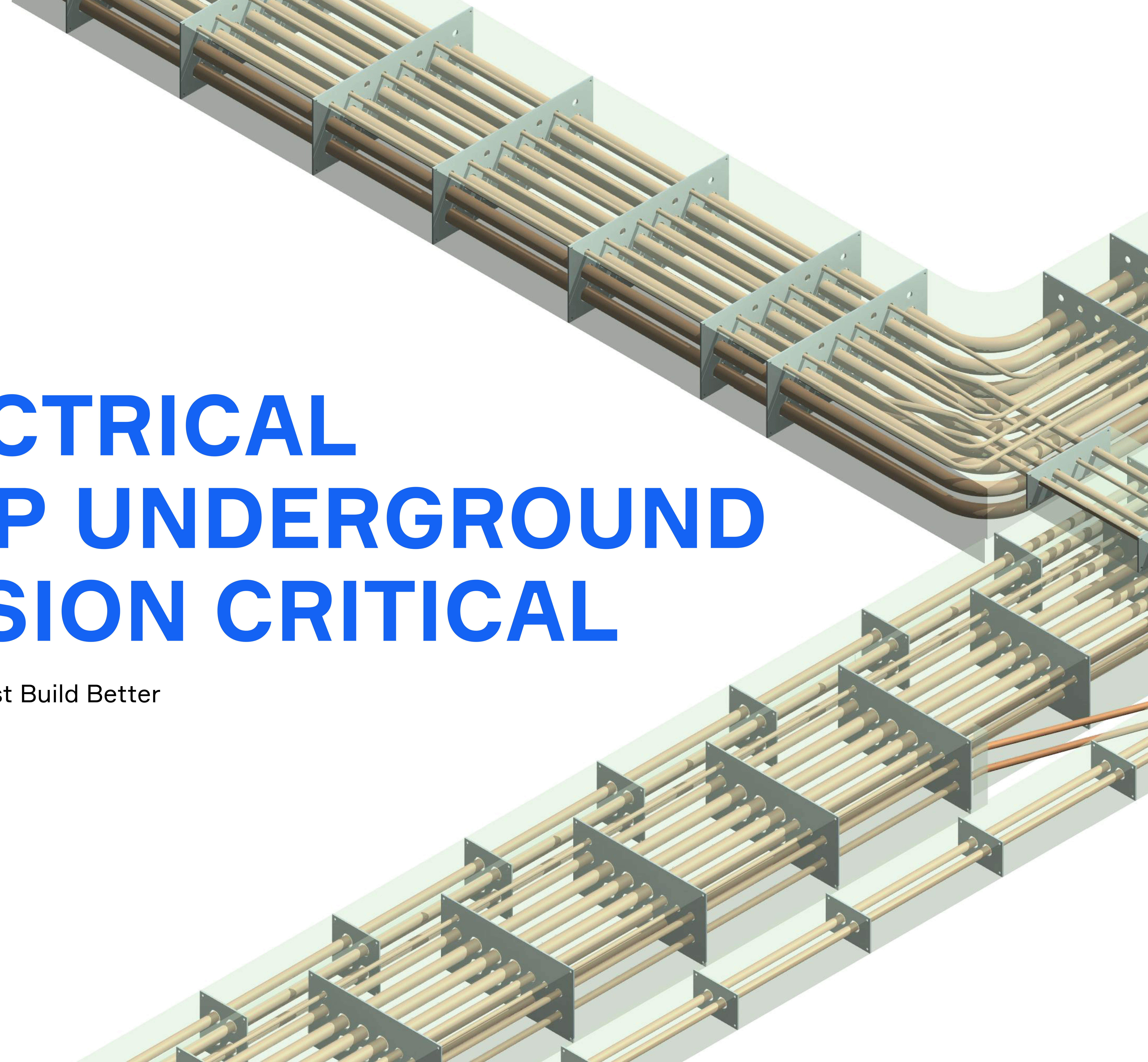




ELECTRICAL DEEP UNDERGROUND MISSION CRITICAL

Helping the Best Build Better

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BUILDING 01 - AREA C



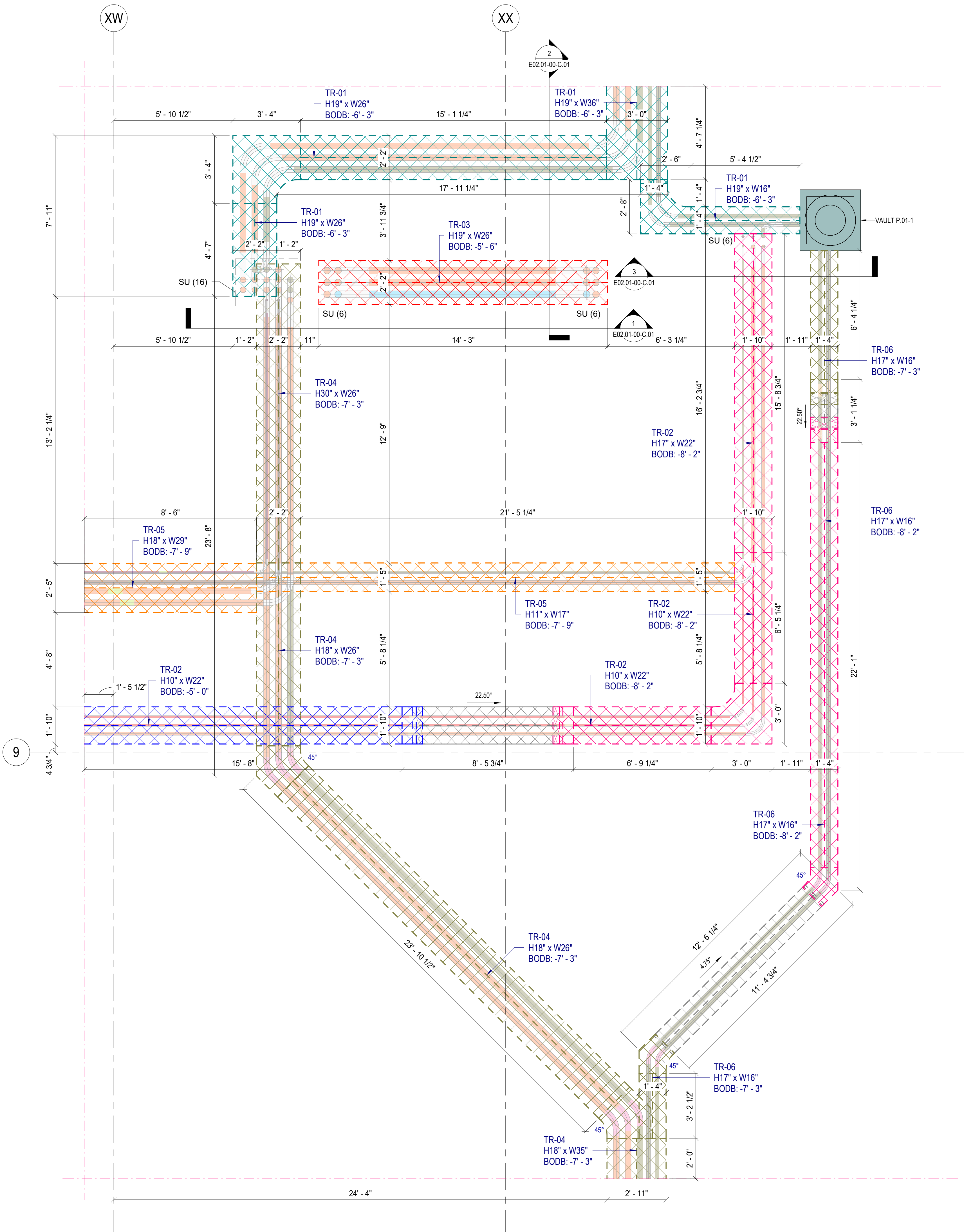
VIRTUAL ENGINEERING AND CONSTRUCTION

