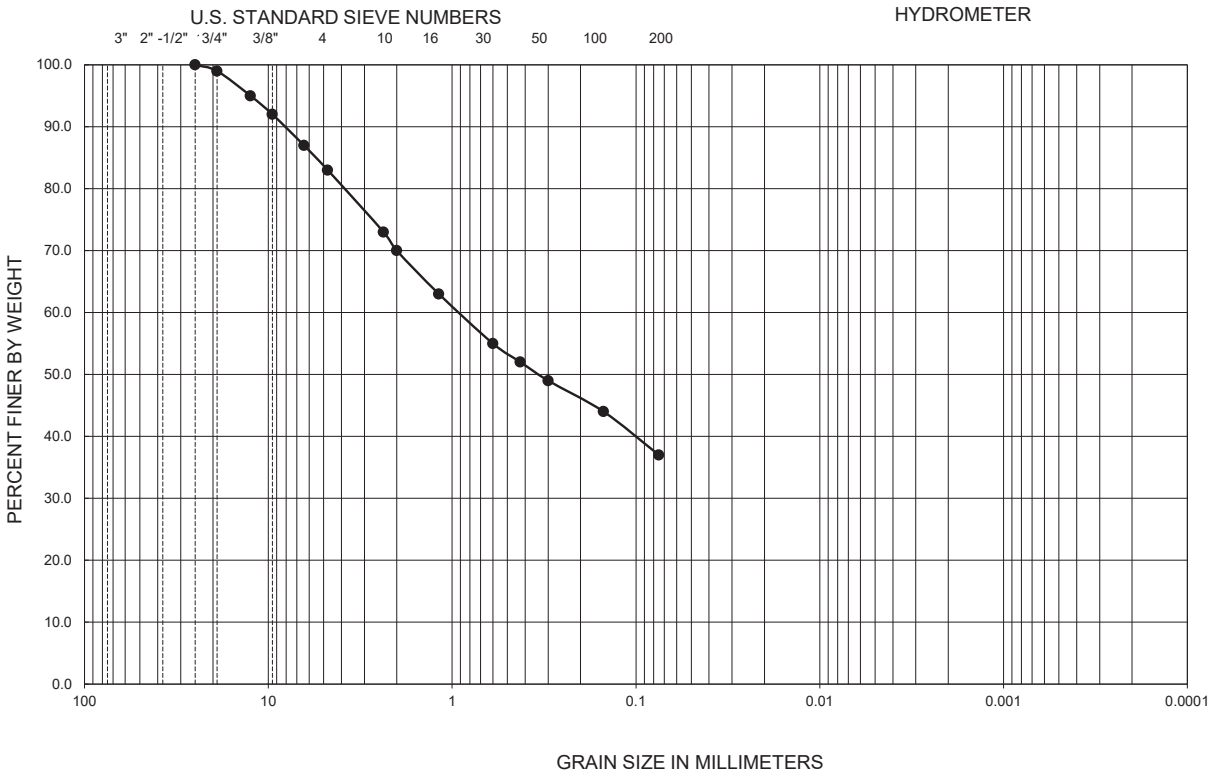
GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-2	40.0-45.0	44	14	30	--	--	0.91	--	--	37.0	SC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM C136 / D422

