



WRF PHOSPHORUS RECOVERY FACILITY

Urban Design Review Board Meeting



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PROJECT LOCATION



Google

PROJECT BACKGROUND

- The Des Moines Wastewater Reclamation Facility (WRF) experiences struvite precipitation in the solids processing and handling system, resulting in several challenges with solids handling. The struvite results predominantly from incidental phosphorus (P) release (P-release) and subsequent precipitation. To reduce the challenges and produce a potentially recoverable product, the WRF is implementing controlled P-release and phosphorus recovery (P-recovery) processes.
- The WRA retained HDR Engineering to assist with design of the new Phosphorus Recovery Facility improvements.

PROPOSED IMPROVEMENTS – SITE INTERNAL

- Improved internal access road and driveways.
- Connection of new paved main site access road in coordination with Site Access & Security Improvements
- New roadway and parking lot lighting within project limits.
- Extension of internal site utilities to support new process buildings.
- Stormwater sewer improvements.
- New forcemains to bring filtrate to from Building 70 to Building 82.

PROPOSED IMPROVEMENTS – BUILDING 70

- Filtrate piping improvements internal to existing Building 70.
- Carbon Dioxide storage tank and feed equipment for pH adjustment.
- New filtrate tank for storage and pH adjustment.

PROPOSED IMPROVEMENTS – BUILDING 81

- New building with new Phosphorus Release process.
- Pump gallery on lower level.
- Warehouse storage for spare parts on upper level.
- Sample room for hauled waste on upper level.
- Covered phosphorus release tank with odor control.
- Truck scale for struvite product loadout and hauled waste receiving.
- Hauled waste receiving and storage tank.

PROPOSED IMPROVEMENTS – BUILDING 82

- New building with new Phosphorus Recovery process.
- Magnesium Chloride storage tanks and feed pump equipment.
- Sodium Hydroxide storage tanks and feed pump equipment.
- Process reactor and settling tanks.
- Drying and dust control equipment.
- Product storage silo and truck loadout.

SCHEDULE AND ESTIMATED COST

- The tentative project schedule assumes project bidding and award in late 2022 or early 2023 and construction complete by end of 2025.
- The preliminary Engineer's opinion of probable cost for the project is approximately \$40 million.



PROPERTY FENCELINE

BUILDING 70
FILTRATE TANK
(TOP AT EL 19.81)

MAIN EXIT GATE

ADMINISTRATION
BUILDING 91

ELECTRICAL
SWITCHGEAR
BUILDING 73

PROPERTY FENCELINE

MAIN ENTRANCE GATE

REINSTALLED HIGH
MAST LIGHTING

LABORATORY
BUILDING 98

SLUDGE
PROCESSING
BUILDING 70

POWER
GENERATION
BUILDING 75

PHOSPHORUS RECOVERY
BUILDING 82
HEIGHT = 68'-0" (EL 88.50)

PHOSPHORUS RELEASE
BUILDING 81
HEIGHT = 40'-0" (EL 50.00)

