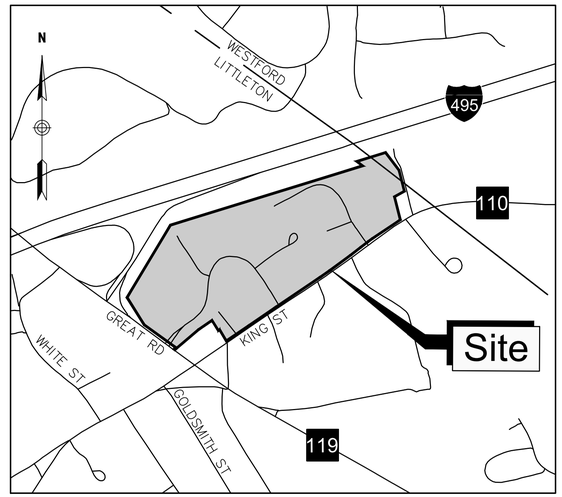
Subdivision Plans

King Street Commons
Definitive Subdivision Plan

550 King Street
Littleton, Massachusetts 01460



LOCUS MAP
1" = 600'

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No.	Drawing Title	Latest Issue
1	Definitive Subdivision Plan of Land (Hancock)	August 1, 2023

APPROVAL BY THE TOWN OF
LITTLETON PLANNING BOARD

DATE: _____

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Title & Index Sheet

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_COV
DRAWING NO.
C-1
SHEET 1 OF 61

GENERAL NOTES

1. CONTRACTOR SHALL NOTIFY DIG-SAFE (1-888-344-7233) AND THE LOCAL MUNICIPAL WATER & SEWER DEPT. AT LEAST 72 HOURS BEFORE EXCAVATING.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS. A 6-FOOT TEMPORARY CHAINLINK FENCE SHALL BE PROVIDED AROUND ALL CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL LEAVE NO UNSECURED OPEN EXCAVATIONS.
3. HANDICAP ACCESSIBLE ROUTES, PARKING SPACES, RAMPS, SIDEWALKS AND WALKWAYS SHALL BE CONSTRUCTED IN CONFORMANCE WITH THE FEDERAL AMERICANS WITH DISABILITIES ACT/ARCHITECTURAL ACCESS BOARD (AAB), AND WITH STATE AND LOCAL LAWS AND REGULATIONS (WHICHEVER ARE MORE STRINGENT).
4. WORK WITHIN THE LOCAL RIGHT-OF-WAY SHALL CONFORM TO LOCAL MUNICIPAL STANDARDS. WORK WITHIN STATE RIGHT-OF-WAY SHALL CONFORM TO THE LATEST EDITION OF THE STATE HIGHWAY DEPARTMENT STANDARD SPECIFICATION FOR HIGHWAYS AND BRIDGES.
5. UPON AWARD OF CONTRACT, CONTRACTOR SHALL MAKE NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN NECESSARY PERMITS, PAY FEES, AND POST BONDS ASSOCIATED WITH THE WORK INDICATED ON THE DRAWINGS, IN THE SPECIFICATIONS, AND IN THE CONTRACT DOCUMENTS. DO NOT CLOSE OR OBSTRUCT ROADWAYS, SIDEWALK, AND FIRE HYDRANTS, WITHOUT APPROPRIATE PERMITS.
6. TRAFFIC SIGNAGE AND PAVEMENT MARKINGS SHALL CONFORM TO THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
8. AREAS OUTSIDE THE LIMITS OF PROPOSED WORK DISTURBED BY THE CONTRACTOR SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
9. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
10. CONTRACTOR SHALL PREVENT DUST, SEDIMENT, AND DEBRIS FROM EXITING THE SITE AND SHALL BE RESPONSIBLE FOR CLEANUP, REPAIRS AND CORRECTIVE ACTION IF SUCH OCCURS.
11. CONTRACTOR SHALL CONTROL STORMWATER RUNOFF DURING CONSTRUCTION TO PREVENT ADVERSE IMPACTS TO OFF SITE AREAS, AND SHALL BE RESPONSIBLE TO REPAIR RESULTING DAMAGES, IF ANY, AT NO COST TO OWNER.
12. CONTRACTOR TO FILE A NOTICE OF INTENT FOR COVERAGE UNDER THE CONSTRUCTION GENERAL PERMIT (CGP) AND PREPARE A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PRIOR TO START OF CONSTRUCTION.
13. CONTRACTOR SHALL PREPARE AND MAINTAIN SWPPP IN ACCORDANCE WITH THE US EPA CGP AND NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS.

GRADING & DRAINAGE NOTES:

1. THE LOCATIONS, SIZES, AND TYPES OF EXISTING UNDERGROUND UTILITIES ARE SHOWN AS AN APPROXIMATE REPRESENTATION ONLY. THE OWNER OR ITS REPRESENTATIVE(S) HAVE NOT INDEPENDENTLY VERIFIED THIS INFORMATION AS SHOWN ON THE PLANS. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES, NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATION, SIZES, AND ELEVATION OF EXISTING UTILITIES.
2. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, OR EXISTING CONDITIONS DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS INTENDED, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED IN WRITING TO THE OWNER'S REPRESENTATIVE FOR THE RESOLUTION OF THE CONFLICT. FAILURE TO PROVIDE OR PERFORM THE ABOVE PRIOR TO PERFORMING ANY WORK SHALL NOT BE GROUNDS FOR EXTRA PAYMENTS TO THE CONTRACTOR.
3. AT ALL LOCATIONS WHERE EXISTING CURBING OR PAVEMENT ABUTS NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAW CUT TO A CLEAN, SMOOTH EDGE. BLEND NEW PAVEMENT, CURBS, AND EARTHWORK SMOOTHLY INTO EXISTING BY MATCHING LINES, GRADES, AND JOINTS.
4. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY COMPANIES, AS REQUIRED.
5. ALL UTILITY COVERS, GRATES, ETC. SHALL BE ADJUSTED TO BE FLUSH WITH THE PAVEMENT FINISH GRADE UNLESS OTHERWISE NOTED.
6. EXISTING TREES AND SHRUBS OUTSIDE THE LIMITS OF GRADING SHALL BE REMOVED ONLY UPON PRIOR APPROVAL OF THE OWNER.
7. ALL SANITARY SEWER PIPE SHALL BE SDR-35 PVC UNLESS OTHERWISE NOTED.
8. WATER LINE SHALL BE CLASS 52 CEMENT LINED DUCTILE IRON.
9. SANITARY SEWER OR STORM DRAIN LINES SHALL BE ENCASED IN CONCRETE WHEN CROSSING ABOVE A WATER LINE AND HAVING LESS THAN 10 FT OF HORIZONTAL SEPARATION. A MINIMUM OF 18" OF VERTICAL SEPARATION SHALL BE PROVIDED AT ALL WATER LINE CROSSINGS WITH SANITARY SEWER OR STORM DRAIN LINES.
10. ALL DRAINAGE PIPING SHALL BE RCP UNLESS OTHERWISE NOTED.
11. INSULATE SANITARY PIPES WHERE INVERT DEPTH IS LESS THAN FIVE (5) FEET BELOW FINISHED GRADE.
12. CONTRACTOR SHALL PROTECT ALL UNDERGROUND DRAINAGE, SEWER AND UTILITY FACILITIES FROM EXCESSIVE VEHICULAR LOADS DURING CONSTRUCTION. ANY DAMAGE TO THESE FACILITIES RESULTING FROM CONSTRUCTION LOADS WILL BE RESTORED TO ORIGINAL CONDITION (AT NO ADDITIONAL COST TO THE OWNER) BY THE CONTRACTOR.
13. ALL WATER AND SEWER UTILITY WORK SHALL CONFORM TO LOCAL DPW, WATER DIVISION SPECIFICATIONS, DETAILS, RULES AND REGULATIONS AND HAVE FIVE (5) FEET OF MINIMUM COVER. GAS, ELECTRIC, AND TELEPHONE LOCATIONS AND ROUTING ARE SUBJECT TO REVIEW AND APPROVAL BY THE APPROPRIATE UTILITY COMPANIES.
14. THE CONTRACTOR SHALL REMOVE ALL EROSION CONTROL BARRIERS AFTER REVEGETATION OF DISTURBED AREAS AND AFTER APPROVAL BY THE LOCAL APPROVING AUTHORITY.
15. EXCAVATION REQUIRED IN THE PROXIMITY OF EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.
16. THE CONTRACTOR SHALL SCHEDULE THEIR WORK TO ALLOW THE FINISHED SUBGRADE ELEVATIONS TO DRAIN PROPERLY WITHOUT PUDDLING. SPECIFICALLY, ALLOW WATER TO ESCAPE WHERE PROPOSED CURB MAY RETAIN RUNOFF PRIOR TO APPLICATION OF THE FINISH SUBGRADE AND/OR SURFACE PAVING.
17. UNLESS OTHERWISE INDICATED, ABANDONED EXISTING UTILITY LINES SHALL BE CAPPED AND ABANDONED IN PLACE UNLESS THEY CONFLICT WITH PROPOSED IMPROVEMENTS, WHERE THEY SHALL THEN BE REMOVED. CAP REMAINING PORTIONS WHERE PARTIALLY REMOVED.
18. MINIMUM MANHOLE DIAMETER IS 4'. CONTRACTOR SHALL VERIFY, THROUGH SHOP DRAWING SUBMITTALS TO THE ENGINEER, ACTUAL SIZES NEEDED TO ACCOMMODATE SPECIFIED PIPES.
19. DETAILED UTILITY SURVEY AND PLAN SHALL BE PROVIDED PRIOR TO CONSTRUCTION.
20. STUBS FOR FUTURE WATER CONNECTIONS SHALL BE EMPTY, CLOSED AT THE VALVE, AND CAPPED.
21. THE LIMIT OF WORK DELINEATES THE AREA OF LAND DISTURBANCE WHICH SHALL BE LIMITED TO 431,300 SF.

PROPOSED CONSTRUCTION SEQUENCING

1. SELECTIVELY REMOVE VEGETATION FOR COMPOST FILTER TUBE INSTALLATION;
2. INSTALL COMPOST FILTER TUBE;
3. INSTALL CONSTRUCTION FENCING AT LIMITS OF WORK, AND NO-DISTURB/TREE SAVE AREAS, IF ANY;
4. STABILIZE CONSTRUCTION ENTRANCES;
5. PREPARE CONSTRUCTION TRAILER/STAGING LOCATION;
6. CONSTRUCT NEW SEDIMENT BASINS AS NECESSARY;
7. STRIP AND STOCKPILE TOPSOIL AND PAVEMENT;
8. TEMPORARILY STABILIZE TOPSOIL STOCKPILES (SEED AND SILT FENCE (GRASSED AREA) OR COMPOST FILTER TUBE OR STRAW BALES (PAVEMENT AREA) AROUND TOE OF SLOPE);
9. CONDUCT EARTHWORK CUTS AND FILLS TO BRING SITE TO GRADE;
10. CONSTRUCT UTILITIES (WATER, SEWER, STORM DRAIN, ETC.);
11. CONSTRUCT DRIVEWAY/PARKING/SIDEWALK PAVEMENT AREAS THROUGH BINDER COURSE;
12. FINISH GRADE LANDSCAPING AREAS;
13. PERMANENTLY STABILIZE LANDSCAPING AREAS WITH SEED/LANDSCAPING;
14. CONSTRUCT DRIVEWAY/PARKING AREAS THROUGH TOP COURSE; AND
15. REMOVE ALL TEMPORARY SOIL EROSION AND SEDIMENT CONTROL MEASURES UPON PERMANENT SITE STABILIZATION AND APPROVAL BY THE ENGINEER AND TOWN OF LITTLETON.

GENERAL SYMBOLS

EXISTING	PROPOSED	
	CB	CATCH BASIN
	DMH	DRAIN MANHOLE
	SMH	SEWER MANHOLE
	EMH	ELECTRIC MANHOLE
	TMH	TELEPHONE MANHOLE
		CABLE MANHOLE
		UNKNOWN MANHOLE
	HH	HANDHOLE
		BOLLARD
	WG	WATER GATE
		FIRE HYDRANT
	GG	GAS GATE
		GAS VALVE
		STREET SIGN
		TRAFFIC SIGNAL
		LIGHT POLE
		UTILITY POLE
TP-#	TP-#	TEST PIT
	EOP	EDGE OF PAVEMENT
	VGC	GRANITE CURB (TYPE VA 4)
	MCC	CONCRETE CURB (MONOLITHIC)
	x	CHAINLINK FENCE
D	D	DRAINAGE LINE
S	S	SEWER LINE
W	W	WATER LINE
G	G	GAS LINE
E	E	UNDERGROUND ELECTRIC LINE
CA/TV	CATV	CABLE/TELEVISION LINE
	OHW	OVERHEAD WIRE
		TREE LINE
		LIMIT OF WORK
		CONSTRUCTION FENCE
	EN	ENTRANCE/EXIT DOOR
PC 10 N00° 00' 00"E +57.59	PC 10 N00° 00' 00"E +57.59	BASELINE
N00° 00' 00"E	N00° 00' 00"E	TOWN LAYOUT
N00° 00' 00"E	N00° 00' 00"E	PROPERTY LINE
	BND	HIGHWAY/PROPERTY BOUND (TYPE NOTED)
		WHEELCHAIR RAMP
		TREE (SIZE AND TYPE NOTED)

PAVEMENT MARKINGS AND SIGNING SYMBOLS

EXISTING	PROPOSED	
CW	CW	CROSSWALK, 12" WHITE LINE (WIDTH NOTED)
SL	SL	STOP LINE, 12" WHITE LINE 4' BEHIND CW (TYP.)
SWEL, SWLL	SWL	SOLID WHITE LINE-4"
DYCL	DYCL	DOUBLE YELLOW CENTER LINE- 2-4" LINES
		TRAFFIC FLOW SYMBOL

ABBREVIATIONS

GENERAL

ABAN	ABANDON
ADJ	ADJUST
APPROX	APPROXIMATE
BLDG	BUILDING
BO	BY OTHERS
BM	BENCHMARK
CC	CONCRETE CURB
CEM	CEMENT
CONC	CONCRETE
COORD	COORDINATE
DEMO	DEMOLISH
DIA	DIAMETER
ELEC	ELECTRIC
ELEV	ELEVATION
EXIST	EXISTING
FGC	FLUSH GRANITE CURB
GAL	GALLON
GC	GRANITE CURB
HMA	HOT MIX ASPHALT
LA	LANDSCAPED AREA
LF	LINEAR FEET
MAX	MAXIMUM
MCC	MONOLITHIC CONCRETE CURB
MIN	MINIMUM
MTD	MOUNTED
NTS	NOT TO SCALE
PROP	PROPOSED
PVMT	PAVEMENT
R	RADIUS
REM	REMOVE
RET	RETAIN
SGE	SLOPED GRANITE EDGING
SW	SIDEWALK
TYP	TYPICAL
VGC	VERTICAL GRANITE CURB
WCR	WHEELCHAIR RAMP

UTILITIES

AD	AREA DRAIN
CB	CATCH BASIN
CI	CAST IRON
CLDI	CEMENT LINED DUCTILE IRON
DCB	DOUBLE CATCH BASIN
DMH	DRAINAGE MANHOLE
GV	GAS VALVE
GT	GREASE TRAP
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HYD	HYDRANT
INV	INVERT ELEVATION
PVC	POLYVINYL CHLORIDE PIPE
OHW	OVER HEAD WIRE
SMH	SEWER MANHOLE
WQU	WATER QUALITY UNIT
WV	WATER VALVE

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Legend & General Notes

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

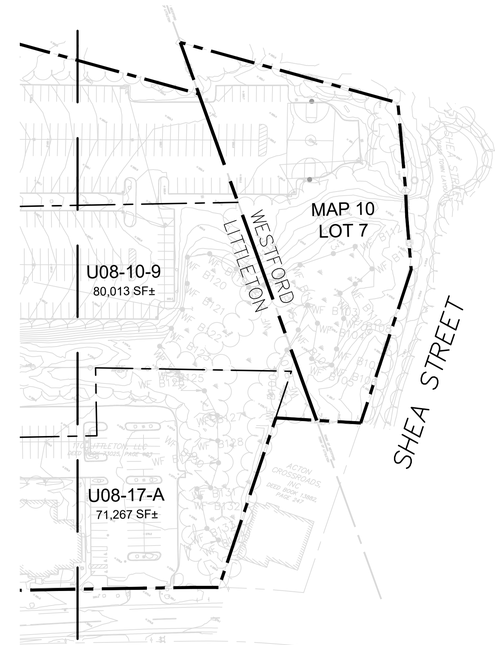
DESIGNER / ENGINEER
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

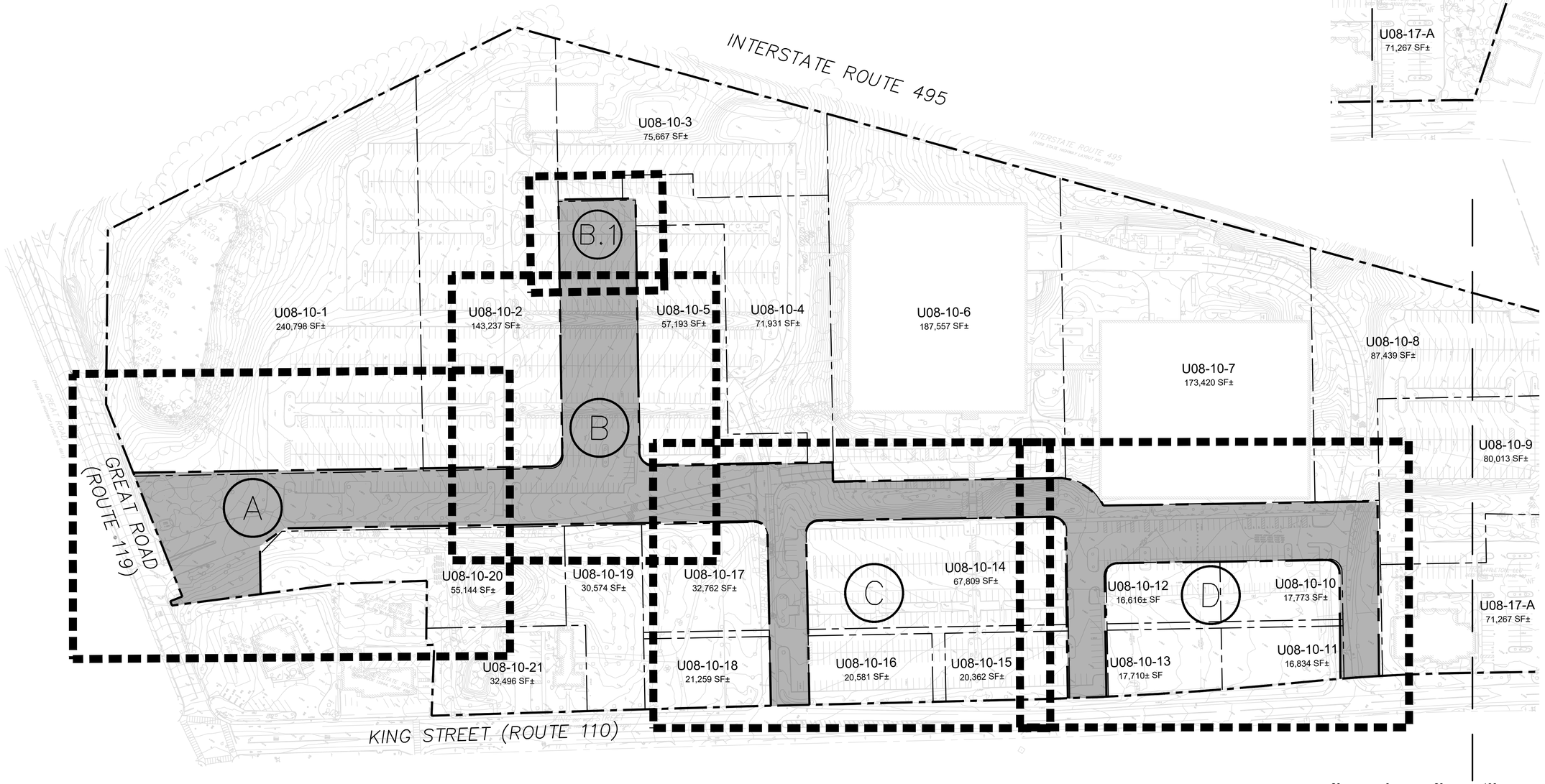
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_INDEX
DRAWING NO. **C-2**
SHEET 2 OF 61

LOT COVERAGE TABLE		
	EXISTING	PROPOSED
PAVEMENT	138,564 SF (51.4%)	154,408 SF (57.2%)
SIDEWALK	3,585 SF (1.3%)	32,852 SF (12.2%)
LANDSCAPE	127,694 SF (47.3%)	82,583 SF (30.6%)
TOTAL	269,843 843 SF	269,843 SF





REVISIONS
1. 2-21-24 PEER REVIEW
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DRAWING TITLE
Index Sheet

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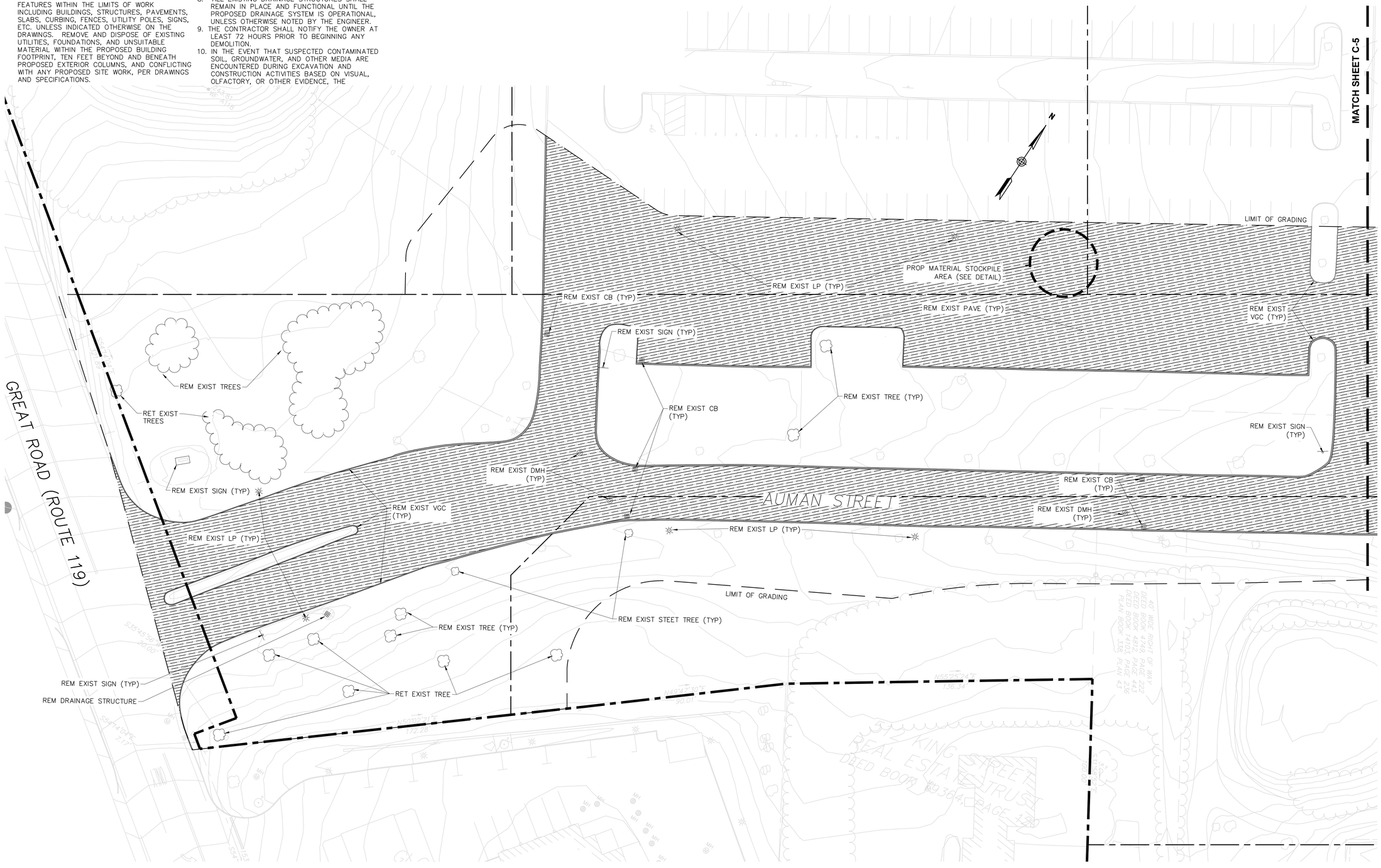
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE 1"=80'

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_INDEX
DRAWING NO.
C-3
SHEET 3 OF 61

SITE DEMOLITION NOTES:

1. DELINEATED CONTAMINATED SOIL TO BE REMOVED AND DISPOSED OF BY QUALIFIED PERSONNEL IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL STANDARDS. CONFIRMATORY SOIL SAMPLING TO BE COMPLETED PRIOR TO INITIATING FURTHER DEMOLITION ACTIVITIES.
2. ALL UTILITIES SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND ELEVATIONS OF EACH UTILITY PRIOR TO REMOVING OR RELOCATING. CONTRACTOR SHALL NOTIFY DIG-SAFE (1-888-344-7233) AND THE LOCAL MUNICIPAL WATER & SEWER DEPT. AT LEAST 72 HOURS BEFORE EXCAVATING.
3. THE CONTRACTOR IS TO REMOVE AND TO DISPOSE OF EXISTING MANMADE SURFACE FEATURES WITHIN THE LIMITS OF WORK INCLUDING BUILDINGS, STRUCTURES, PAVEMENTS, SLABS, CURBING, FENCES, UTILITY POLES, SIGNS, ETC. UNLESS INDICATED OTHERWISE ON THE DRAWINGS. REMOVE AND DISPOSE OF EXISTING UTILITIES, FOUNDATIONS, AND UNSUITABLE MATERIAL WITHIN THE PROPOSED BUILDING FOOTPRINT, TEN FEET BEYOND AND BENEATH PROPOSED EXTERIOR COLUMNS, AND CONFLICTING WITH ANY PROPOSED SITE WORK, PER DRAWINGS AND SPECIFICATIONS.
4. ALL UTILITIES AND STUBS WITHIN THE SITE SHALL BE MAINTAINED AND PROTECTED DURING CONSTRUCTION UNLESS OTHERWISE NOTED.
5. THE CONTRACTOR SHALL DISPOSE OF DEMOLITION DEBRIS IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES, AND STATUTES.
6. ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED AND APPROVED PRIOR TO DEMOLITION.
7. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. CONSTRUCTION ACTIVITIES SHALL BE IN ACCORDANCE WITH OSHA STANDARDS AND LOCAL REQUIREMENTS. A 6-FOOT TEMPORARY CHAIN LINK FENCE SHALL BE PROVIDED AROUND ALL CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL LEAVE NO UNSECURED OPEN EXCAVATIONS.
8. ALL EXISTING DRAINAGE STRUCTURES SHALL REMAIN IN PLACE AND FUNCTIONAL UNTIL THE PROPOSED DRAINAGE SYSTEM IS OPERATIONAL, UNLESS OTHERWISE NOTED BY THE ENGINEER.
9. THE CONTRACTOR SHALL NOTIFY THE OWNER AT LEAST 72 HOURS PRIOR TO BEGINNING ANY DEMOLITION.
10. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE OWNER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.
11. ALL LIGHTING AND TREES WITHIN LIMIT OF WORK SHALL BE REMOVED UNLESS OTHERWISE NOTED.
12. TOTAL DISTURBED AREA: 431,300 SF.



REVISIONS
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DRAWING TITLE

Demolition Plan A

SUBDIVISION NAME & LOCATION

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DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE 1"=20'

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
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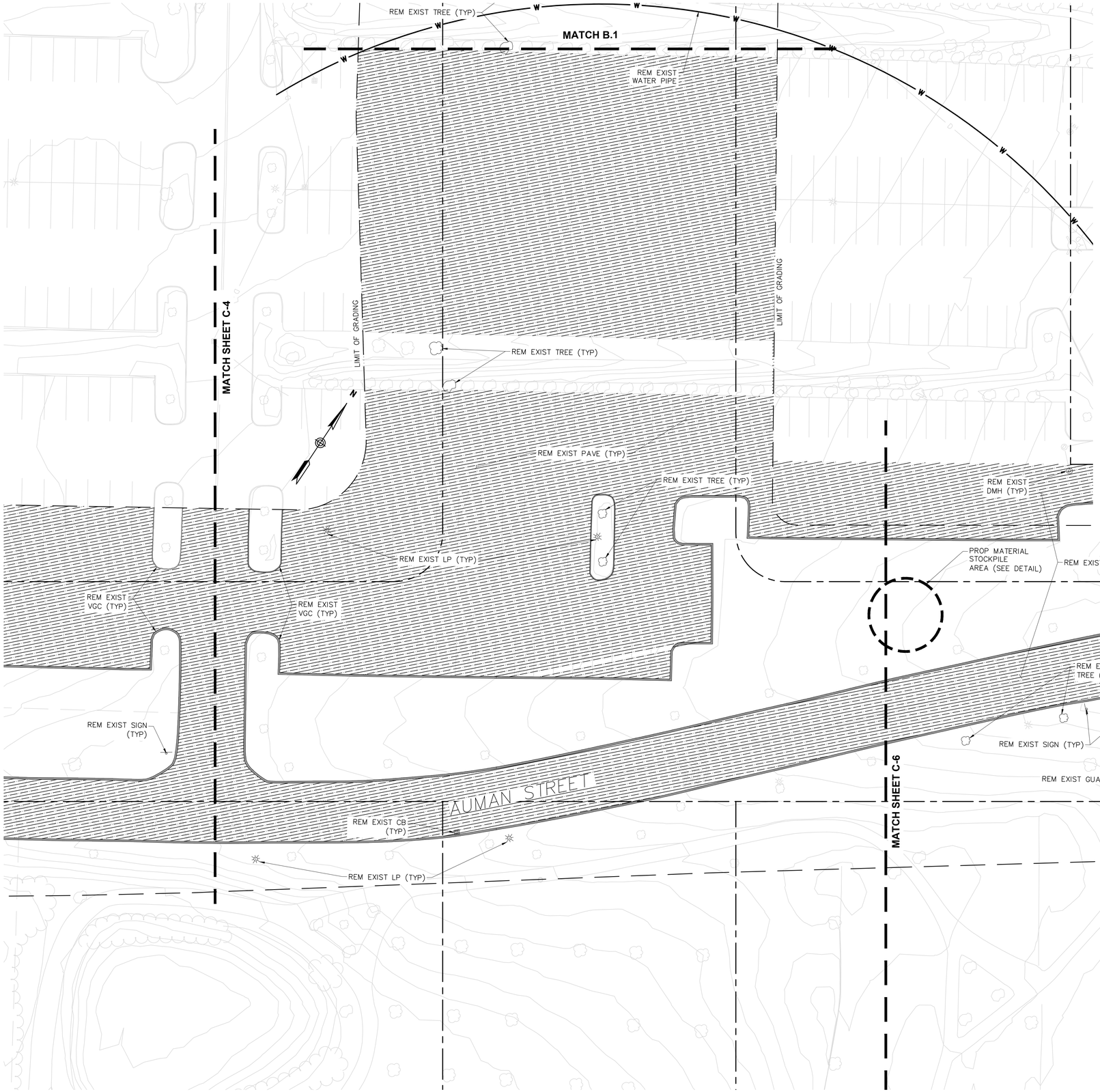
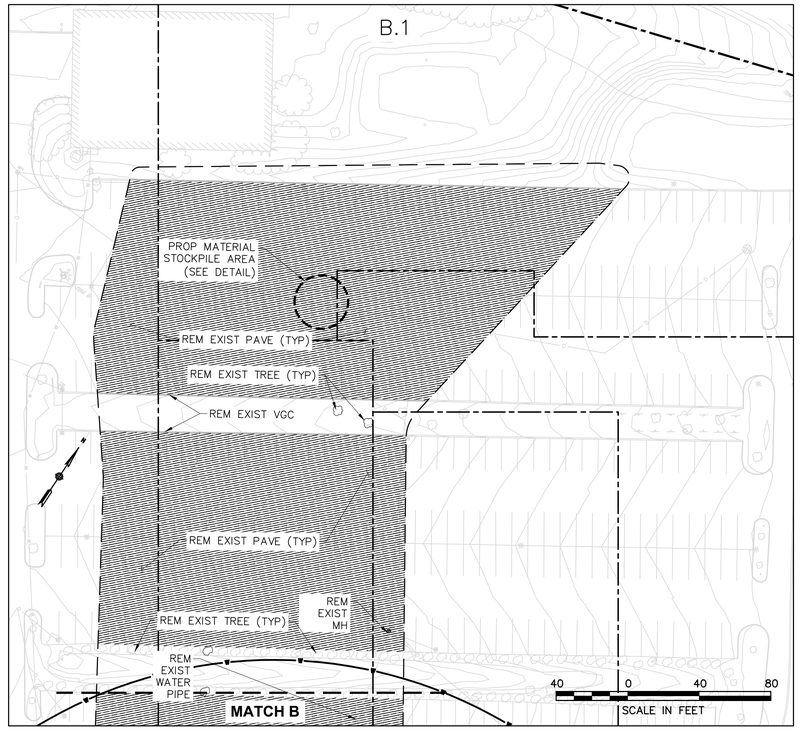
PROJECT NO. T1180
TEC CAD FILE T1180_DEMO
DRAWING NO. C-4
SHEET 4 OF 61





REVISIONS
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2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Demolition Plan B

SUBDIVISION NAME & LOCATION

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COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_DEMO
DRAWING NO. C-5

REM EXIST DMH (TYP)
REM EXIST TREE (TYP)
RET EXIST SMH
REM EXIST DMH (TYP)
PROP MATERIAL STOCKPILE AREA (SEE DETAIL)
REM EXIST PAVE (TYP)
RET EXIST PAVE FOR PHASE 1 CONSTRUCTION VEHICLES
STUB & CAP EXIST WATER PIPE
REM EXIST CB (TYP)
PHASE 1
PHASE 2
SAWCUT
REM EXIST WATER PIPE
RET GUARDRAIL
AUMAN STREET
REM EXIST STREET TREE (TYP)
REM EXIST SIGN (TYP)
REM EXIST TREE (TYP)
REM EXIST LP (TYP)
REM EXIST SIGN (TYP)
REM EXIST STAIRS (TYP)
REM EXIST GUARDRAIL
REM EXIST SW
MATCH SHEET C-5
LIMIT OF GRADING
AUMAN STREET
REM EXIST SIGN (TYP)
REM EXIST SW
REM EXIST CB (TYP)
REM EXIST VGC (TYP)
REM EXIST DMH (TYP)
REM EXIST TREE (TYP)
REM EXIST PAVE
REM EXIST WATER PIPE
REM EXIST DRAINAGE PIPE
REM EXIST DMH
REM EXIST CB (TYP)
REM EXIST PAVE
REM EXIST SIGN
REM EXIST SW
RET EXIST PAVE FOR PHASE 1
R&R EXIST DMH
KING STREET (ROUTE 110)
MATCH SHEET C-7

20 0 20 40
SCALE IN FEET

REVISIONS
1. 2-21-24 PEER REVIEW
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3.