201 Spear St. Suite 1750
San Francisco, CA, 94105
hello@vec-us.com
+1 (415) 888-1832

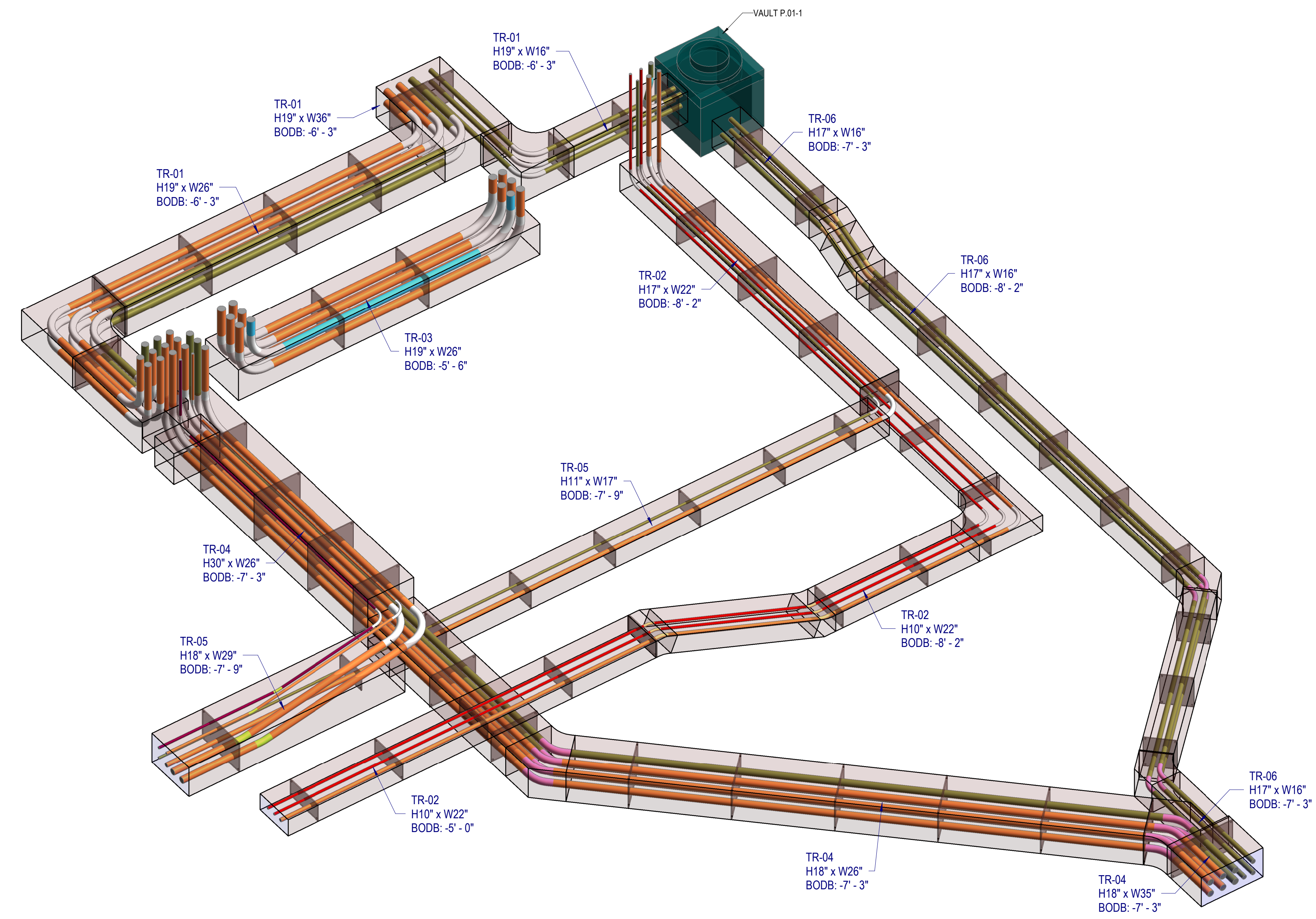
CONSULTANTS

STAMP

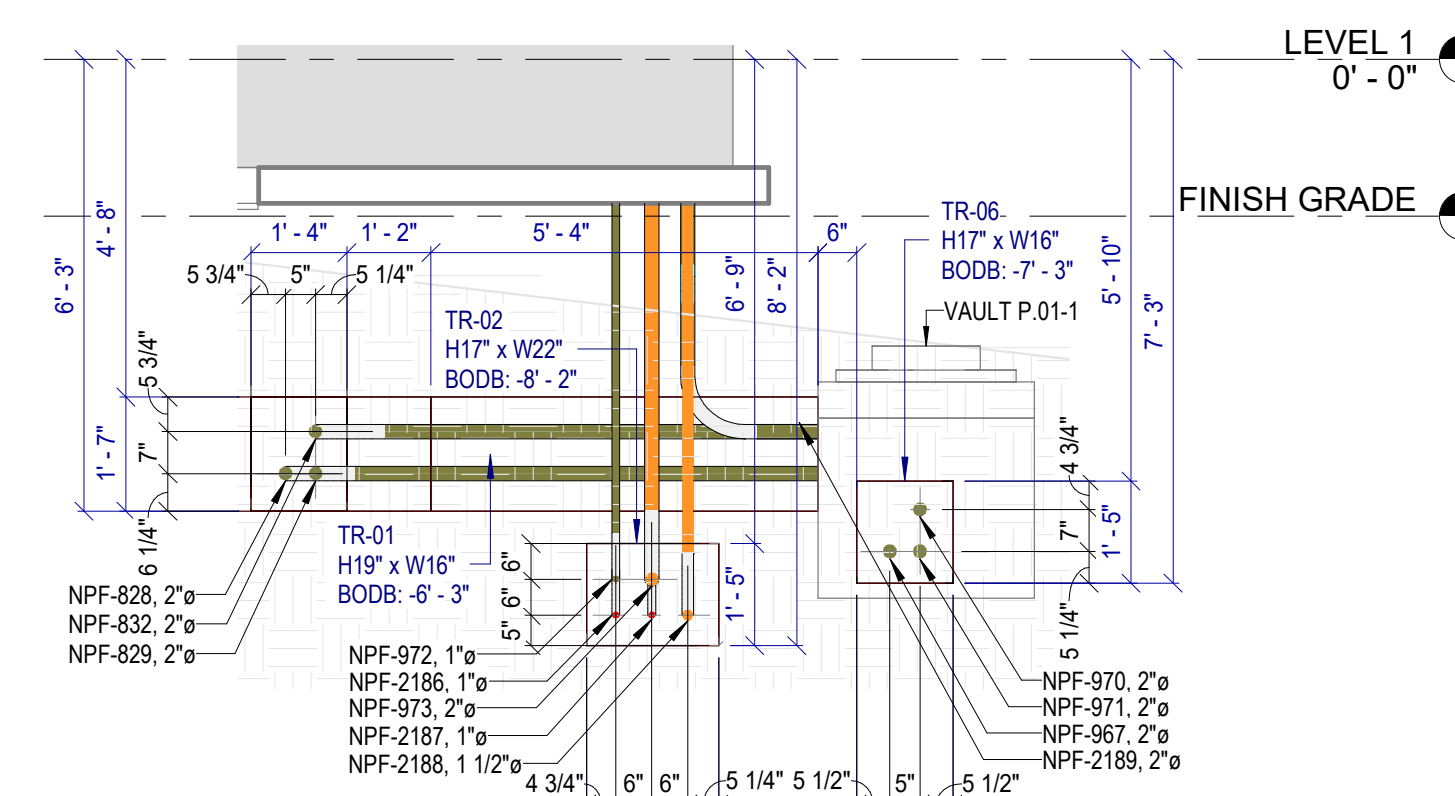
KEY PLAN



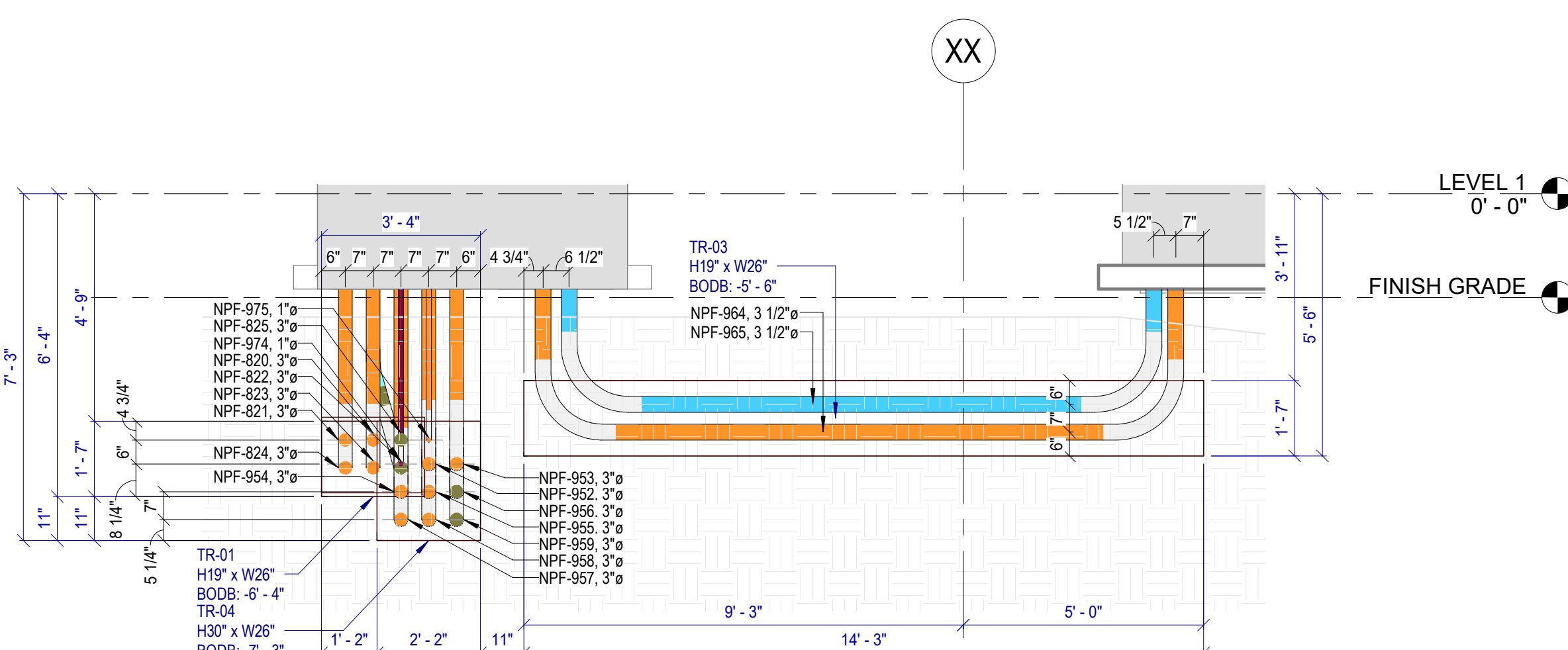
② UNDERGROUND LAYOUT - BUILDING 01 - AREA C