EXISTING HIGH
MAST LIGHTING

ROUGHING
FILTER
CONTROL
CHAMBER
BUILDING 24

EXISTING HIGH
MAST LIGHTING

MAINTENANCE BUILDING 92

BUILDING 83
WSL VAULT

PROPERTY FENCELINE

PROPERTY FENCELINE

DES MOINES RIVER



BUILDING 70 – FACING WEST



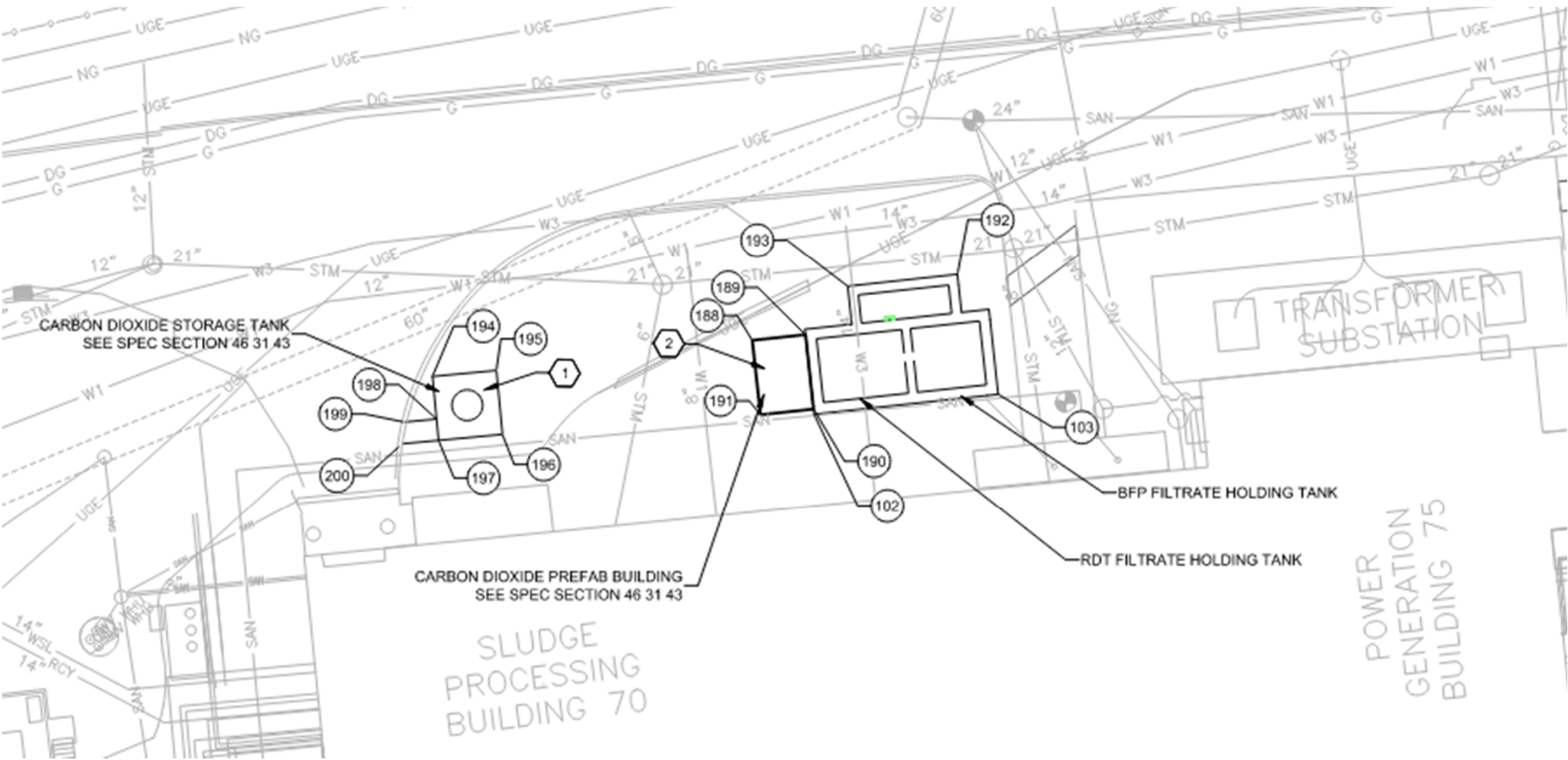
BUILDING 70 – FACING SOUTH



BUILDING 70 – FACING NORTHEAST



BUILDING 70 – SITE PLAN



BUILDING 81 & 82 – FACING SOUTH



BUILDING 81 & 82 – FACING NORTH



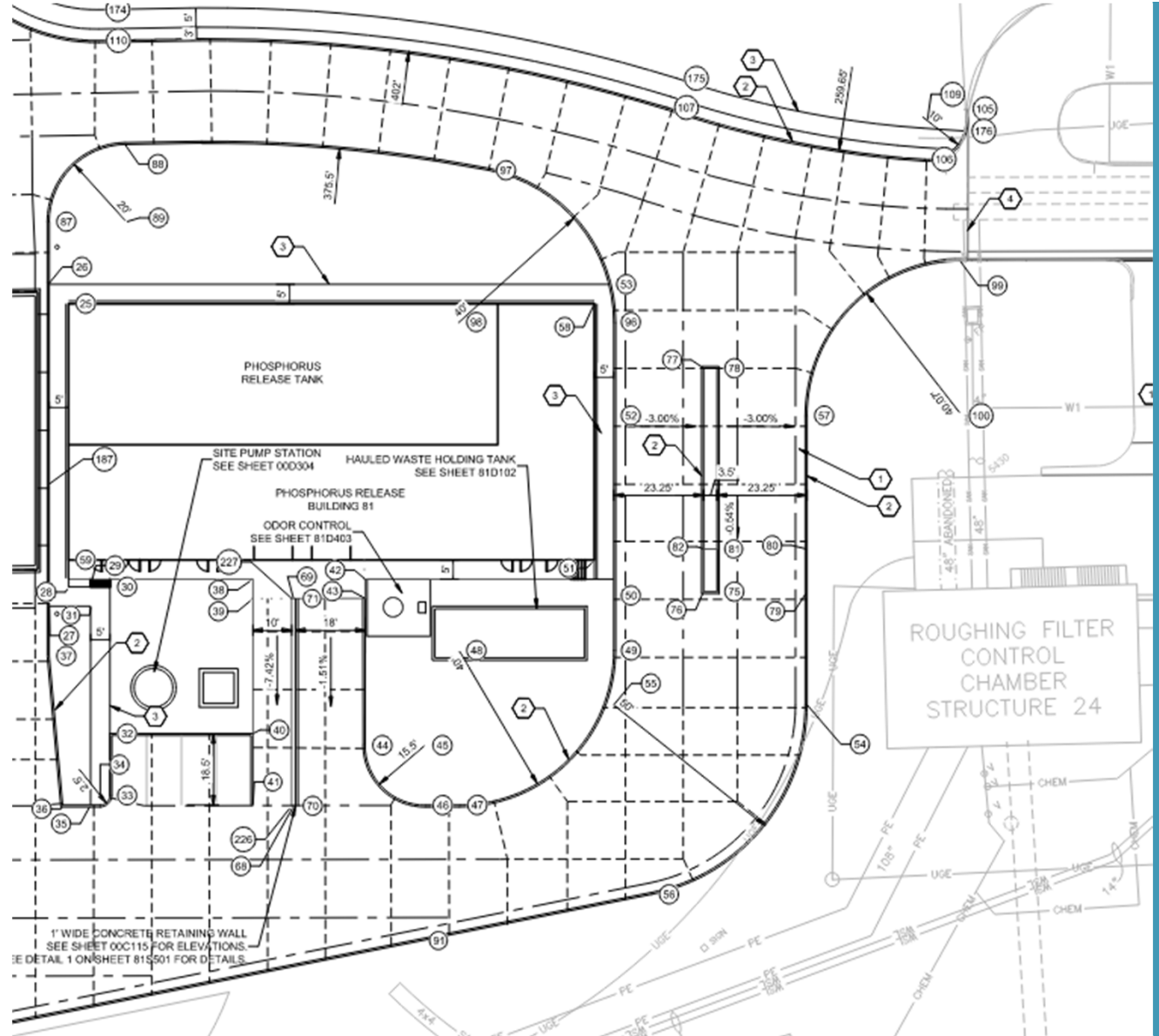