DRAWING TITLE
Demolition Plan C

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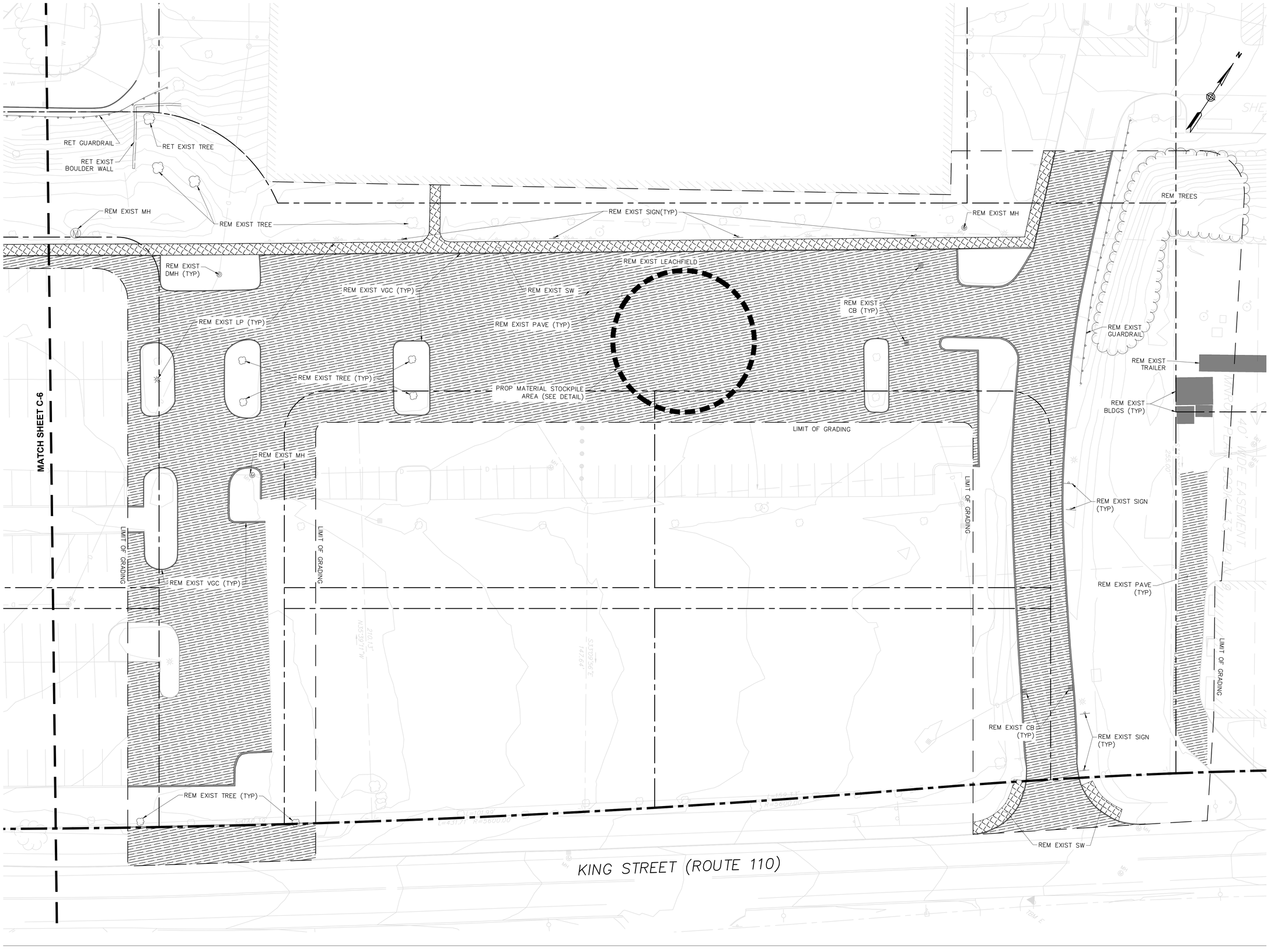
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE 1"=20'

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_DEMO
DRAWING NO. C-6
SHEET 6 OF 61



20 0 20 40
SCALE IN FEET

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Demolition Plan D

SUBDIVISION NAME & LOCATION

King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
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DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE 1"=20'

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_DEMO
DRAWING NO.
C-7
SHEET 7 OF 61

ZONING TABLE

ZONING DISTRICT	KING STREET COMMON	
PROPOSED USE	MIXED–USE	
PROPOSED USE ALLOWABLE BY	BY RIGHT/SPECIAL PERMIT*	
DIMENSIONAL REQUIREMENTS	REQUIRED	PROVIDED
PRIMARY FRONT SETBACK	10 FT (MIN), 20 FT (MAX)	10 FT (MIN), 20 FT (MAX)
SECONDARY FRONT SETBACK	10 FT (MIN), 20 FT (MAX)	10 FT (MIN), 20 FT (MAX)
SIDE SETBACK	15 FT (MIN)	49 FT
REAR SETBACK	15 FT (MIN)	15 FT
PRIMARY PARKING SETBACK	20 FT	20 FT
SECONDARY PARKING SETBACK	20 FT	36 FT
LOT COVERAGE	80% (MAX)	65%
BUILDING COVERAGE	50% (MAX)	33%
FACADE BUILD OUT	60% (MIN)	54%**
BUILDING HEIGHT	6 STORIES/75 FT (MAX)	6 STORIES/75 FT

* WAIVER FROM 173–221.J.A., AS SPECIFICALLY ALLOWED BY SECTION 173–233.H.
** WAIVER FROM FORM BASED CODE, AS SPECIFICALLY ALLOWED BY SECTION 173–233.H.

PARKING TABLE

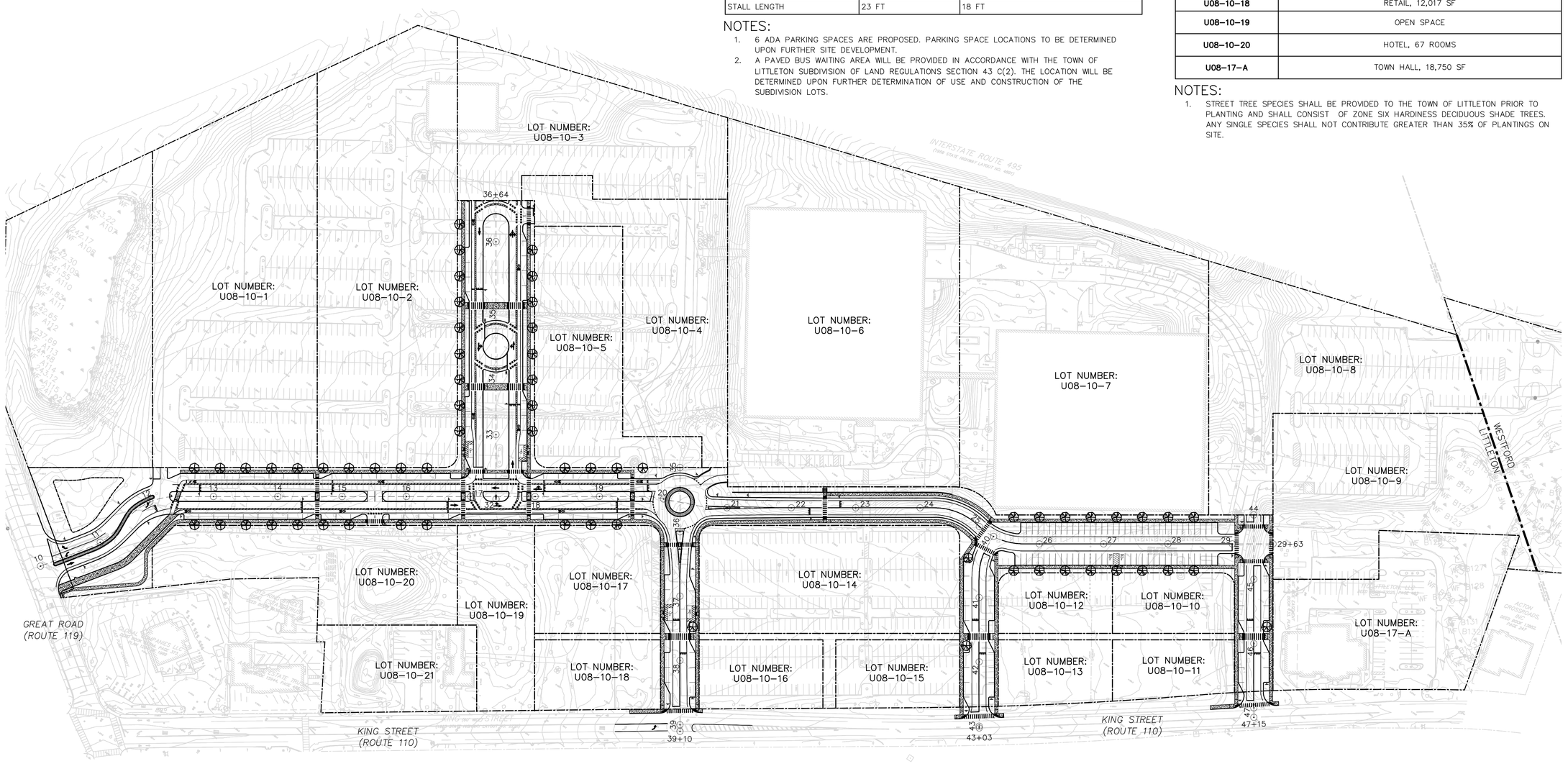
REQUIRED PARKING	RETAIL/COMMERCIAL: 112,879 SF X 3 SP/1,000 SF =339 SPACES OFFICE: 564,270 SF X 3 SP/1,000 SF = 775 SPACES RESIDENTIAL: 865 UNITS X 1.25 SP/UNIT =1,081 SPACES HOTEL: 67 UNITS X 1.25 SP/UNIT =84 SPACES TOTAL REQUIRED PARKING = 2,279 SPACES	
PROPOSED PARKING	STREET PARKING: 156 SPACES PROPOSED OFF SITE PARKING: ON–GRADE PARKING: 235 SPACES PODIUM PARKING: 798 SPACES STRUCTURED PARKING: U08–10–4 = 827 SPACES U08–10–8&9 = 548 SPACES TOTAL = 1,375 SPACES TOTAL PROPOSED PARKING = 2,564 SPACES	
ON STREET PARKING	PARALLEL	HEAD–IN
	88	68
PARKING REQUIREMENTS	REQUIRED	PROVIDED
HANDICAP ACCESSIBLE SPACES (ON SITE)	6	6
HANDICAP ACCESSIBLE SPACES (OFF SITE)	64	64
AISLE WIDTH	24 FT	24 FT
STALL WIDTH	8 FT (BIKE LANE)	9 FT
	9 FT (NO BIKE LANE)	
STALL LENGTH	23 FT	18 FT

NOTES:
1. 6 ADA PARKING SPACES ARE PROPOSED. PARKING SPACE LOCATIONS TO BE DETERMINED UPON FURTHER SITE DEVELOPMENT.
2. A PAVED BUS WAITING AREA WILL BE PROVIDED IN ACCORDANCE WITH THE TOWN OF LITTLETON SUBDIVISION OF LAND REGULATIONS SECTION 43 C(2). THE LOCATION WILL BE DETERMINED UPON FURTHER DETERMINATION OF USE AND CONSTRUCTION OF THE SUBDIVISION LOTS.

BUILDING PROGRAM

LOT	USE
U08–10–1	RESIDENTIAL, 274,000 SF, 239 UNITS
U08–10–2	RESIDENTIAL, 240,000 SF, 223 UNITS
U08–10–3	RESIDENTIAL, 143,000 SF, 142 UNITS
U08–10–4	PARKING GARAGE, 827 SPACES
U08–10–5	RESIDENTIAL, 185,000 SF, 177 UNITS
U08–10–6	OFFICE, 272,619 SF
U08–10–7	OFFICE, 272,901 SF
U08–10–8, U08–10–9	RETAIL, 13,600 SF PARKING GARAGE, 548 SPACES
U08–10–10	RETAIL, 8,685 SF RESIDENTIAL, 7 UNITS
U08–10–11	RETAIL, 5,274 SF RESIDENTIAL, 3 UNITS
U08–10–12	RETAIL, 5,833 SF RESIDENTIAL, 7 UNITS
U08–10–13	RETAIL, 6,949 SF RESIDENTIAL, 4 UNITS
U08–10–14	RETAIL, 26,510 SF RESIDENTIAL, 40 UNITS
U08–10–15	RETAIL, 10,772 SF RESIDENTIAL, 8 UNITS
U08–10–16	RETAIL, 10,479 SF RESIDENTIAL, 8 UNITS
U08–10–17	RETAIL, 12,760 SF RESIDENTIAL, 7 UNITS
U08–10–18	RETAIL, 12,017 SF
U08–10–19	OPEN SPACE
U08–10–20	HOTEL, 67 ROOMS
U08–17–A	TOWN HALL, 18,750 SF

NOTES:
1. STREET TREE SPECIES SHALL BE PROVIDED TO THE TOWN OF LITTLETON PRIOR TO PLANTING AND SHALL CONSIST OF ZONE SIX HARDINESS DECIDUOUS SHADE TREES. ANY SINGLE SPECIES SHALL NOT CONTRIBUTE GREATER THAN 35% OF PLANTINGS ON SITE.



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SCALE IN FEET

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Layout Plan

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER
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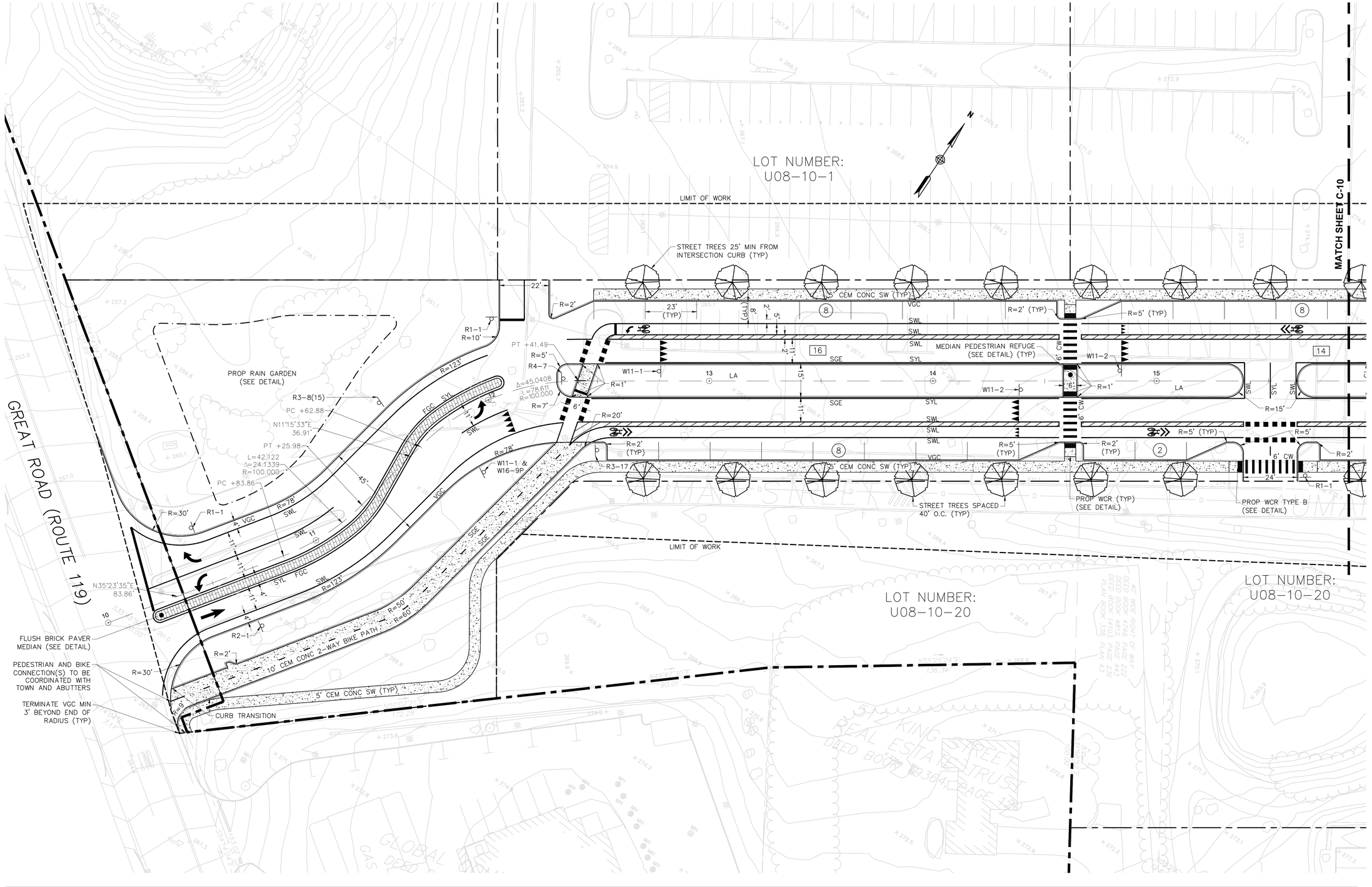
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE 1"=20'

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_SITE
DRAWING NO.
C-8
SHEET 8 OF 61



REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Layout Plan A

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
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DESIGNED BY	RJF	DATE	8-22-23
CHECKED BY	CPR	SCALE	1"=20'

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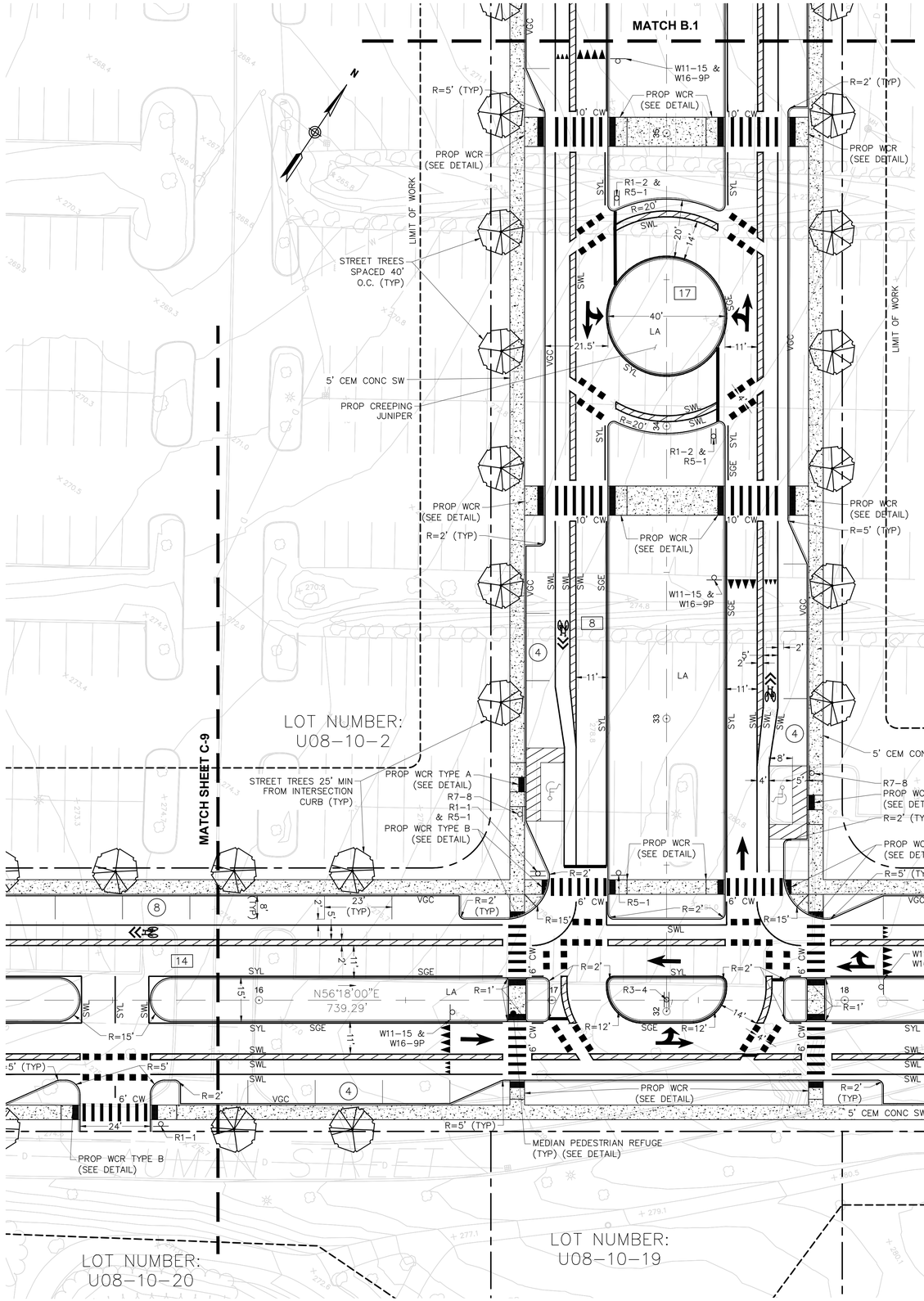
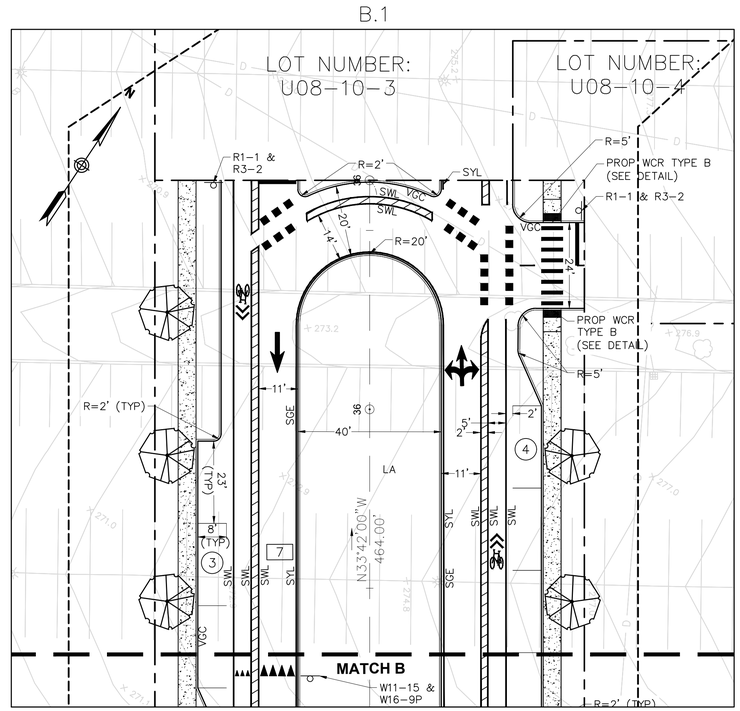
PROJECT NO.
T1180
TEC CAD FILE
T1180_SITE
DRAWING NO.
C-9
SHEET 9 OF 61

TRAFFIC SIGN SUMMARY

ID NUMBER	SIZE OF SIGN (in) WIDTH	HEIGHT	LEGEND	TEXT DIMENSIONS (in) LETTER HEIGHT	VERTICAL SPACING	ROUTE MARKER	NUMBER OF SIGNS REQUIRED	NUMBER OF POSTS REQUIRED
R1-1	30	30	STOP	SEE MUTCD SIGN STANDARDS			13	13
R1-2	36 X 36 X 36		YIELD				7	7
R1-3P	18	6	ALL WAY				3	0
R2-1	24	30	SPEED LIMIT 25				4	4
R3-2	24	24					2	0
R3-4	24	24					2	1
R3-8(15)	30	30	ONLY ONLY				1	1
R3-17	24	18	BIKE LANE				3	2
R3-17BP	24	8	ENDS				1	0
R4-7	24	30					2	2
R5-1	30	30	DO NOT ENTER				4	1
R6-5P	30	30					2	2
R7-8	12	18	RESERVED PARKING				6	6
R7-8P	18	9	VAN ACCESSIBLE				2	0
W11-1	30	30					2	2
W11-2	30	30					5	5
W11-15	30	30					4	4
W16-7PL	24	12					1	1
W16-9P	24	12	AHEAD				5	0

* HANDICAP PARKING SIGNS SHALL BE IN ACCORDANCE WITH TOWN OF LITTLETON STANDARDS, AND ADA REGULATIONS. VAN SIGNS SHALL BE LOCATED AT ALL ADA SPACES. PER ADA ACCESSIBILITY GUIDELINES (AMENDED 2010) ANY SPACE WITH A VAN SIGN IS NOT INTENDED TO BE RESTRICTED ONLY TO VANS





20 0 20 40
SCALE IN FEET

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Layout Plan B

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
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Lawrence, MA 01840

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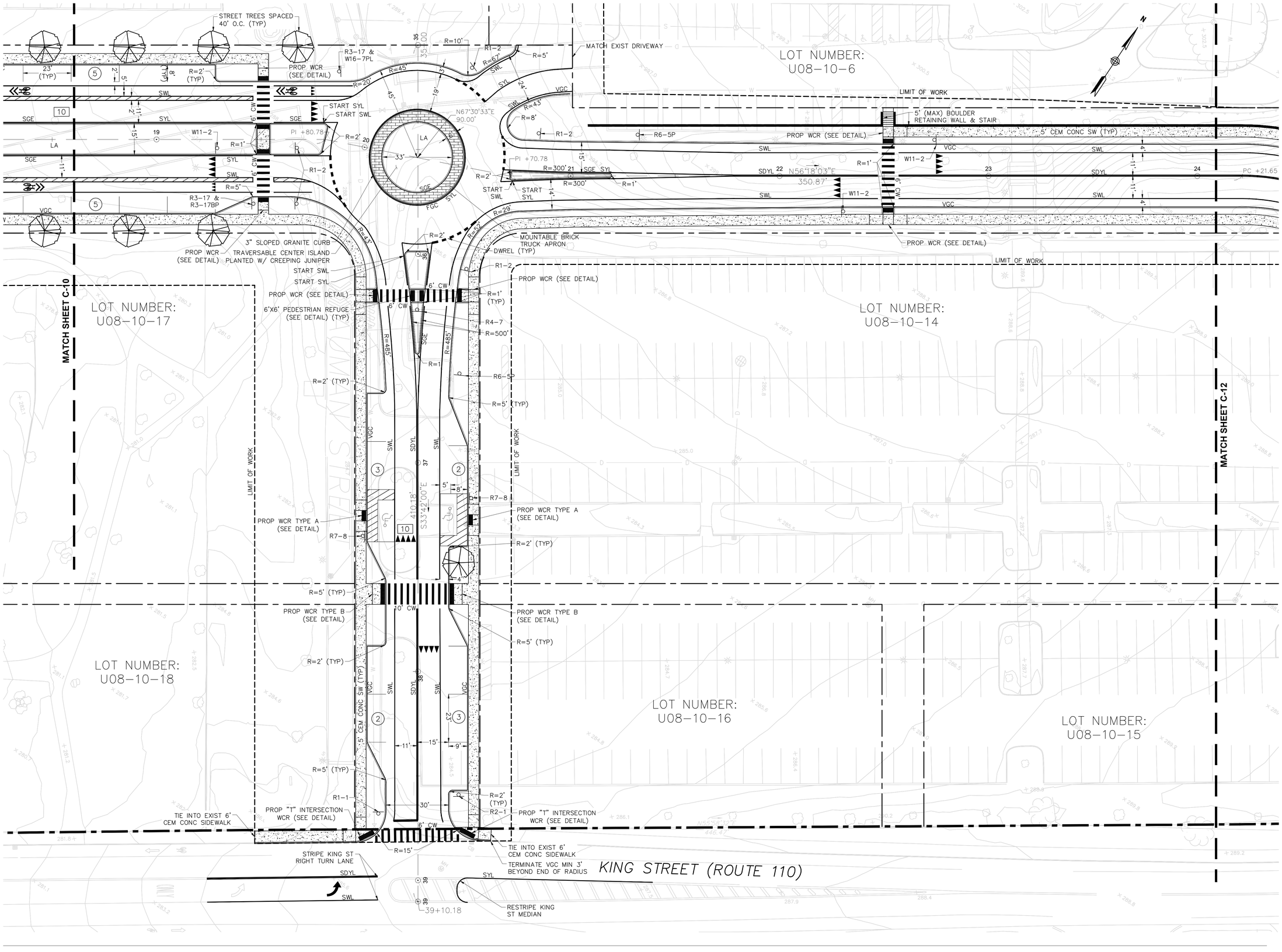
CHECKED BY	CPR	SCALE	1"=20'

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_SITE
DRAWING NO. C-10
SHEET 10 OF 61



20 0 20 40
SCALE IN FEET

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Layout Plan C

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

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COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
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REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_SITE
DRAWING NO. C-11

MATCH EXIST BOULDER WALL
PRC +98.49
PROP WCR (SEE DETAIL)
PC +21.65
R=115'
Δ=44.0206
L=76.832
R=100.000
R=80'
SWL
SDYL
24
25
R=1'
40+00
S0°02'04"E
10.20'
PC +10.20
R=85'
R=5'
5' CEM CONC SW
LIMIT OF WORK
VGC
STREET TREES SPACED 40' O.C. (TYP)
LOT NUMBER: U08–10–7
LOT NUMBER: U08–10–8
LOT NUMBER: U08–10–14
PROP WCR (SEE DETAIL)
R=15'
6' CW
PT +75.32
26
27
28
29
N56°18'00"E
388.02'
68
R7–8 & R7–8P
9'
18'
11' (TYP)
15' (TYP)
PROP WCR TYP B (SEE DETAIL)
R1–1
R=2'
R=100.000
L=68.795
Δ=33.6654
PT +68.95
STREET TREES 25' MIN FROM INTERSECTION CURB (TYP)
WCR TYPE A (SEE DETAIL)
STREET TREES SPACED 40' O.C. (TYP)
R7–8 & R7–8P
LIMIT OF WORK
R=2' (TYP)
R1–1 & R1–3P
44+00
PROP WCR TYPE B W/ FLARE (TYP)
6' CW
30'
11'
R=15'
R=5' (TYP)
MATCH SHEET C-11
LOT NUMBER: U08–10–12
LOT NUMBER: U08–10–10
LOT NUMBER: U08–10–13
LOT NUMBER: U08–10–11
LOT NUMBER: U08–10–15
4 CEM CONC SW (TYP)
3 5' CEM CONC SW (TYP)
13
41
42
43
45
46
47
10' CW
23'
15'
11'
9'
S33°42'00"E
233.85'
314.76'
43+02.80
47+14.76
R=2' (TYP)
PROP WCR (SEE DETAIL)
R=5' (TYP)
R2–1
R=20'
TIE INTO EXIST 6' CEM CONC SIDEWALK
TERMINATE VGC MIN 3' BEYOND END OF RADIUS (TYP)
TERMINATE VGC MIN 3' BEYOND END OF RADIUS
PROP "T" INTERSECTION WCR (SEE DETAIL)
WARNING STRIPING (TYP)
TERMINATE VGC 3' BEYOND END OF R.
KING STREET (ROUTE 110)
DRAINAGE DISPOSAL EASEMENT DEED BOOK 14237, PAGE 395 DEED BOOK 15849, PAGE 80
MANORVILLE ESTATES EASEMENT BOOK 333, PLAN

20 0 20 40
SCALE IN FEET

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Layout Plan D

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

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COMMONWEALTH OF MASSACHUSETTS
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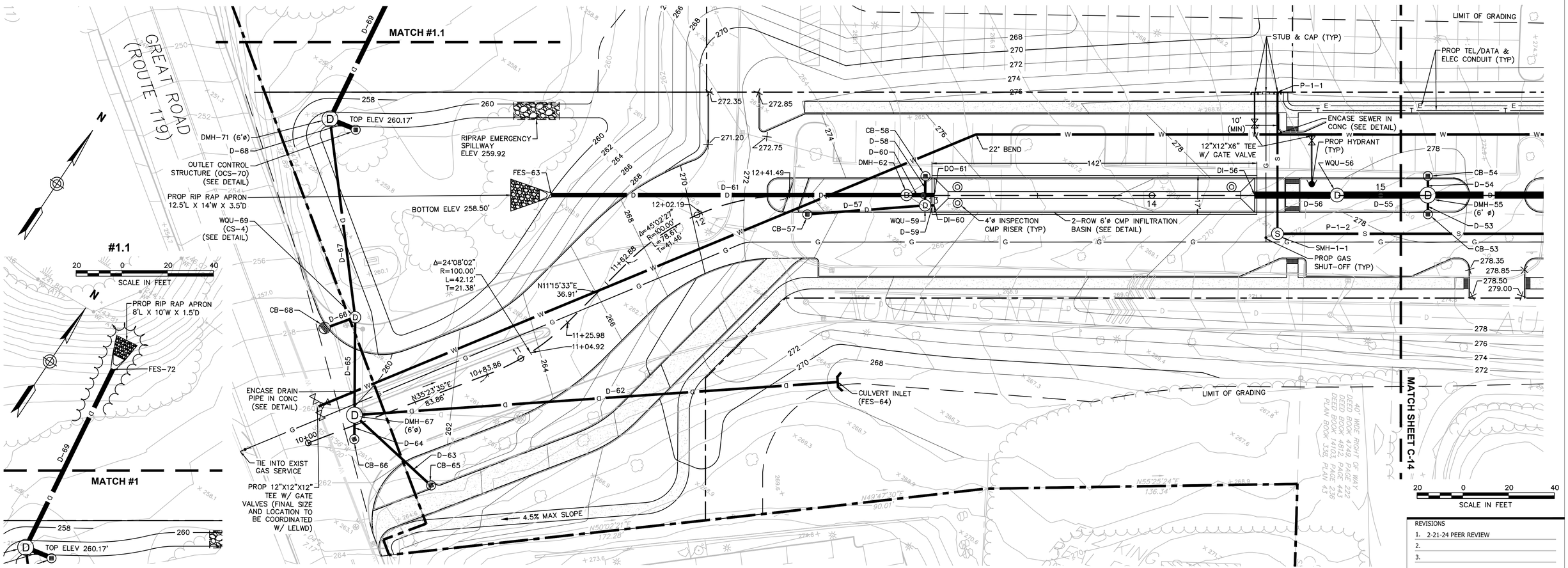
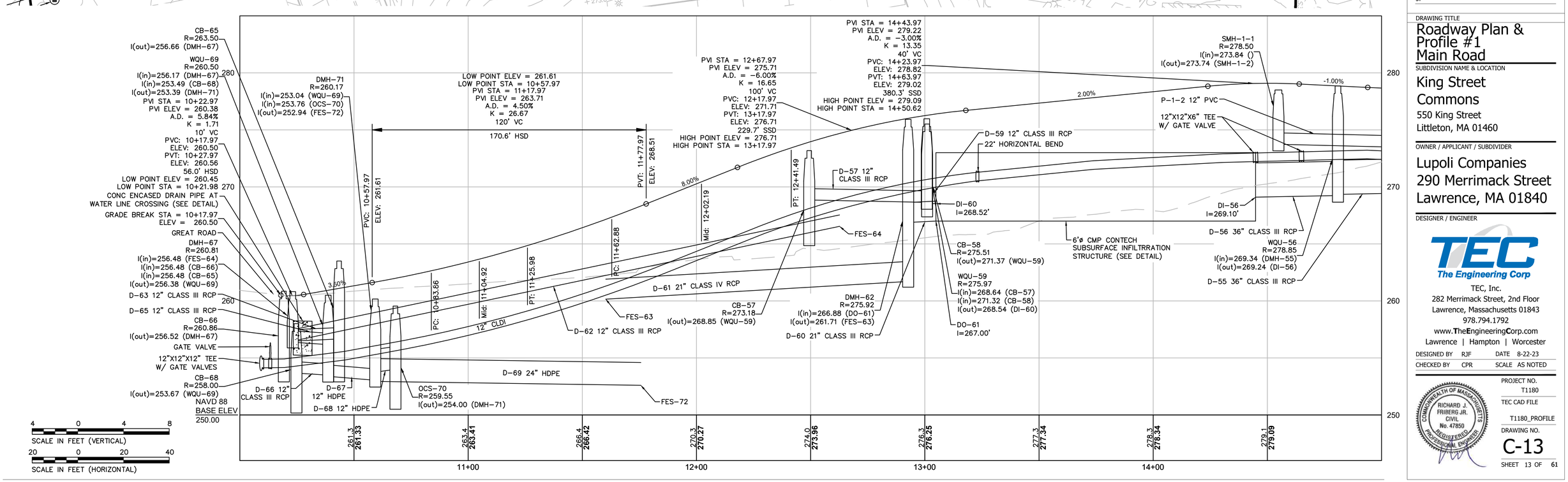
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_SITE
DRAWING NO. C-12
SHEET 12 OF 61





REVISIONS
1. 2-21-24 PEER REVIEW
2.
3.

DRAWING TITLE
Roadway Plan & Profile #1 Main Road

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

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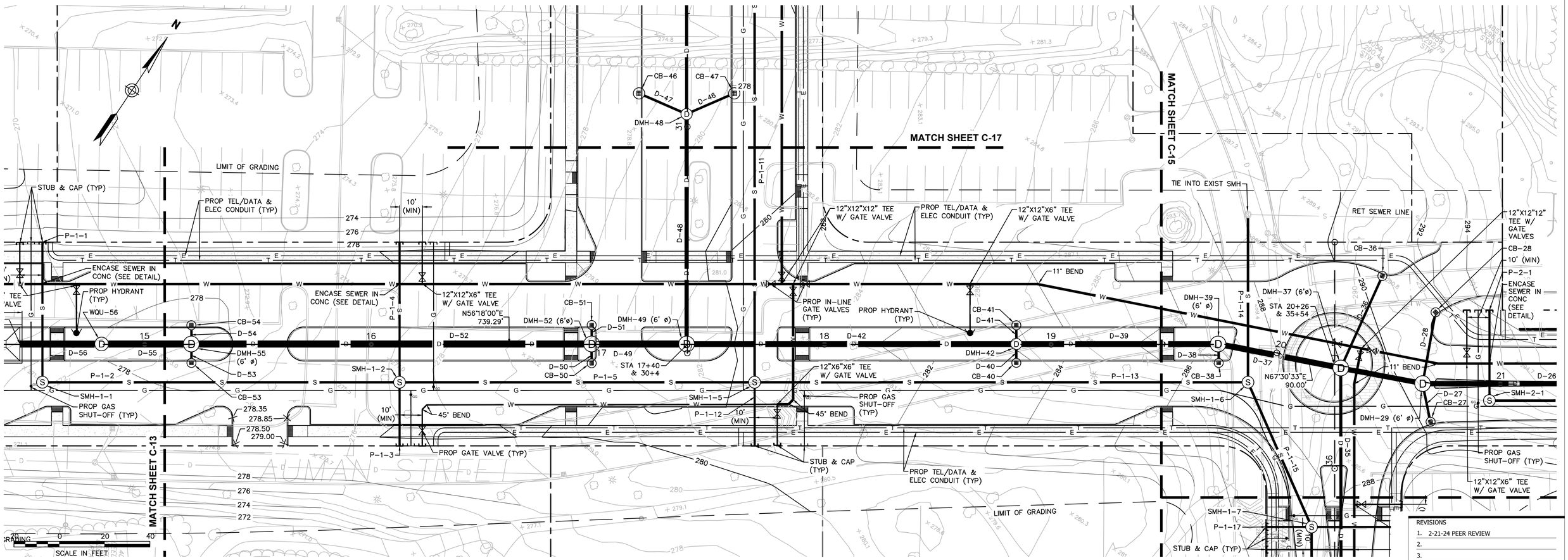
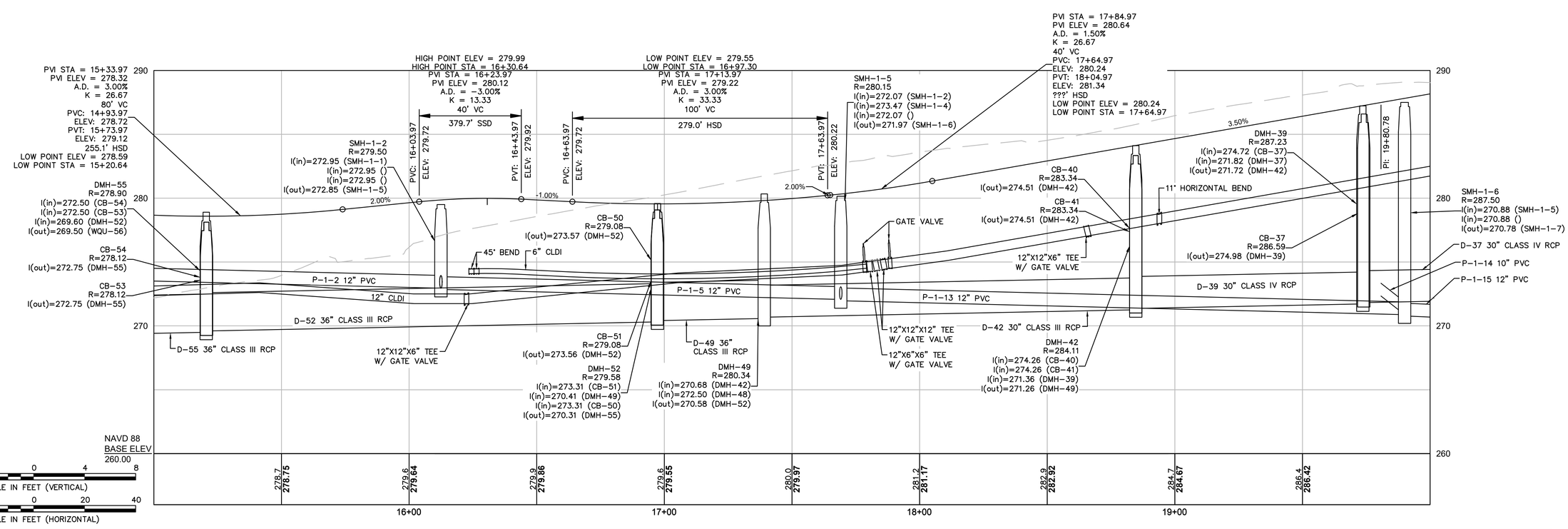
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_PROFILE
DRAWING NO.
C-13
SHEET 13 OF 61





REVISIONS
1. 2-21-24 PEER REVIEW
2.
3.