3/8" = 1'-0"



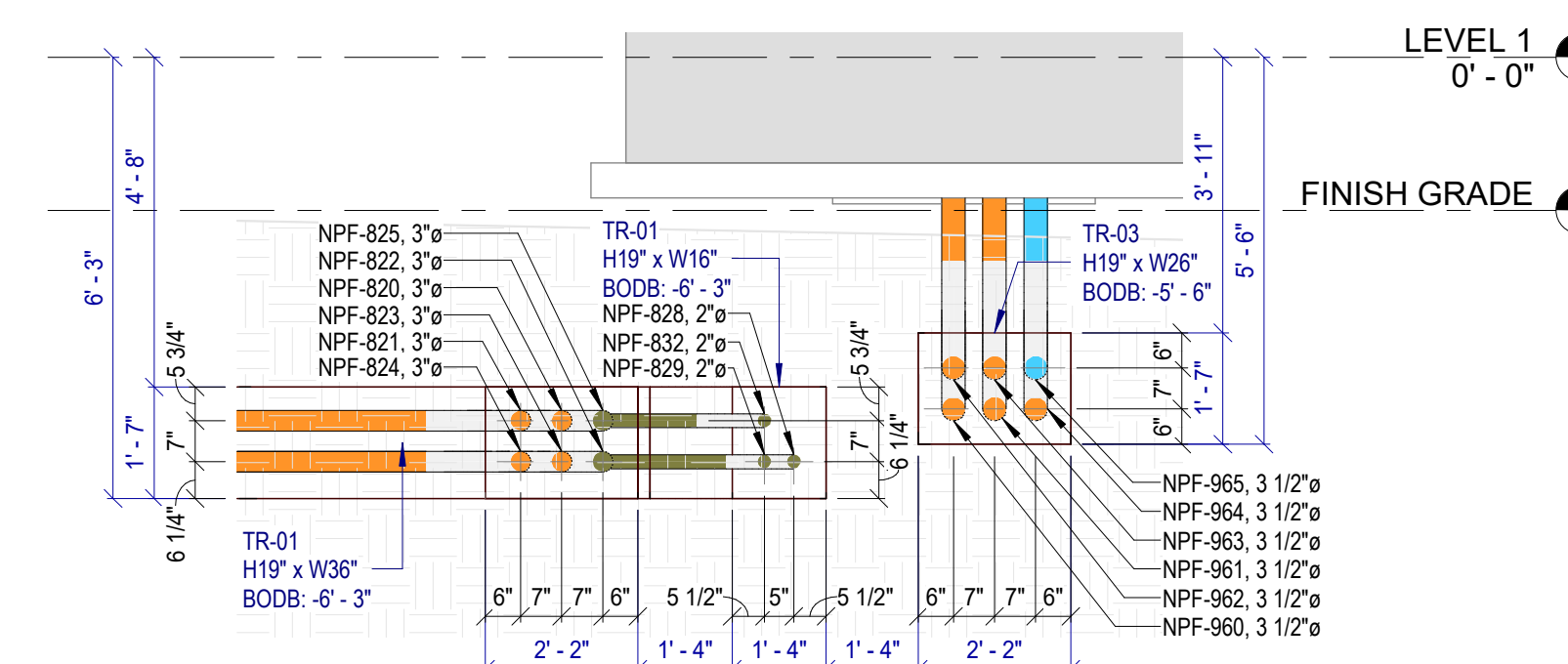
③ 3D - UNDERGROUND LAYOUT - BUILDING 01 - AREA C



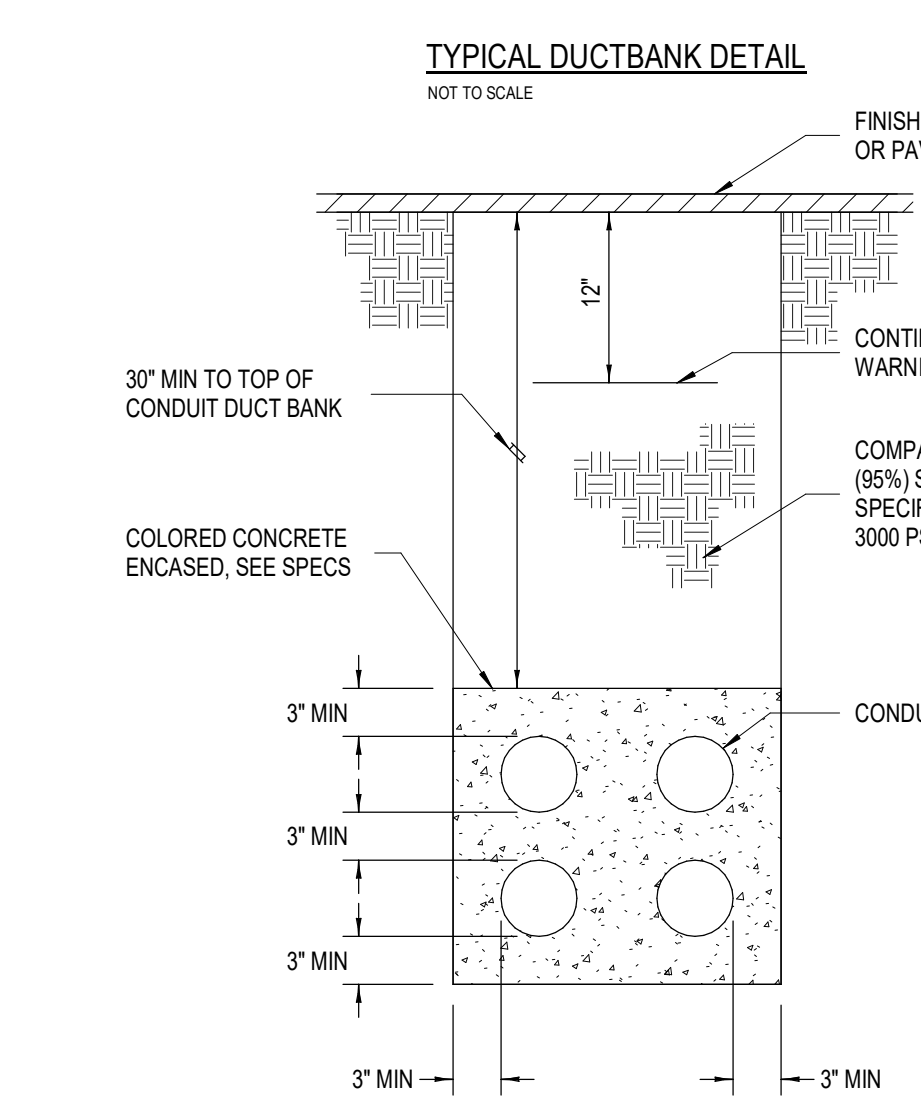
③ UNDERGROUND LAYOUT - BLD 01 - AREA C - SECTION 3
3/8" = 1'-0"



① UNDERGROUND LAYOUT - BLD 01 - AREA C - SECTION 1
3/8" = 1'-0"