BUILDING 81 & 82 – FACING EAST



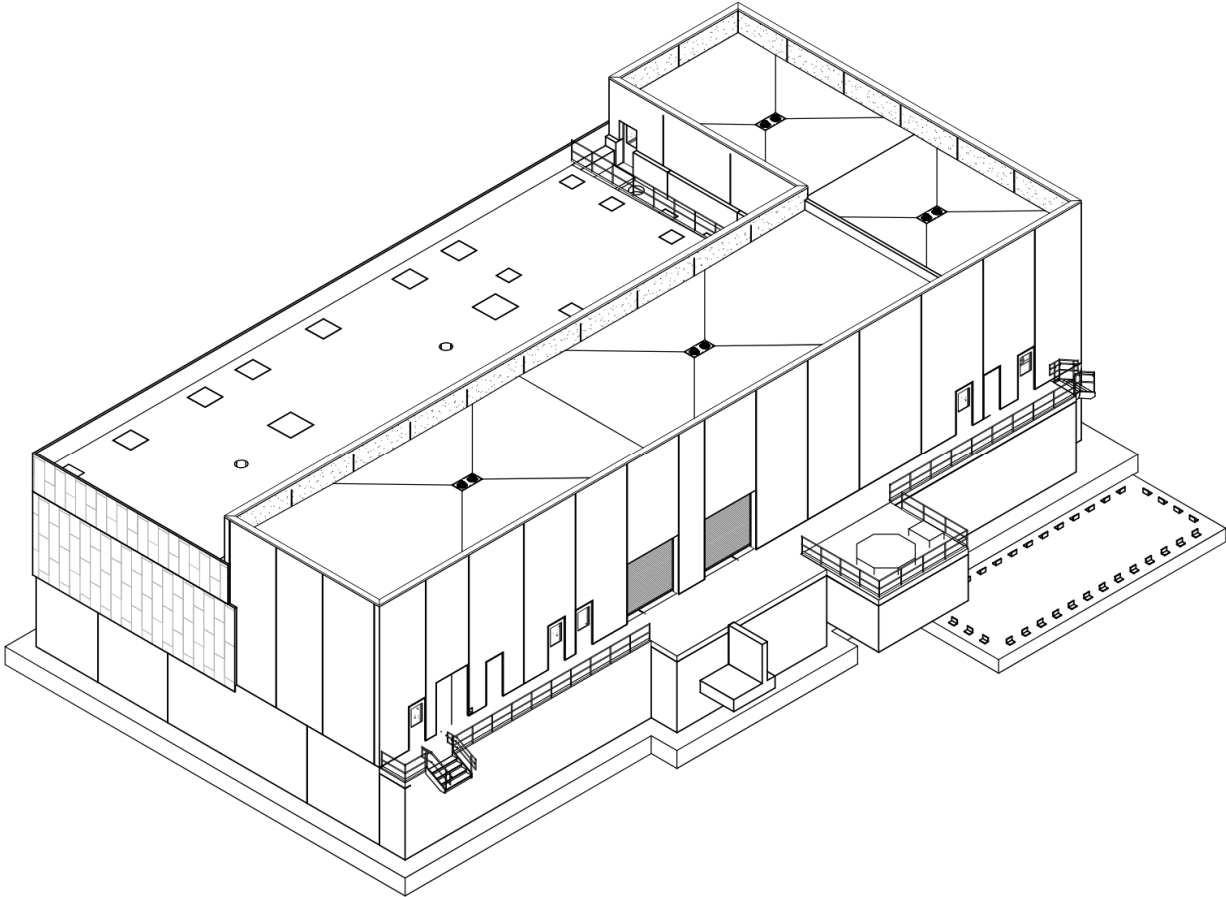
BUILDING 81 & 82 – FACING WEST



BUILDING 81 SITE PLAN



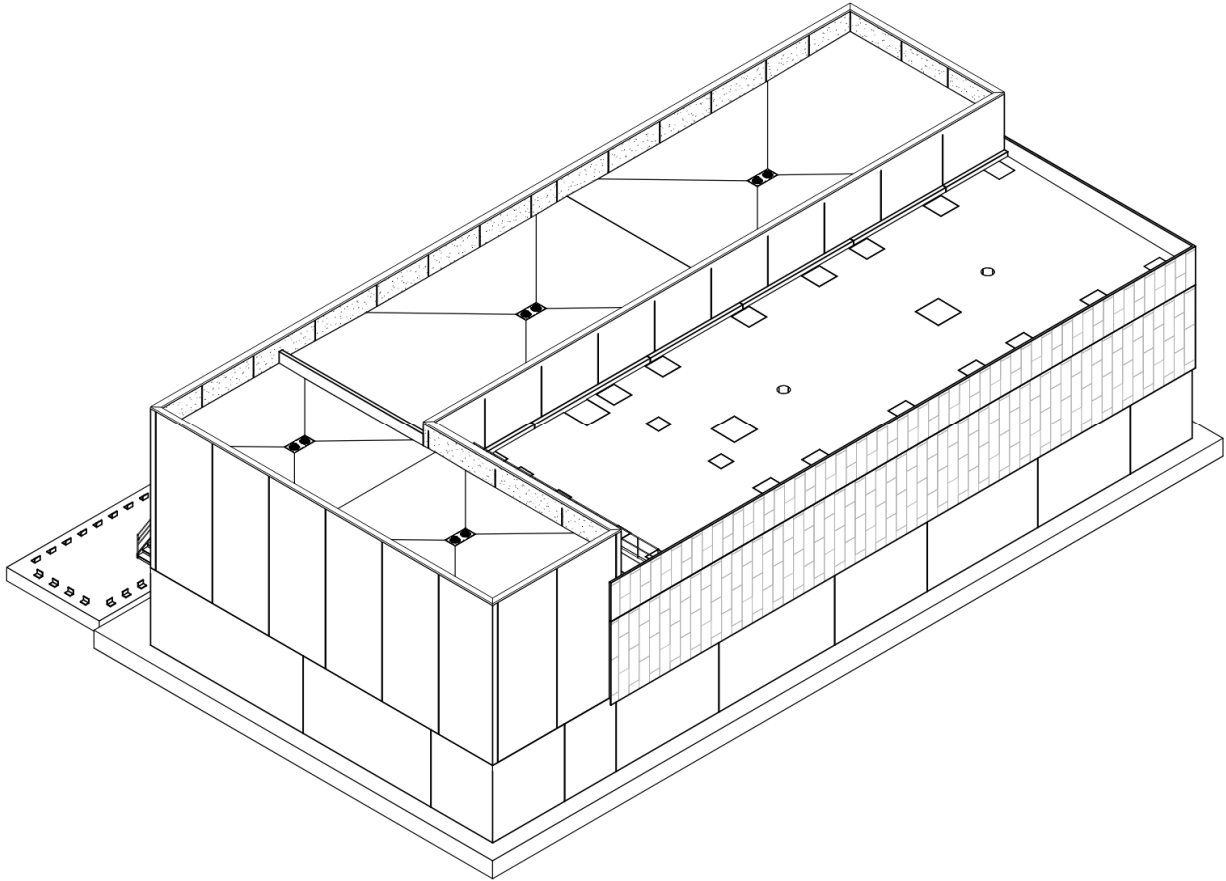
BUILDING 81 – SOUTHWEST PERSPECTIVE

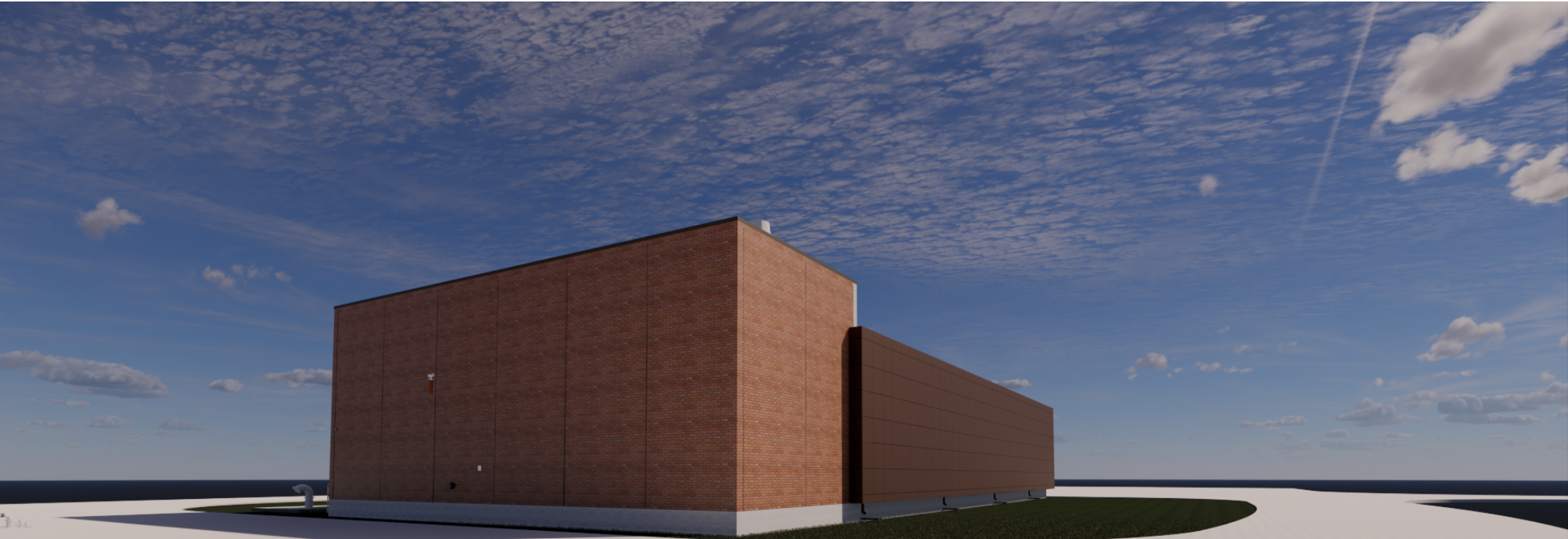