DRAWING TITLE
Roadway Plan & Profile #2 Main Road

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER
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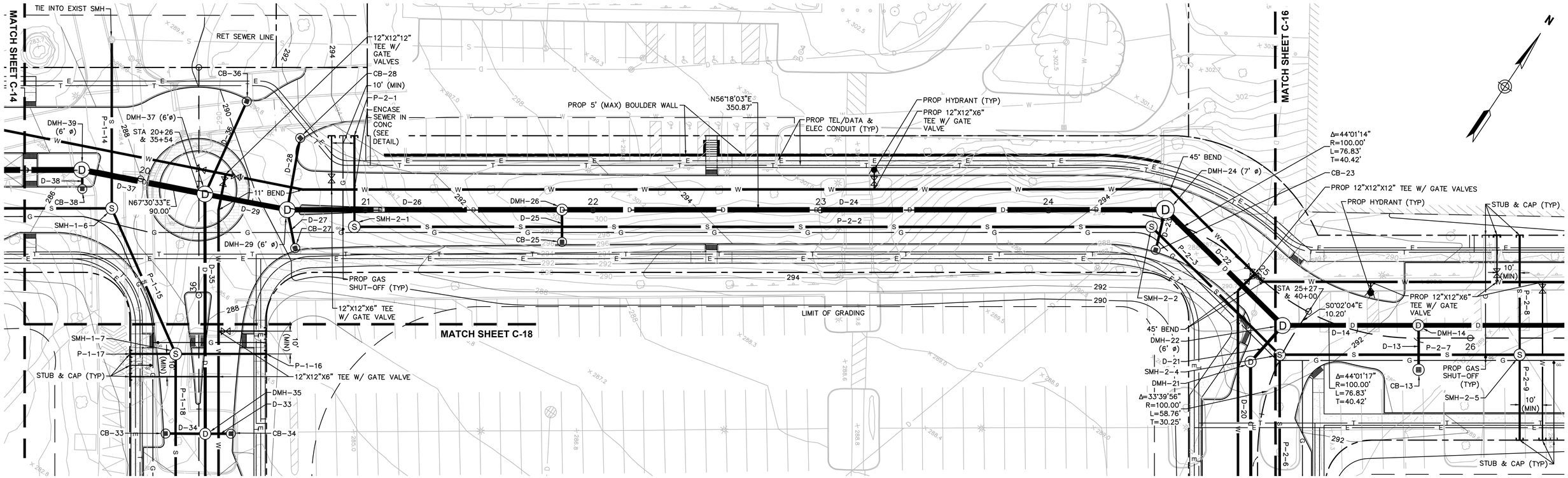
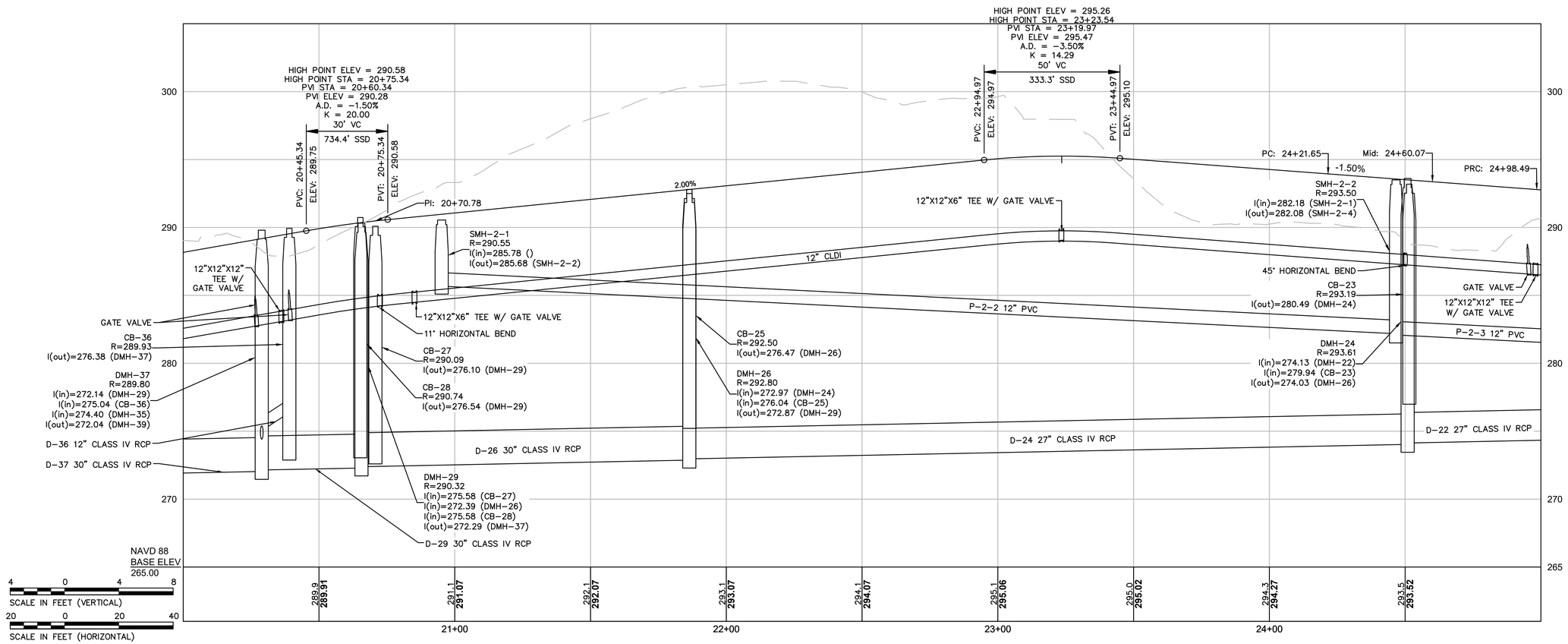
PROJECT NO. T1180
TEC CAD FILE T1180_PROFILE
DRAWING NO. C-14
SHEET 14 OF 61





REVISIONS
1. 2-21-24 PEER REVIEW
2.
3.

DRAWING TITLE
Roadway Plan & Profile #3 Main Road

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

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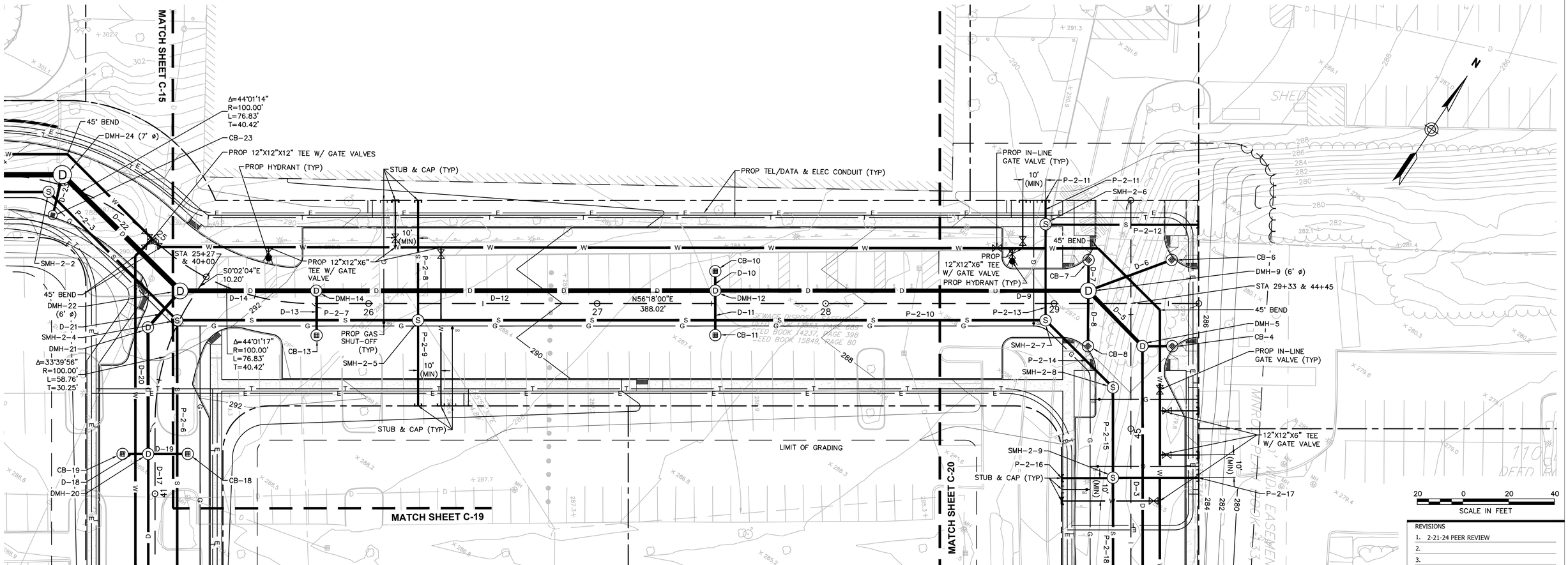
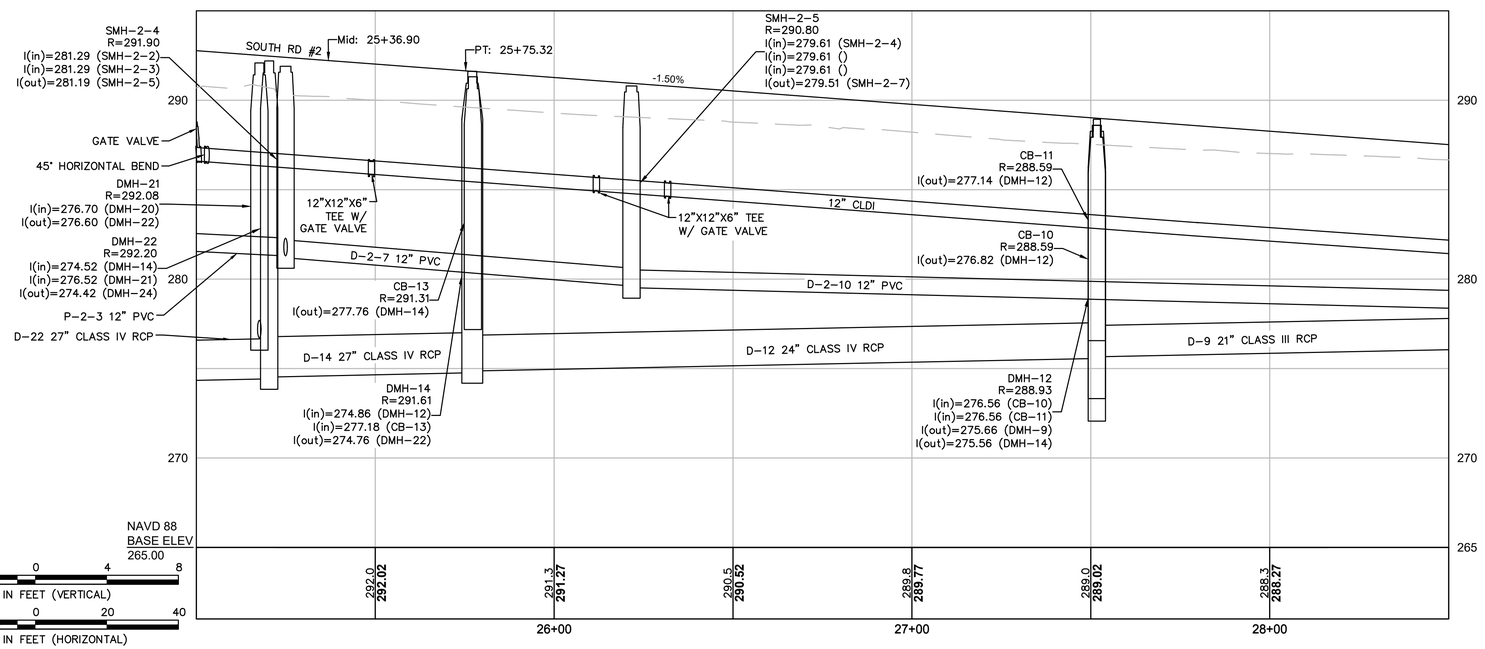
PROJECT NO. T1180
TEC CAD FILE T1180_PROFILE
DRAWING NO. C-15
SHEET 15 OF 61





REVISIONS
1. 2-21-24 PEER REVIEW
2.
3.

DRAWING TITLE
Roadway Plan & Profile #4 Main Road

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
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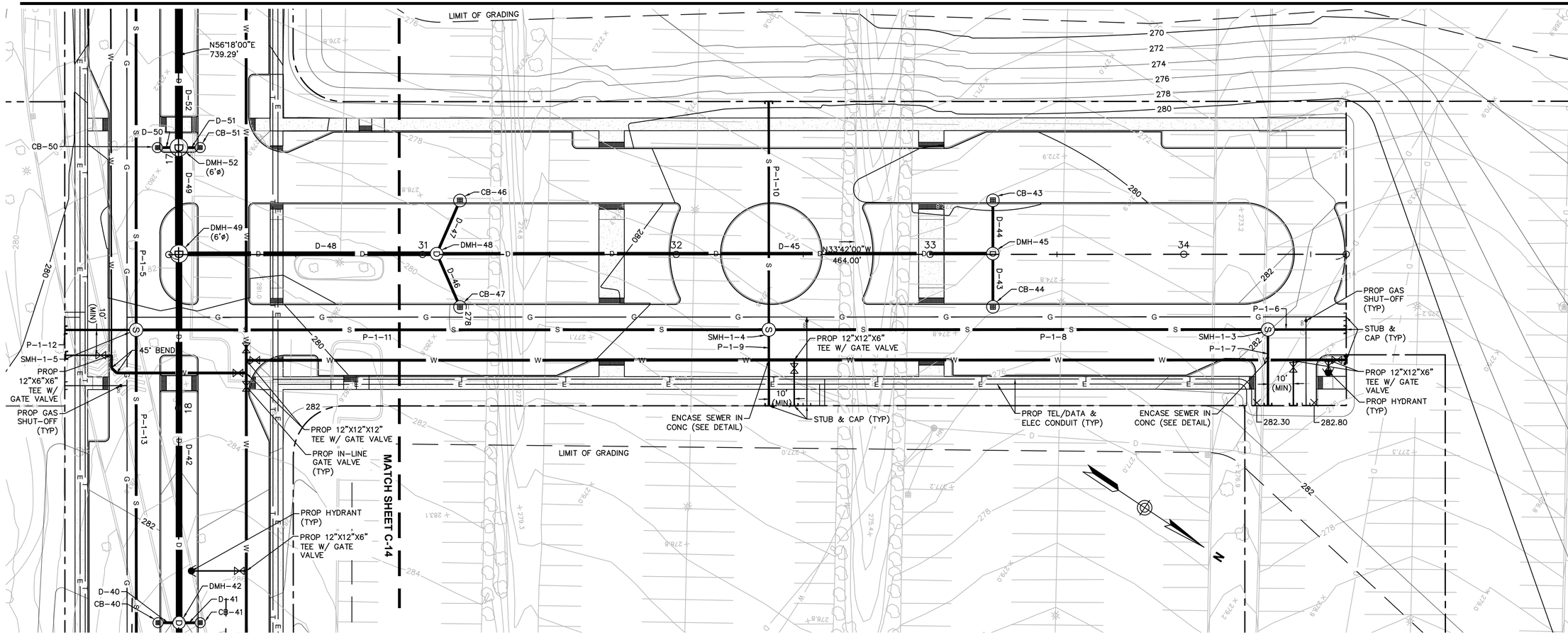
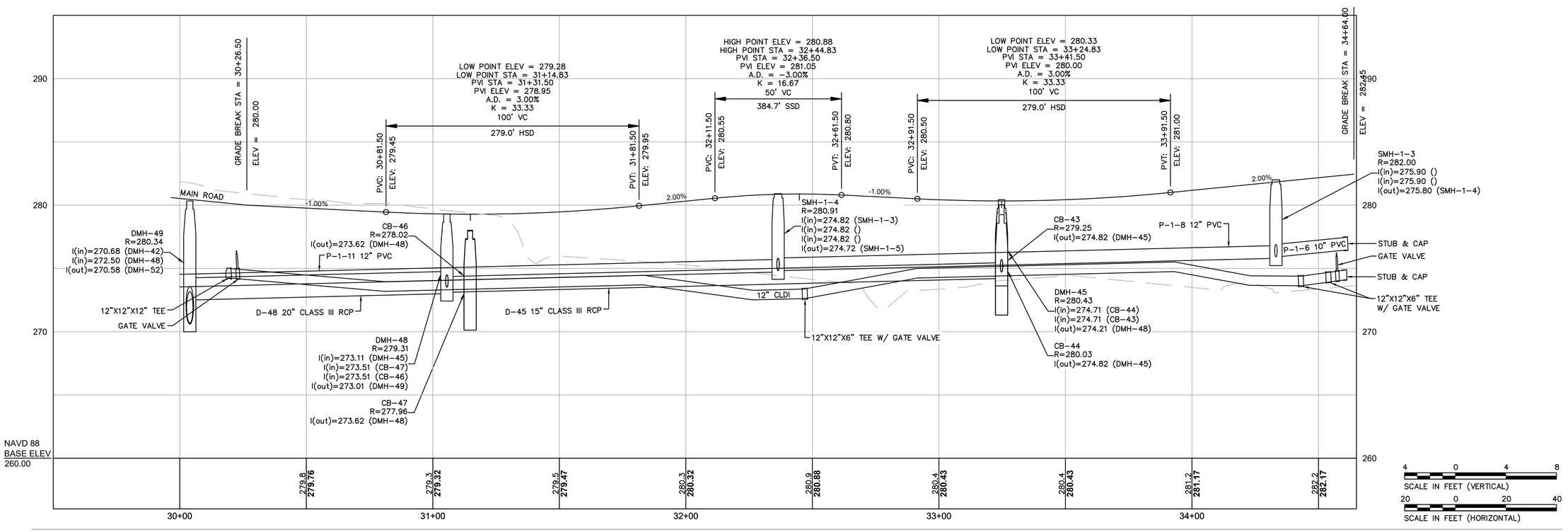
PROJECT NO. T1180
TEC CAD FILE T1180_PROFILE
DRAWING NO. C-16
SHEET 16 OF 61





REVISIONS
1. 2-21-24 PEER REVIEW
2.
3.

DRAWING TITLE
Roadway Plan & Profile #5
North Road

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER
TEC
The Engineering Corp
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
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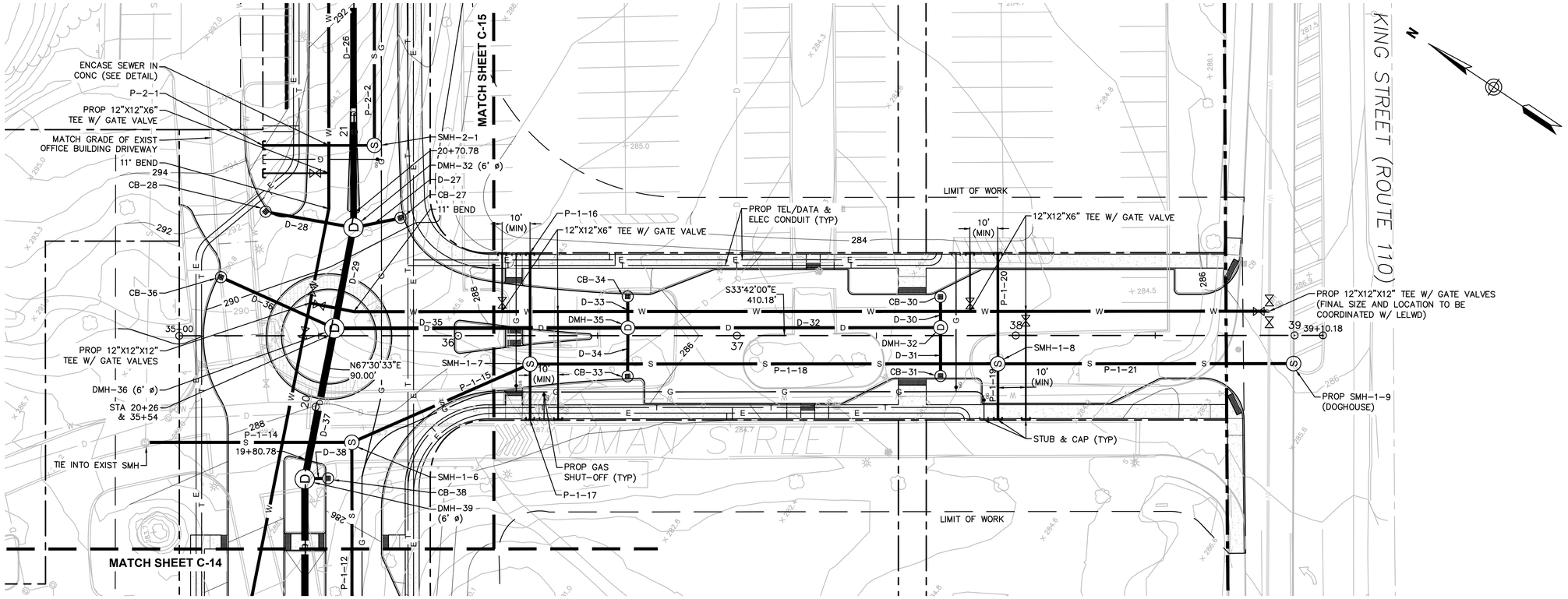
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_PROFILE
DRAWING NO.
C-17
SHEET 17 OF 61



20 0 20 40
SCALE IN FEET

4 0 4 8
SCALE IN FEET (VERTICAL)

20 0 20 40
SCALE IN FEET (HORIZONTAL)

REVISIONS
1. 2-21-24 PEER REVIEW
2.
3.

DRAWING TITLE
Roadway Plan & Profile #6 South Road #1

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

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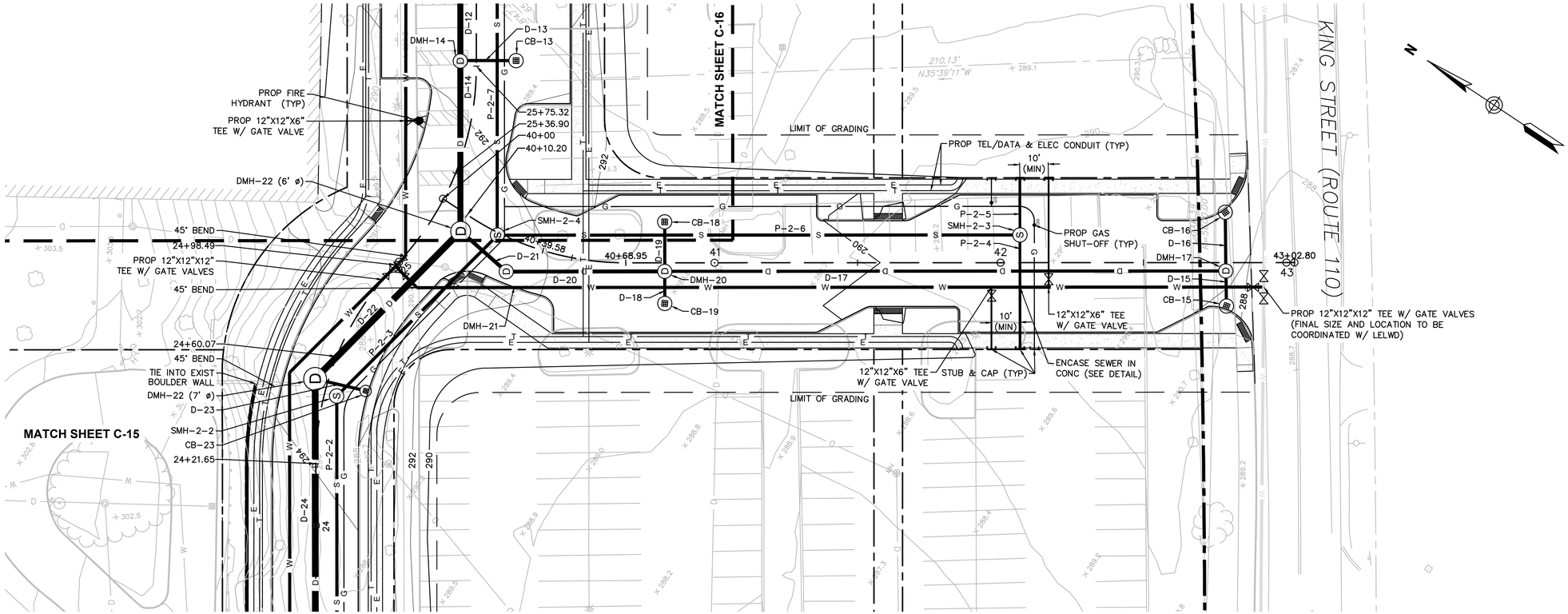
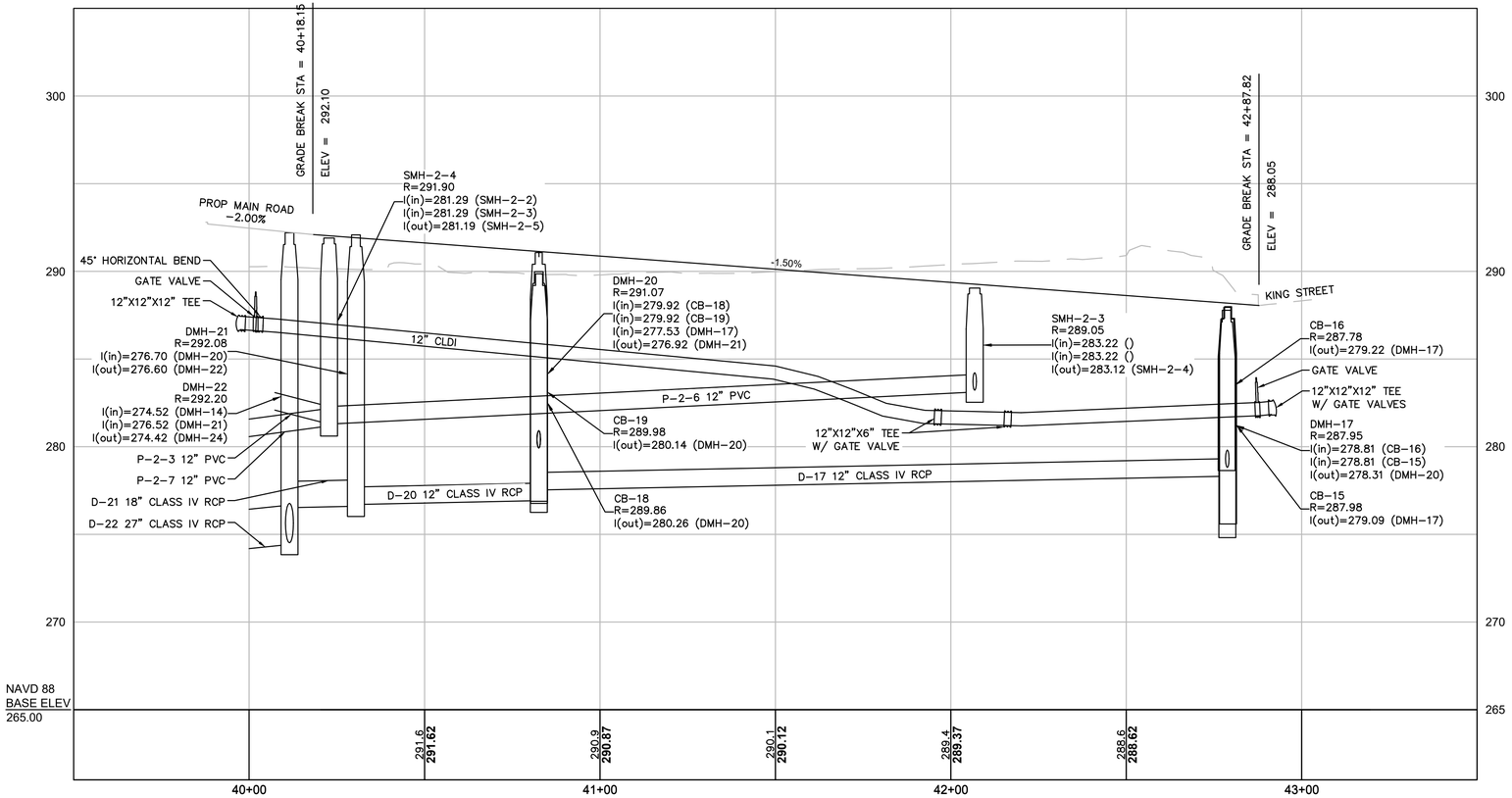
PROJECT NO.
T1180
TEC CAD FILE
T1180_PROFILE
DRAWING NO.
C-18
SHEET 18 OF 61





4 0 4 8
SCALE IN FEET (VERTICAL)

20 0 20 40
SCALE IN FEET (HORIZONTAL)

20 0 20 40
SCALE IN FEET

REVISIONS
1. 2-21-24 PEER REVIEW
2.
3.

DRAWING TITLE
Roadway Plan & Profile #7
South Road #2

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER
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DESIGNED BY RJF DATE 8-22-23
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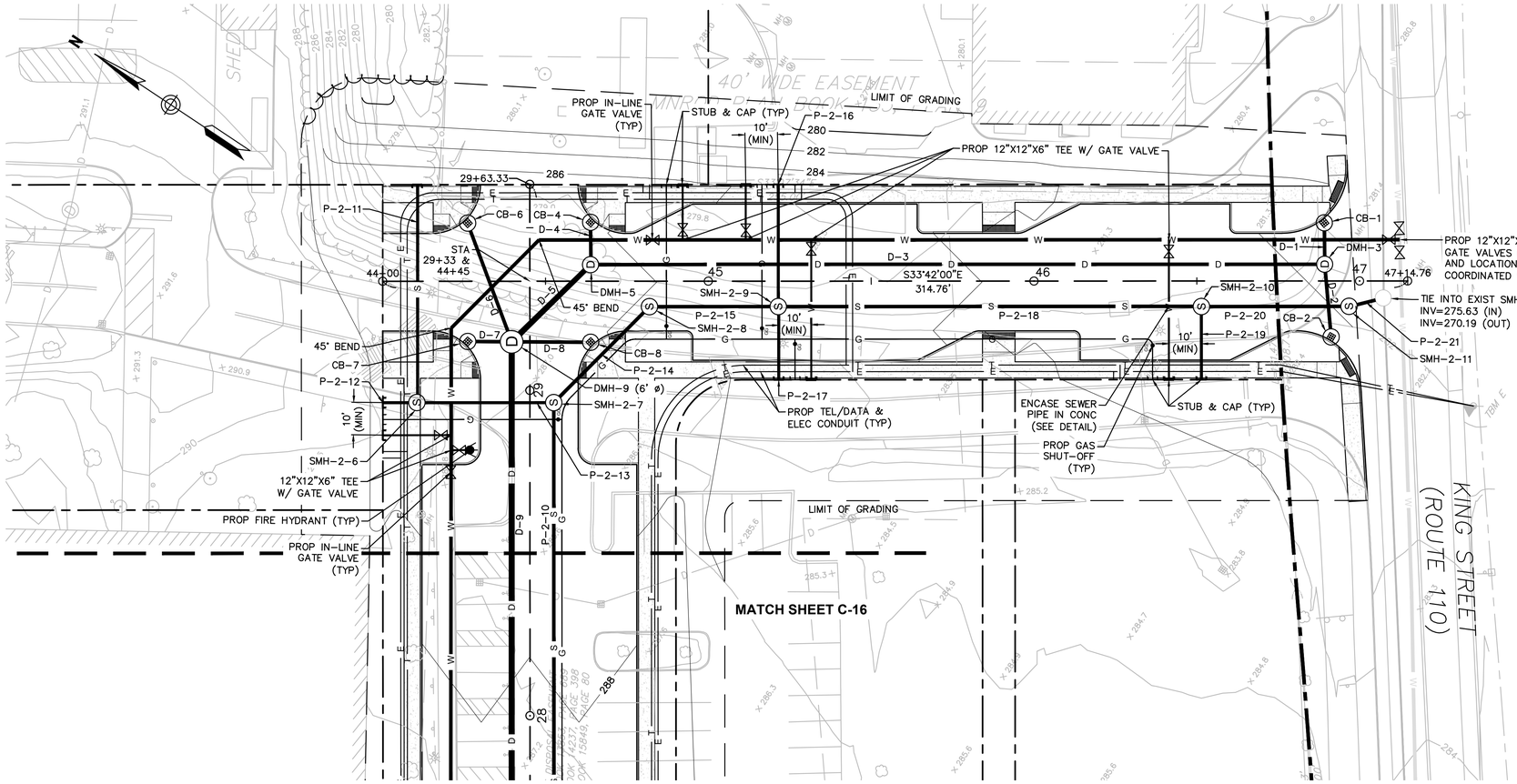
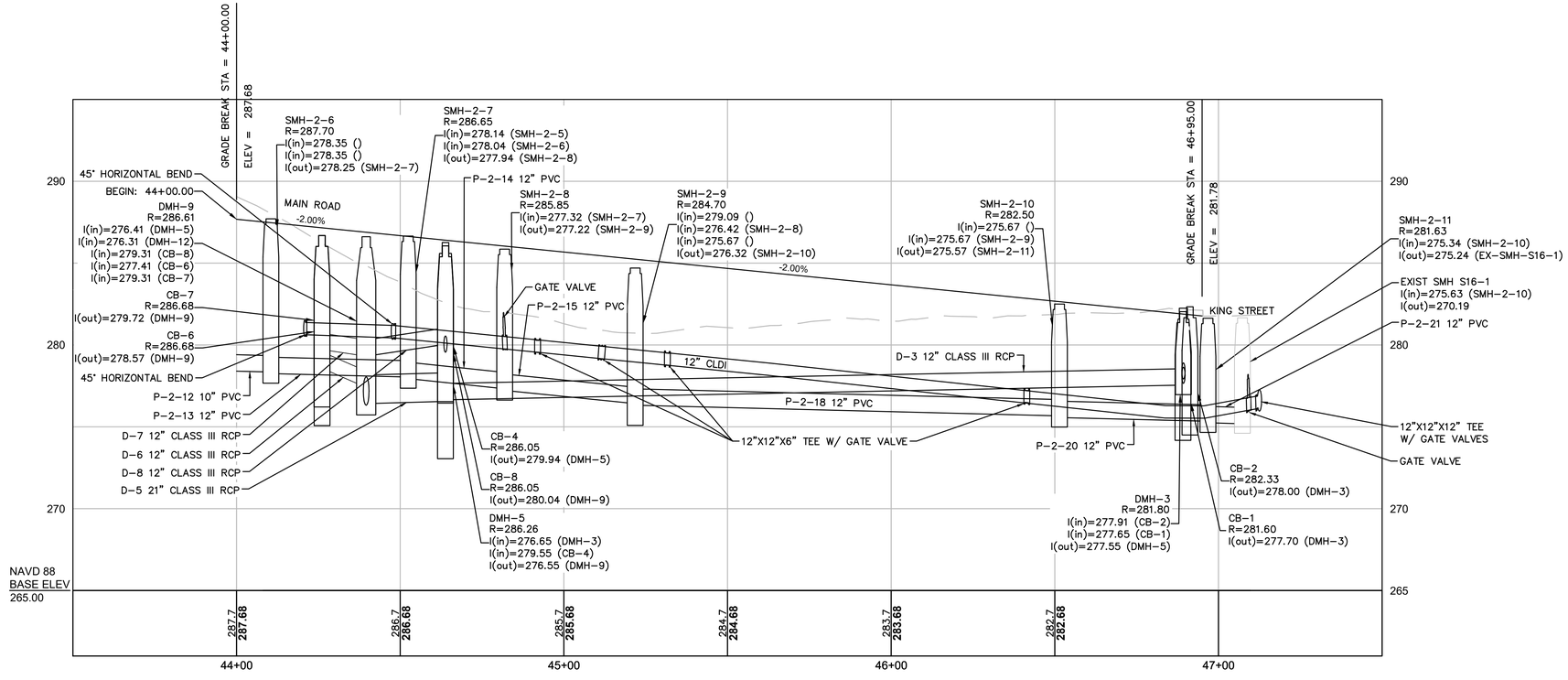
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_PROFILE
DRAWING NO. C-19
SHEET 19 OF 61





4 0 4 8
SCALE IN FEET (VERTICAL)

20 0 20 40
SCALE IN FEET (HORIZONTAL)

20 0 20 40
SCALE IN FEET

REVISIONS
1. 2-21-24 PEER REVIEW
2.
3.