② UNDERGROUND LAYOUT - BLD 01 - AREA C - SECTION 2
3/8" = 1'-0"

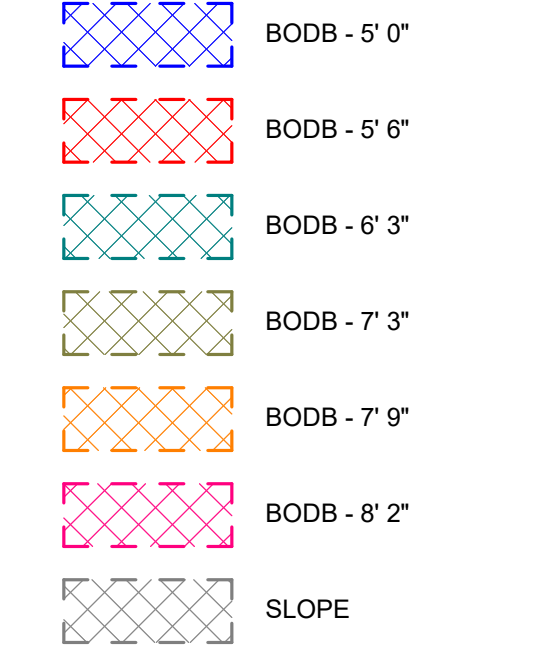


DUCT BANK ID	ROUGH CUBIC FT.
TR-01	970.99 SF
TR-02	531.32 SF
TR-03	108.98 SF
TR-04	481.08 SF
TR-05	414.19 SF
TR-06	232.20 SF

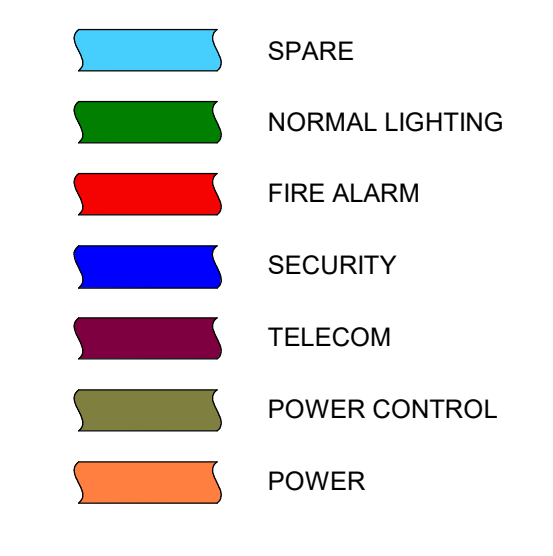
BEND TYPE	SIZE	BEND ANGLE	COUNT
PVC	1 1/2" x 1 1/2"	22.50°	2
PVC	1 1/2" x 1 1/2"	90.00°	2
PVC	1" x 1"	22.50°	5
PVC	1" x 1"	90.00°	10
PVC	2" x 2"	15.00°	1
PVC	2" x 2"	22.50°	6
PVC	2" x 2"	45.00°	6
PVC	2" x 2"	90.00°	6
PVC	3 1/2" x 3 1/2"	90.00°	13
PVC	3" x 3"	15.64°	1
PVC	3" x 3"	45.00°	12
PVC	3" x 3"	90.00°	28

CONDUIT TYPE	SIZE	LENGTH (EXCLUDING BENDS)
PVC	1 1/2"	104'-8"
PVC	1"	402'-2"
PVC	2"	638'-0"
PVC	3 1/2"	78'-7"
PVC	3"	1111'-4"

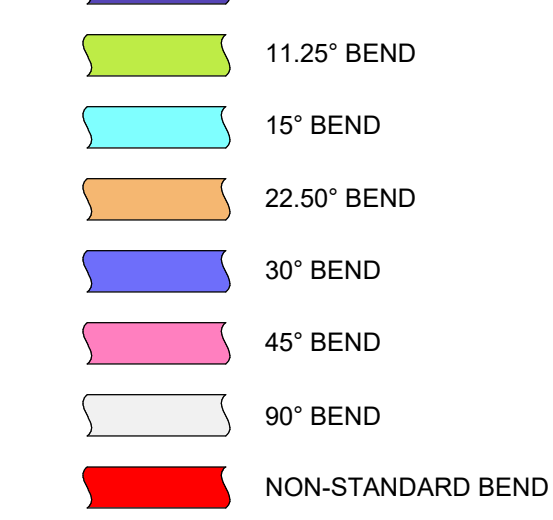
BOTTOM OF DUCT BANK COLOR LEGEND



CONDUIT COLOR LEGEND BY SYSTEM



CONDUIT BEND COLOR LEGEND



ABBREVIATION	DESCRIPTION
BOC	BOTTOM OF CONDUIT
BOB	BOTTOM OF DUCT BANK
FFL	FINISHED FLOOR LEVEL
H	HEIGHT OF DUCT BANK
W	WIDTH OF DUCT BANK

GENERAL NOTES:
 1. ALL DIMENSIONS ARE IN FEET-INCHES.
 2. ALL ELEVATION IN PLAN AND SECTION VIEWS ARE TAKEN FROM FFL.
 3. DISTANCE FROM THE EDGE OF CONDUIT TO THE EDGE OF THE DUCT BANK 3' MIN.

NO.	DESCRIPTION	ISSUE FOR REVIEW	DRW	CHK	DATE

SHEET SIZE: 36"x48"

PROJECT NO.:

SCALE: As indicated

CLIENT NAME:

PROJECT NAME:

PROJECT ADDRESS:

SHEET NAME:

UNDERGROUND LAYOUT - BUILDING 01 - AREA C

SHEET NUMBER:

E02.01-00-C.01

UG DUCTBANK LAYOUT



201 Spear Street, Suite 1750
San Francisco, CA 94105

DATE	DESCRIPTION	ISSUED FOR CONSTRUCTION
06/22/23		

BIM COORDINATOR APPROVAL STAMP:

FIELD APPROVAL STAMP:

LEGEND:

LEGEND

DUCT BANK
DUCT BANK WITH SLOPE

CONDUIT AND BOX COLOR

LEGEND BY SYSTEM

- █ = POWER
- █ = LIGHTING
- █ = FIRE ALARM
- █ = SECURITY
- █ = TEMP POWER
- █ = GROUNDING
- █ = TELECOM
- █ = RADIO REPEATER
- █ = COMMUNICATION CONTROL

CONDUIT BEND

COLOR LEGEND

- █ 9-10° BEND (UNDERGROUND ONLY)
- █ 11.25° BEND
- █ 15° BEND
- █ 22.50° BEND
- █ 30° BEND
- █ 45° BEND
- █ NON-STANDARD BEND

GENERAL NOTES:

- ALL DIMENSIONS ARE IN FEET-INCHES.
- ALL ELEVATIONS IN PLAN AND SECTION VIEW ARE FROM FFL (SEA LEVEL).
- GRIDS V.1-V.12 ARE USED ONLY FOR DUCT BANKS PLACING AND MUST BE PLACED MANUALLY.
- LOCATION OF VAULTS TO BE FIELD COORDINATE.
- TYP. 3" DISTANCE FROM OUTER EDGE OF REBAR REINFORCEMENT TO EDGE OF THE DUCT BANK PER EM1153.
- ANY DUCTBANK FROM BUILDING TO MANHOLE = START SLOPE 20' FROM MANHOLE 1/4" EVERY 10'

SHEET NOTES:

- CONDUITS CC-009FP910-FB1 AND CC-009FACU-FB2 WERE MOVED FROM DUCT BANK BA/BC/BE TO DUCT BANK BA.1 REFER TO SECTION 8
- PER RFI 1644, FOR DUCTBANKS CROSSING BELOW PILE SUPPORTED SLABS, EXPANSION JOINT LOCATIONS SHALL BE FIELD COORDINATED TO BE INSTALLED BETWEEN HANGAR SUPPORTS TO ACCOMMODATE CONDUIT BENDS AND FITTINGS

ABBREVIATION

B.O.C.	BOTTOM OF CONDUIT
B.O.D.B.	BOTTOM OF DUCT BANK
F.F.L.	FINISHED FLOOR LEVEL
H.	HEIGHT OF DUCT BANK
W.	WIDTH OF DUCT BANK

REQUEST: CALCULATE CUBIC YARDS OF CONCRETE AND TONS OF SAND FOR A BACKFILL
SOLUTION: A BILL OF MATERIALS WITH A FULL BREAKDOWN

TRENCH SCHEDULE

Mark	Volume, CY	Area, SF	Width	Depth	Length
TR-1	69.63	470.0	40 1/2"	48"	139' - 2"
TR-2	82.57	405.3	26"	66"	187' - 1"