BUILDING 81 – SOUTHWEST RENDERING

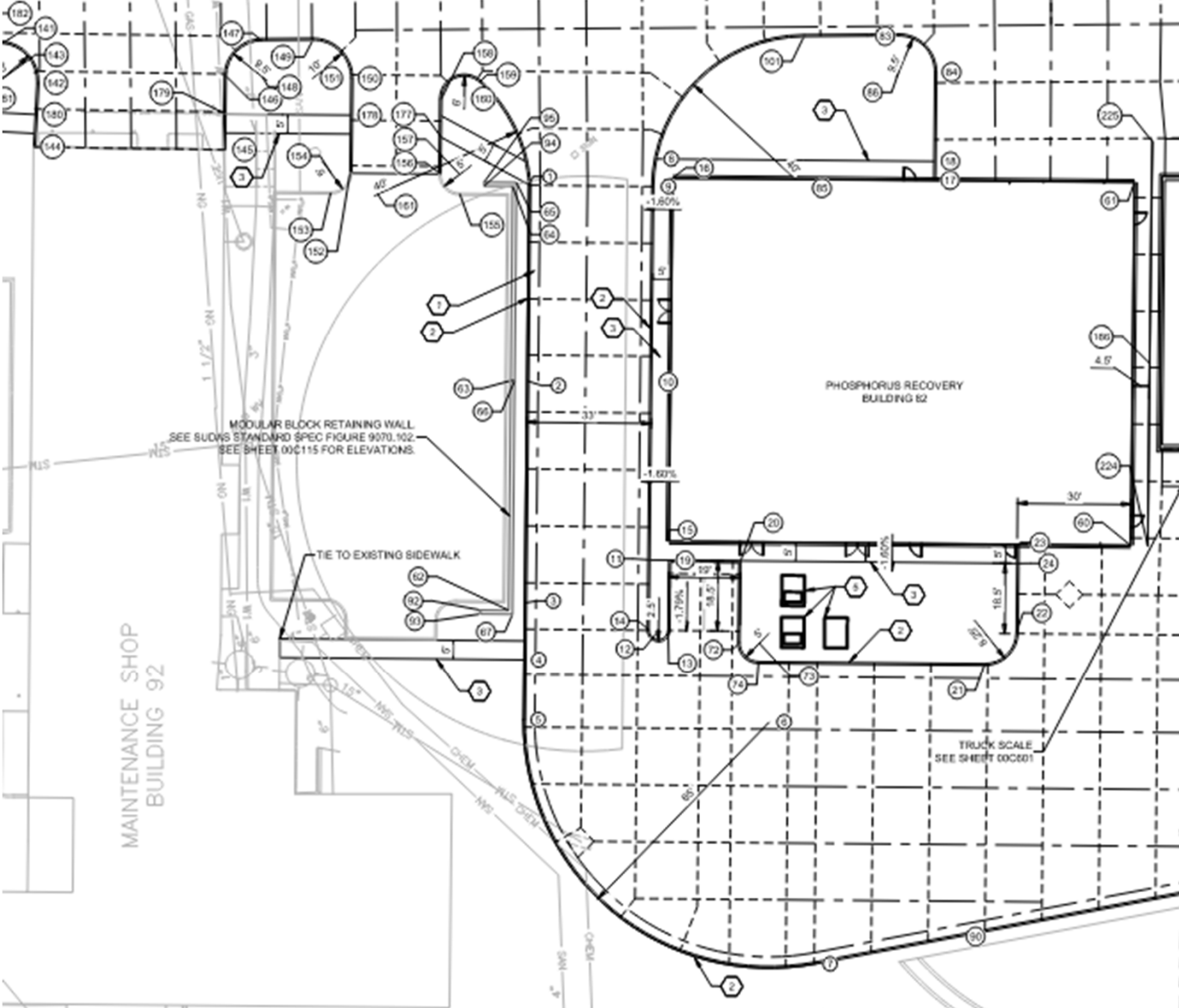
BUILDING 81 – NORTHEAST PERSPECTIVE



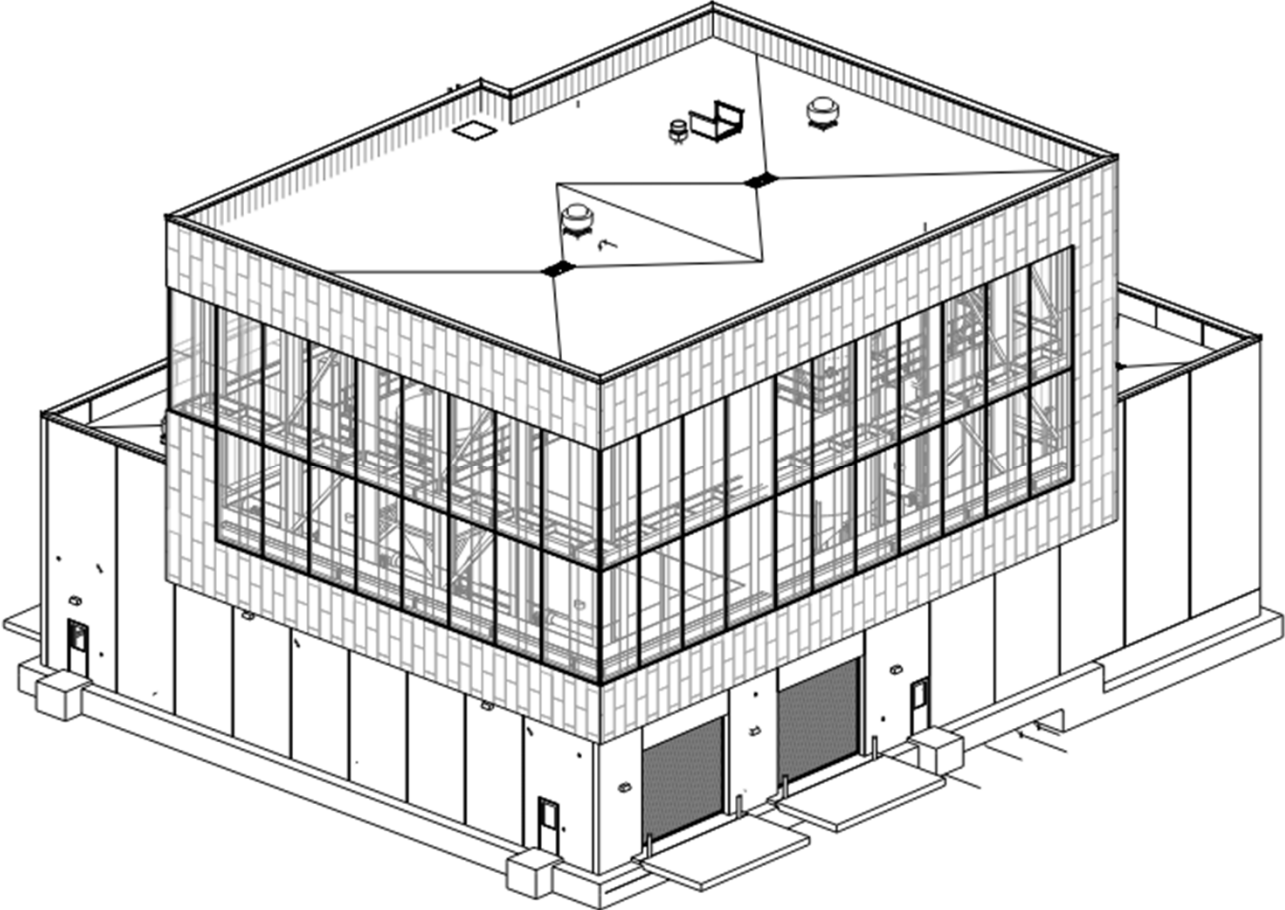


BUILDING 81 – NORTHEAST RENDERING

BUILDING 82 SITE PLAN