DRAWING TITLE
Roadway Plan & Profile #7
South Road #3

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
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290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER
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DESIGNED BY RJF DATE 8-22-23
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COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_PROFILE
DRAWING NO.
C-20
SHEET 20 OF 61

PHASE 1 SANITARY SEWER:

SEWER STRUCTURE DATA					
NO.	**TYPE**	**STATION**	**RIM ELEV.**	**INV. ELEV. IN**	**INV. ELEV. OUT**
SMH-1-1	SMH-48	14+54.8 16.7' RT	278.50	I=273.84' ()	I=273.74' (SMH-1-2)
SMH-1-2	SMH-48	16+12.5 16.8' RT	279.50	I=272.95' (SMH-1-1) I=272.95' () I=272.95' ()	I=272.85' (SMH-1-5)
SMH-1-3	SMH-48	34+33.2 29.7' RT	282.00	I=275.90' () I=275.90' ()	I=275.80' (SMH-1-4)
SMH-1-4	SMH-48	32+36.4 29.7' RT	280.91	I=274.82' (SMH-1-3) I=274.82' () I=274.82' ()	I=274.72' (SMH-1-5)
SMH-1-5	SMH-48	17+69.1 16.7' RT	280.15	I=272.07' (SMH-1-2) I=273.47' (SMH-1-4) I=272.07' ()	I=271.97' (SMH-1-6)
SMH-1-6	SMH-48	19+90 15.2' RT	287.50	I=270.88' (SMH-1-5) I=270.88' ()	I=270.78' (SMH-1-7)
SMH-1-7	SMH-48	20+30 72.5' RT	287.13	I=270.43' (SMH-1-6) I=270.43' () I=270.43' ()	I=270.33' (SMH-1-8)
SMH-1-8	SMH-48	20+62.7 237.0' RT	284.84	I=269.49' (SMH-1-7) I=269.49' () I=269.49' ()	I=269.39' (SMH-1-9)
SMH-1-9	SMH-48	20+70.8 341.4' RT	286.36	I=268.86' (SMH-1-8)	

SEWER PIPE DATA					
PIPE	**PIPE LOCATION**	**SIZE & TYPE**	**LENGTH**	**SLOPE**	**SHEET # (C-)**
P-1-1	STUB TO SMH-1-1 STA 14+55 TO 14+55	10" PVC	60 LF	0.005	13
P-1-2	SMH-1-1 TO SMH-1-2 STA 14+55 TO 16+12	12" PVC	154 LF	0.005	13, 14
P-1-3	STUB TO SMH-1-2 STA 16+12 TO 16+12	10" PVC	26 LF	0.020	14
P-1-4	STUB TO SMH-1-2 STA 16+14 TO 16+12	10" PVC	56 LF	0.020	14
P-1-5	SMH-1-2 TO SMH-1-5 STA 16+12 TO 17+69	12" PVC	153 LF	0.005	14
P-1-6	STUB TO SMH-1-3 STA 34+61 TO 34+33	12" PVC	26 LF	0.020	17
P-1-7	STUB TO SMH-1-3 STA 34+33 TO 34+33	10" PVC	28 LF	0.020	17
P-1-8	SMH-1-3 TO SMH-1-4 STA 34+33 TO 32+36	12" PVC	193 LF	0.005	17
P-1-9	STUB TO SMH-1-4 STA 32+36 TO 32+36	10" PVC	28 LF	0.020	17
P-1-10	STUB TO SMH-1-4 STA 32+37 TO 32+36	10" PVC	88 LF	0.005	17
P-1-11	SMH-1-4 TO SMH-1-5 STA 32+36 TO 17+69	12" PVC	245 LF	0.005	17
P-1-12	STUB TO SMH-1-5 STA 17+69 TO 17+69	10" PVC	26 LF	0.020	14
P-1-13	SMH-1-5 TO SMH-1-6 STA 17+69 TO 19+90	12" PVC	214 LF	0.005	14
P-1-14	STUB TO SMH-1-6 STA 19+81 TO 19+90	10" PVC	71 LF	0.020	14, 15
P-1-15	SMH-1-6 TO SMH-1-7 STA 35+62 TO 36+26	12" PVC	66 LF	0.005	15, 18
P-1-16	STUB TO SMH-1-7 STA 36+26 TO 36+26	10" PVC	38 LF	0.020	18
P-1-17	SMH-1-7 TO SMH-1-8 STA 36+26 TO 36+26	10" PVC	18 LF	0.020	18
P-1-18	SMH-1-7 TO SMH-1-8 STA 36+26 TO 37+94	12" PVC	164 LF	0.005	18
P-1-19	STUB TO SMH-1-8 STA 37+94 TO 37+94	10" PVC	18 LF	0.020	18
P-1-20	STUB TO SMH-1-8 STA 37+94 TO 37+94	10" PVC	38 LF	0.020	18
P-1-21	SMH-1-8 TO SMH-1-9 STA 37+94 TO 39+00	12" PVC	102 LF	0.005	18

PHASE 2 SANITARY SEWER:

SEWER STRUCTURE DATA					
NO.	**TYPE**	**STATION**	**RIM ELEV.**	**INV. ELEV. IN**	**INV. ELEV. OUT**
EX-SMH-S16-1	SMH-48	47+07.3 5.3' RT	281.66	I=275.19' (SMH-2-11)	
SMH-2-1	SMH-48	20+95.2 7.3' RT	290.55	I=285.78' ()	I=285.68' (SMH-2-2)
SMH-2-2	SMH-48	24+46.7 4.4' RT	293.50	I=282.18' (SMH-2-1)	I=282.08' (SMH-2-4)
SMH-2-3	SMH-48	42+06.8 -9.7' LT	289.05	I=283.22' () I=283.22' ()	I=283.12' (SMH-2-4)
SMH-2-4	SMH-48	40+22.8 0.9' RT	291.90	I=281.29' (SMH-2-2) I=281.29' (SMH-2-3)	I=281.19' (SMH-2-5)
SMH-2-5	SMH-48	26+21.6 7.3' RT	290.80	I=279.61' (SMH-2-4) I=279.61' () I=279.61' ()	I=279.51' (SMH-2-7)
SMH-2-6	SMH-48	28+96.3 -34.7' LT	287.70	I=278.35' () I=278.35' ()	I=278.25' (SMH-2-7)
SMH-2-7	SMH-48	28+96.3 7.3' RT	286.65	I=278.14' (SMH-2-5) I=278.04' (SMH-2-6)	I=277.94' (SMH-2-8)
SMH-2-8	SMH-48	44+81.9 7.8' RT	285.85	I=277.32' (SMH-2-7)	I=277.22' (SMH-2-9)
SMH-2-9	SMH-48	45+21.8 7.8' RT	284.70	I=279.09' () I=276.42' (SMH-2-8) I=275.67' ()	I=276.32' (SMH-2-10)
SMH-2-10	SMH-48	46+51.4 7.8' RT	282.50	I=275.67' () I=275.67' (SMH-2-9)	I=275.57' (SMH-2-11)
SMH-2-11	SMH-48	46+96.8 7.9' RT	281.63	I=275.34' (SMH-2-10)	I=275.24' (EX-SMH-S16-1)

SEWER PIPE DATA					
PIPE	**PIPE LOCATION**	**SIZE & TYPE**	**LENGTH**	**SLOPE**	**SHEET # (C-)**
P-2-1	STUB TO SMH-2-1 STA 20+95 TO 20+95	10" PVC	38 LF	0.005	15
P-2-2	SMH-2-1 TO SMH-2-2 STA 20+95 TO 24+47	12" PVC	346 LF	0.010	15
P-2-3	SMH-2-2 TO SMH-2-4 STA 24+47 TO 25+25	12" PVC	75 LF	0.010	15, 16
P-2-4	STUB TO SMH-2-3 STA 42+07 TO 42+07	10" PVC	38 LF	0.005	19
P-2-5	STUB TO SMH-2-3 STA 42+07 TO 42+07	10" PVC	18 LF	0.005	19
P-2-6	SMH-2-3 TO SMH-2-4 STA 42+07 TO 40+23	12" PVC	179 LF	0.010	19
P-2-7	SMH-2-4 TO SMH-2-5 STA 25+25 TO 26+22	12" PVC	101 LF	0.015	16
P-2-8	STUB TO SMH-2-5 STA 26+22 TO 26+22	10" PVC	50 LF	0.010	16
P-2-9	STUB TO SMH-2-5 STA 26+22 TO 26+22	10" PVC	36 LF	0.010	16
P-2-10	SMH-2-5 TO SMH-2-7 STA 26+22 TO 28+96	12" PVC	271 LF	0.005	16, 20
P-2-11	STUB TO SMH-2-6 STA 28+96 TO 28+96	10" PVC	8 LF	0.005	16, 20
P-2-12	STUB TO SMH-2-6 STA 44+11 TO 44+10	10" PVC	65 LF	0.005	16, 20
P-2-13	SMH-2-6 TO SMH-2-7 STA 28+96 TO 28+96	12" PVC	38 LF	0.005	16, 20
P-2-14	SMH-2-7 TO SMH-2-8 STA 28+96 TO 29+26	12" PVC	38 LF	0.015	16, 20
P-2-15	SMH-2-8 TO SMH-2-9 STA 44+82 TO 45+22	12" PVC	36 LF	0.020	16, 20
P-2-16	STUB TO SMH-2-9 STA 45+22 TO 45+22	10" PVC	21 LF	0.005	16, 20
P-2-17	SMH-2-9 TO SMH-2-10 STA 45+22 TO 46+51	12" PVC	126 LF	0.005	16, 20
P-2-18	STUB TO SMH-2-10 STA 46+51 TO 46+51	10" PVC	20 LF	0.005	16, 20
P-2-19	STUB TO SMH-2-9 STA 45+21 TO 45+22	10" PVC	36 LF	0.005	20
P-2-20	SMH-2-10 TO SMH-2-11 STA 46+51 TO 46+97	12" PVC	41 LF	0.005	20
P-2-21	SMH-2-11 TO EX-SMH-S16-1 STA 46+97 TO 47+07	12" PVC	7 LF	0.005	20

REVISIONS
1. 2-21-24 PEER REVIEW
2.
3.

DRAWING TITLE
Sanitary Sewer Tables

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

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DESIGNED BY RJF DATE 8-22-23
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COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_PROFILE
DRAWING NO. C-21
SHEET 21 OF 61

DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT
CB-1	CB	46+89.1 -17.9' LT	281.60		I=277.70' (DMH-3)
CB-2	CB	46+91.3 17.2' RT	282.33		I=278.00' (DMH-3)
CB-4	CB	44+63.8 -18.1' LT	286.05		I=279.94' (DMH-5)
CB-6	CB	44+26.1 -17.8' LT	286.68		I=278.57' (DMH-9)
CB-7	CB	44+26.1 18.5' RT	286.68		I=279.72' (DMH-9)
CB-8	CB	44+63.8 18.8' RT	286.05		I=280.04' (DMH-9)
CB-10	CB	27+51.7 -14.2' LT	288.59		I=276.82' (DMH-12)
CB-11	CB	27+51.7 13.8' RT	288.59		I=277.14' (DMH-12)
CB-13	CB	25+77.3 13.8' RT	291.31		I=277.76' (DMH-14)
CB-15	CB	42+79 17.2' RT	287.98		I=279.09' (DMH-17)
CB-16	CB	42+78.6 -17.6' LT	287.78		I=279.22' (DMH-17)
CB-18	CB	40+82.6 -14.2' LT	289.86		I=280.26' (DMH-20)
CB-19	CB	40+82.6 14.2' RT	289.98		I=280.14' (DMH-20)
CB-23	CB	24+51.5 13.6' RT	293.19		I=280.49' (DMH-24)
CB-25	CB	21+86.4 14.0' RT	292.50		I=276.47' (DMH-26)
CB-27	CB	20+70.8 16.7' RT	290.09		I=276.10' (DMH-29)
CB-28	CB	20+65.2 -31.2' LT	290.74		I=276.54' (DMH-29)
CB-30	CB	37+73.1 -13.9' LT	284.46		I=276.41' (DMH-32)
CB-31	CB	37+73 14.4' RT	284.45		I=276.44' (DMH-32)
CB-33	CB	36+60.8 14.6' RT	286.14		I=276.34' (DMH-35)
CB-34	CB	36+60.8 -14.1' LT	286.15		I=276.16' (DMH-35)
CB-36	CB	20+39.1 -42.4' LT	289.93		I=276.38' (DMH-37)
CB-37	CB	19+74 8.4' RT	286.59		I=274.98' (DMH-39)
CB-40	CB	18+84.7 8.2' RT	283.34		I=274.51' (DMH-42)
CB-41	CB	18+84.6 -8.5' LT	283.34		I=274.51' (DMH-42)
CB-43	CB	33+24.8 -21.4' LT	279.25		I=274.82' (DMH-45)
CB-44	CB	33+24.8 20.7' RT	280.03		I=274.82' (DMH-45)
CB-46	CB	31+14.7 -21.4' LT	278.02		I=273.62' (DMH-48)
CB-47	CB	31+14.7 20.7' RT	277.96		I=273.62' (DMH-48)
CB-50	CB	16+97.2 8.4' RT	279.08		I=273.57' (DMH-52)
CB-51	CB	16+97.2 -8.6' LT	279.08		I=273.56' (DMH-52)
CB-53	CB	15+20.6 8.2' RT	278.12		I=272.75' (DMH-55)
CB-54	CB	15+20.6 -8.5' LT	278.12		I=272.75' (DMH-55)
CB-57	CB	12+49.4 8.4' RT	273.18		I=268.85' (WQU-59)
CB-58	CB	13+01 -8.6' LT	275.51		I=271.37' (WQU-59)
CB-65	CB	10+43.5 36.5' RT	263.50		I=256.66' (DMH-67)
CB-66	CB	10+19.3 5.5' RT	260.86		I=256.52' (DMH-67)
CB-68	CB	10+24.8 -44.4' LT	258.00		I=253.55' (WQU-69)
DI-56	CMP DETENTION INLET	14+43.8 -0.2' LT		I=269.10' (WQU-56)	
DI-60	CMP DETENTION INLET	13+04.9 4.3' RT		I=268.52' (WQU-59)	

DRAINAGE STRUCTURE DATA

NO.	TYPE	STATION	RIM ELEV.	INV. ELEV. IN	INV. ELEV. OUT
DMH-3	DMH (4'Ø)	46+89.3 -5.1' LT	282.24	I=277.91' (CB-2) I=277.65' (CB-1)	I=277.55' (DMH-5)
DMH-5	DMH (4'Ø)	44+63.8 -5.0' LT	281.80	I=276.65' (DMH-3) I=279.55' (CB-4)	I=276.55' (DMH-9)
DMH-9	DMH (6'Ø)	29+15 -5.6' LT	286.61	I=276.41' (DMH-5) I=279.31' (CB-8) I=279.31' (CB-6) I=279.31' (CB-7)	I=276.31' (DMH-12)
DMH-12	DMH (4'Ø)	27+51.7 -5.6' LT	288.93	I=278.56' (CB-10) I=277.98 (CB-11) I=275.66' (DMH-9)	I=275.56' (DMH-14)
DMH-14	DMH (4'Ø)	25+77.1 -5.6' LT	291.61	I=274.86' (DMH-12) I=277.18' (CB-13)	I=274.76' (DMH-22)
DMH-17	DMH (4'Ø)	42+78.8 3.0' RT	287.95	I=278.81' (CB-16) I=278.81' (CB-15)	I=278.31' (DMH-20)
DMH-20	DMH (4'Ø)	40+82.6 3.0' RT	291.07	I=279.92' (CB-18) I=279.92' (CB-19) I=277.53' (DMH-17)	I=276.92' (DMH-21)
DMH-21	DMH (4'Ø)	40+30.4 11.3' RT	292.08	I=276.70' (DMH-20)	I=276.60' (DMH-22)
DMH-22	DMH (6'Ø)	25+20.3 10.9' RT	292.20	I=274.52' (DMH-14) I=276.52' (DMH-21)	I=274.42' (DMH-24)
DMH-24	DMH (7'Ø)	24+50.9 -4.7' LT	293.61	I=274.13' (DMH-22) I=279.94' (CB-23)	I=274.03' (DMH-26)
DMH-26	DMH (4'Ø)	21+86.4 -0.2' LT	292.80	I=272.97' (DMH-24) I=276.04' (CB-25)	I=272.87' (DMH-29)
DMH-29	DMH (6'Ø)	20+65.7 0.8' RT	290.32	I=275.58' (CB-27) I=272.39' (DMH-26) I=275.58' (CB-28)	I=272.29' (DMH-37)
DMH-32	DMH (4'Ø)	37+73 -2.8' LT	284.95	I=276.37' (CB-30) I=276.37' (CB-31)	I=275.37' (DMH-35)
DMH-35	DMH (4'Ø)	36+60.9 -2.8' LT	286.62	I=274.92' (DMH-32) I=275.82' (CB-34) I=275.82' (CB-33)	I=274.82' (DMH-37)
DMH-37	DMH (6'Ø)	20+28.9 1.0' RT	289.80	I=272.14' (DMH-29) I=275.04' (CB-36) I=274.40' (DMH-35)	I=272.04' (DMH-39)
DMH-39	DMH (6'Ø)	19+73.7 -0.2' LT	287.23	I=274.72' (CB-37) I=271.82' (DMH-37)	I=271.72' (DMH-42)
DMH-42	DMH (4'Ø)	18+84.7 -0.2' LT	284.11	I=274.26' (CB-40) I=274.26' (CB-41) I=271.36' (DMH-39)	I=271.26' (DMH-49)
DMH-45	DMH (4'Ø)	33+24.8 -0.3' LT	280.43	I=274.71' (CB-44) I=274.71' (CB-43)	I=274.21' (DMH-48)
DMH-48	DMH (4'Ø)	31+05.6 -0.3' LT	279.31	I=273.11' (DMH-45) I=273.51' (CB-47) I=273.51' (CB-46)	I=273.01' (DMH-49)
DMH-49	DMH (6'Ø)	17+39.1 -0.1' LT	280.34	I=270.68' (DMH-42) I=272.50' (DMH-48)	I=270.58' (DMH-52)
DMH-52	DMH (6'Ø)	16+97.3 -0.2' LT	279.58	I=273.31' (CB-51) I=270.41' (DMH-49) I=273.31' (CB-50)	I=270.31' (DMH-55)
DMH-55	DMH (6'Ø)	15+20.5 -0.1' LT	278.90	I=272.50' (CB-54) I=272.50' (CB-53) I=269.60' (DMH-52)	I=269.50' (WQU-56)
DMH-62	DMH (4'Ø)	12+92.7 -0.2' LT	275.92	I=266.88' (DO-61)	I=261.71' (FES-63)
DMH-67	DMH (6'Ø)	10+23.2 -4.2' LT	260.81	I=256.48' (FES-64) I=256.48' (CB-66) I=256.48' (CB-65)	I=256.38' (WQU-69)
DMH-71	DMH (6'Ø)	10+59.3 -128.9' LT	260.17	I=253.04' (WQU-69) I=253.76' (OCS-70)	I=252.94' (FES-72)
DO-61	CMP DETENTION OUTLET	13+04.9 -0.2' LT			I=267.00' (DMH-62)
FES-63	FLARED END SECTION	11+60.3 -44.4' LT		I=260.16' (DMH-62)	
FES-64	CULVERT INLET	12+62.7 81.5' RT			I=266.54' (DMH-67)
FES-72	FLARED END SECTION	11+75.6 -166.3' LT		I=252.60' (DMH-71)	
OCS-70	OUTLET CONTROL STRUCTURE	10+68.2 -120.5' LT	259.55		I=254.00' (DMH-71)
WQU-56	WQU (CONTECH CS-5)	14+80.9 -0.3' LT	278.85	I=269.34' (DMH-55)	I=269.24' (DI-56)
WQU-59	WQU (CONTECH CS-4)	13+00.8 4.3' RT	275.97	I=268.64' (CB-57) I=271.32' (CB-58)	I=268.54' (DI-60)
WQU-69	WQU (CONTECH CS-4)	10+38.7 -44.0' LT	260.50	I=256.17' (DMH-67) I=253.49' (CB-68)	I=253.39' (DMH-71)

DRAINAGE PIPE DATA

PIPE	PIPE LOCATION	SIZE & TYPE	LENGTH	SLOPE
D-1	CB-1 TO DMH-3 STA 46+89 TO 46+89	12" CLASS III RCP	9 LF	0.004
D-2	CB-2 TO DMH-3 STA 46+91 TO 46+89	12" CLASS III RCP	18 LF	0.004
D-3	DMH-3 TO DMH-5 STA 46+89 TO 44+64	12" CLASS III RCP	221 LF	0.004
D-4	CB-4 TO DMH-5 STA 44+64 TO 44+64	12" CLASS III RCP	9 LF	0.030
D-5	DMH-5 TO DMH-9 STA 44+64 TO 44+40	21" CLASS III RCP	29 LF	0.004
D-6	CB-6 TO DMH-9 STA 44+26 TO 44+40	12" CLASS III RCP	34 LF	0.030
D-7	CB-7 TO DMH-9 STA 44+26 TO 44+40	12" CLASS III RCP	9 LF	0.030
D-8	CB-8 TO DMH-9 STA 44+64 TO 44+40	12" CLASS III RCP	20 LF	0.030
D-9	DMH-9 TO DMH-12 STA 29+15 TO 27+52	21" CLASS III RCP	159 LF	0.004
D-10	CB-10 TO DMH-12 STA 27+52 TO 27+52	12" CLASS III RCP	5 LF	0.030
D-11	CB-11 TO DMH-12 STA 27+52 TO 27+52	12" CLASS III RCP	15 LF	0.030
D-12	DMH-12 TO DMH-14 STA 27+52 TO 25+77	24" CLASS IV RCP	170 LF	0.004
D-13	CB-13 TO DMH-14 STA 25+77 TO 25+77	12" CLASS IV RCP	15 LF	0.030
D-14	DMH-14 TO DMH-22 STA 25+77 TO 25+20	27" CLASS IV RCP	55 LF	0.004
D-15	CB-15 TO DMH-17 STA 42+79 TO 42+79	12" CLASS III RCP	10 LF	0.020
D-16	CB-16 TO DMH-17 STA 42+79 TO 42+79	12" CLASS III RCP	17 LF	0.020
D-17	DMH-17 TO DMH-20 STA 42+79 TO 40+83	12" CLASS IV RCP	192 LF	0.004
D-18	CB-19 TO DMH-20 STA 40+83 TO 40+83	12" CLASS IV RCP	7 LF	0.020
D-19	CB-18 TO DMH-20 STA 40+83 TO 40+83	12" CLASS IV RCP	13 LF	0.020
D-20	DMH-20 TO DMH-21 STA 40+83 TO 40+30	12" CLASS IV RCP	51 LF	0.004
D-21	DMH-21 TO DMH-22 STA 40+30 TO 40+11	18" CLASS IV RCP	17 LF	0.004
D-22	DMH-22 TO DMH-24 STA 25+20 TO 24+51	27" CLASS IV RCP	68 LF	0.004
D-23	CB-23 TO DMH-24 STA 24+52 TO 24+51	12" CLASS IV RCP	14 LF	0.030
D-24	DMH-24 TO DMH-26 STA 24+51 TO 21+86	27" CLASS IV RCP	261 LF	0.004
D-25	CB-25 TO DMH-26 STA 21+86 TO 21+86	12" CLASS IV RCP	10 LF	0.030
D-26	DMH-26 TO DMH-29 STA 21+86 TO 20+66	30" CLASS IV RCP	117 LF	0.004
D-27	CB-27 TO DMH-29 STA 20+71 TO 20+66	12" CLASS IV RCP	13 LF	0.030
D-28	CB-28 TO DMH-29 STA 20+65 TO 20+66	12" CLASS IV RCP	28 LF	0.030
D-29	DMH-29 TO DMH-37 STA 20+66 TO 20+29	30" CLASS IV RCP	33 LF	0.004
D-30	CB-30 TO DMH-32 STA 37+73 TO 37+73	12" CLASS III RCP	7 LF	0.004
D-31	CB-31 TO DMH-32 STA 37+73 TO 37+73	12" CLASS III RCP	13 LF	0.004
D-32	DMH-32 TO DMH-35 STA 37+73 TO 36+61	15" CLASS III RCP	108 LF	0.004
D-33	CB-34 TO DMH-35 STA 36+61 TO 36+61	12" CLASS III RCP	7 LF	0.030

DRAINAGE PIPE DATA

PIPE	PIPE LOCATION	SIZE & TYPE	LENGTH	SLOPE
D-34	CB-33 TO DMH-35 STA 36+61 TO 36+61	12" CLASS III RCP	13 LF	0.030
D-35	DMH-35 TO DMH-37 STA 36+61 TO 35+56	12" CLASS IV RCP	101 LF	0.004
D-36	CB-36 TO DMH-37 STA 20+39 TO 20+29	12" CLASS IV RCP	41 LF	0.030
D-37	DMH-37 TO DMH-39 STA 20+29 TO 19+74	30" CLASS IV RCP	51 LF	0.004
D-38	CB-37 TO DMH-39 STA 19+74 TO 19+74	12" CLASS III RCP	5 LF	0.030
D-39	DMH-39 TO DMH-42 STA 19+74 TO 18+85	30" CLASS IV RCP	85 LF	0.004
D-40	CB-40 TO DMH-42 STA 18+85 TO 18+85	12" CLASS III RCP	4 LF	0.030
D-41	CB-41 TO DMH-42 STA 18+85 TO 18+85	12" CLASS III RCP	4 LF	0.030
D-42	DMH-42 TO DMH-49 STA 18+85 TO 17+39	30" CLASS III RCP	142 LF	0.004
D-43	CB-44 TO DMH-45 STA 33+25 TO 33+25	12" CLASS III RCP	17 LF	0.005
D-44	CB-43 TO DMH-45 STA 33+25 TO 33+25	12" CLASS III RCP	17 LF	0.005
D-45	DMH-45 TO DMH-48 STA 33+25 TO 31+06	15" CLASS III RCP	215 LF	0.005
D-46	CB-47 TO DMH-48 STA 31+15 TO 31+06	12" CLASS III RCP	19 LF	0.005
D-47	CB-46 TO DMH-48 STA 31+15 TO 31+06	12" CLASS III RCP	19 LF	0.005
D-48	DMH-48 TO DMH-49 STA 31+06 TO 30+04	21" CLASS III RCP	98 LF	0.005
D-49	DMH-49 TO DMH-52 STA 17+39 TO 16+97	36" CLASS III RCP	38 LF	0.004
D-50	CB-50 TO DMH-52 STA 16+97 TO 16+97	12" CLASS III RCP	5 LF	0.030
D-51	CB-51 TO DMH-52 STA 16+97 TO 16+97	12" CLASS III RCP	4 LF	0.030
D-52	DMH-52 TO DMH-55 STA 16+97 TO 15+21	36" CLASS III RCP	173 LF	0.004
D-53	CB-53 TO DMH-55 STA 15+21 TO 15+21	12" CLASS III RCP	4 LF	0.030
D-54	CB-54 TO DMH-55 STA 15+21 TO 15+21	12" CLASS III RCP	4 LF	0.030
D-55	DMH-55 TO WQU-56 STA 15+21 TO 14+81	36" CLASS III RCP	36 LF	0.004
D-56	WQU-56 TO DI-56 STA 14+81 TO 14+45	36" CLASS III RCP	34 LF	0.004
D-57	CB-57 TO WQU-59 STA 12+49 TO 13+01	12" CLASS III RCP	48 LF	0.004
D-58	CB-58 TO WQU-59 STA 13+01 TO 13+01	12" CLASS III RCP	9 LF	0.004
D-59	WQU-59 TO DI-60 STA 13+01 TO 13+05	12" CLASS III RCP	2 LF	0.004
D-60	DO-61 TO DMH-62 STA 13+05 TO 12+93	21" CLASS III RCP	10 LF	0.010
D-61	DMH-62 TO FES-63 STA 12+93 TO 11+60	21" CLASS IV RCP	153 LF	0.010
D-62	FES-64 TO DMH-67 STA 12+63 TO 10+23	12" CLASS III RCP	210 LF	0.048
D-63	CB-65 TO DMH-67 STA 10+43 TO 10+23	12" CLASS III RCP	41 LF	0.004
D-64	CB-66 TO DMH-67 STA 10+19 TO 10+23	12" CLASS III RCP	6 LF	0.004
D-65	DMH-67 TO WQU-69 STA 10+23 TO 10+39	12" CLASS III RCP	39 LF	0.005
D-66	CB-68 TO WQU-69 STA 10+25 TO 10+39	12" CLASS III RCP	10 LF	0.004

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Storm Sewer Tables

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER
TEC The Engineering Corp
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

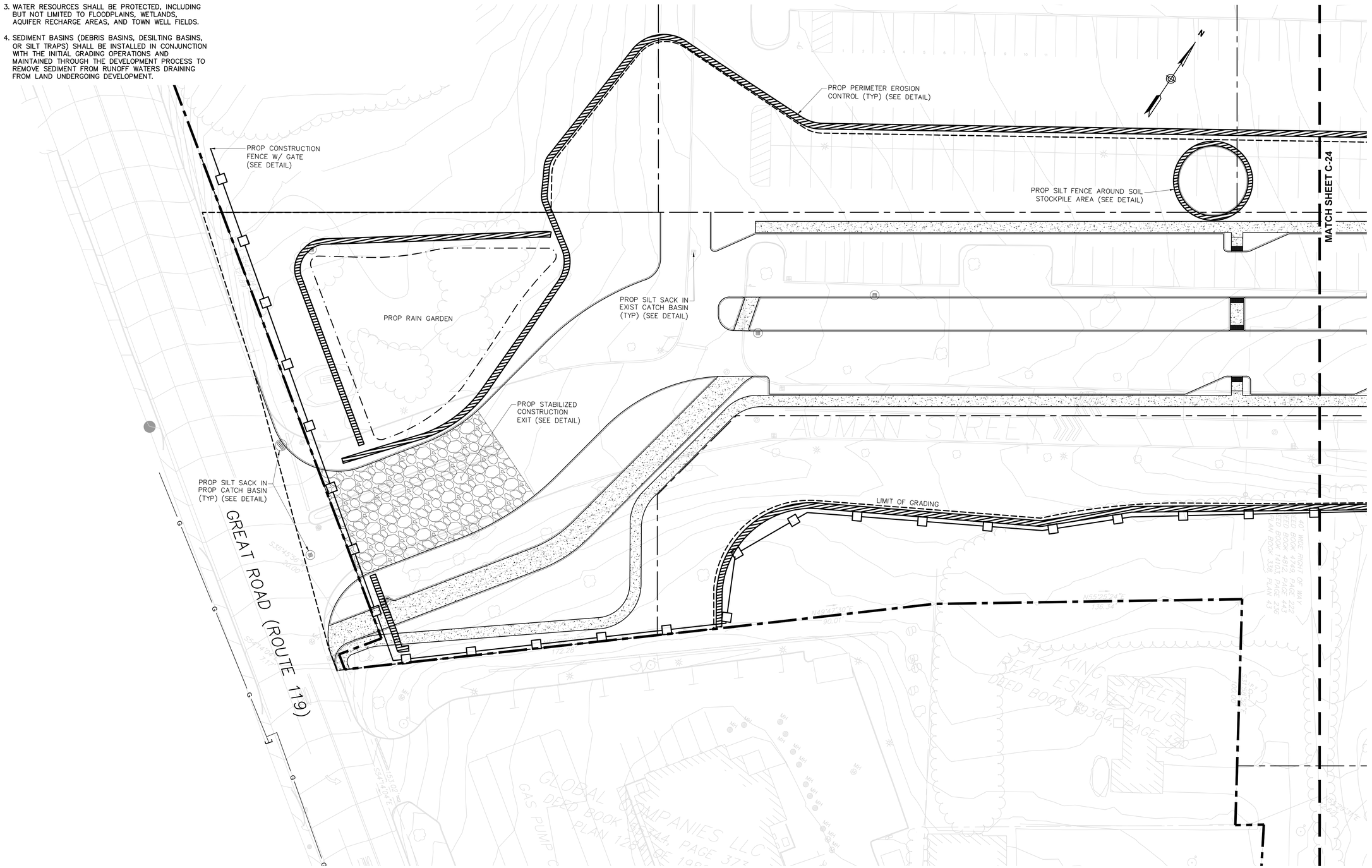
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_PROFILE
DRAWING NO.
C-22
SHEET 22 OF 61
61

NOTES:

1. LAND SHALL BE DEVELOPED IN INCREMENTS OF WORKABLE SIZE WHICH CAN BE COMPLETED DURING A SINGLE CONSTRUCTION SEASON. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE COORDINATED WITH THE SEQUENCE OF GRADING, DEVELOPMENT AND CONSTRUCTION OPERATIONS. CONTROL MEASURES SUCH AS HYDROSEEDING, BERMS, INTERCEPTOR DITCHES, MULCHING, TEMPORARY SODDING, TERRACES, AND SEDIMENT TRAPS SHALL BE PUT INTO EFFECT PRIOR TO THE COMMENCEMENT OF EACH INCREMENT OF THE DEVELOPMENT/CONSTRUCTION PROCESS.
2. VEGETATIVE COVER AND RUNOFF CHARACTERISTICS SHALL BE MAINTAINED AS CLOSE AS POSSIBLE TO CONDITIONS BEFORE DEVELOPMENT BY REDUCING CUT AND FILL AND OTHER CONSIDERATIONS.
3. WATER RESOURCES SHALL BE PROTECTED, INCLUDING BUT NOT LIMITED TO FLOODPLAINS, WETLANDS, AQUIFER RECHARGE AREAS, AND TOWN WELL FIELDS.
4. SEDIMENT BASINS (DEBRIS BASINS, DESILTING BASINS, OR SILT TRAPS) SHALL BE INSTALLED IN CONJUNCTION WITH THE INITIAL GRADING OPERATIONS AND MAINTAINED THROUGH THE DEVELOPMENT PROCESS TO REMOVE SEDIMENT FROM RUNOFF WATERS DRAINING FROM LAND UNDERGOING DEVELOPMENT.
5. THE APPLICANT IS REQUIRED TO CLEAN UP ANY SAND, DIRT, OR DEBRIS WHICH ERODES FROM THE SUBDIVISION ONTO ANY PUBLIC STREET OR PRIVATE PROPERTY, AND TO REMOVE SILT OR DEBRIS THAT ENTERS ANY EXISTING DRAINAGE SYSTEM INCLUDING CATCH BASIN SUMPS, PIPELINES, MANHOLES AND DITCHES WITHIN 24 HOURS OF BEING NOTED BY THE TOWN.
6. HAY BALES OR BOARD APPROVED EQUIVALENT MUST BE USED AROUND THE CATCH BASINS ON THE PROPOSED STREETS TO PROTECT THEM FROM THE ERODING SOILS AND PROVIDE A CHECK DAM TO SLOW RUNOFF DURING CONSTRUCTION.



REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Erosion & Sedimentation Control Plan A

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

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Lawrence, Massachusetts 01843
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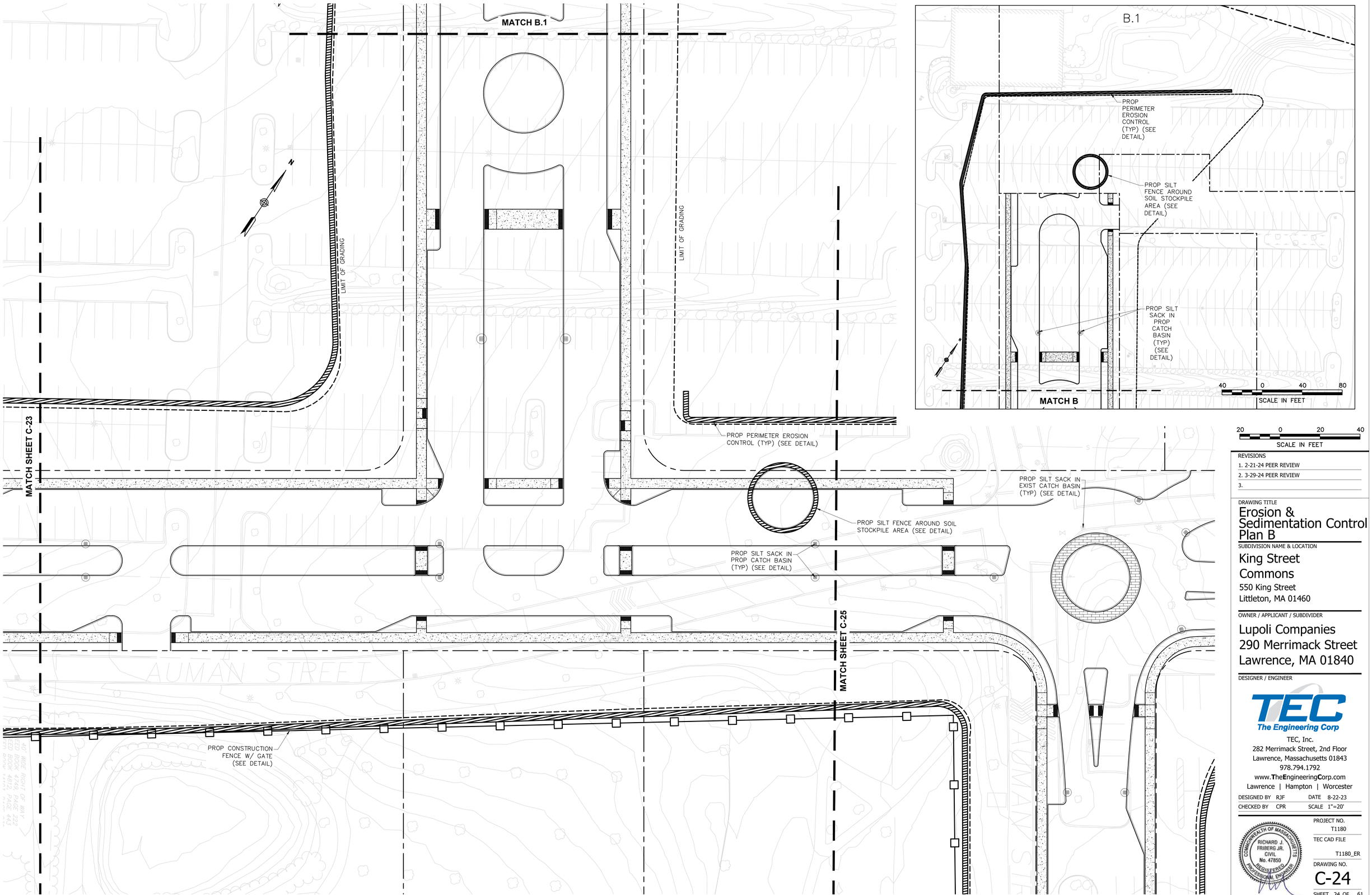
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE 1"=20'

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_ER
DRAWING NO. C-23
SHEET 23 OF 61



REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Erosion & Sedimentation Control Plan B

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
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290 Merrimack Street
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DESIGNER / ENGINEER

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CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_ER
DRAWING NO. C-24

PROP PERIMETER EROSION CONTROL (TYP) (SEE DETAIL)

PROP SILT SACK IN EXIST CATCH BASIN (TYP) (SEE DETAIL)

PROP SILT FENCE AROUND SOIL STOCKPILE AREA (SEE DETAIL)

PROP SILT SACK IN PROP CATCH BASIN (TYP) (SEE DETAIL)

PROP SILT SACK IN PROP CATCH BASIN (TYP) (SEE DETAIL)

MATCH SHEET C-24

LIMIT OF GRADING

PROP PERIMETER EROSION CONTROL (TYP) (SEE DETAIL)

MATCH SHEET C-26

LIMIT OF GRADING

LIMIT OF GRADING

PROP CONSTRUCTION FENCE W/ GATE (SEE DETAIL)

KING STREET (ROUTE 110)

N

20 0 20 40
SCALE IN FEET

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Erosion & Sedimentation Control Plan C

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

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COMMONWEALTH OF MASSACHUSETTS
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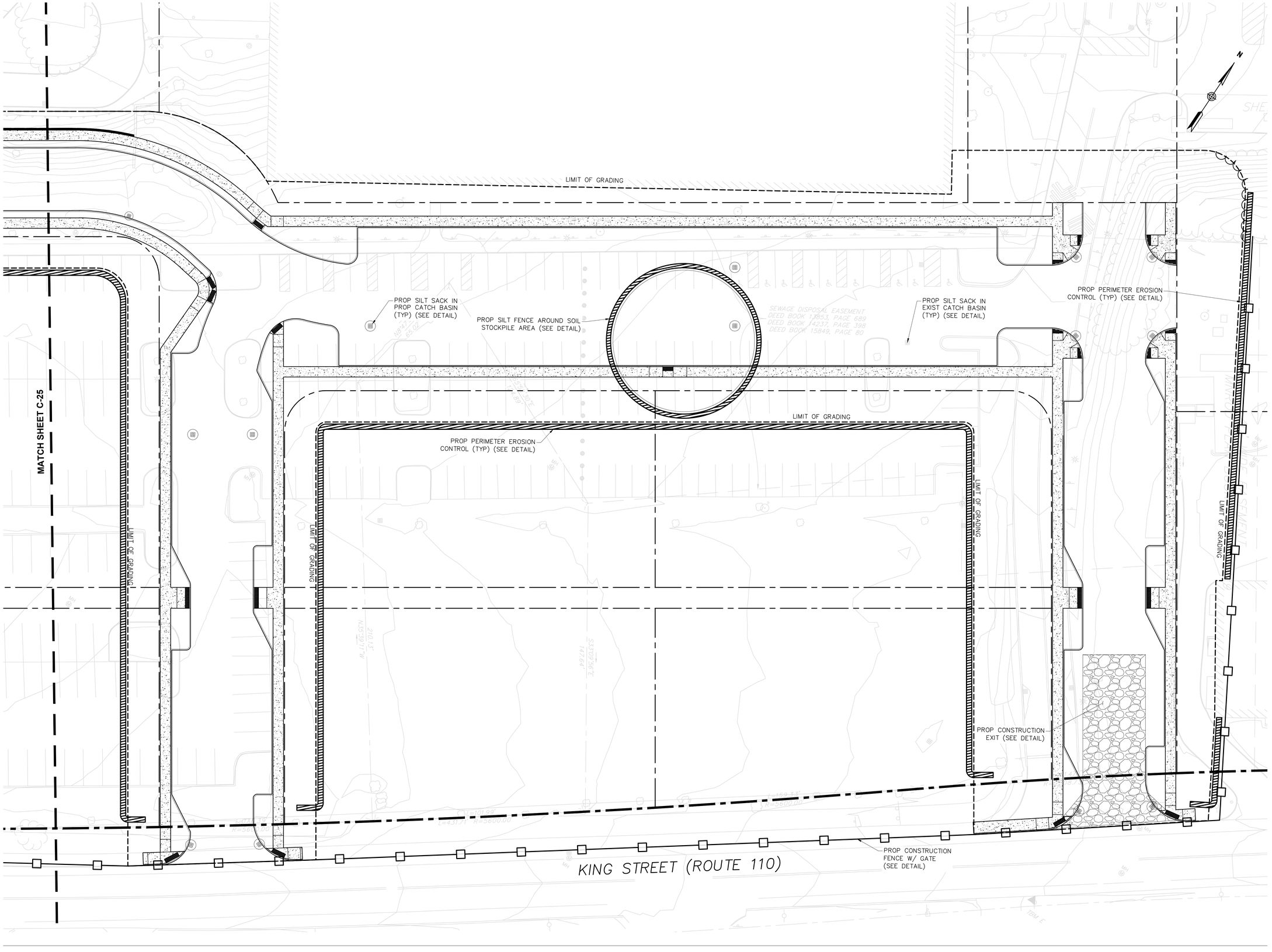
PROJECT NO.
T1180
TEC CAD FILE
T1180_ER
DRAWING NO.
C-25
SHEET 25 OF 61



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SCALE IN FEET

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Erosion & Sedimentation Control Plan D

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

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DESIGNED BY RJF DATE 8-22-23
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COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
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No. 47850
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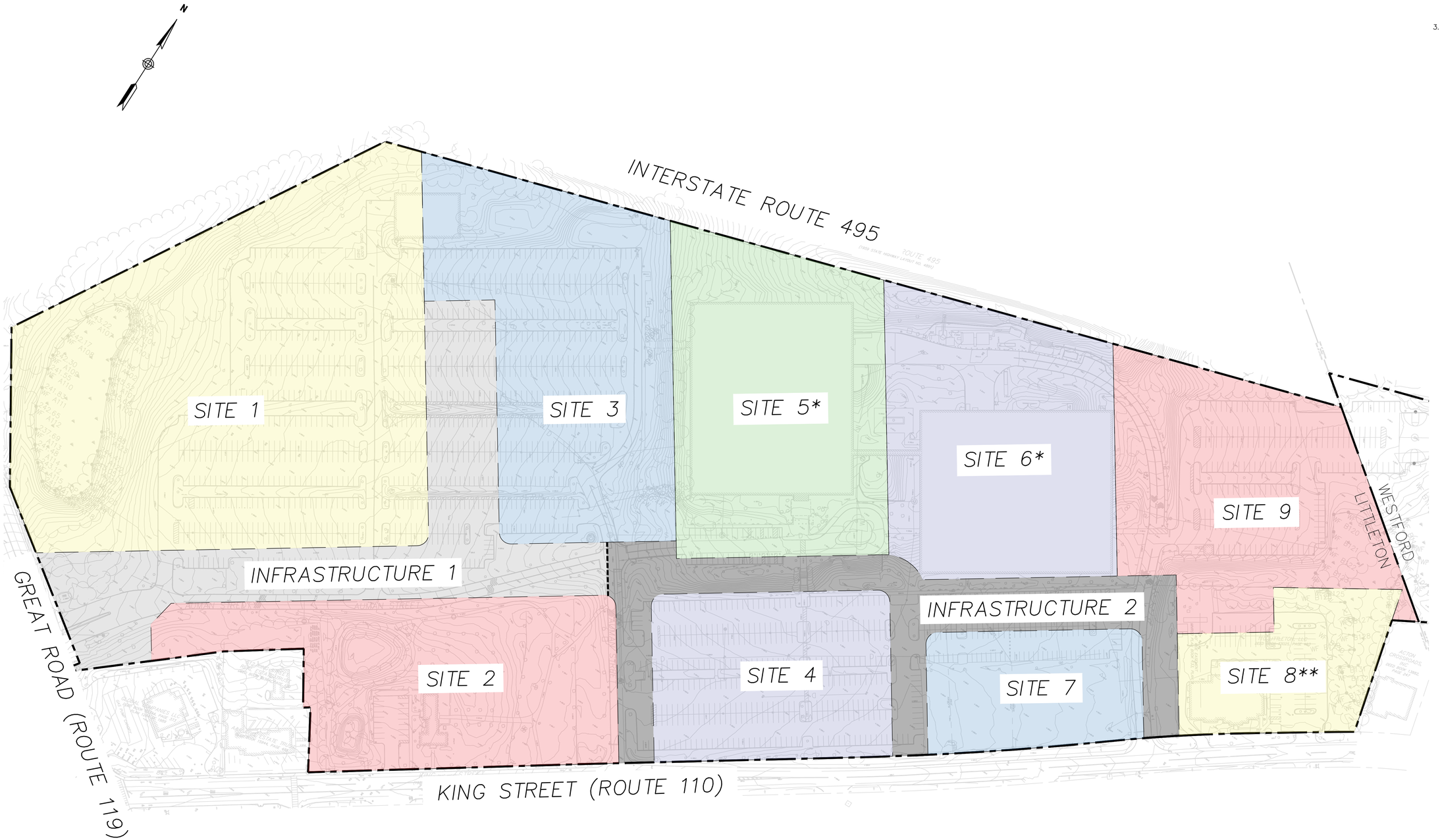
PROJECT NO.
T1180
TEC CAD FILE
T1180_ER
DRAWING NO.
C-26
SHEET 26 OF 61

NOTES:
1. *DEVELOPMENT OF SITES 5 & 6, BOTH OF WHICH ARE CURRENTLY OCCUPIED BY OFFICE BUILDINGS, IS DEPENDENT UPON MARKET CONDITIONS.
2. **SITE 8 TO BE INCORPORATED INTO PLANNED DEVELOPMENT UPON COMPLETION OF LAND PURCHASE.
3. INFRASTRUCTURE PHASE 1 IS TO TIE THE PROPOSED ROAD INTO THE EXISTING AUMAN STREET.



REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Construction Phasing

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

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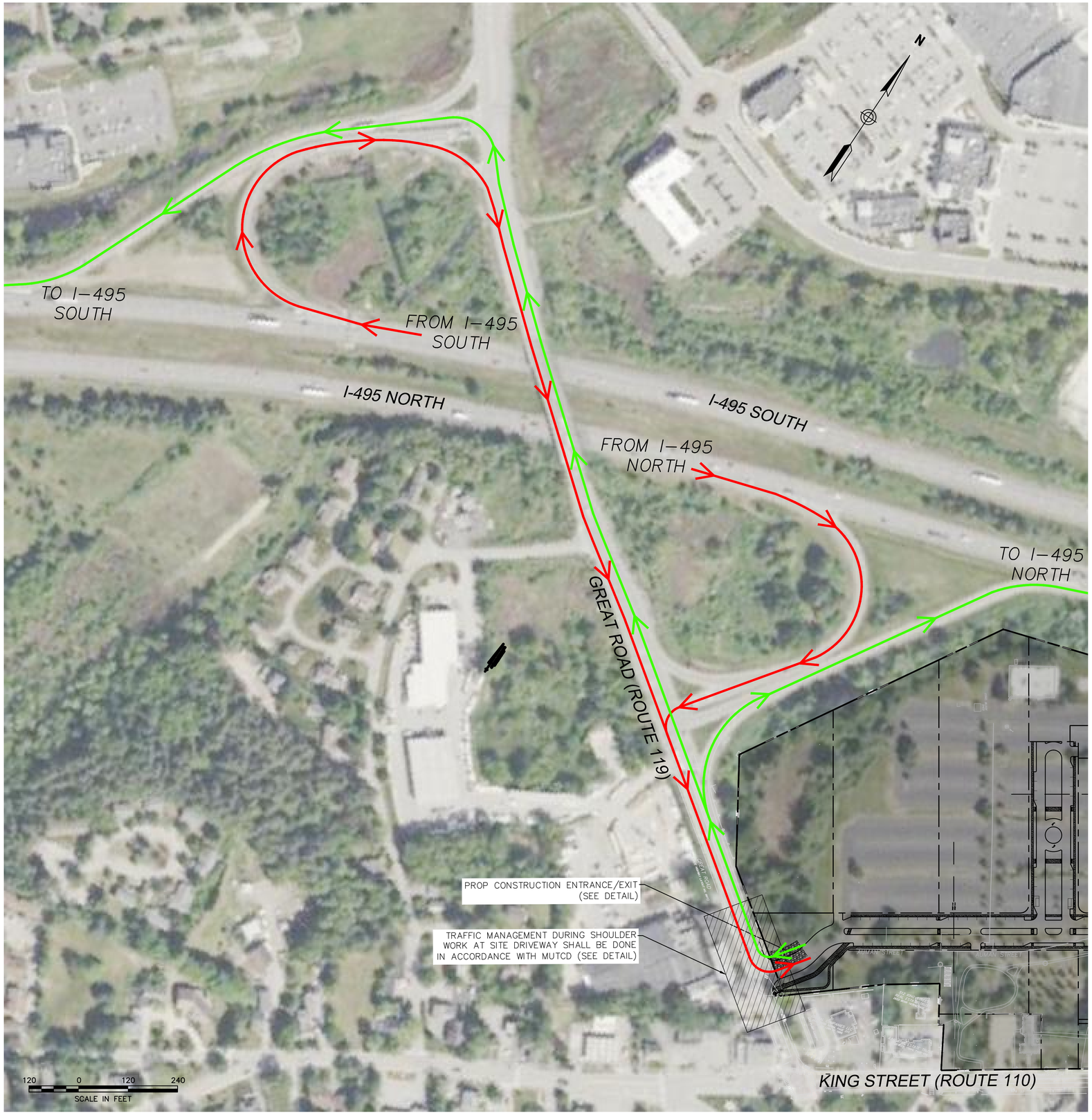
DESIGNED BY	RJF	DATE	8-22-23
CHECKED BY	CPR	SCALE	AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_PHASING
DRAWING NO. C-27
SHEET 27 OF 61



LEGEND

TO THE SITE

FROM THE SITE

NOTES:
1. CONSTRUCTION SHALL OCCUR MON–SAT BETWEEN 7:00 AM AND 7:00 PM WITH THE EXCEPTION OF HOLIDAYS. ALL HOURS OF CONSTRUCTION OPERATIONS SHALL BE IN ACCORDANCE WITH ALL STATE AND LOCAL REGULATIONS.
2. SITE ENTRANCE/EXIT SHALL BE STABILIZED THROUGHOUT CONSTRUCTION, SEE EROSION AND SEDIMENT CONTROL PLAN FOR DETAILS.

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Construction Management Plan

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

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DESIGNED BY RJF DATE 8-22-23
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COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_CMP.dwg
DRAWING NO. C-28

Notes for Figure 6H-6—Typical Application 6
Shoulder Work with Minor Encroachment

Guidance:

1. *All lanes should be a minimum of 10 feet in width as measured to the near face of the channelizing devices.*
2. *The treatment shown should be used on a minor road having low speeds. For higher-speed traffic conditions, a lane closure should be used.*

Option:

3. For short-term use on low-volume, low-speed roadways with vehicular traffic that does not include longer and wider heavy commercial vehicles, a minimum lane width of 9 feet may be used.
4. Where the opposite shoulder is suitable for carrying vehicular traffic and of adequate width, lanes may be shifted by use of closely-spaced channelizing devices, provided that the minimum lane width of 10 feet is maintained.
5. Additional advance warning may be appropriate, such as a ROAD NARROWS sign.
6. Temporary traffic barriers may be used along the work space.
7. The shadow vehicle may be omitted if a taper and channelizing devices are used.
8. A truck-mounted attenuator may be used on the shadow vehicle.
9. For short-duration work, the taper and channelizing devices may be omitted if a shadow vehicle with activated high-intensity rotating, flashing, oscillating, or strobe lights is used.
10. Vehicle hazard warning signals may be used to supplement high-intensity rotating, flashing, oscillating, or strobe lights.

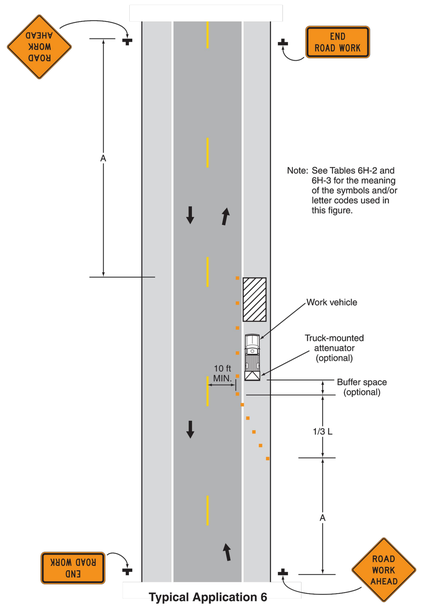
Standard:

11. Vehicle-mounted signs shall be mounted in a manner such that they are not obscured by equipment or supplies. Sign legends on vehicle-mounted signs shall be covered or turned from view when work is not in progress.

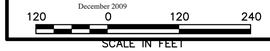
12. Shadow and work vehicles shall display high-intensity rotating, flashing, oscillating, or strobe lights.

13. Vehicle hazard warning signals shall not be used instead of the vehicle's high-intensity rotating, flashing, oscillating, or strobe lights.

Figure 6H-6. Shoulder Work with Minor Encroachment (TA-6)



Typical Application 6



Notes for Figure 6H-10—Typical Application 10
Lane Closure on a Two-Lane Road Using Flaggers

Option:

1. For low-volume situations with short work zones on straight roadways where the flagger is visible to road users approaching from both directions, a single flagger, positioned to be visible to road users approaching from both directions, may be used (see Chapter 6E).
2. The ROAD WORK AHEAD and the END ROAD WORK signs may be omitted for short-duration operations.
3. Flashing warning lights and/or flags may be used to call attention to the advance warning signs. A BE PREPARED TO STOP sign may be added to the sign series.

Guidance:

4. *The buffer space should be extended so that the two-way traffic taper is placed before a horizontal (or crest vertical) curve to provide adequate sight distance for the flagger and a queue of stopped vehicles.*

Standard:

5. At night, flagger stations shall be illuminated, except in emergencies.

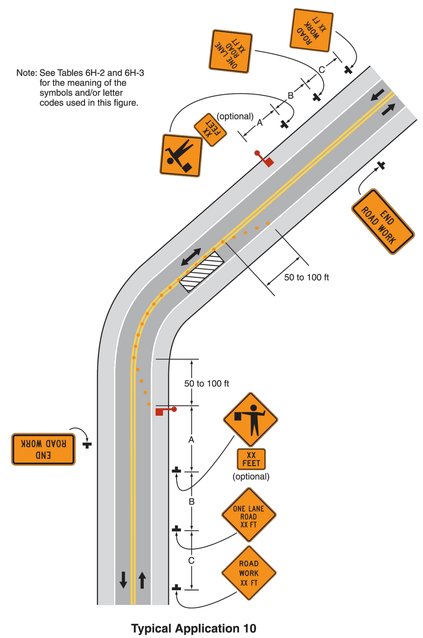
Guidance:

6. *When used, the BE PREPARED TO STOP sign should be located between the Flagger sign and the ONE LANE ROAD sign.*
7. *When a grade crossing exists within or upstream of the transition area and it is anticipated that queues resulting from the lane closure might extend through the grade crossing, the TTC zone should be extended so that the transition area precedes the grade crossing.*
8. *When a grade crossing equipped with active warning devices exists within the activity area, provisions should be made for keeping flaggers informed as to the activation status of these warning devices.*
9. *When a grade crossing exists within the activity area, drivers operating on the left-hand side of the normal center line should be provided with comparable warning devices as for drivers operating on the right-hand side of the normal center line.*
10. *Early coordination with the railroad company or light rail transit agency should occur before work starts.*

Option:

11. A flagger or a uniformed law enforcement officer may be used at the grade crossing to minimize the probability that vehicles are stopped within 15 feet of the grade crossing, measured from both sides of the outside rails.

Figure 6H-10. Lane Closure on a Two-Lane Road Using Flaggers (TA-10)



Typical Application 10

NOTES:

1. APPROPRIATE TRAFFIC MANAGEMENT METHODS ARE TO BE USED ON ALL PUBLIC ROADS TO ENSURE AND PROTECT THE SAFETY OF BOTH THE PUBLIC AND WORKERS DURING CONSTRUCTION OF THE SITE DRIVEWAYS. ALL TRAFFIC MANAGEMENT SHALL BE PERFORMED IN ACCORDANCE WITH MUTCD STANDARDS.
2. IF DETOURS ARE REQUIRED DURING CONSTRUCTION, ALL DETOUR ROUTES AND ASSOCIATED SIGNAGE SHALL BE SHOWN IN ACCORDANCE WITH MUTCD AND ARE SUBJECT TO APPROVAL BY THE FIRE DEPARTMENT AND POLICE DEPARTMENT.
3. TO MINIMIZE IMPACTS TO LOCAL ROADS, SCHOOLS, PARKS, RESIDENTS, AND ABUTTERS ALL TRUCK TRAFFIC SHALL BE ROUTED TO AND FROM THE ABUTTING I-495 FREEWAY AND TO AND FROM THE NEAREST SITE DRIVEWAY ON GREAT ROAD.
4. SHOULDER AND PARTIAL LANE CLOSURE ON THE NORTHEAST SIDE OF GREAT ROAD IS EXPECTED AT THE LOACTION OF UTILITY CONNECTIONS. PARTIAL LANE CLOSURE SHALL FOLLOW TA-6. TWO-WAY TRAVEL SHALL BE MAINTAINED BY USE OF THE SOUTHBOUND SHOULDER AND LEFT TURN LANE, AS NECESSARY.
5. FULL WEST-BOUND LANE CLOSURE IS EXPECTED ON KING STREET AT THE LOCATION OF UTILITY CONNECTIONS. LANE CLOSURE SHALL FOLLOW TA-10.

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Traffic Management Plan

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

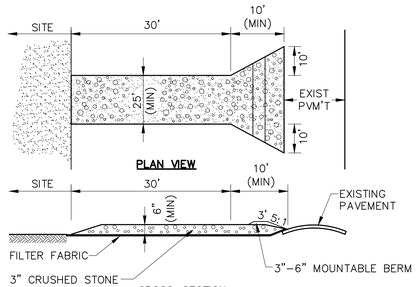
DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

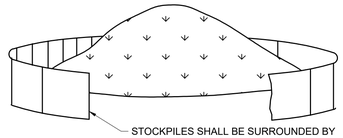
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_CMP.dwg
DRAWING NO. C-29
SHEET 29 OF 61



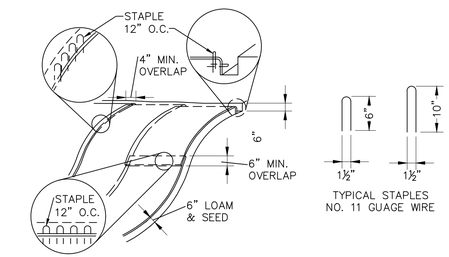
NOTES:
1. ENTRANCE WIDTH SHALL BE A TWENTY–FIVE (25) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
2. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY MUST BE REMOVED IMMEDIATELY. BERM SHALL BE PERMITTED. PERIODIC INSPECTION AND MAINTENANCE SHALL BE PROVIDED AS NEEDED.
3. STABILIZED CONSTRUCTION EXIT SHALL BE REMOVED PRIOR TO FINAL FINISH MATERIALS BEING INSTALLED.

STABILIZED CONSTRUCTION EXIT
N.T.S.



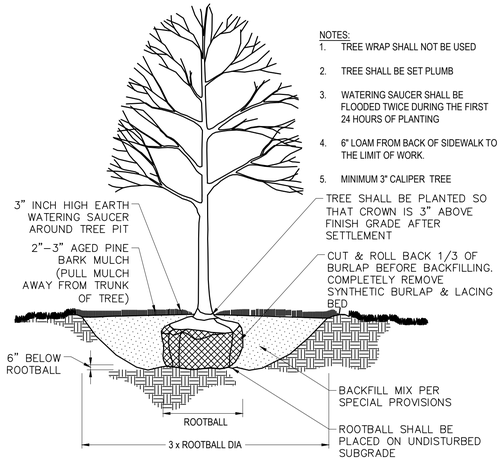
NOTES:
SOIL STOCKPILES SHALL BE COVERED WITH ANCHORED TARPS AND THE END OF EACH WORK DAY.

SOIL STOCKPILE
N.T.S.

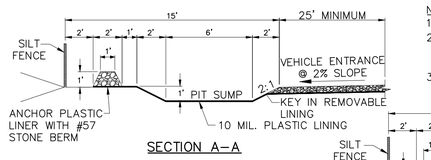


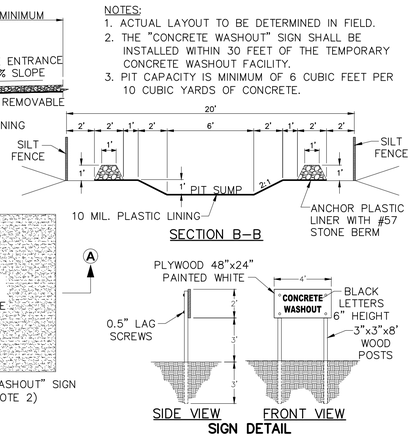
NOTES:
1. BEGIN AT THE TOP OF BLANKET INSTALLATION AREA BY ANCHORING BLANKET IN A 6" DEEP TRENCH. BACKFILL AND COMPACT TRENCH AFTER STAPLING.
2. ROLL THE BLANKET DOWN THE SWALE IN THE DIRECTION OF THE WATER FLOW.
3. THE EDGES OF BLANKETS SHALL BE STAPLED WITH APPROX. 4 INCH OVERLAP WHERE 2 OR MORE STRIP WIDTHS ARE REQUIRED.
4. WHEN BLANKETS ARE SPLICED DOWN THE SWALE, PLACE UPPER BLANKET END OVER LOWER END WITH 6 INCH (MIN) OVERLAP AND STAPLE BOTH TOGETHER.
5. METHOD OF INSTALLATION SHALL BE AS PER MANUFACTURERS RECOMMENDATIONS.

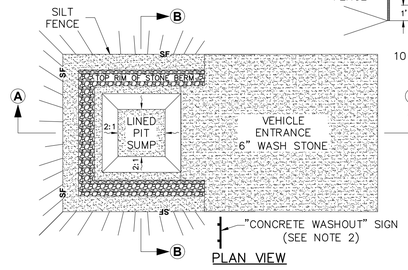
EROSION CONTROL MAT SLOPE INSTALLATION
N.T.S.



DECIDUOUS TREE PLANTING
N.T.S.

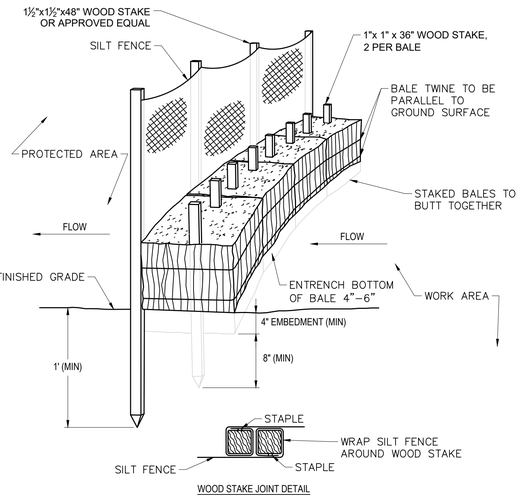






NOTES:
1. ACTUAL LAYOUT TO BE DETERMINED IN FIELD.
2. THE "CONCRETE WASHOUT" SIGN SHALL BE INSTALLED WITHIN 30 FEET OF THE TEMPORARY CONCRETE WASHOUT FACILITY.
3. PIT CAPACITY IS MINIMUM OF 6 CUBIC FEET PER 10 CUBIC YARDS OF CONCRETE.

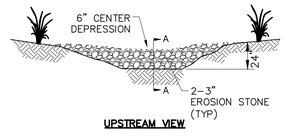
LINED CONCRETE WASHOUT PIT
N.T.S.

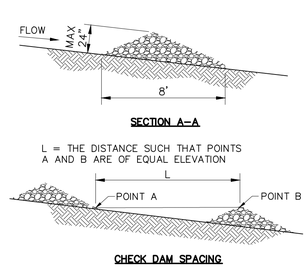


NOTES:
1. FILTER CLOTH SHALL BE FASTENED SECURELY TO POSTS WITH STAPLES. POSTS SHALL BE SPACED 8'-10' ON CENTER.
2. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
3. ENTRENCH SILT FENCE BUT NOT STRAW BALES.
4. INSPECTIONS SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED, OR WHEN SEDIMENT ACCUMULATES TO HALF THE HEIGHT OF FENCING.
5. EACH BALE SHALL BE AT LEAST 14 INCHES WIDE, 18 INCHES HIGH, AND 30 INCHES LONG, WITH MINIMUM MASS OF 50 LBS.
6. STEEL WIRE, NYLON, OR POLYPROPYLENE STRING SHALL BE USED TO BIND THE BALES.
7. CONFIGURE BALES AROUND EXISTING FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF. STRAW BALES SHALL BE PLACED PERPENDICULARLY TO STORMWATER FLOW WHERE POSSIBLE.
8. PLACE BALES TO ENSURE GOOD CONTACT WITH GROUND SURFACE.
9. UPON COMPLETION OF PROJECT, ALL EROSION CONTROL DEVICES SHALL BE REMOVED FROM PROJECT LIMITS.

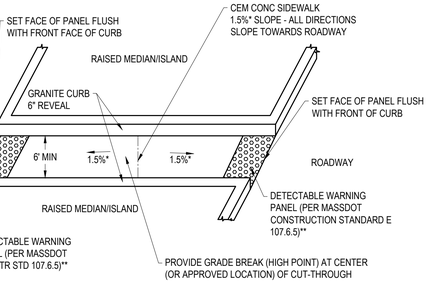
PERIMETER EROSION CONTROL
N.T.S.

NOTE:
KEY STONE INTO CHANNEL BANKS AND EXTEND IT BEYOND THE ABUTMENTS A MINIMUM OF 18" TO PREVENT FLOW AROUND THE DAM.



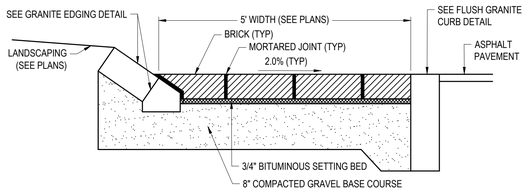


STONE CHECK DAM
N.T.S.

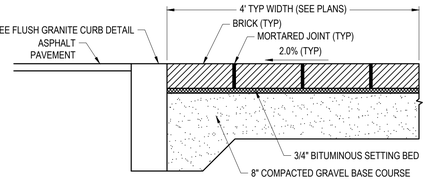


NOTES:
1. ALL SLOPES ARE MAXIMUMS, TOLERANCE FOR CONSTRUCTION ±0.5%*
2. DETECTABLE WARNING PANELS TO BE PLACED WHEN MEDIAN OPENING IS 6' OR GREATER IN WIDTH.**
3. CROSS SLOPE TO MATCH ROADWAY SLOPE

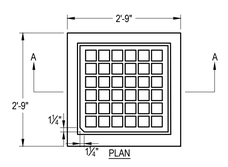
MEDIAN CUT-THROUGH
N.T.S.



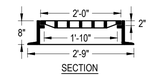
ROUNDABOUT BRICK TURN APRON
N.T.S.



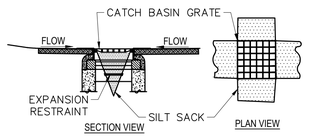
BRICK PAVER MEDIAN
N.T.S.



NOTES:
1. FRAME AND GRATE SHALL BE RATED FOR HS-20 LOADING.
2. USE 3 FLANGE FRAMES AT CURB INLETS.
3. MIN FRAME WEIGHT:
   4 FLANGE - 295 LB
   3 FLANGE - 264 LB



CATCH BASIN FRAME AND GRATE
N.T.S.



NOTES:
1. INSTALL SILTSACK IN ALL DOWNGRADIENT EXISTING CATCH BASINS BEFORE COMMENCING WORK, AND IN NEW CATCH BASINS IMMEDIATELY AFTER INSTALLATION OF STRUCTURE. MAINTAIN UNTIL BINDER COURSE PAVING IS COMPLETE OR A PERMANENT STAND OF GRASS HAS BEEN ESTABLISHED.
2. GRATE TO BE PLACED OVER SILTSACK.
3. SILTSACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLAEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.

CATCH BASIN INLET PROTECTION
N.T.S.

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Construction Details

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

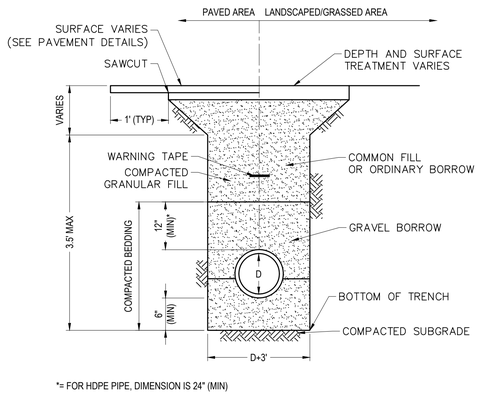
OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY	RJF	DATE	8-22-23
CHECKED BY	CPR	SCALE	AS NOTED

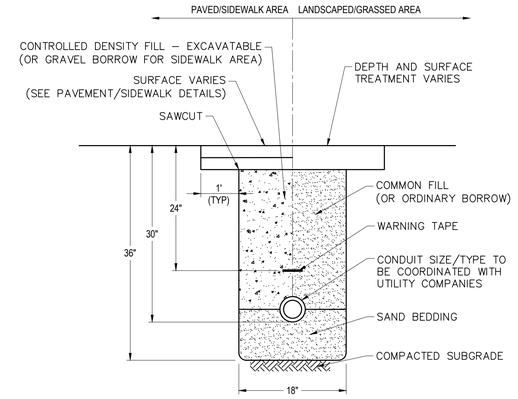
COMMONWEALTH OF MASSACHUSETTS — RICHARD J. FRIBERG JR. CIVIL No. 47850 REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_DET
DRAWING NO. C-30

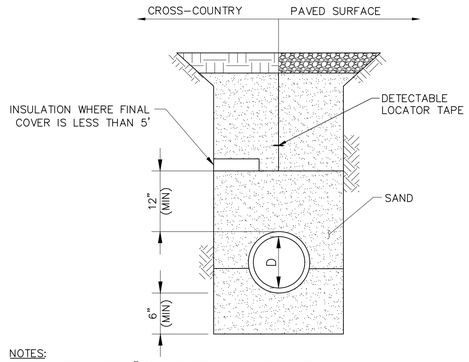


*= FOR HDPE PIPE, DIMENSION IS 24" (MIN)

UTILITY TRENCH
N.T.S.

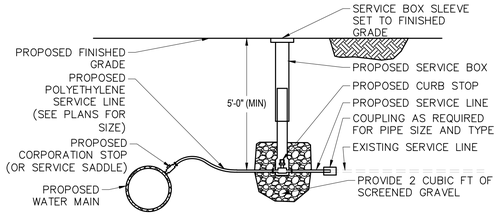


CONDUIT TRENCH
N.T.S.