DUCT BANK SCHEDULE

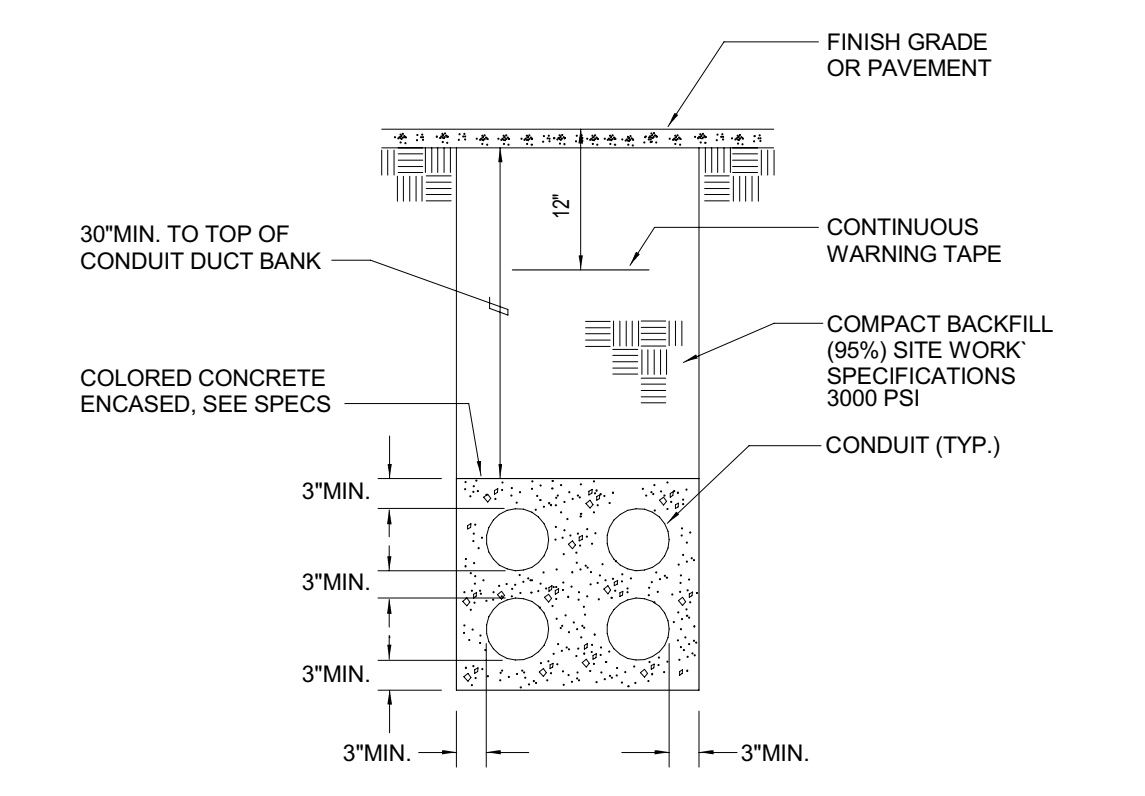
Mark	Duct Bank Volume, CY	Concrete Volume, CY	Width	Depth	Length	Bottom of Duct Bank
DB-1	34.81	27.67	40 1/2"	24"	139' - 2"	-4' - 0"
DB-2	26.50	21.79	26"	26"	188' - 8 3/4"	-5' - 6"

Concrete, CY 49.45

Total Backfill Space, CY 90.89

Dry Sand Backfill, CY 24.31

Dry Sand Backfill, Tons 32.82



2 TYPICAL DUCTBANK DETAIL
SCALE: NOT TO SCALE

NOTES FROM SPECIFICATIONS

2.1 MATERIALS

- Backfill materials will be subject to approval of the Engineer.
 - For approval of backfill material, notify the Geotechnical Engineer of Record at least 7 days in advance of intention to import material.
 - Consideration shall also be given to the environmental characteristics as well as the corrosion potential of backfill materials. Laboratory testing, including pH, sulfate, chlorides, and resistivity shall be reviewed. Backfill materials shall not be more corrosive than the native materials.
 - All imported materials, including pipe bedding shall have a pH between 6 and 8.
- a. Place minimum 3 inches of sand as a bed for duct. Place sand to a minimum of 6 inches above top level of duct.

ORIGINAL PRINT SIZE = 36x48

KEY PLAN:

JOB NUMBER: 0001

ISSUED FOR:

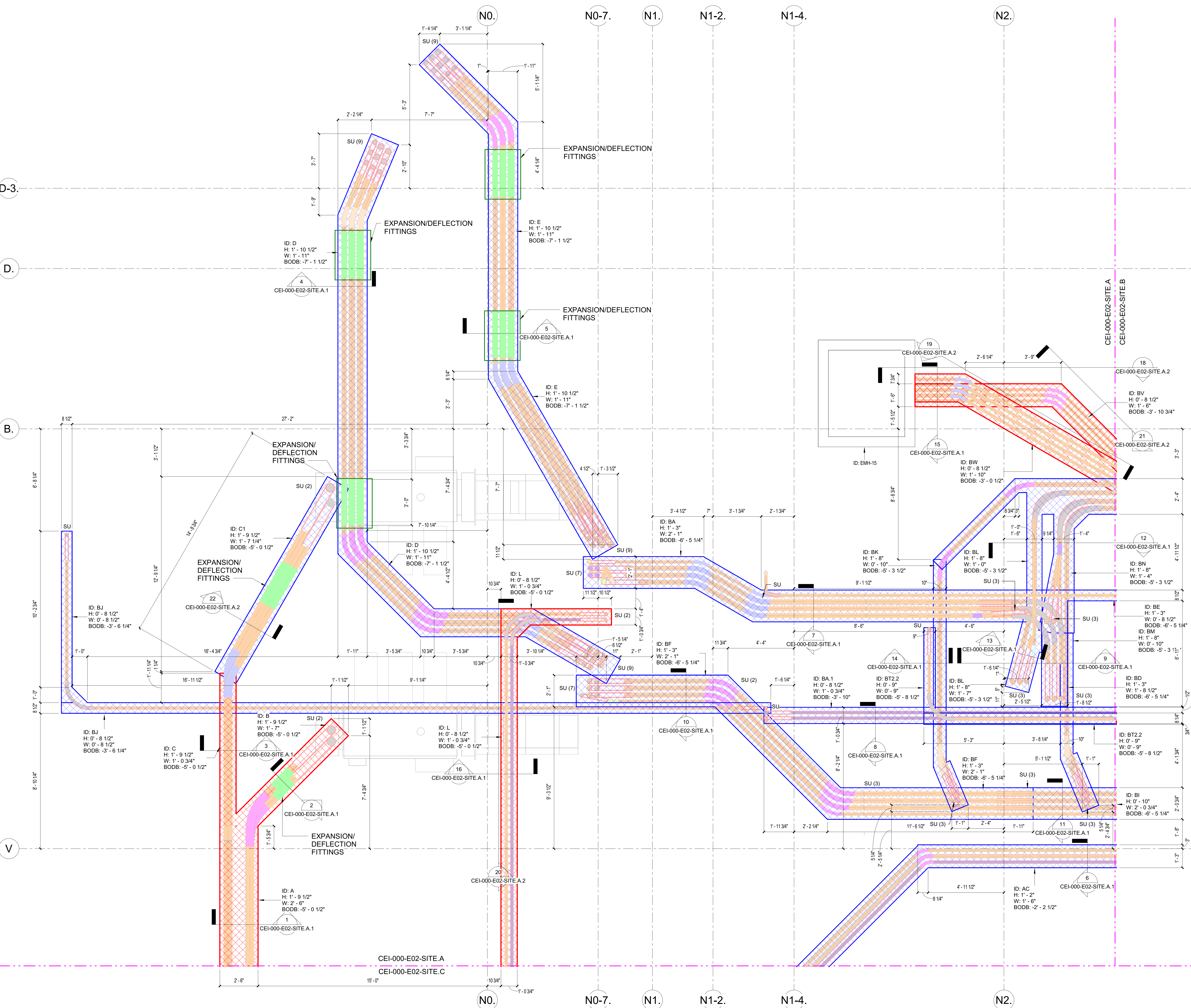
DATE: 5/23/2023 3:12:37 PM

DRAWN BY: Author CHECKED BY: Checker

DRAWING SCALE: As indicated

SHEET TITLE: UG DUCTBANK LAYOUT

DRAWING NUMBER: E02-00-01



1 DUCT BANK LAYOUT - SITE - AREA A
3/8" = 1'-0"

UG TRENCH CARD LAYOUT



201 Spear Street, Suite 1750
San Francisco, CA 94105

REVISION	DESCRIPTION	DATE
1	ISSUED FOR CONSTRUCTION	06/22/23

BIM COORDINATOR APPROVAL STAMP:

FIELD APPROVAL STAMP:

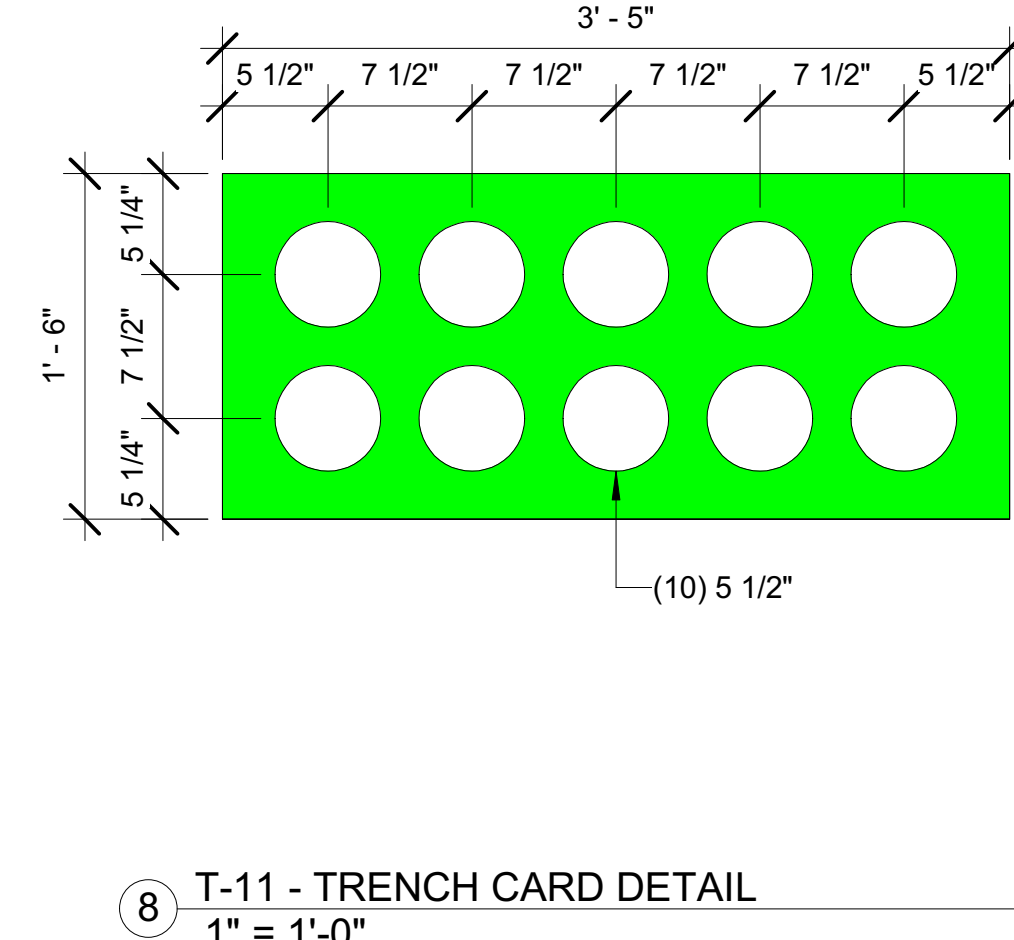
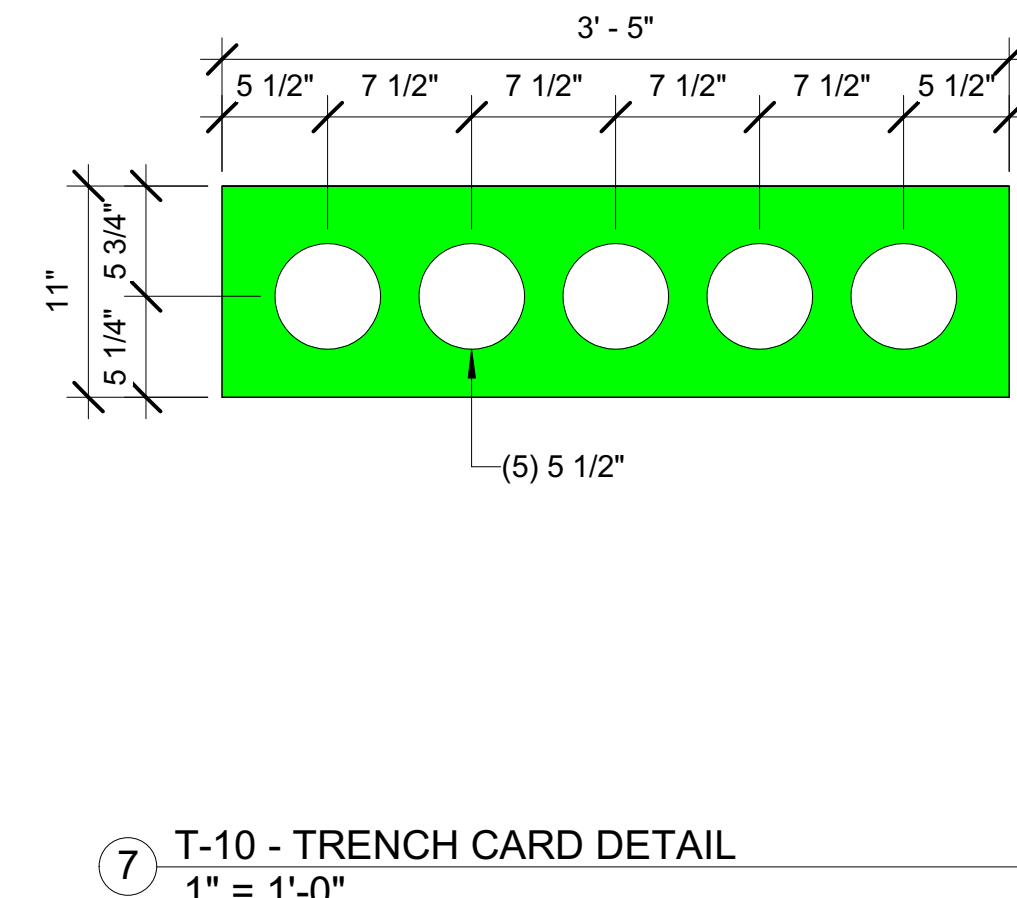
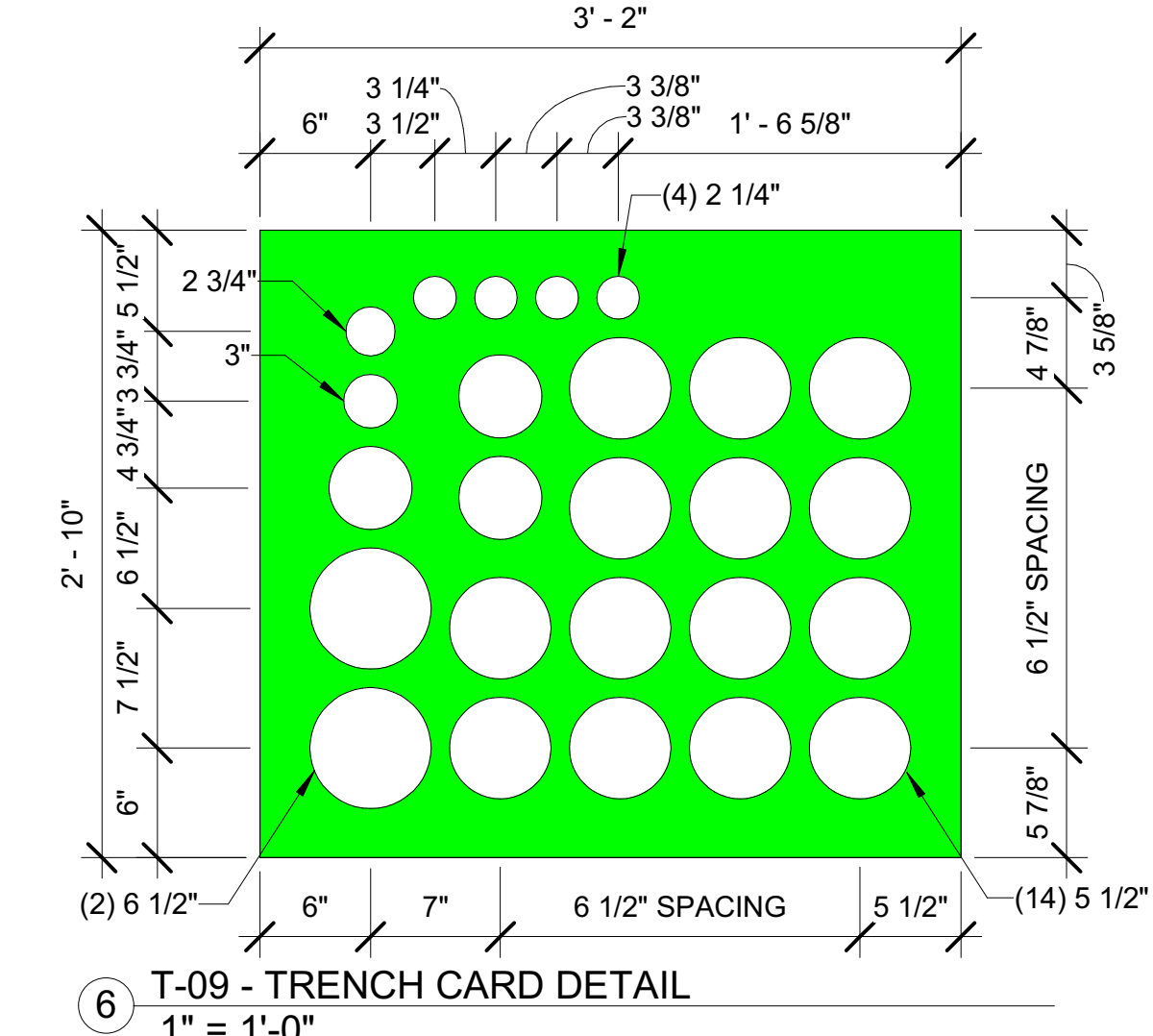
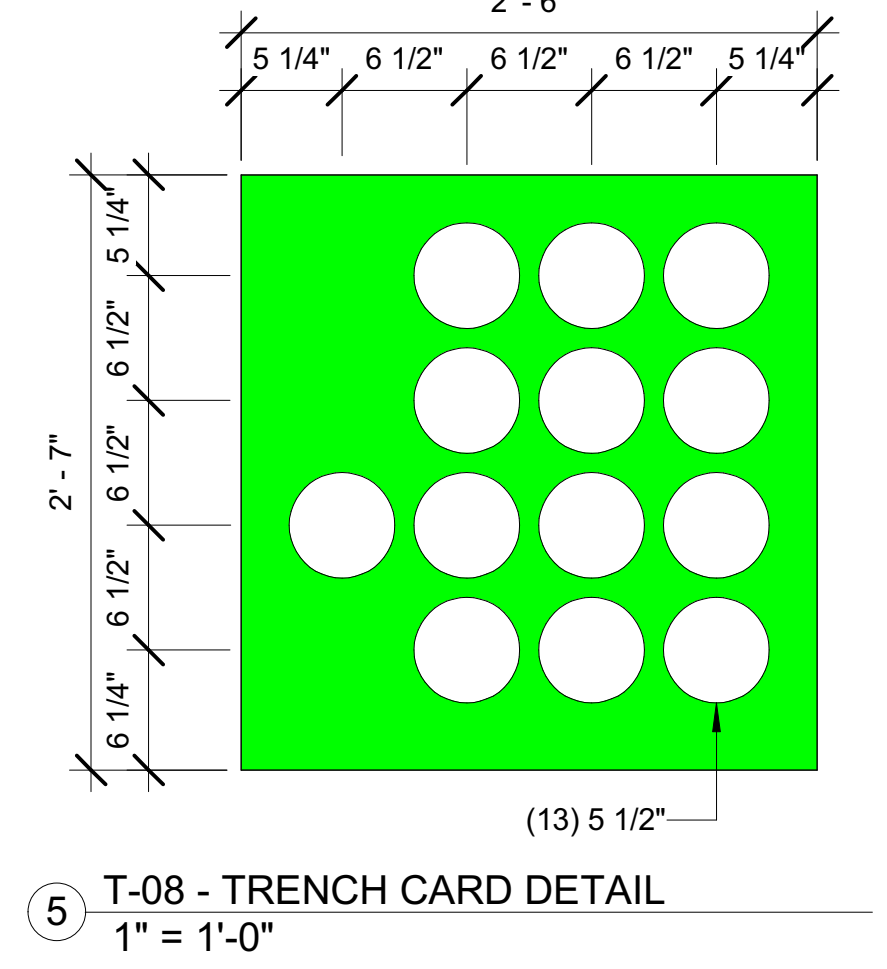
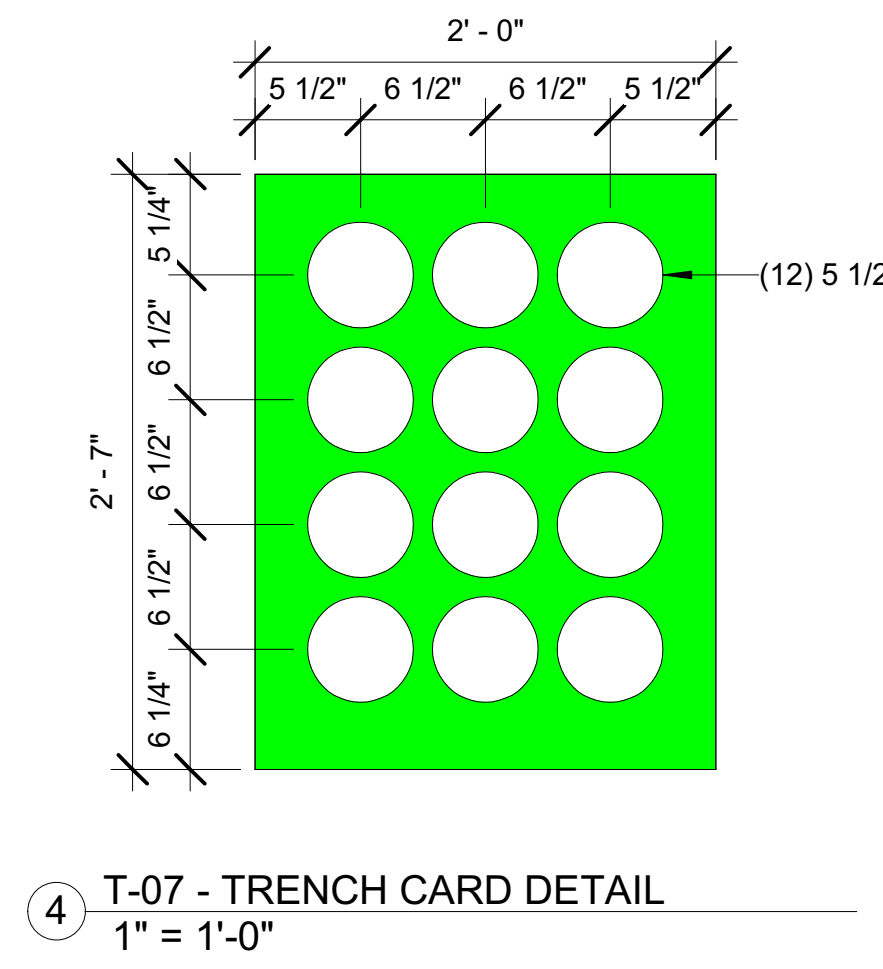
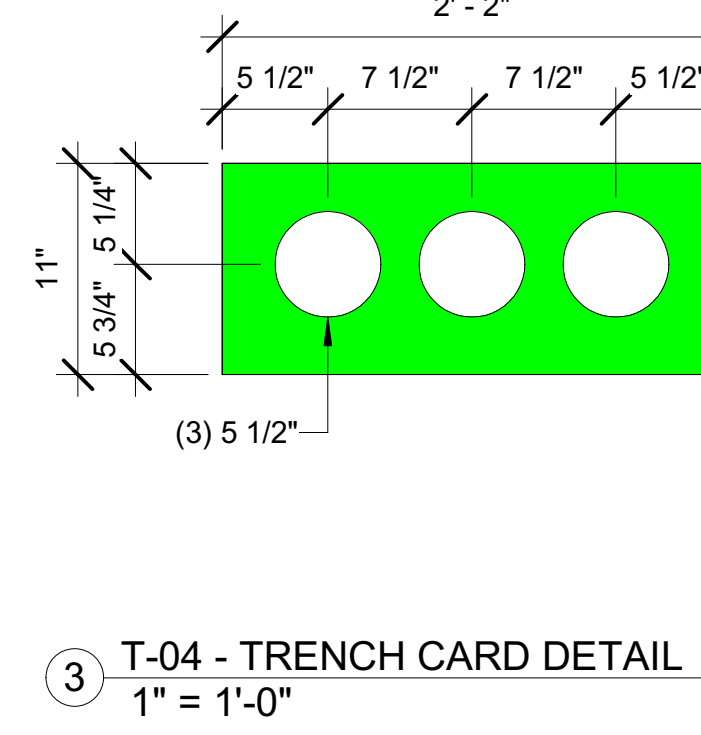