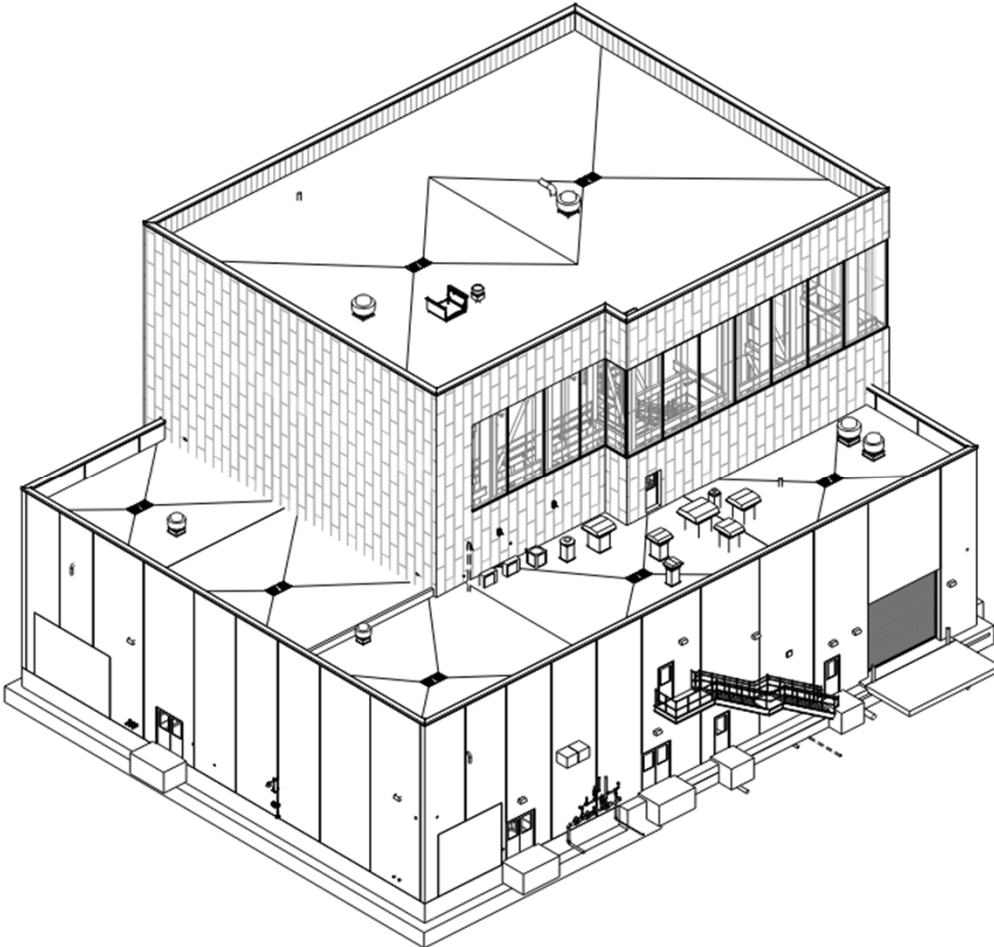
BUILDING 82 – NORTHEAST PERSPECTIVE





BUILDING 82 – NORTHEAST RENDERING

BUILDING 82 – SOUTHWEST PERSPECTIVE





BUILDING 82 – SOUTHWEST RENDERING

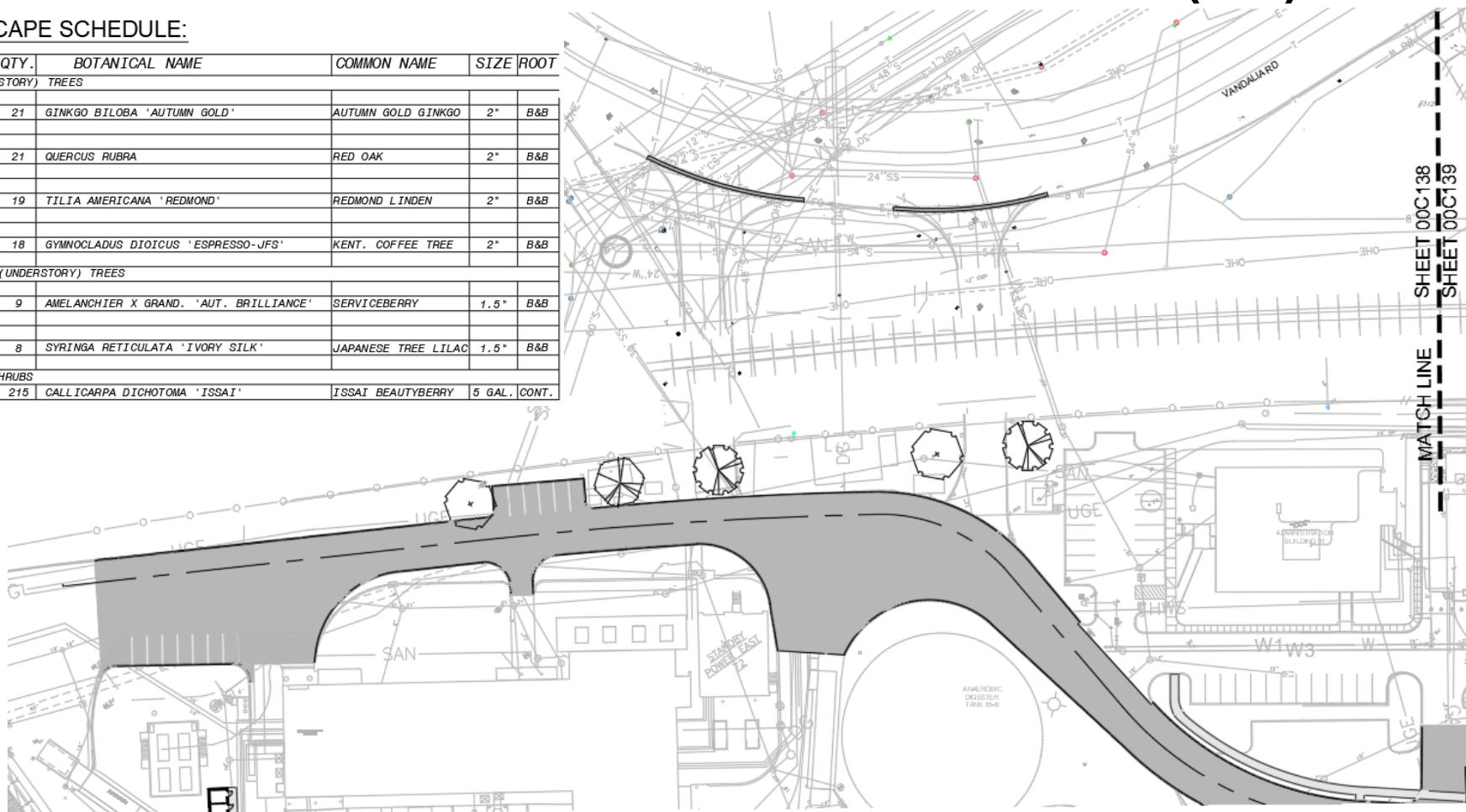
Questions?