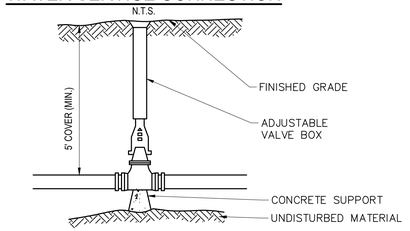


NOTES:
1. ALL WATER LINES 4" OR GREATER SHALL BE DUCTILE IRON WITH AN 8 MIL POLYETHYLENE WRAP. CONTRACTOR MAY FORGO WRAPPING PIPE IF THE DUCTILE IRON PIPE IS ZINC–COATED, TEES AND OTHER CONNECTIONS WILL STILL NEED TO BE WRAPPED.

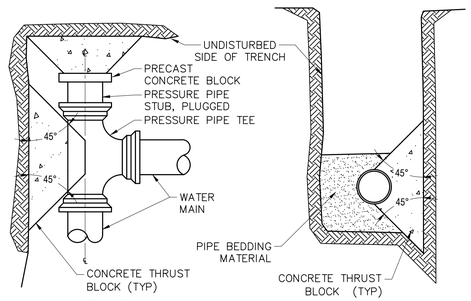
WATERLINE TRENCH
N.T.S.



WATER SERVICE CONNECTION

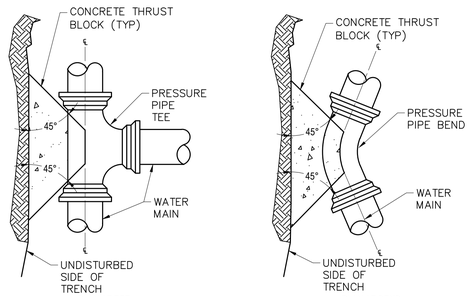


WATER GATE VALVE
N.T.S.



PLAN AT TEE W/ STUB FOR FUTURE USE

SECTION



PLAN AT TEE

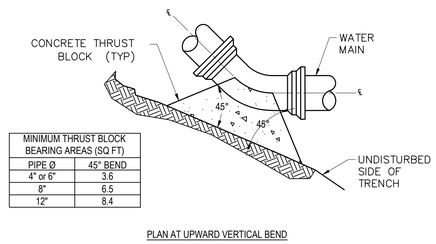
PLAN AT BEND

MINIMUM THRUST BLOCK BEARING AREAS (SQ FT)				
PIPE Ø	90° BEND	45° BEND	22.5° BEND	TEES
4",6", or 8"	6.0	2.9	2.3	4.5
10"	9.6	5.2	2.3	6.7
12"	133	6.7	3.7	9.6

MINIMUM PIPE RESTRAINT LENGTH (IN FEET)*					
PIPE Ø	90° BEND	45° BEND	22.5° BEND	TEES	PLUG/CAP
8"	21.0	9.0	4.0	29.0	38.0
10"	26.0	11.0	5.0	38.0	46.0
12"	33.0	14.0	6.0	48.0	69.0

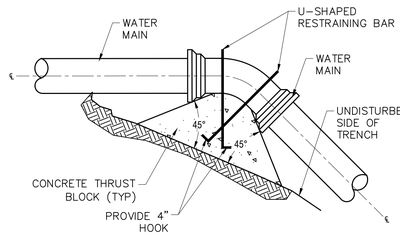
NOTES:
1. ALL WATER MAIN FITTINGS, BENDS, TEES, PLUGS ETC. SHALL BE RESTRAINED W/ THRUST BLOCKS EXCEPT WHERE NOTED.
2. ALL THRUST BLOCKS & COLLARS SHALL BE INSTALLED SO THAT THEY BEAR AGAINST UNDISTURBED EARTH.
3. MINIMUM COMPRESSIVE STRENGTH OF THRUST BLOCK CONCRETE SHALL BE 3,000 P.S.I.
4. KEEP CONCRETE CLEAR OF MECHANICAL JOINTS.
5. MINIMUM BEARING AREAS ARE BASED ON 250 P.S.I INTERNAL PIPE PRESSURE & 1.5 TON/S.F. ALLOWABLE SOIL BEARING CAPACITY.
6. MINIMUM PIPE RESTRAINT LENGTH IS BASED ON DUCTILE IRON PIPE WITH A 150 P.S.I INTERNAL PIPE PRESSURE WITH 5.0' OF BURY IN UNIFIED SOIL CLASSIFICATION SM.

THRUST BLOCK - HORIZONTAL BENDS
N.T.S.



MINIMUM THRUST BLOCK BEARING AREAS (SQ FT)	
PIPE Ø	45° BEND
4" or 6"	3.6
8"	6.5
12"	8.4

PLAN AT UPWARD VERTICAL BEND



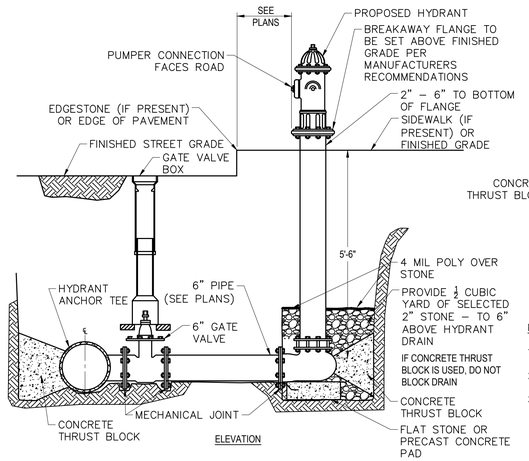
MINIMUM THRUST BLOCK BEARING AREAS (SQ FT)	
PIPE Ø	45° BEND
4" or 6"	0.9
8"	1.6
12"	3.3

RESTRAINING BAR DIMENSIONS		
PIPE Ø	BAR SIZE	EMBEDMENT LENGTH
4", 6"	#4	15"
8"	#4	15"
12"	#6	2'-0"

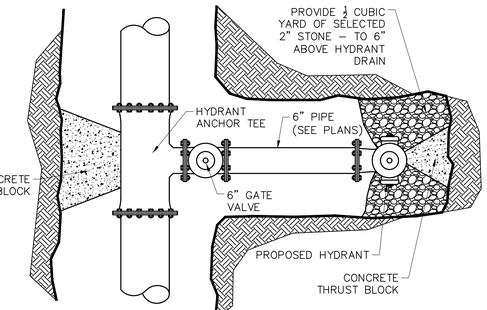
PLAN AT DOWNWARD VERTICAL BEND

NOTES:
1. ALL WATER MAIN BENDS SHALL BE RESTRAINED W/ THRUST BLOCKS EXCEPT WHERE NOTED.
2. ALL THRUST BLOCKS & COLLARS SHALL BE INSTALLED SO THAT THEY BEAR AGAINST UNDISTURBED EARTH.
3. MINIMUM COMPRESSIVE STRENGTH OF THRUST BLOCK CONCRETE SHALL BE 3,000 P.S.I.
4. KEEP CONCRETE CLEAR OF MECHANICAL JOINTS.
5. MINIMUM BEARING AREAS ARE BASED ON 250 P.S.I INTERNAL PIPE PRESSURE & 1.5 TON/S.F. ALLOWABLE SOIL BEARING CAPACITY.

THRUST BLOCK - VERTICAL BENDS
N.T.S.



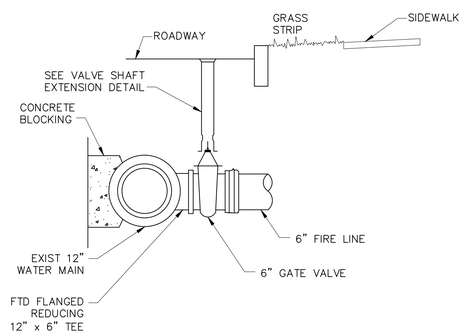
ELEVATION



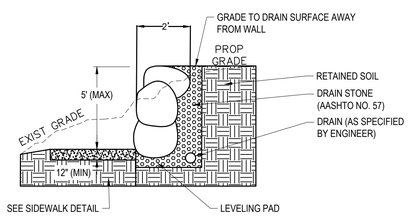
PLAN

NOTES:
1. ALL CONCRETE TO BE CAST-IN-PLACE (MIN 3000 PSI)
2. CONCRETE THRUST BLOCK TO BE USED ONLY WHERE IT WILL BEAR ON UNDISTURBED EARTH.
3. CONTRACTOR SHALL SHIELD HYDRANT BASE DRAIN HOLES, MECHANICAL JOINT GLANDS, AND BOLTS DURING PLACEMENT OF CONCRETE THRUST BLOCKS. DRAIN HOLES, GLANDS AND BOLTS, SHALL BE VERIFIED AS OPEN AND FREE OF OBSTRUCTIONS PRIOR TO BACKFILLING.

HYDRANT ASSEMBLY
N.T.S.



FIRE SERVICE CONNECTION
N.T.S.



NOTES:
1. WALL HEIGHTS OVER 4 FEET WILL REQUIRE A FINAL WALL DESIGN STAMPED BY A STRUCTURAL ENGINEER.
2. FINAL WALL DESIGN TO BE SUBJECT TO THE RECOMMENDATIONS OF THE GEOTHECHNICAL ENGINEER INCLUDING DESIGN ON LATERAL EARTH PRESSURES, GLOBAL STABILITY, FILL MATERIALS ADJACENT TO THE WALLS AND REQUIRED GEOGRID REINFORCEMENT.

BOULDER WALL
N.T.S.

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Construction Details

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

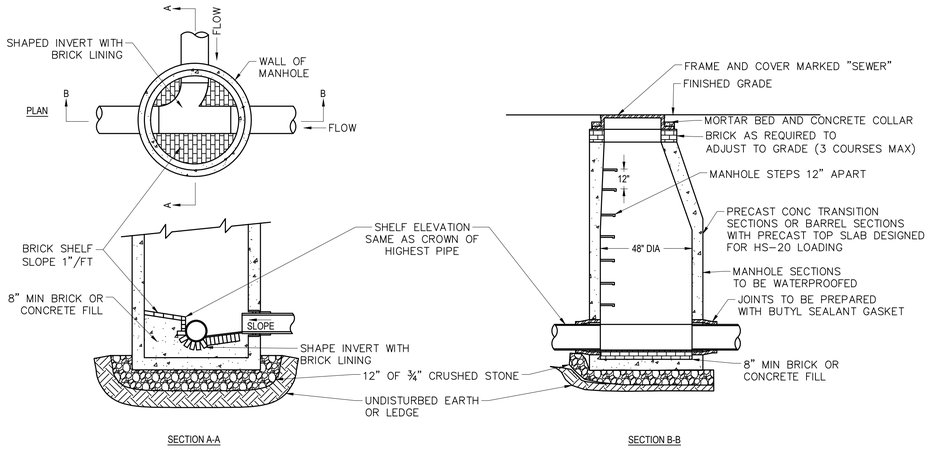
DESIGNER / ENGINEER

TEC
The Engineering Corp
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

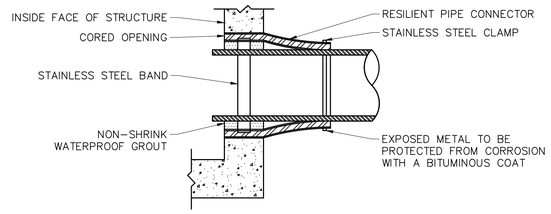
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

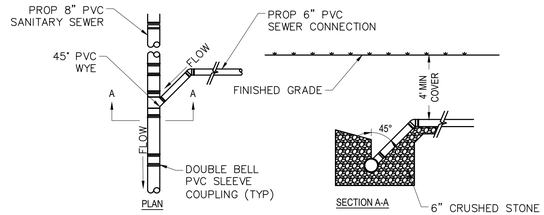
PROJECT NO.
T1180
TEC CAD FILE
T1180_DET
DRAWING NO.
C-31
SHEET 31 OF 61



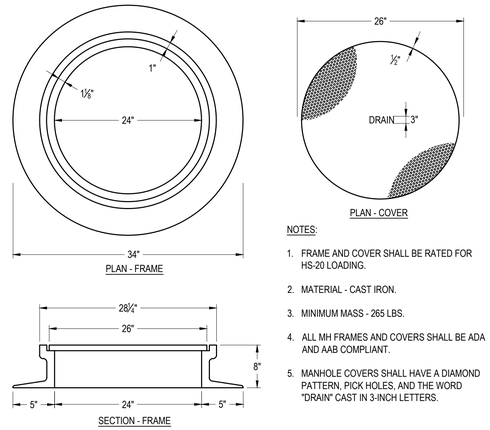
SEWER MANHOLE
N.T.S.



SEWER PIPE CONNECTION
N.T.S.



TYPICAL SEWER SERVICE CONNECTION
N.T.S.



MANHOLE FRAME AND COVER
N.T.S.

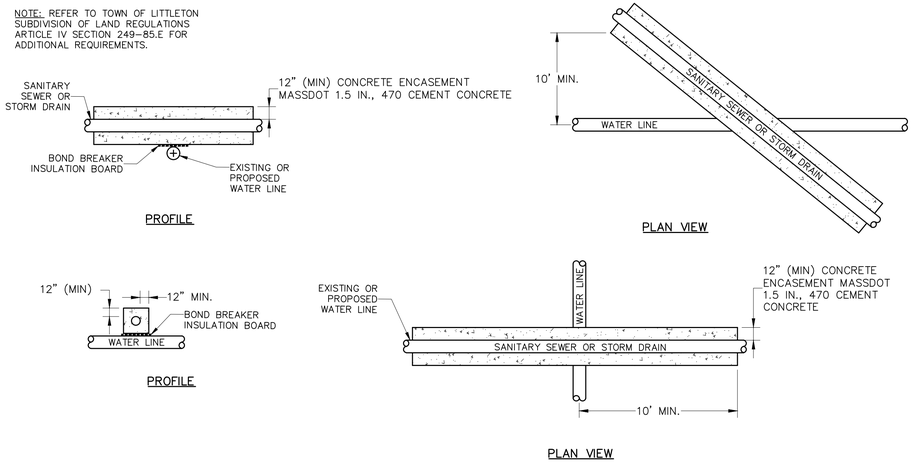
NOTES:
1. STRUCTURE SHALL BE DESIGNED FOR HS-20 LOADING.
2. PROVIDE OPENINGS FOR PIPES WITH 2" MAXIMUM CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS (NON-SHRINK GROUT).
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.

DOGHOUSE SEWER MANHOLE
N.T.S.

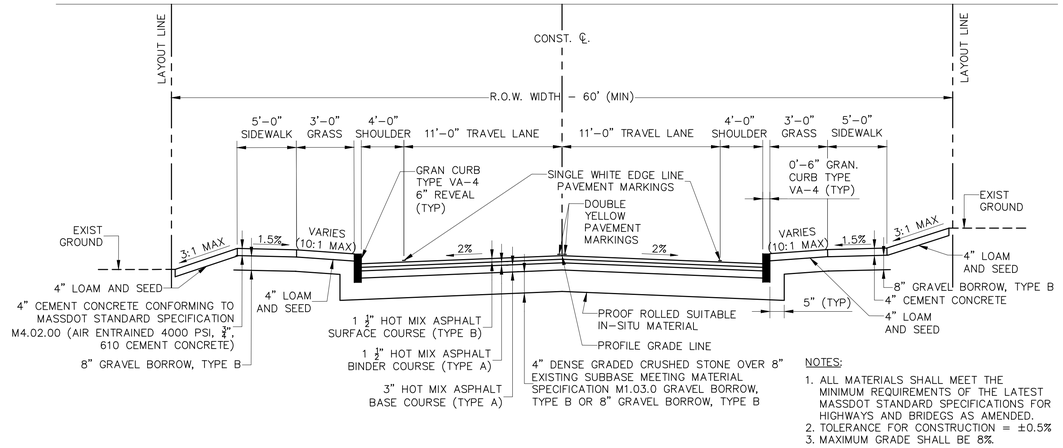
NOTES:
1. ALL MATERIALS SHALL MEET THE MINIMUM REQUIREMENTS OF THE LATEST MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES AMENDED.

ROADWAY UTILITIES - TYPICAL SECTION
N.T.S.

NOTE: REFER TO TOWN OF LITTLETON SUBDIVISION OF LAND REGULATIONS ARTICLE IV SECTION 249-85.E FOR ADDITIONAL REQUIREMENTS.



TYPICAL CONCRETE ENCASEMENT OF SANITARY SEWERS OR STORM DRAINS
N.T.S.



NOTES:
1. ALL MATERIALS SHALL MEET THE MINIMUM REQUIREMENTS OF THE LATEST MASSDOT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDEGS AS AMENDED.
2. TOLERANCE FOR CONSTRUCTION = ±0.5%
3. MAXIMUM GRADE SHALL BE 8%.

COLLECTOR ROAD TYPICAL SECTION
NTS

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

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Construction Details

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Littleton, MA 01460

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DESIGNED BY	RJF	DATE	8-22-23
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COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
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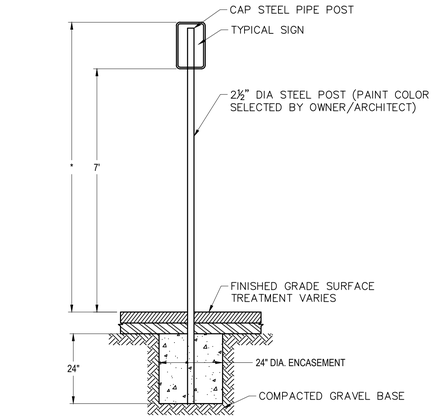
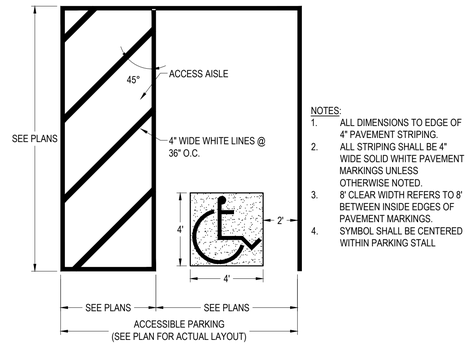
PROJECT NO.
T1180
TEC CAD FILE
T1180_DET
DRAWING NO.
C-32
SHEET 32 OF 61



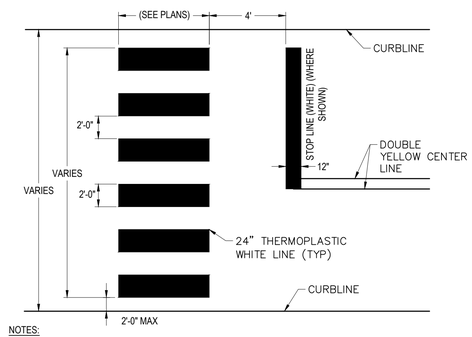
*THIS DIMENSION SHALL BE A MINIMUM OF 5' AND A MAXIMUM OF 8' FOR ACCESSIBLE SIGNAGE IN THE COMMONWEALTH OF MASSACHUSETTS.

SIGN POST
N.T.S.



NOTES:
1. ALL DIMENSIONS TO EDGE OF 4" PAVEMENT STRIPING.
2. ALL STRIPING SHALL BE 4" WIDE SOLID WHITE PAVEMENT MARKINGS UNLESS OTHERWISE NOTED.
3. 8' CLEAR WIDTH REFERS TO 8' BETWEEN INSIDE EDGES OF PAVEMENT MARKINGS.
4. SYMBOL SHALL BE CENTERED WITHIN PARKING STALL

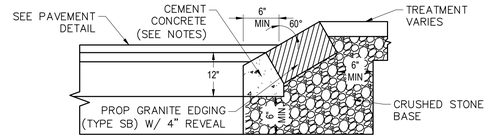
ACCESSIBLE PARKING SPACE
N.T.S.



NOTES:

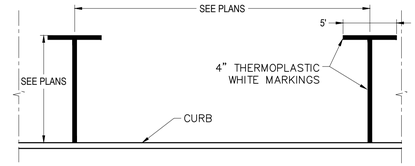
1. ALL 12" LINES SHALL BE APPLIED IN ONE APPLICATION, NO COMBINATION OF LINES (TWO - 6" LINES) WILL BE ACCEPTED. ALL 24" LINES MAY BE EITHER ONE 24" LINE OR A COMBINATION OF TWO - 12" LINES.
2. LAYOUT OF CROSSWALKS SHALL BE APPROVED BY THE ENGINEER PRIOR TO APPLICATION.
3. CROSSWALK BARS SHALL BE PLACED OUTSIDE THE VEHICULAR WHEEL PATH WHEREVER POSSIBLE.

CROSSWALK PAVEMENT MARKING
N.T.S.



1. CONCRETE SHALL BE INCLUDED IN PRICE BID FOR VARIOUS GRANITE EDGING ITEMS FOR 6" OFFSET FROM FACE OF CURB.
2. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF THE MASSDOT STANDARD SPECIFICATIONS MAY BE USED; ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.
3. FOR ALL OTHER DIMENSIONS, SEE MASSDOT CONSTRUCTION STANDARD E106.5.0

GRANITE EDGING
N.T.S.



PARALLEL PARKING PAVEMENT MARKING
N.T.S.

BOLLARD MOUNTED SIGN
N.T.S.

LEGEND:
HSL = HIGH SIDE TRANSITION LENGTH (SEE MASSDOT CONSTRUCTION STANDARD E 107.9.0)
W = SIDEWALK WIDTH
W1 = PERPENDICULAR RAMP LENGTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:
1. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0"
2. ROADWAY GUTTER SLOPE MEASURED IN UPSTATION DIRECTION
3. SEE MASSDOT CONSTRUCTION STANDARD E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS

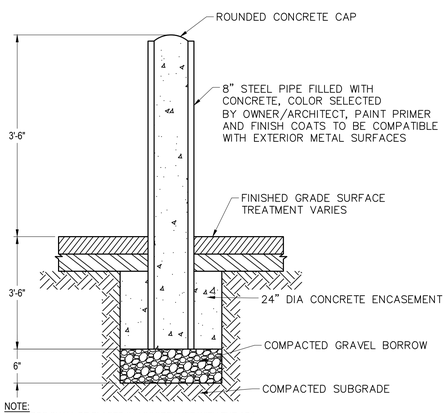
WHEELCHAIR RAMP
N.T.S.

NOTES:
1. ROADWAY, GUTTER, AND FIRST 6" OF SIDEWALK TO BE ADJUSTED FOR FIELD CONDITIONS

LEGEND:
** BUILDING OR OTHER UNALTERABLE CONDITION
TOLERANCE FOR CONSTRUCTION ±0.5%

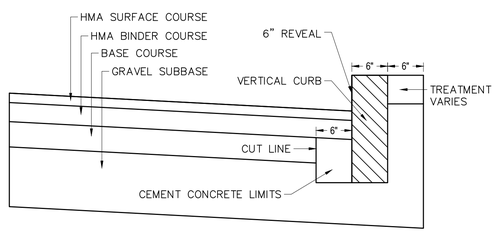
"T" INTERSECTION WHEELCHAIR RAMP
N.T.S.

WHEELCHAIR RAMP TYPE B
N.T.S.



NOTE:
BOLLARDS SHALL BE PLACED IN ACCORDANCE WITH THE ADA ACCESSABILITY GUIDELINES. A MINIMUM CLEAR WIDTH OF 36" SHALL BE PROVIDED TO MAINTAIN AN ACCESSIBLE PATH.

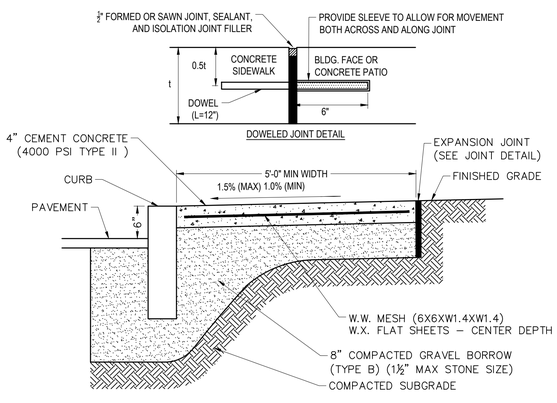
BOLLARD
N.T.S.



NOTES:

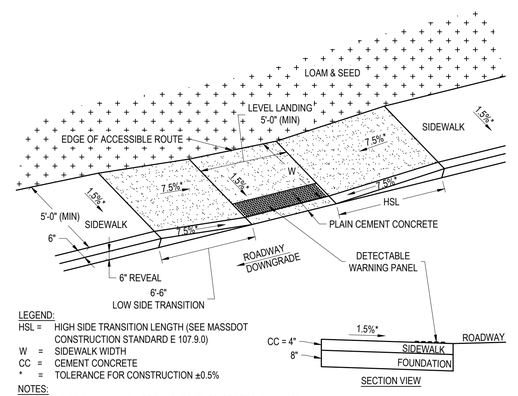
1. THIS PROCEDURE IS APPLICAPLE ONLY IF CURB IS TO BE SET AFTER BASE COURSE IS IN PLACE PRIOR TO BINDER AND TOP PLACEMENT.
2. CUT NEAT LINE 6" FROM CURB LINE AND REMOVE BASE AND GRAVEL. REPLACE WITH CEMENT CONCRETE
3. ANY DESIGNATED CEMENT CONCRETE THAT IS ACCEPTABLE UNDER SECTION M4 OF MADOT STANDARD SPECIFICATIONS MAY BE USED; ALL TEST REQUIREMENTS ARE WAIVED. HOT MIX ASPHALT SHALL NOT BE USED AS A SUBSTITUTE.

VERTICAL GRANITE CURB
N.T.S.



NOTES:
1. PROVIDE A DOWELED CONSTRUCTION JOINT AT ALL DOORWAY LOCATIONS

CEMENT CONCRETE SIDEWALK
N.T.S.



LEGEND:
HSL = HIGH SIDE TRANSITION LENGTH (SEE MASSDOT CONSTRUCTION STANDARD E 107.9.0)
W = SIDEWALK WIDTH
CC = CEMENT CONCRETE
* = TOLERANCE FOR CONSTRUCTION ±0.5%

NOTES:
1. USABLE SIDEWALK WIDTH PER AAB IS NOT TO BE LESS THAN 4'-0".
2. ROADWAY GUTTER SLOPE MEASURED IN UPSTATION DIRECTION.
3. SEE MASSDOT CONSTRUCTION STANDARD E 107.6.5 FOR DETECTABLE WARNING PANEL DETAILS.
4. SEE MASSDOT CONSTRUCTION STANDARD E 107.2.1 FOR ALL OTHER DETAILS.

WHEELCHAIR RAMP TYPE A
N.T.S.

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

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Construction Details

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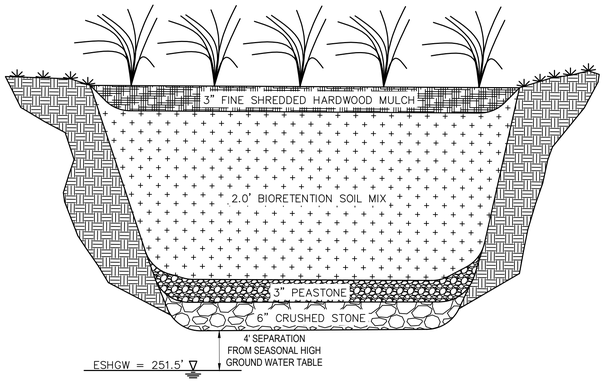
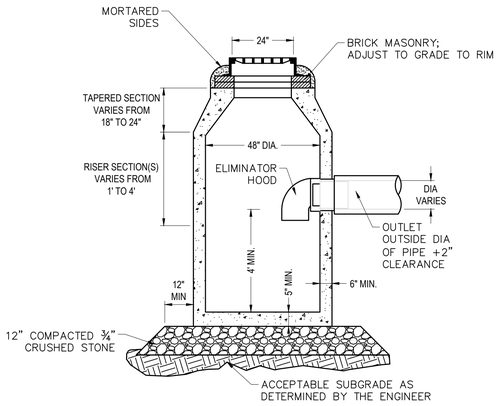
PROJECT NO.
T1180
TEC CAD FILE
T1180_DET
DRAWING NO.
C-33
SHEET 33 OF 61



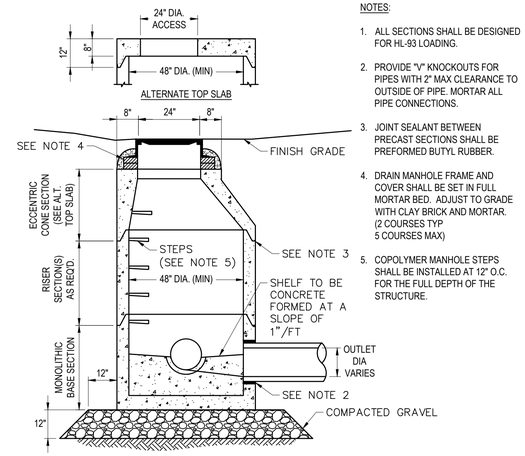
RAIN GARDEN
N.T.S.

NOTES:

1. THE BIORETENTION SOIL MIX SHALL CONSIST OF A UNIFORM MIXTURE OF TWO PARTS (40% BY VOLUME) COURSE SAND (MASSDOT MATERIAL SPECIFICAITON M1.04.0 TYPE A), TWO PARTS (40% BY VOLUME) TOPSOIL (MASSDOT SPECIFICATION M1.05.0 OR M1.06.1) AND ONE PART (20% BY VOLUME HARDWORD CHIPS.
2. THE LARGEST STONE SIZE SHALL BE 2" DIAMETER IN THE TOPSOIL.
3. REMOVE ANY FILL BENEATH THE RAIN GARDEN. REPLACE WITH TITLE 5 SAND BACKFILL.
4. SOIL SURROUNDING TREES TO REMAIN SHALL NOT BE EXCAVATED TO PROTECT THE ROOTS.



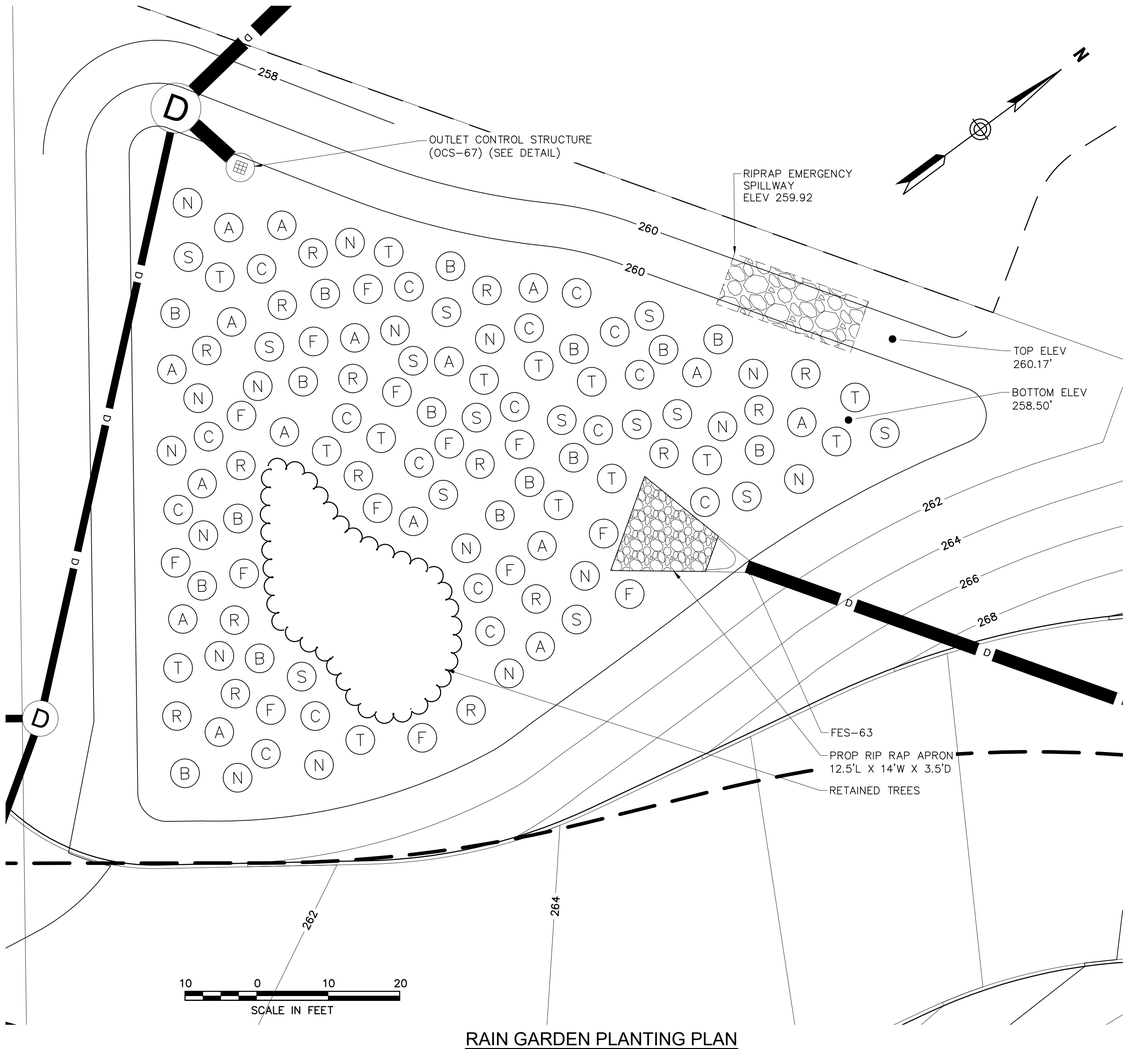
DEEP SUMP CATCH BASIN WITH HOOD
N.T.S.



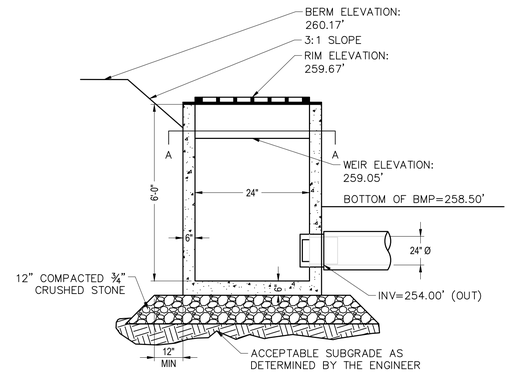
NOTES:

1. ALL SECTIONS SHALL BE DESIGNED FOR HL-93 LOADING.
2. PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
3. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PREFORMED BUTYL RUBBER.
4. DRAIN MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR. (2 COURSES TYP 5 COURSES MAX)
5. COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.

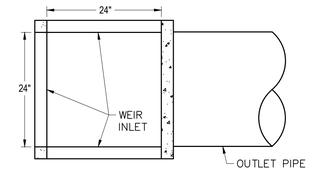
DRAINAGE MANHOLE
N.T.S.



RAIN GARDEN PLANTING PLAN
1"=10'



RAIN GARDEN OUTLET CONTROL STRUCTURE (OCS-67)
N.T.S.

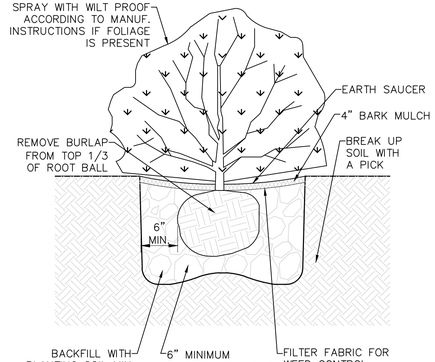


SECTION A–A

NOTES:

1. THREE SIDES OF THE OCS SHALL BE CUT TO PROVIDE A BROAD-CRESTED WEIR 0.5 FEET DEEP MEASURED FROM THE BOTTOM OF THE GRATE INLET.
2. THE WEIR SHALL PROVIDE 6' TOTAL LENGTH.

RAIN GARDEN PLANTINGS			
SYMBOL	PLANT SPECIES	PLANT TYPE	NUMBER OF PLANTS
F	FOX SEDGE (Carex vulpinoidea)	GRASS	14
S	SWITCHGRASS (Panicum virgatum)	GRASS	14
T	BIRDSFOOT TREFOIL (Lotus corniculatus)	GRASS	14
A	ARROW-WOOD (Viiburnum dentatum)	SHRUB	16
B	NORTHERN BAYBERRY (Myrica pensylvanica)	SHRUB	16
N	NANNYBERRY (Viburnum lentago)	SHRUB	16
R	NORTHERN WILD RAISIN (Viburnum cassinoides)	SHRUB	16
C	RED CHOKEBERRY (Aronia arbutifolia)	SHRUB	16



NOTE:
1. DOUBLE PLANTING SOIL MIX DIMENSIONS IN LEDGE.

SHRUB PLANTING DETAIL
N.T.S.

REVISIONS
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3.