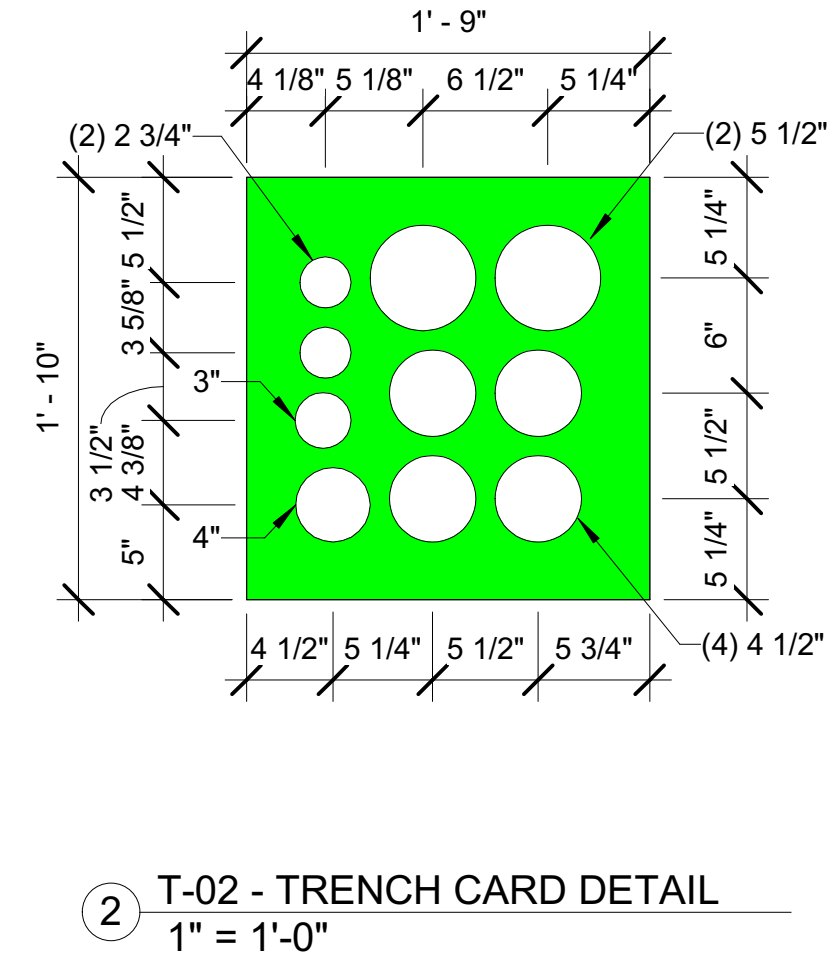
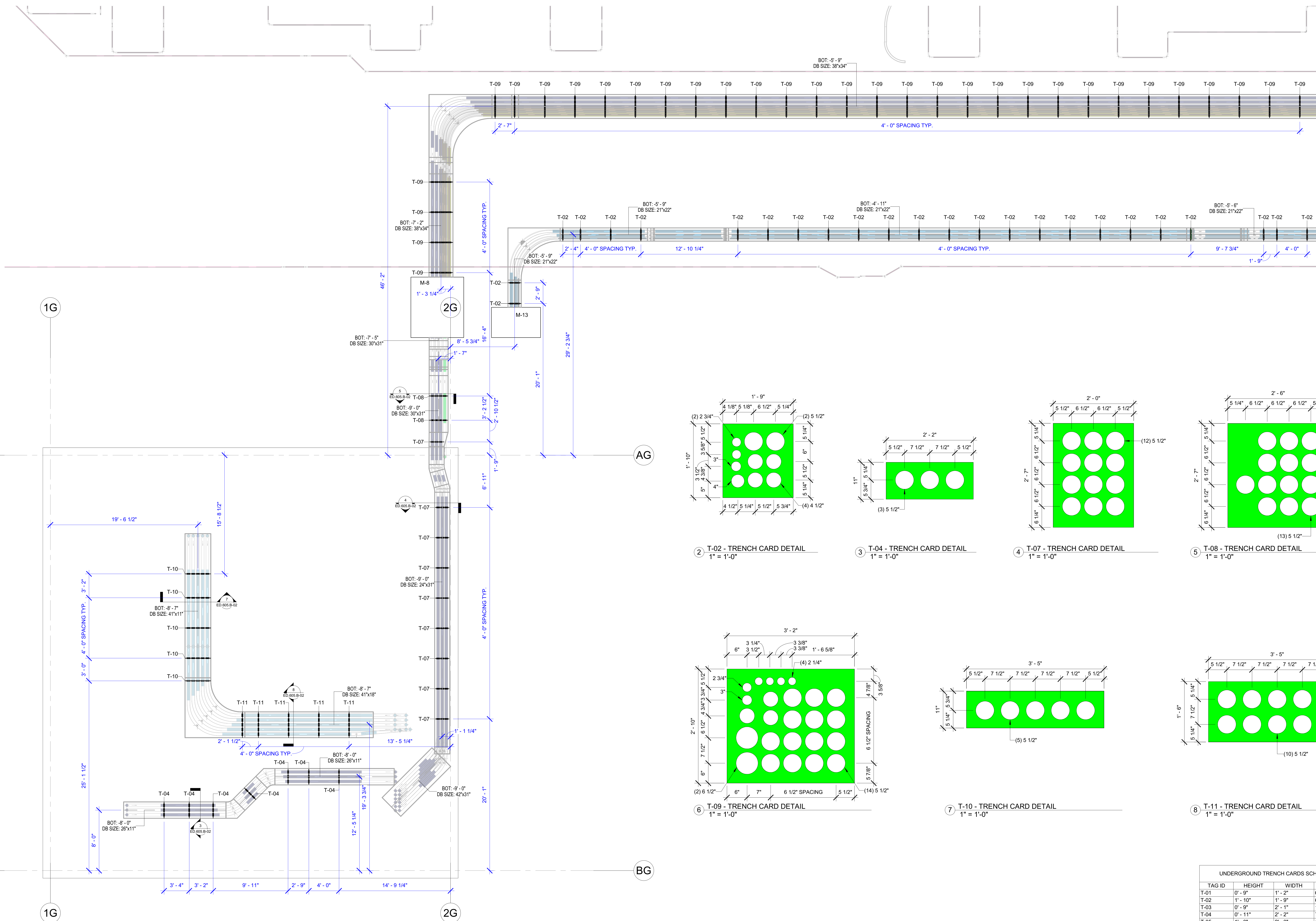
LEGEND:
GENERAL NOTES
LEVEL 01 ELEVATION OF 00' - 00" IS TAKEN AS A REFERENCE FOR:
BOTTOM OF CONDUIT (BOC),
BOTTOM OF DUCT BANK (BODB),
BOTTOM OF TRENCH (BOT).