LANDSCAPING – SITE ACCESS SITE PLAN (1/2)

LANDSCAPE SCHEDULE:

SYMB	KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
SHADE (OVERSTORY) TREES						
	GB	21	GINKGO BILOBA 'AUTUMN GOLD'	AUTUMN GOLD GINKGO	2"	B&B
	QR	21	QUERCUS RUBRA	RED OAK	2"	B&B
	TA	19	TILIA AMERICANA 'REDMOND'	REDMOND LINDEN	2"	B&B
	GD	18	GYNOCLADUS DIOICUS 'ESPRESSO-JFS'	KENT. COFFEE TREE	2"	B&B
ORNAMENTAL (UNDERSTORY) TREES						
	AG	9	AMELANCHIER X GRAND. 'AUT. BRILLIANCE'	SERVICEBERRY	1.5"	B&B
	SR	8	SYRINGA RETICULATA 'IVORY SILK'	JAPANESE TREE LILAC	1.5"	B&B
DECIDUOUS SHRUBS						
	CD	215	CALLICARPA DICHOTOMA 'ISSAI'	ISSAI BEAUTYBERRY	5 GAL.	CONT.



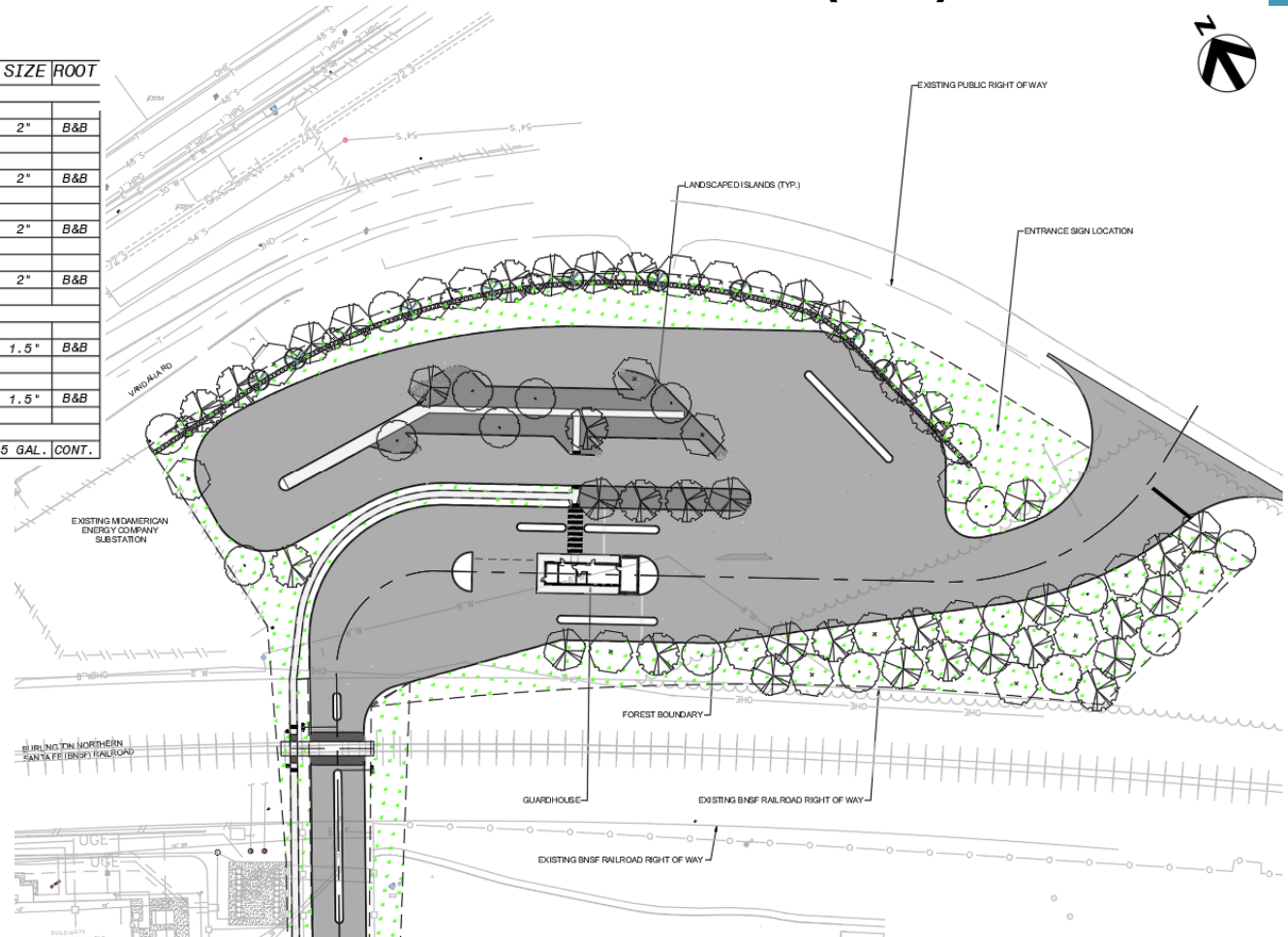
SHEET 00C138
SHEET 00C139

MATCH LINE

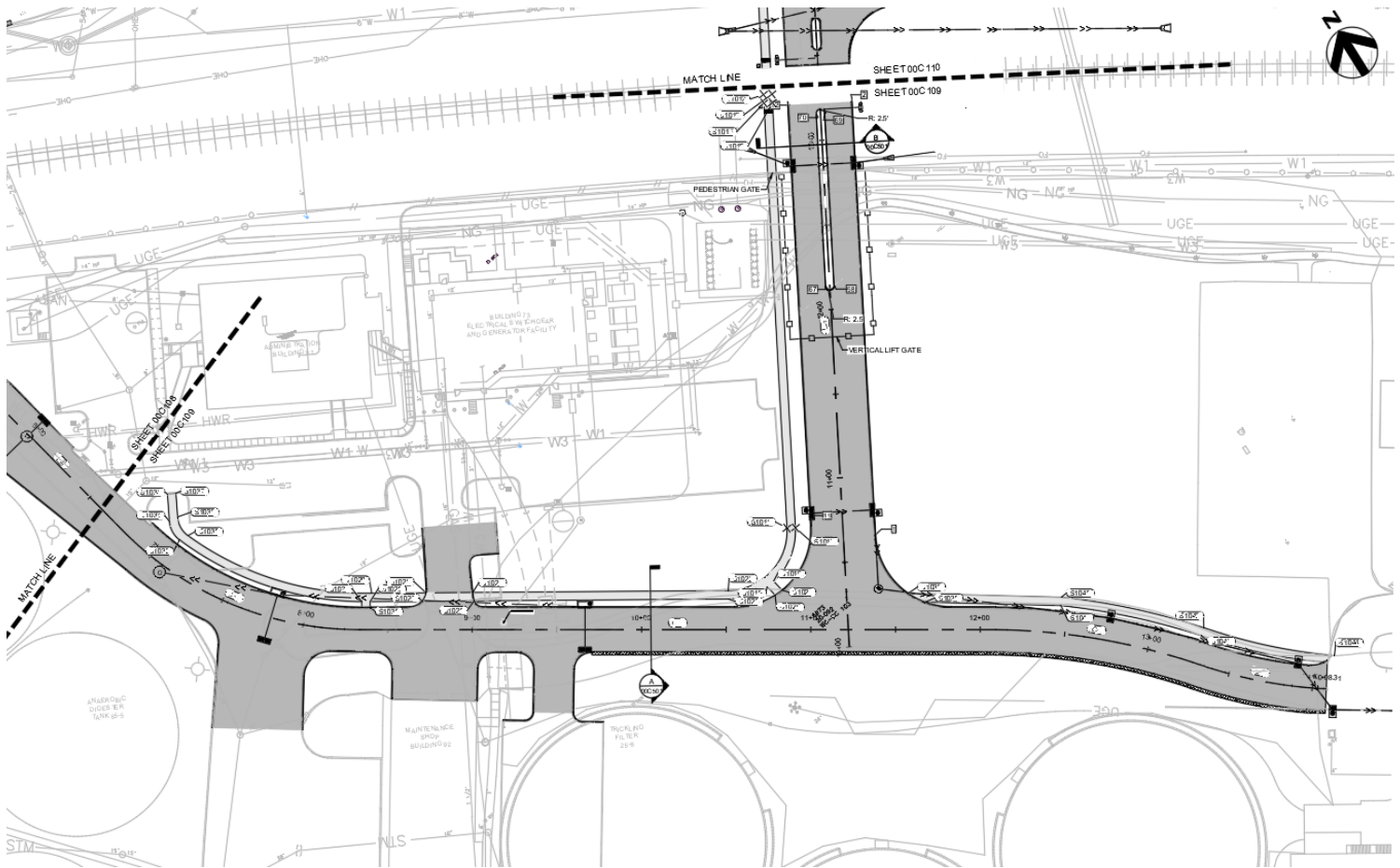
LANDSCAPING – SITE ACCESS SITE PLAN (2/2)

LANDSCAPE SCHEDULE:

SYMB	KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	ROOT
SHADE (OVERSTORY) TREES						
	GB	21	GINKGO BILOBA 'AUTUMN GOLD'	AUTUMN GOLD GINKGO	2"	B&B
	QR	21	QUERCUS RUBRA	RED OAK	2"	B&B
	TA	19	TILIA AMERICANA 'REDMOND'	REDMOND LINDEN	2"	B&B
	GD	18	GYMNOCLADUS DIOICUS 'ESPRESSO-JFS'	KENT. COFFEE TREE	2"	B&B
ORNAMENTAL (UNDERSTORY) TREES						
	AG	9	AMELANCHIER X GRAND. 'AUT. BRILLIANCE'	SERVICEBERRY	1.5"	B&B