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PROJECT NO.
T1180
TEC CAD FILE
T1180_DET
DRAWING NO.
C-34
SHEET 34 OF 61

PROJECT SUMMARY

CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 290 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = N/A
- PIPE STORAGE VOLUME = 8,086 CF
- BACKFILL STORAGE VOLUME = 3,525
- TOTAL STORAGE PROVIDED = 11,611 CF

PIPE DETAILS
- DIAMETER = 72"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 36"

BACKFILL DETAILS
- WIDTH AT ENDS = 12"
- ABOVE PIPE = 6"
- WIDTH AT SIDES = 12"
- BELOW PIPE = 6"

ASSEMBLY
SCALE: 1" = 20'

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

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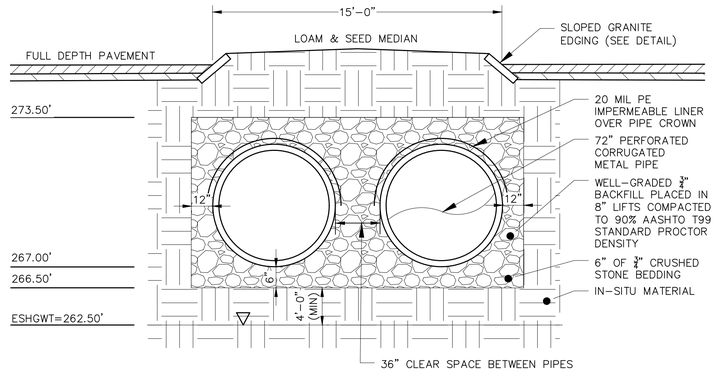
CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO42752 King Street Commons Subdivision
CMP Detention
Littleton, MA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
29349	42752	2/8/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.:		1

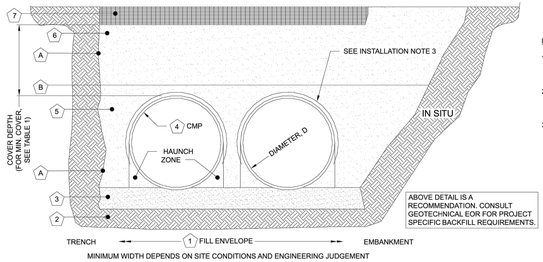


CMP INFILTRATION SECTION
N.T.S.

TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT.



MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

INSTALLATION NOTES

1. WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.
2. OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.
3. AN HDPE MEMBRANE LINER WILL BE PLACED ON THE CROWN OF EACH PIPE TO PROVIDE AN IMPERMEABLE BARRIER AGAINST ENVIRONMENTAL CHANGES THAT MAY ADVERSELY AFFECT THE SYSTEM OVER TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL TECHNICAL DETAILS.

TABLE 2: PERFORATED STANDARD

CMP RETENTION STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.0D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2** - PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4			CORRUGATED METAL PIPE	
5	BACKFILL	FREE-DRAINING, ANGULAR, WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTION WITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	**"IN
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A-3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	OPTIONAL SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.
- APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MIDOT 6AA, 6A, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL

NOT TO SCALE

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CONTECH CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO42752 King Street Commons Subdivision
CMP Detention
Littleton, MA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
29349	42752	1/10/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.:		1

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Construction Details

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

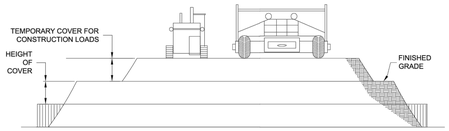
DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_DET
DRAWING NO.
C-35
SHEET 35 OF 61



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

NOTE:
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PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

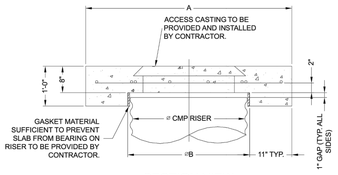
POLYMER COATED: AASHTO M-245 OR ASTM A-762

ALUMINUM: AASHTO M-196 OR ASTM B-745

APPLICABLE
HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSPS (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.

REQUIREMENTS
INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

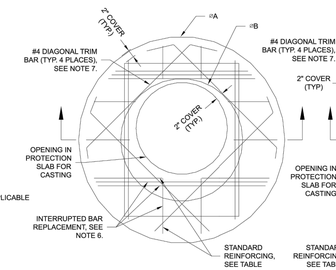
IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.



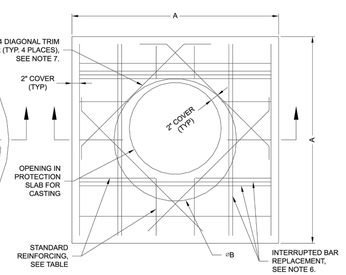
SECTION VIEW

REINFORCING TABLE				
⌀ CMP RISER	A	⌀ B	REINFORCING	**BEARING PRESSURE (PSF)
24"	⌀ 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	⌀ 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	⌀ 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	⌀ 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	⌀ 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW



SQUARE OPTION PLAN VIEW

NOTES:

1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL

SCALE: N.T.S.

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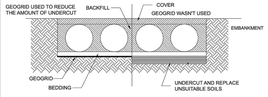
CMP DETENTION INSTALLATION GUIDE

PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION

CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.

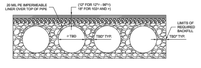


GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

GEOMEMBRANE BARRIER

A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

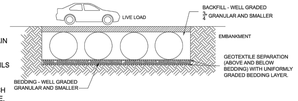
THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.



IN-SITU TRENCH WALL

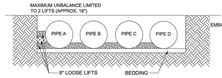
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.



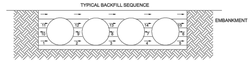
BACKFILL PLACEMENT

MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

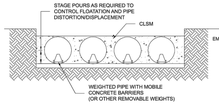


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.



WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.

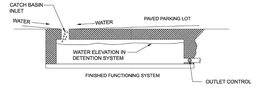


CONSTRUCTION LOADING

TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS

BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE

UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION

INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE

CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH® CMP DETENTION SYSTEMS
CONTECH DYODS DRAWING

DYO42752 King Street Commons Subdivision
CMP Detention
Littleton, MA
DETENTION SYSTEM

PROJECT No.:	SEQ. No.:	DATE:
29349	42752	1/10/2024
DESIGNED: DYO	DRAWN: DYO	
CHECKED: DYO	APPROVED: DYO	
SHEET NO.:	1	

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Construction Details

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

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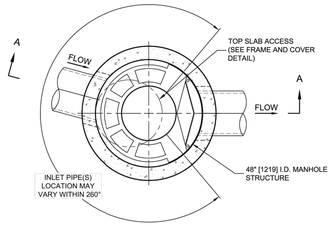
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

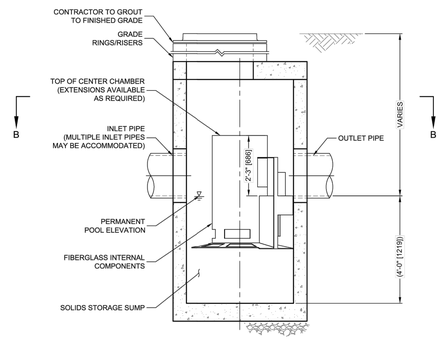
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_DET
DRAWING NO.
C-36



PLAN VIEW B-B
NOT TO SCALE



ELEVATION A-A
NOT TO SCALE

CASCADE
separator™

CASCADE SEPARATOR DESIGN NOTES

THE STANDARD CS-4 CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES

FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (cfs [L/s])			
PEAK FLOW RATE (cfs [L/s])			
RETURN PERIOD OF PEAK FLOW (yrs)			
RIM ELEVATION			
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			

NOTES / SPECIAL REQUIREMENTS:

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. CASCADE SEPARATOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610], AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. CASCADE SEPARATOR STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C478 AND AASHTO LOAD FACTOR DESIGN METHOD.
6. ALTERNATE UNITS ARE SHOWN IN MILLIMETERS [mm].

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CASCADE SEPARATOR MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

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CS-4
CASCADE SEPARATOR
STANDARD DETAIL

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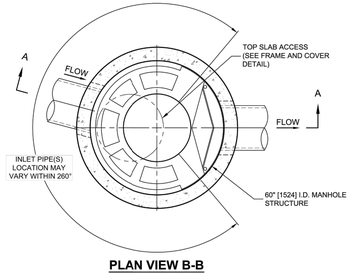
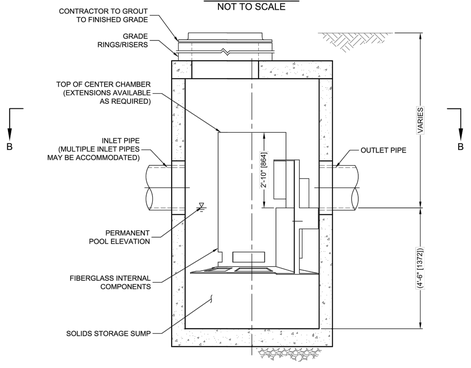


PLAN VIEW B-B
NOT TO SCALE



ELEVATION A-A
NOT TO SCALE

CASCADE
separator™

CASCADE SEPARATOR DESIGN NOTES

THE STANDARD CS-5 CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES

FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (cfs [L/s])			
PEAK FLOW RATE (cfs [L/s])			
RETURN PERIOD OF PEAK FLOW (yrs)			
RIM ELEVATION			
PIPE DATA:	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE			

NOTES / SPECIAL REQUIREMENTS:

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3. CASCADE SEPARATOR WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. CASCADE SEPARATOR STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2' [610], AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
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CS-5
CASCADE SEPARATOR
STANDARD DETAIL

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Construction Details

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
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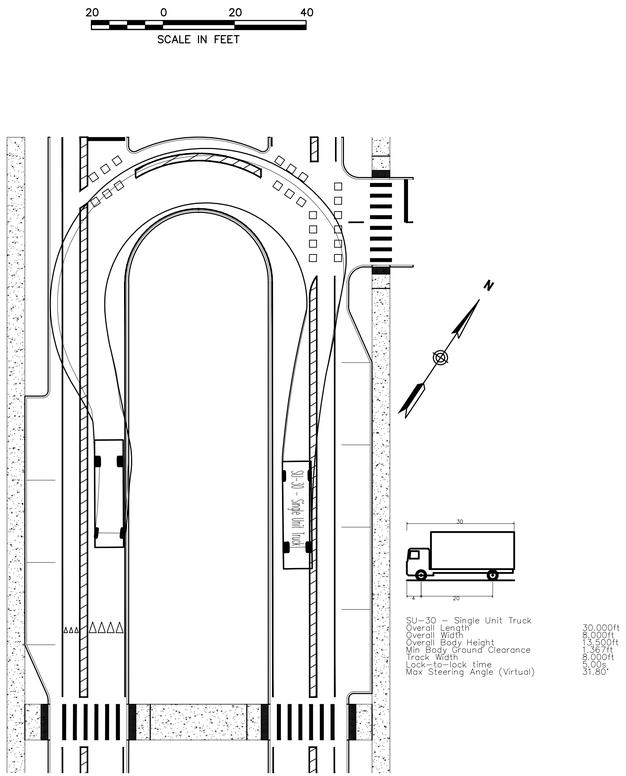
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

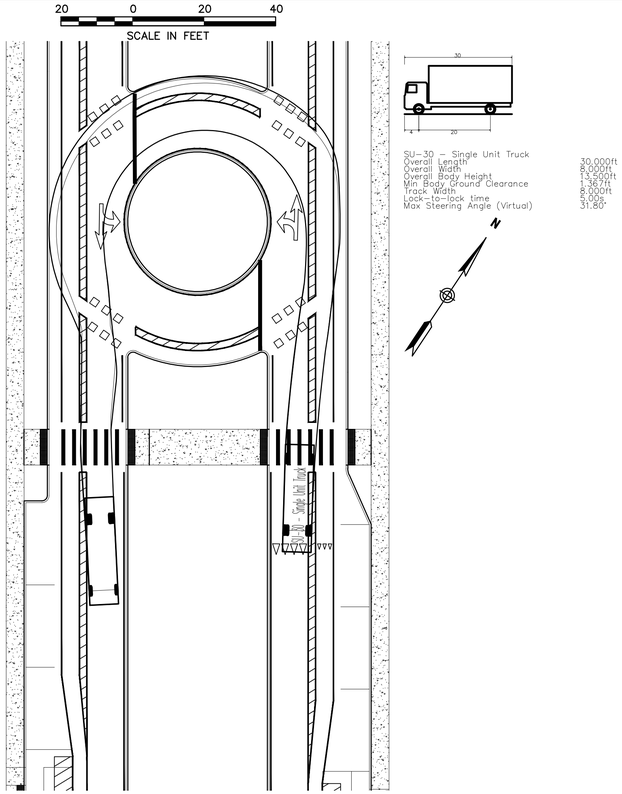
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_DET
DRAWING NO.
C-37
SHEET 37 OF 61



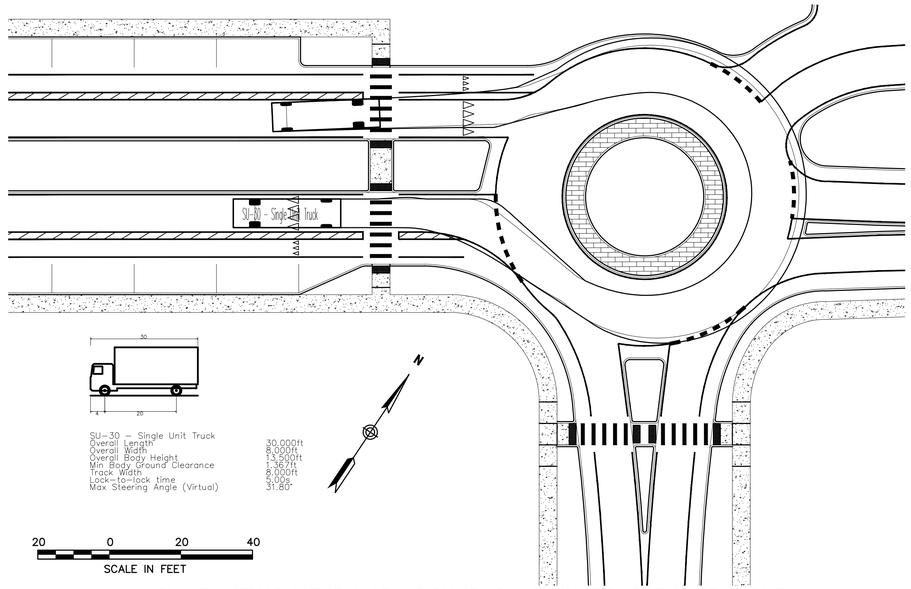
SU-30 TRUCK TURNING AROUND ON NORTH ROAD

1"=20'



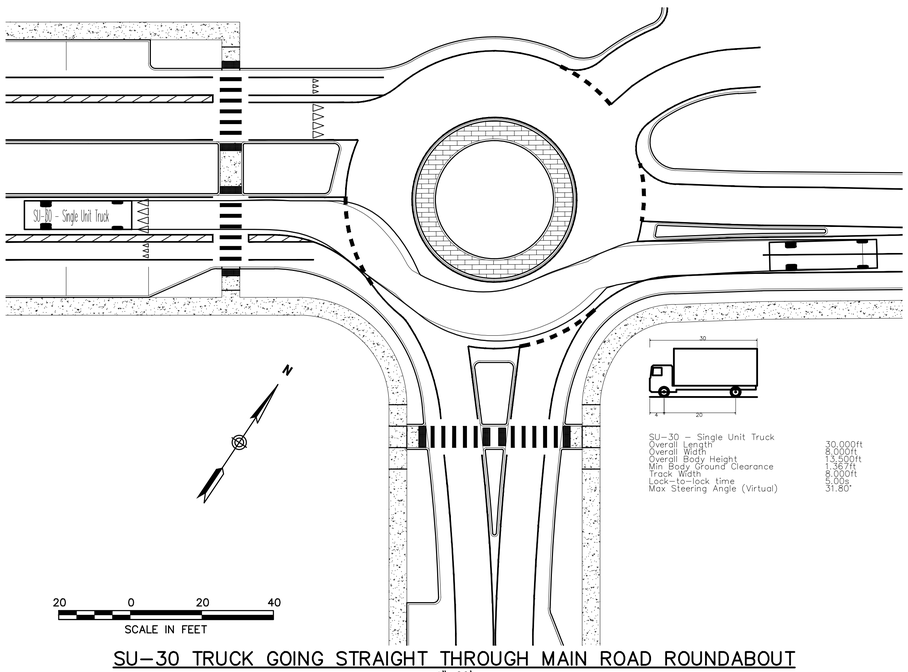
SU-30 TRUCK TURNING AROUND ON NORTH ROAD ROUNDABOUT

1"=20'



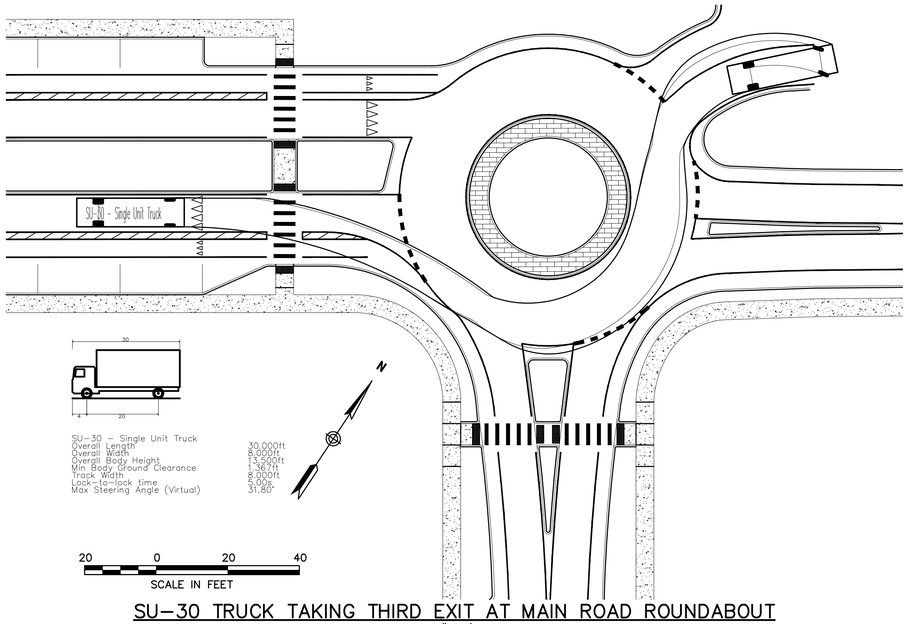
SU-30 TRUCK TURNING AROUND ON MAIN ROAD ROUNDABOUT

1"=20'



SU-30 TRUCK GOING STRAIGHT THROUGH MAIN ROAD ROUNDABOUT

1"=20'



SU-30 TRUCK TAKING THIRD EXIT AT MAIN ROAD ROUNDABOUT

1"=20'

REVISIONS
1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE
Truck Turning Plan

SUBDIVISION NAME & LOCATION
King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER
Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER
TEC
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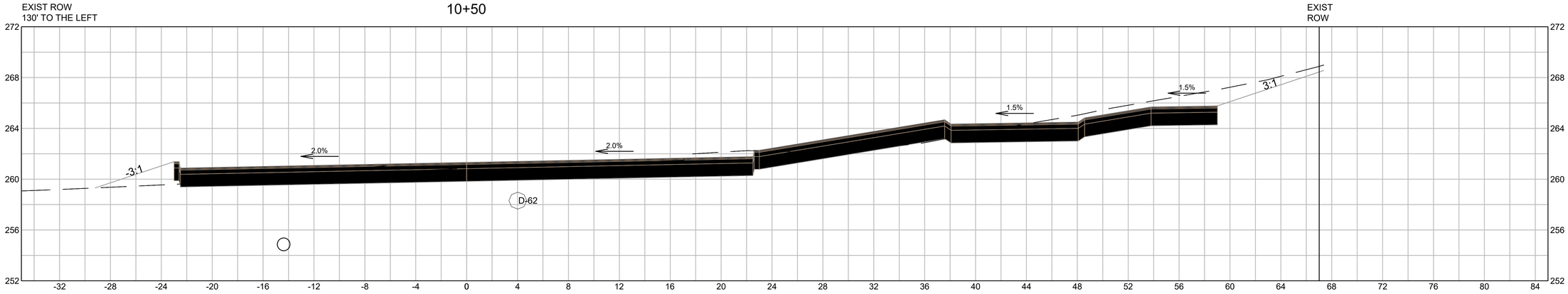
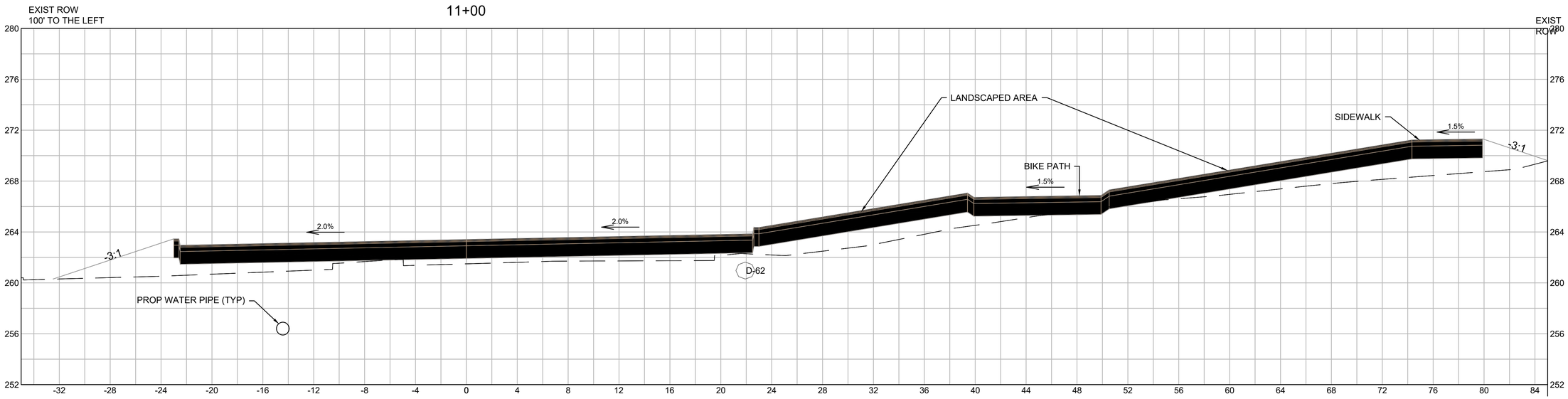
Lawrence | Hampton | Worcester

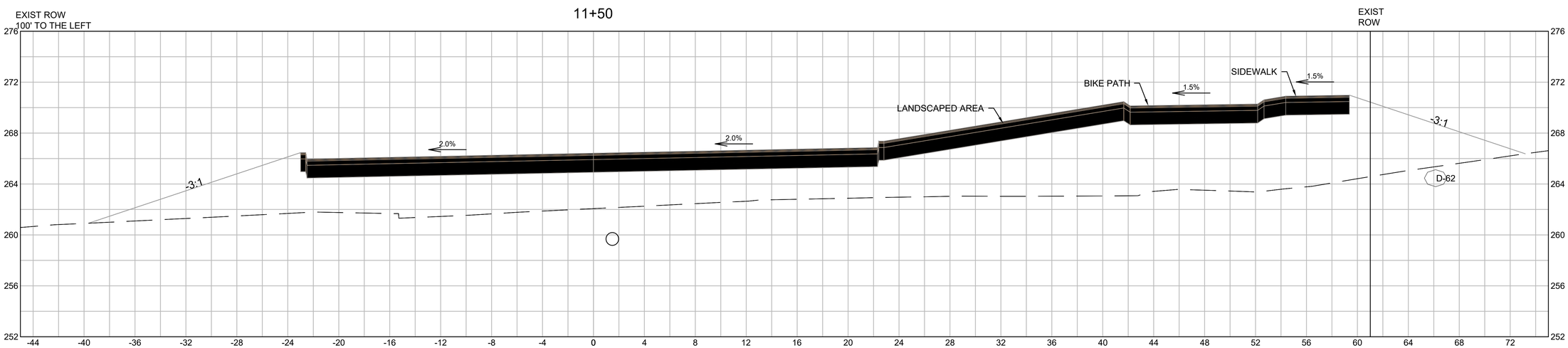
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_DET
DRAWING NO.
C-38
SHEET 38 OF 61







NOTES:

1. ALL LANDSCAPE BUFFERS TO BE A MAX OF 1:10 SLOPE.

HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 10+50 to 11+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
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REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180

TEC CAD FILE
T1180_SECTION

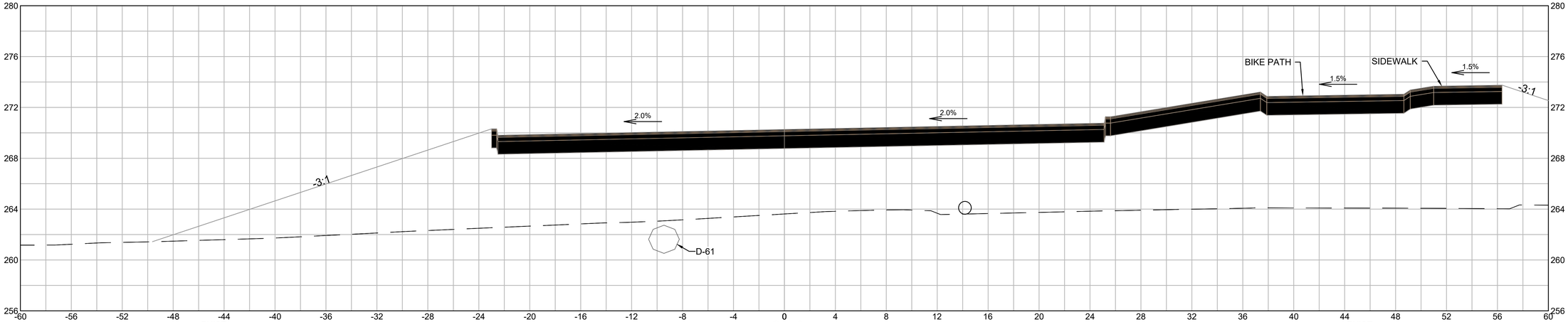
DRAWING NO.
C-39

SHEET 39 OF 61

12+00

EXIST ROW
20' TO THE LEFT

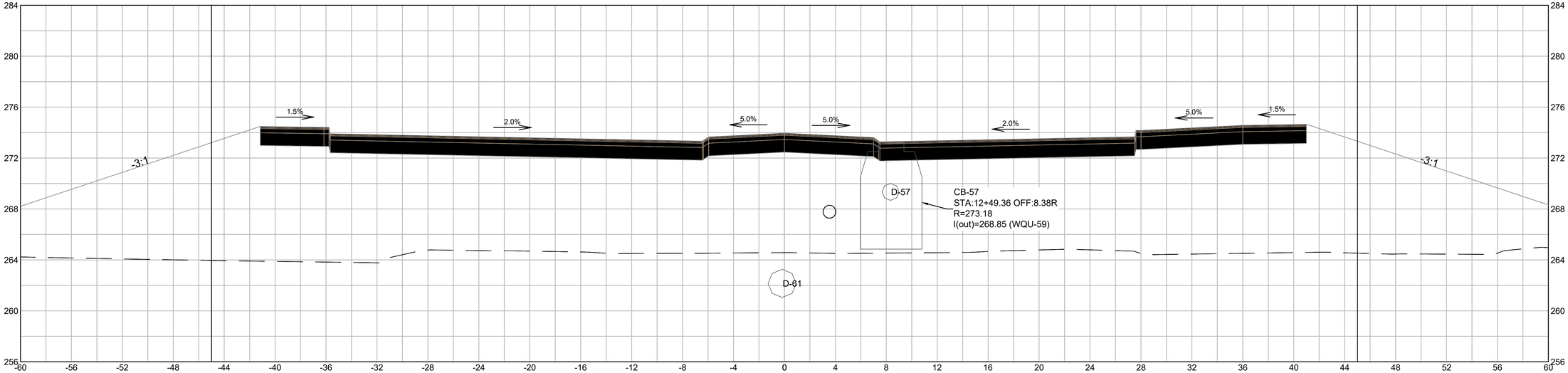
EXIST ROW
2' TO THE RIGHT



12+50

EXIST ROW

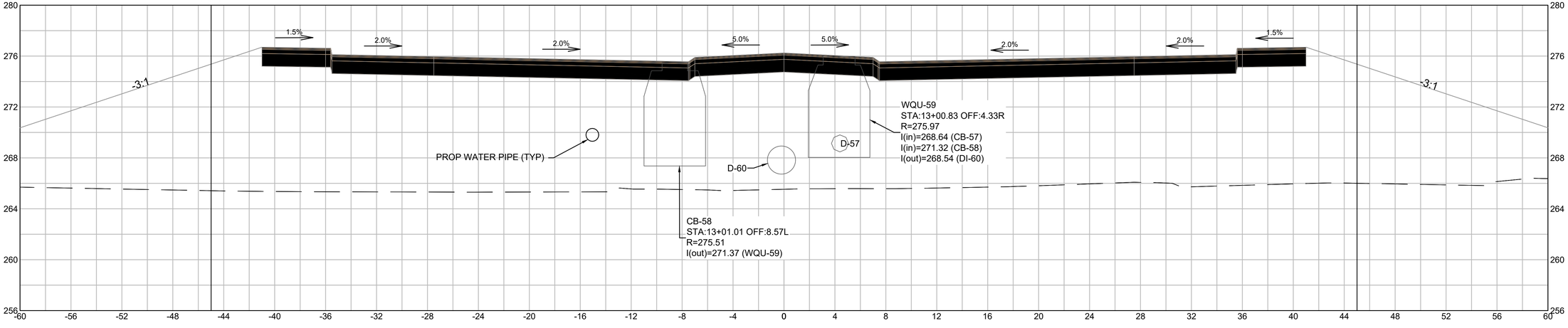
EXIST ROW



13+00

EXIST ROW

EXIST ROW



HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

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3.

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Roadway Cross Sections
12+00 to 13+00

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Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

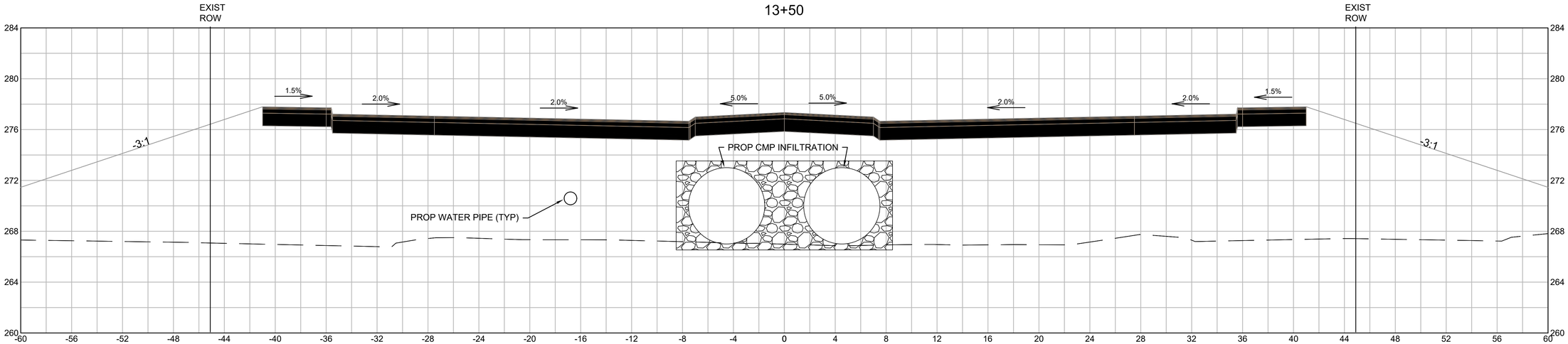
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

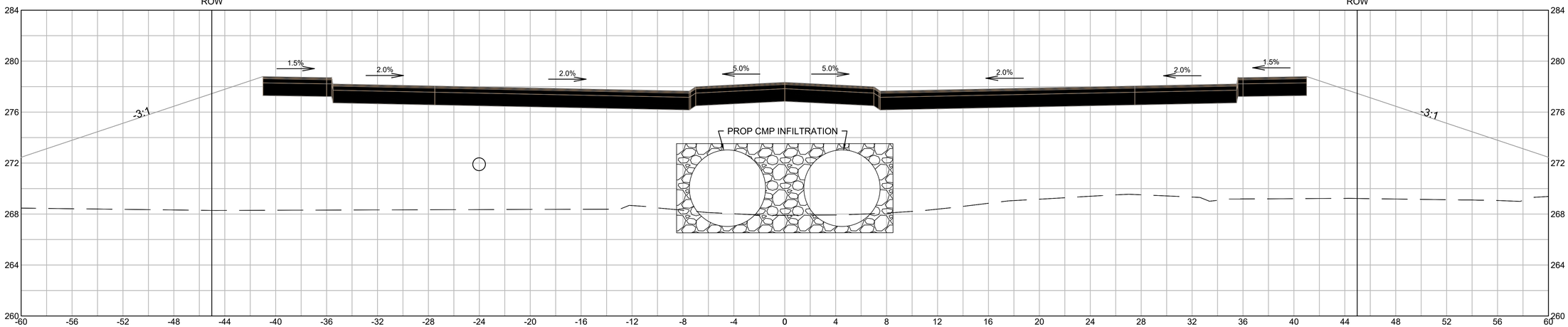
PROJECT NO.
T1180

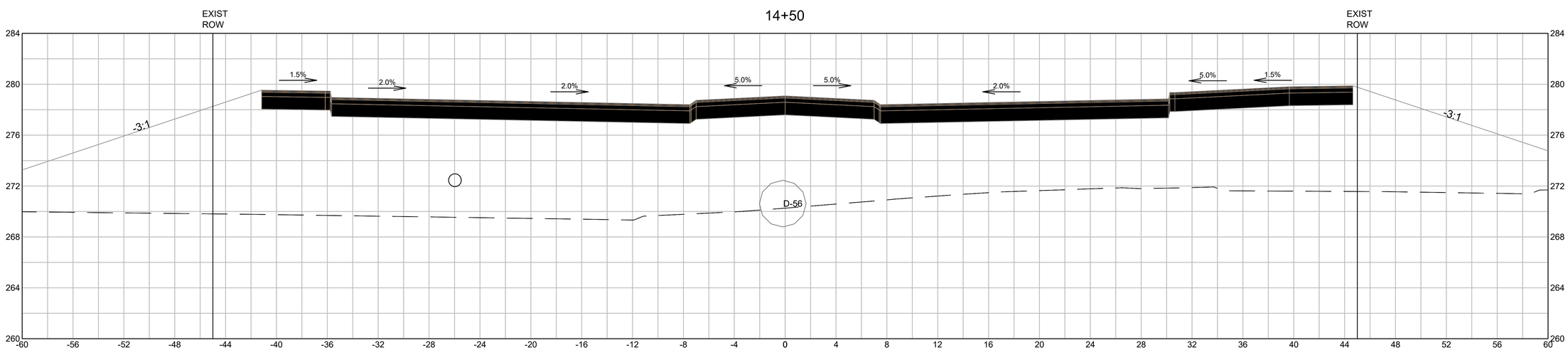
TEC CAD FILE
T1180_SECTION

DRAWING NO.
C-40

SHEET 40 OF 61







HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 13+50 to 14+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

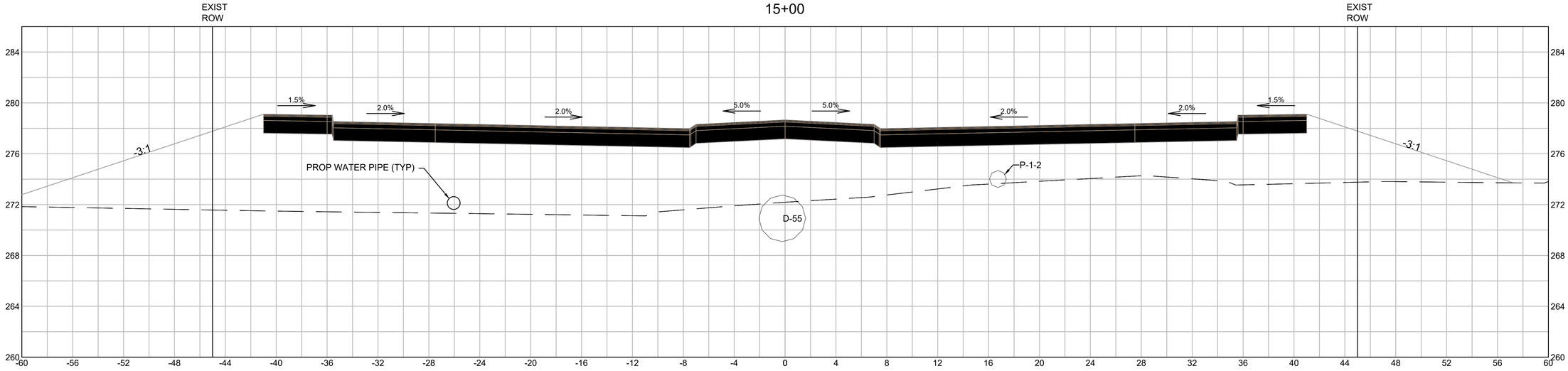
CHECKED BY CPR SCALE AS NOTED

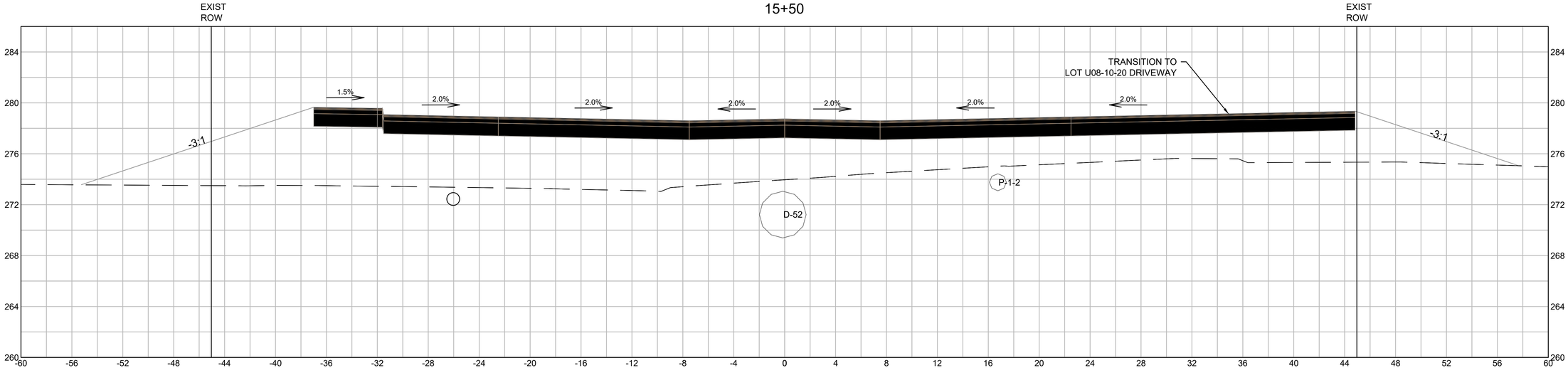
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