FIGURE B-6

GRADATION TEST RESULTS

FRANCISCO ELIAS PARK DEVELOPMENT

TUCSON, ARIZONA

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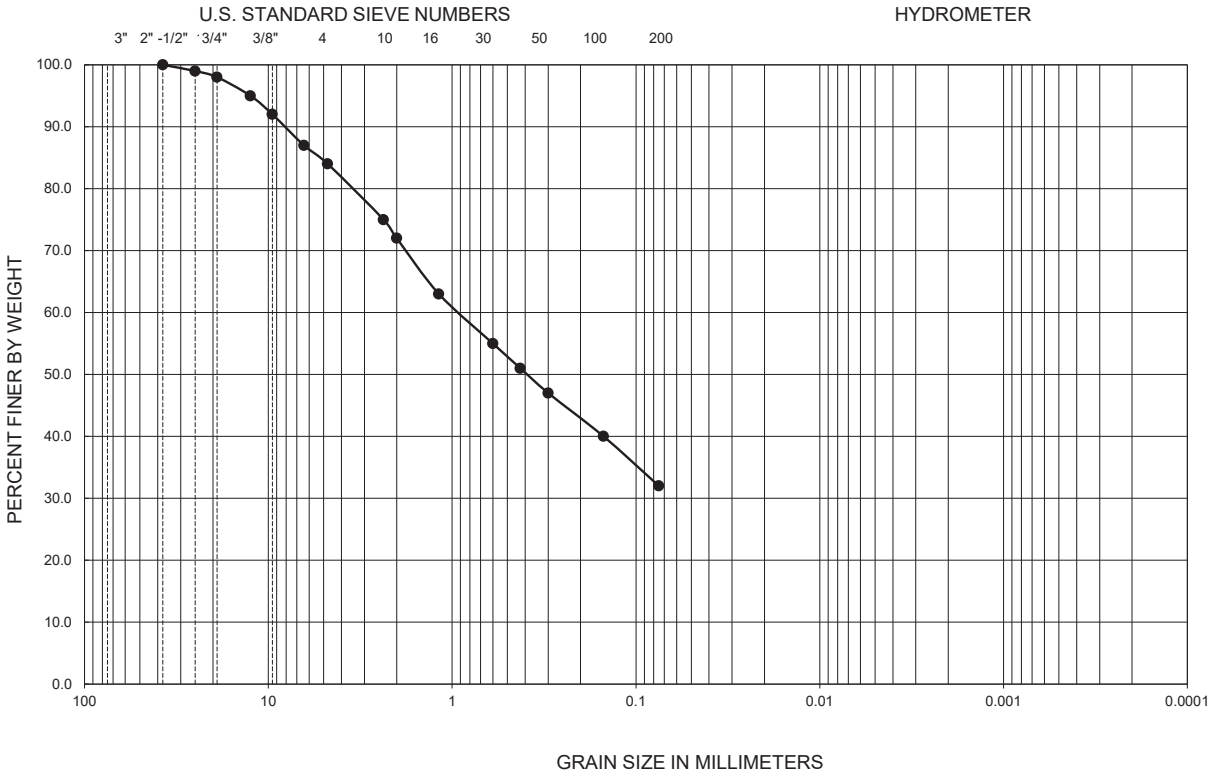
Geotechnical & Environmental Sciences Consultants

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (percent)	USCS
●	B-3	0.0-5.0	35	22	13	--	--	0.91	--	--	32.0	SC

PERFORMED IN GENERAL ACCORDANCE WITH ASTM C136 / D422

FIGURE B-7

GRADATION TEST RESULTS

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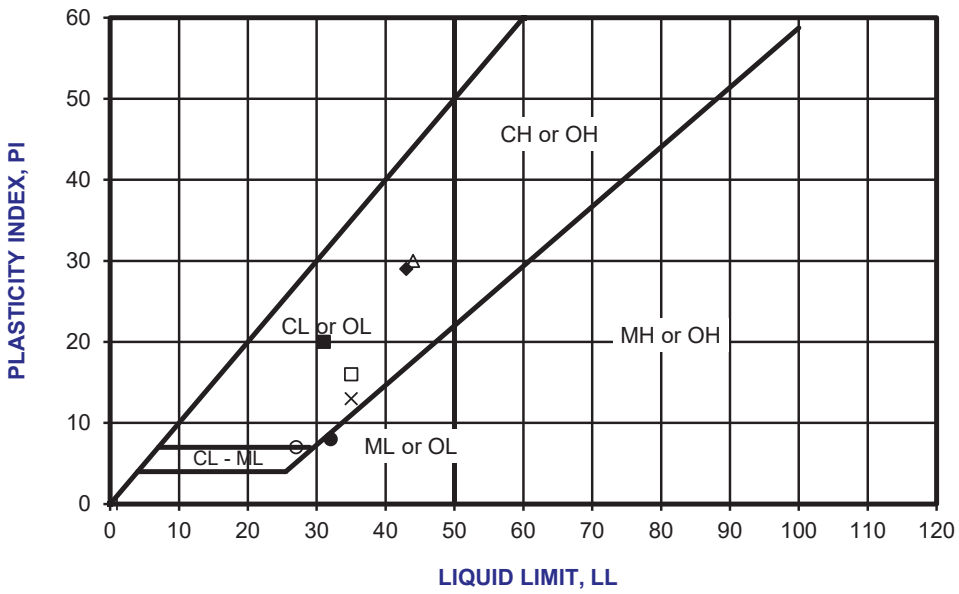
SYMBOL	LOCATION	DEPTH (ft)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	USCS CLASSIFICATION (Fraction Finer Than No. 40 Sieve)	USCS
●	B-1	0.0-5.0	32	24	8	ML	SM
■	B-1	20.0-25.0	31	11	20	CL	SC
◆	B-1	35.0-40.0	43	14	29	CL	SC
○	B-2	0.0-5.0	27	20	7	CL-ML	SC-SM
□	B-2	30.0-35.0	35	19	16	CL	SC
△	B-2	40.0-45.0	44	14	30	CL	SC
X	B-3	0.0-5.0	35	22	13	CL	SC



PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 4318

FIGURE B-8

ATTERBERG LIMITS TEST RESULTS

FRANCISCO ELIAS PARK DEVELOPMENT

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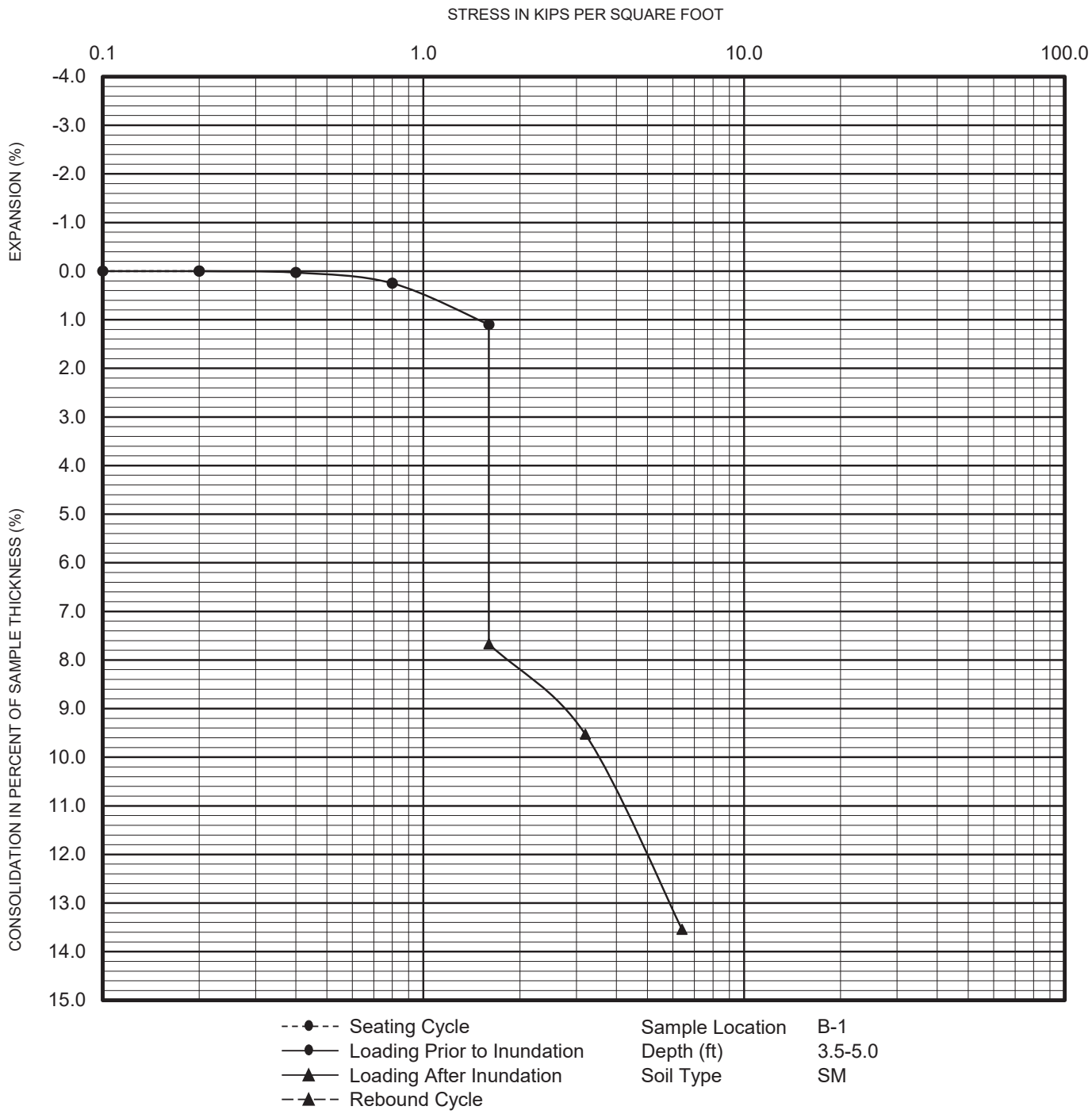