	SR	8	SYRINGA RETICULATA 'IVORY SILK'	JAPANESE TREE LILAC	1.5"	B&B
DECIDUOUS SHRUBS						
	CD	215	CALLICARPA DICHOTOMA 'ISSAI'	ISSAI BEAUTYBERRY	5 GAL.	CONT.



INTERNAL ROADWAY IMPROVEMENTS – SITE PLAN (1/2)



INTERNAL ROADWAY IMPROVEMENTS – SITE PLAN (2/2)

INTERNAL ROADWAY ALIGNMENT TABLE				
NUMBER	PI STA	RADIUS	NORTHING	EASTING
C-3	PC: 2+48.80 PL 3+67.87 PT: 4+86.73	2686.00'	START: 573453.806 END: 573300.475	START: 1624306.239 END: 1624511.517
C-4	PC: 4+86.73 PL 5+300.09 PT: 5+88.56	100.00'	START: 573330.475 END: 573262.714	START: 1624511.517 END: 1624563.222
C-5	PC: 6+77.25 PL 7+658.55 PT: 8+33.59	196.00'	START: 573154.515 END: 573020.482	START: 1624563.573 END: 1624636.736
C-6	PC: 12+09.12 PL 12+88.67 PT: 13+27.31	386.00'	START: 572764.426 END: 572666.476	START: 1624627.800 END: 1625006.074
C-7	PC: 13+27.31 PL 13+65.11 PT: 14+06.31	273.00'	START: 572666.476 END: 572534.424	START: 1625006.074 END: 1625597.866
L-4	START: 0+00.00 END: 2+48.80	NA	START: 573573.314 END: 573453.806	START: 1624269.625 END: 1624306.239
L-5	START: 6+33.59 END: 12+09.12	NA	START: 573020.482 END: 572764.426	START: 1624636.736 END: 1624563.222
L-6	START: 6+88.56 END: 6+77.25	NA	START: 573262.714 END: 573154.515	START: 1624563.222 END: 1624563.573