COLOR LINE LEGEND
4' - 0" SPACE AROUND DUCT BANK

DUCT BANK TAG
BOT: -X' -XX" - BOTTOM OF TRENCH
DB SIZE: W"xH" - DUCT BANK SIZE

TRENCH CARD TAG
T-XX
NUMBER
TRENCH CARD

OPENING SIZE TAG
(X) XX"
SIZE
COUNT



TAG ID	HEIGHT	WIDTH	COUNT
T-01	0' - 9"	1' - 2"	67
T-02	1' - 10"	1' - 9"	63
T-03	0' - 9"	2' - 1"	12
T-04	0' - 11"	2' - 2"	7
T-05	1' - 0"	2' - 3"	13
T-07	2' - 7"	2' - 0"	9
T-08	2' - 7"	2' - 6"	2
T-09	2' - 10"	3' - 2"	73
T-09A	2' - 10"	3' - 2"	1
T-10	0' - 11"	3' - 5"	5
T-11	1' - 0"	3' - 5"	5
T-12	0' - 11"	4' - 0"	3
T-13	1' - 0"	4' - 7"	7
T-14	0' - 9"	4' - 10"	1
T-15	0' - 11"	4' - 10"	17
T-17	0' - 11"	5' - 5"	26
T-18	1' - 9"	5' - 9"	13
T-19	0' - 11"	5' - 11"	5

1 UNDERGROUND TRENCH CARD LAYOUT - GENERATOR YARD PART 4

3/16" = 1'-0"

ORIGINAL PRINT SIZE = 36x48

KEY PLAN:

JOB NUMBER: 0001
ISSUED FOR:
DATE: 5/23/2023 3:12:38 PM
DRAWN BY: Author
CHECKED BY: Checker
DRAWING SCALE: As indicated
SHEET TITLE:

UG TRENCH CARD LAYOUT

DRAWING NUMBER: E02-00-03