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2435

FIGURE B-9

CONSOLIDATION TEST RESULTS

FANCISCO ELIAS ESQUER PARK IMPROVEMENTS

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SAMPLE LOCATION	SAMPLE DEPTH (ft)	pH [1]	RESISTIVITY [1] (Ohm-cm)	SULFATE CONTENT [2] (ppm)	(%)	CHLORIDE CONTENT [3] (ppm)
B-1	0.0-5.0	6.9	870	50	0.005	53

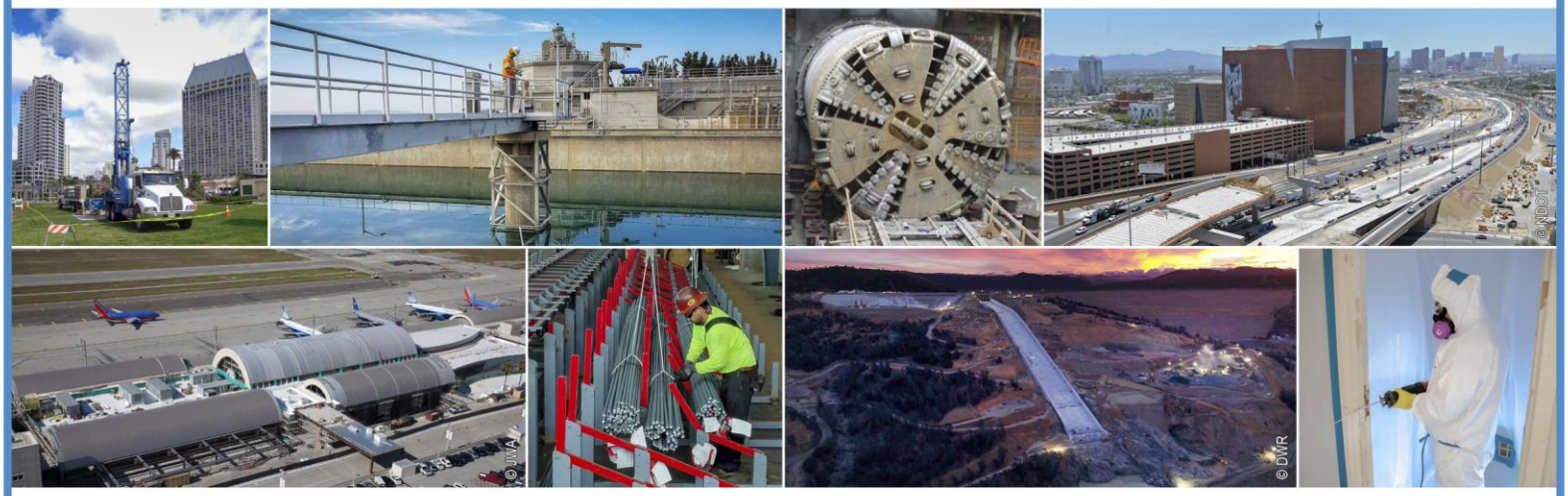
[1] PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 236c
[2] PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 733
[3] PERFORMED IN GENERAL ACCORDANCE WITH ARIZONA TEST METHOD 736

FIGURE B-10

CORROSIVITY TEST RESULTS

FANCISCO ELIAS ESQUER PARK IMPROVEMENTS

TUCSON, ARIZONA



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