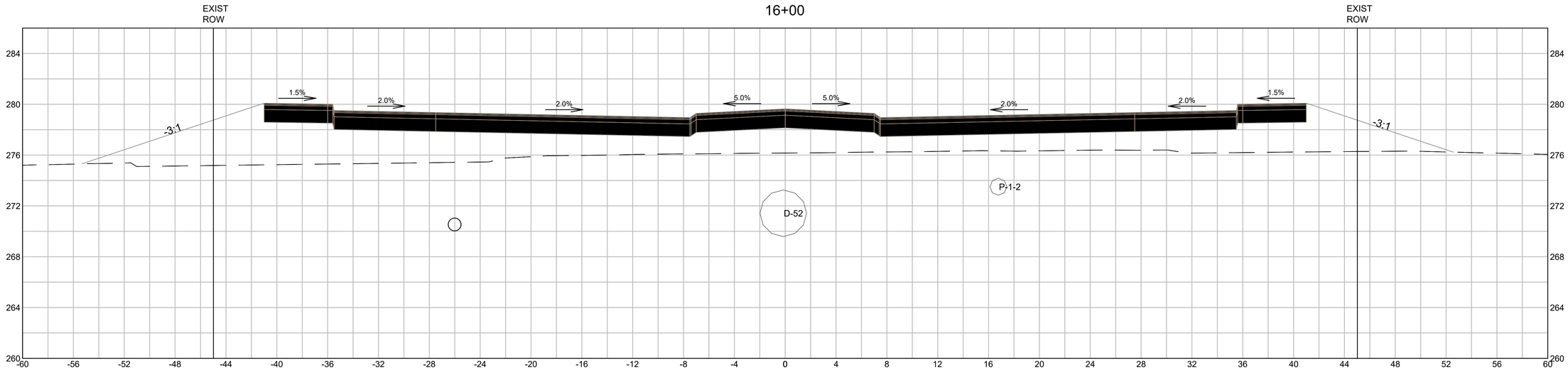
PROJECT NO. T1180

TEC CAD FILE T1180_SECTION

DRAWING NO. C-41







HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 15+00 to 16+00

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
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Lawrence | Hampton | Worcester

DESIGNED BY	RJF	DATE	8-22-23
CHECKED BY	CPR	SCALE	AS NOTED

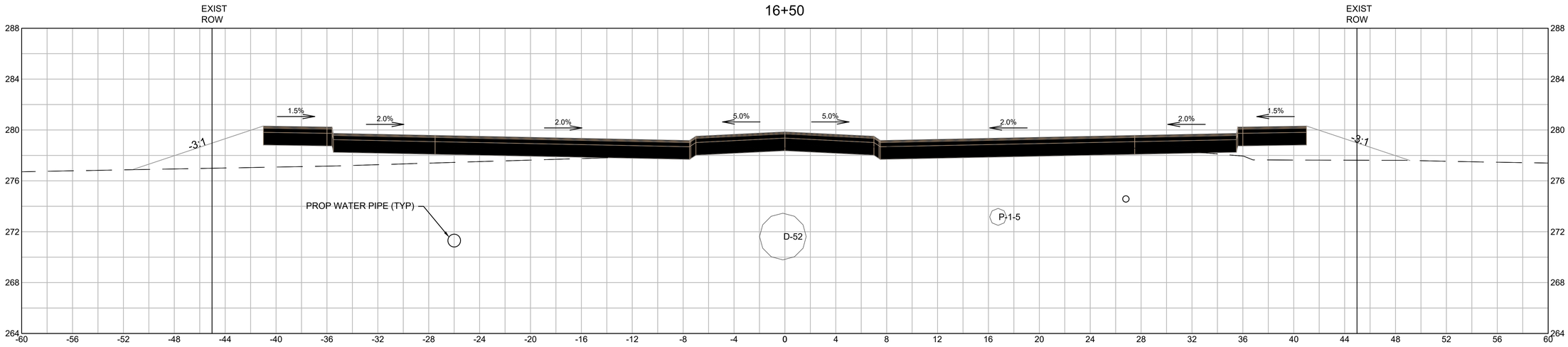
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

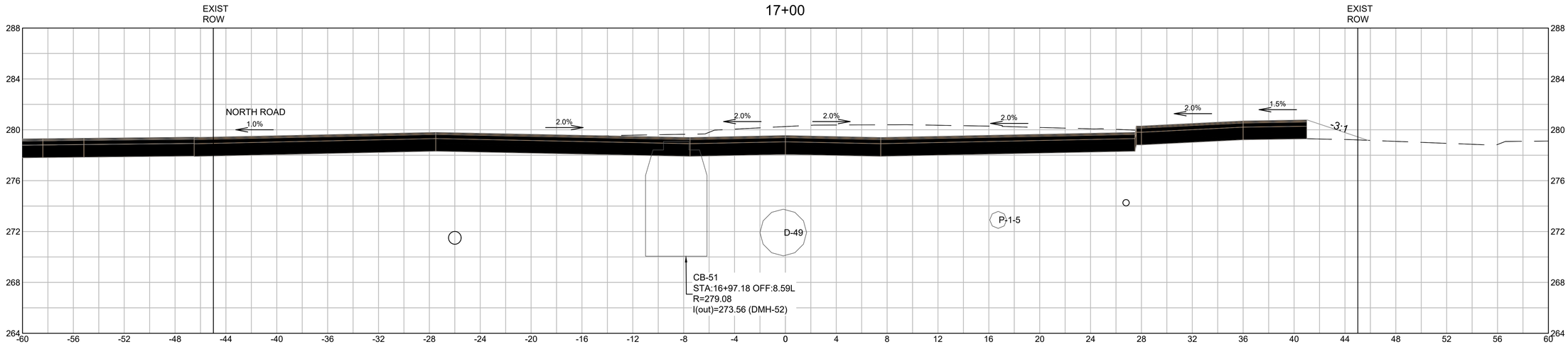
PROJECT NO.
T1180

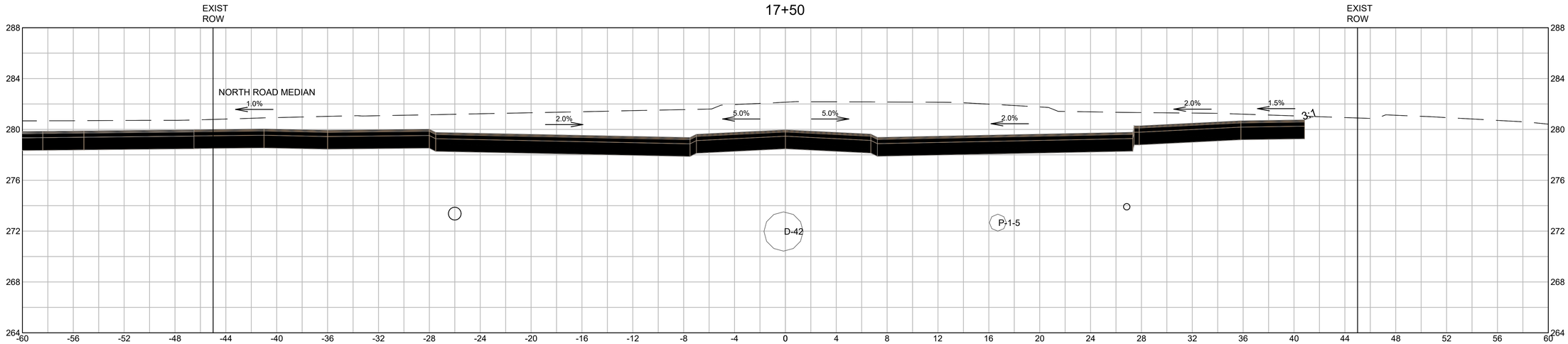
TEC CAD FILE
T1180_SECTION

DRAWING NO.
C-42

SHEET 42 OF 61







HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 16+50 to 17+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC
The Engineering Corp
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

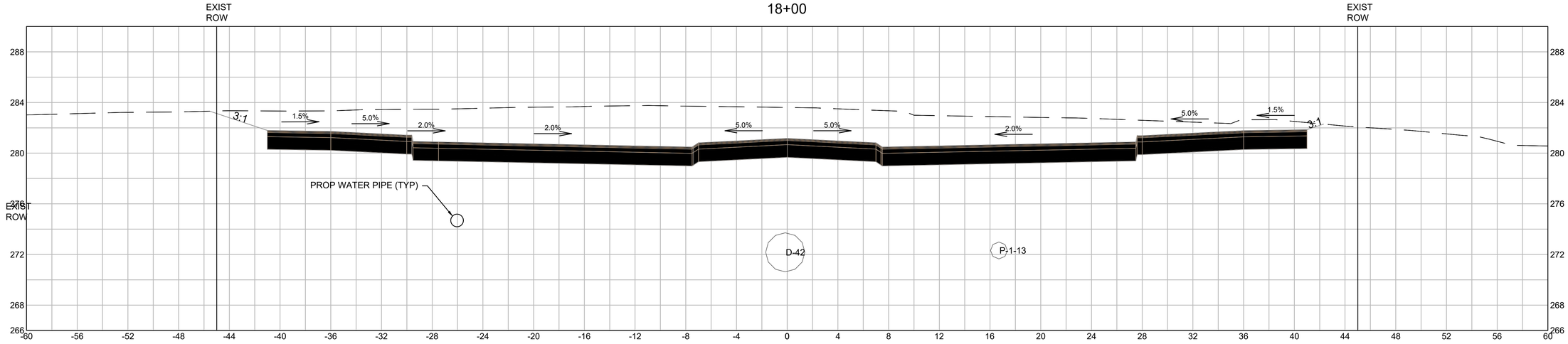
PROJECT NO.
T1180

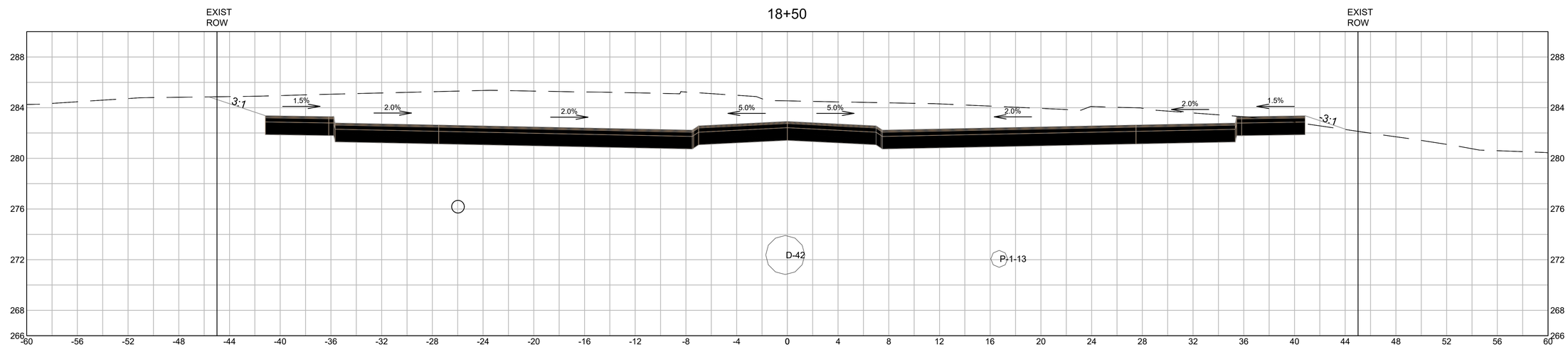
TEC CAD FILE
T1180_SECTION

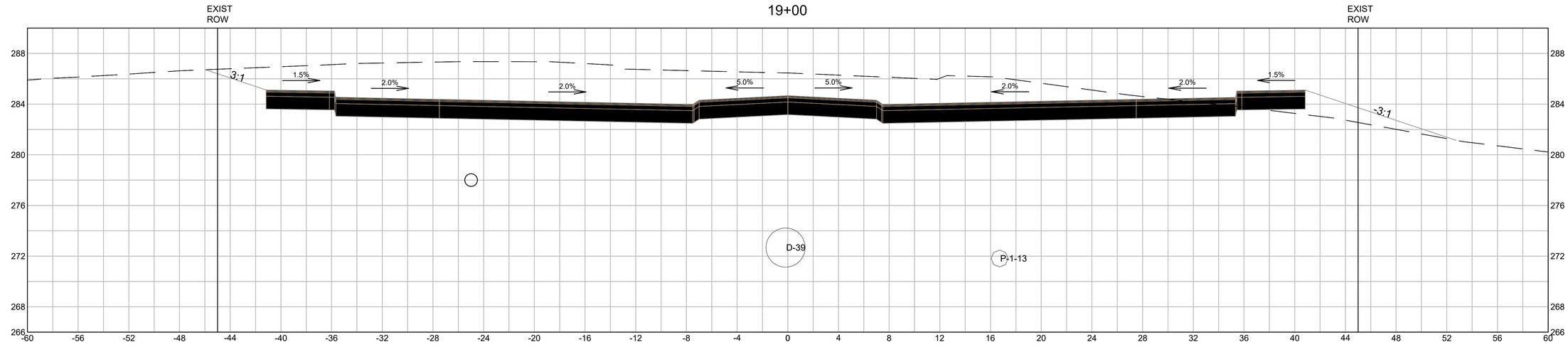
DRAWING NO.
C-43

SHEET 43 OF 61

61







HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 18+00 to 19+00

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
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Lawrence, Massachusetts 01843
978.794.1792
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DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

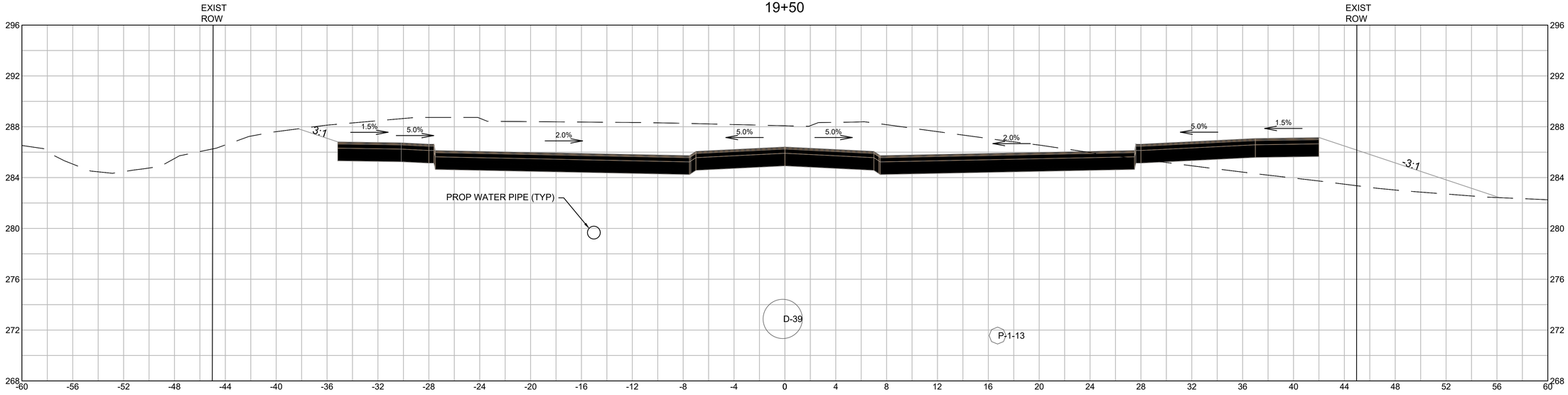
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

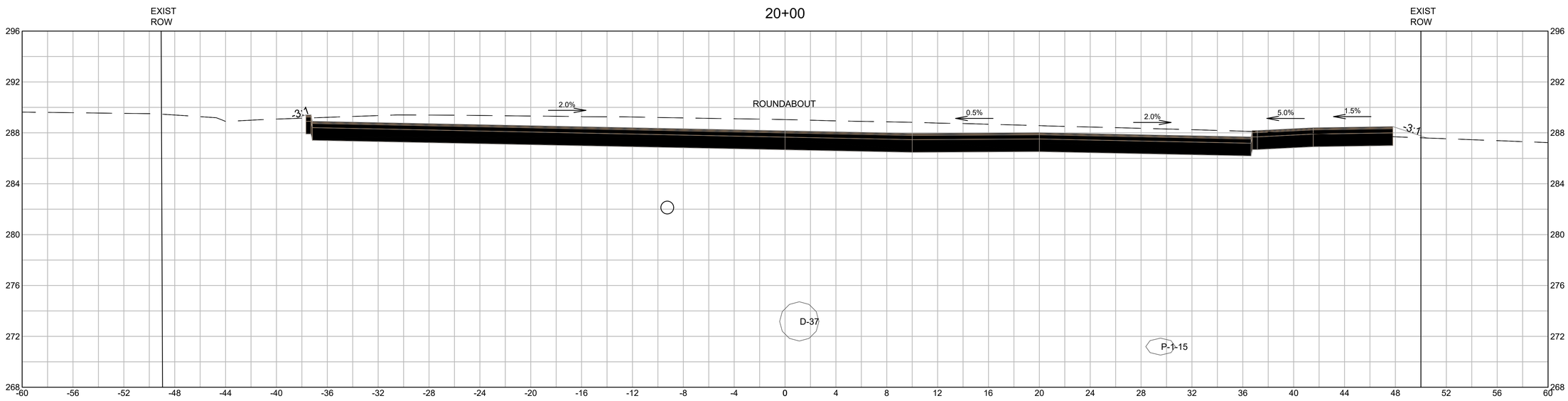
PROJECT NO. T1180

TEC CAD FILE T1180_SECTION

DRAWING NO. C-44

SHEET 44 OF 61





HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 19+50 to 20+00

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

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282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
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DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

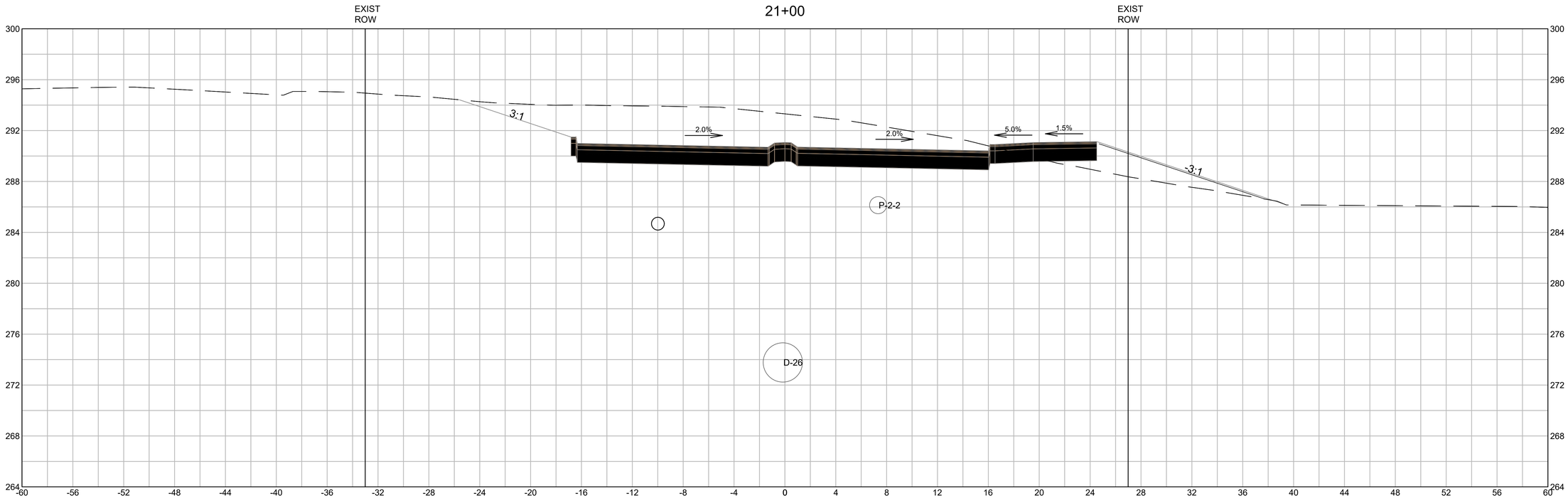
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

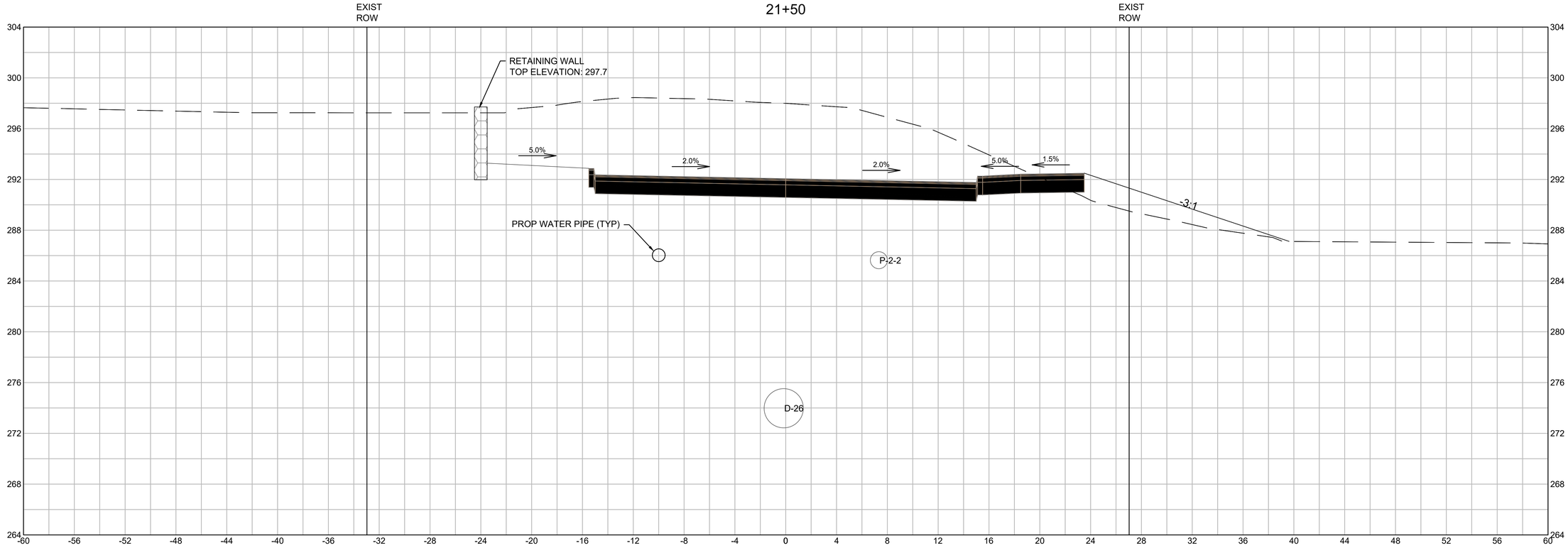
PROJECT NO.
T1180

TEC CAD FILE
T1180_SECTION

DRAWING NO.
C-45

SHEET 45 OF 61





HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 21+00 to 21+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

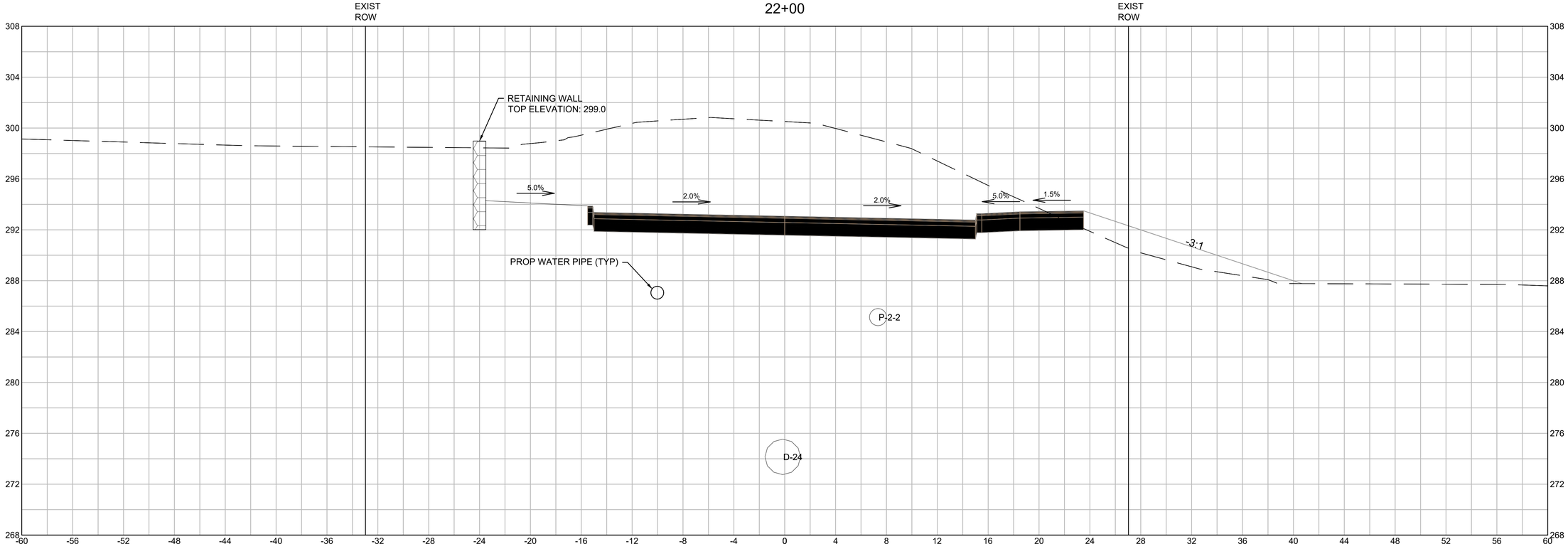
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

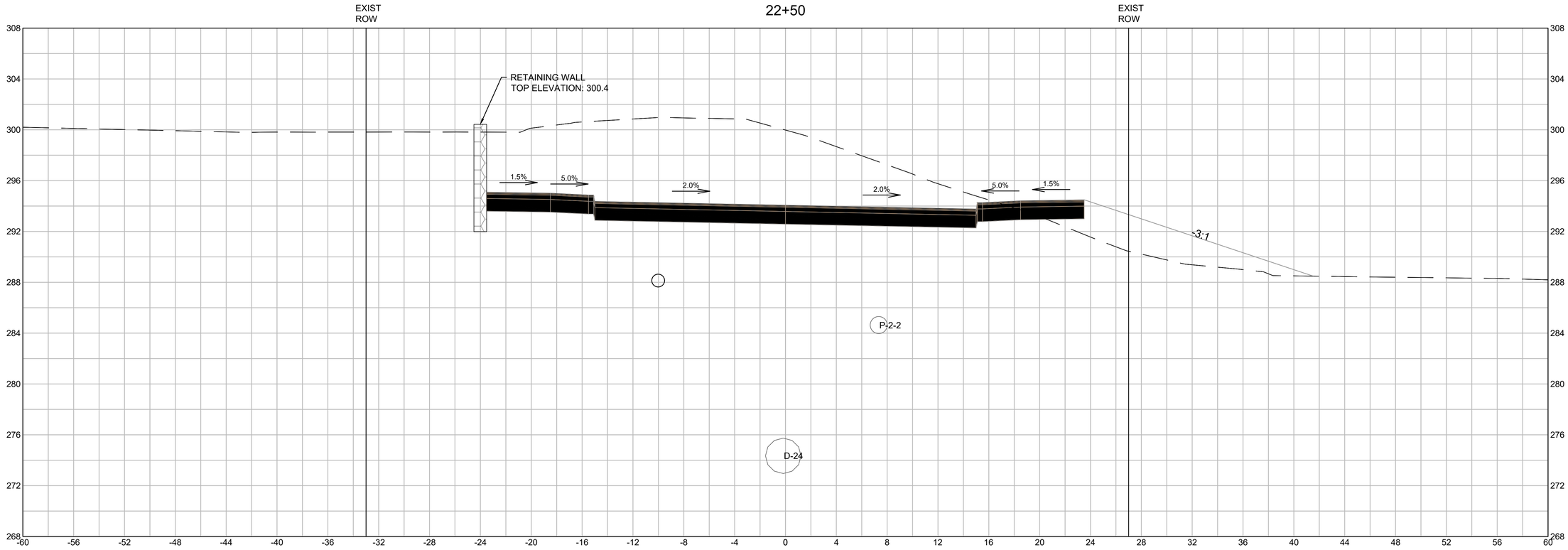
PROJECT NO. T1180

TEC CAD FILE T1180_SECTION

DRAWING NO. C-46

SHEET 46 OF 61





HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 22+00 to 22+50

SUBDIVISION NAME & LOCATION

King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

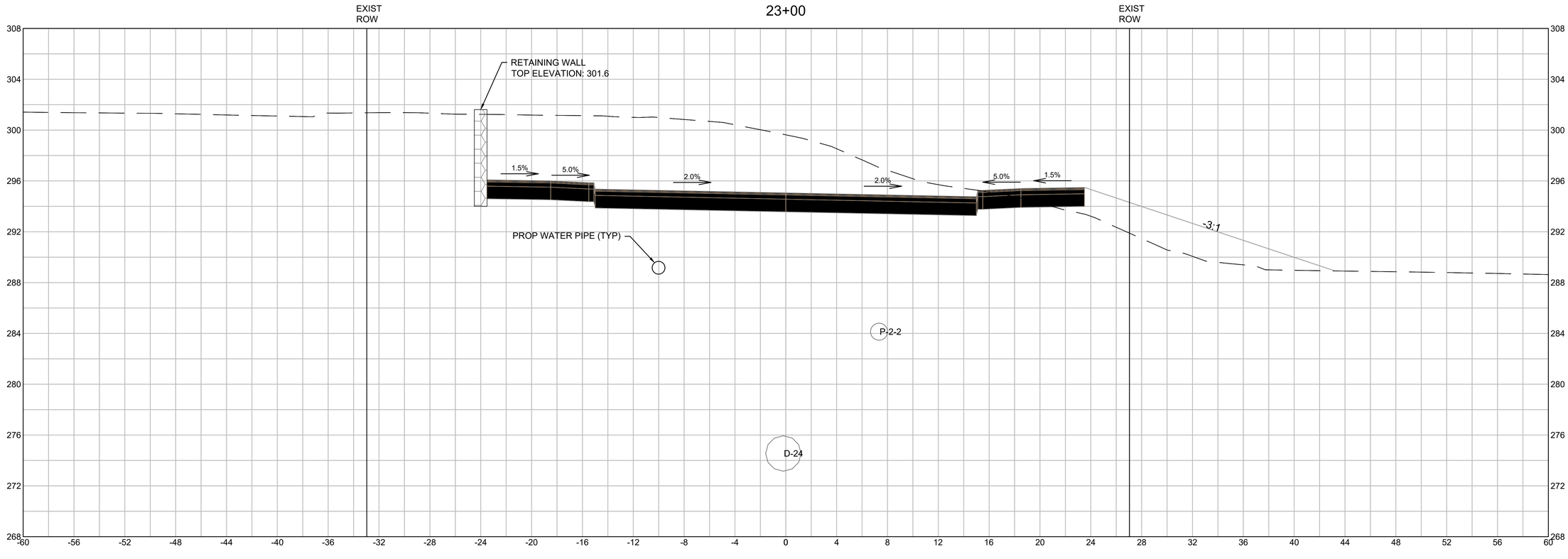
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

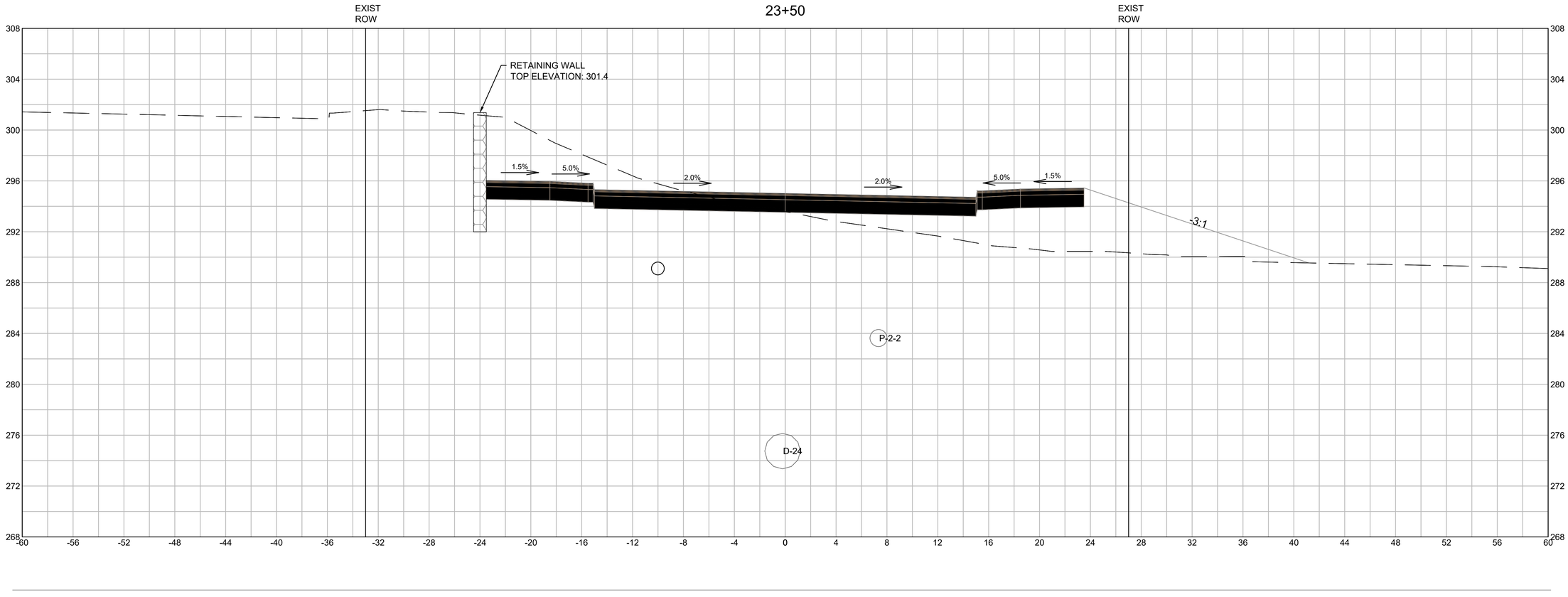
PROJECT NO. T1180

TEC CAD FILE T1180_SECTION

DRAWING NO. C-47

SHEET 47 OF 61





HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 23+00 to 23+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

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282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
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Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

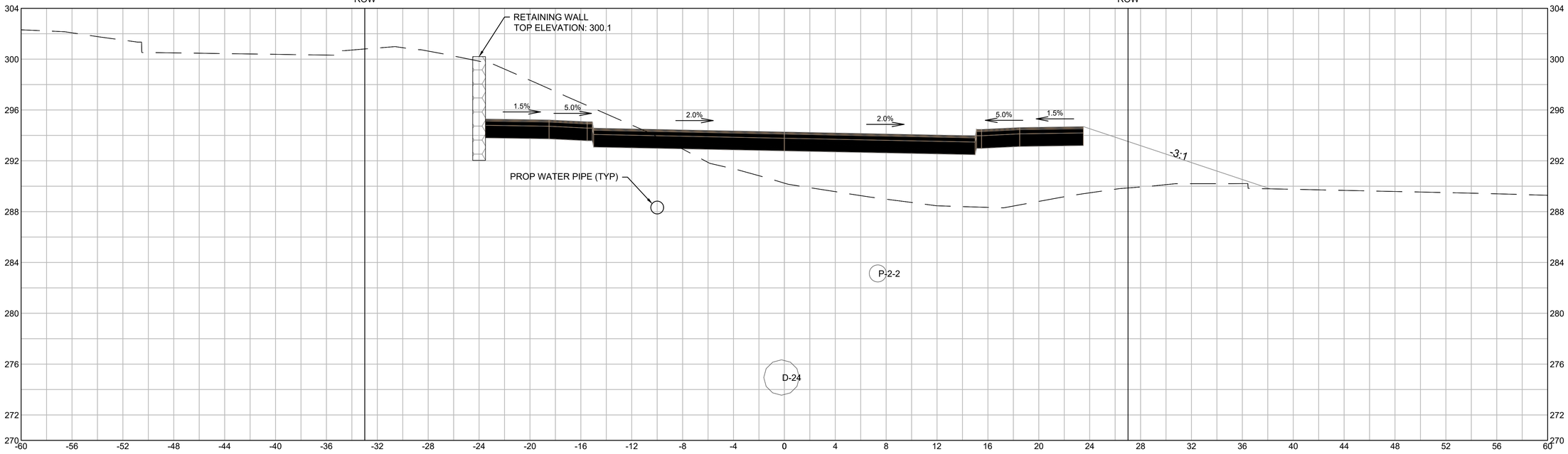
PROJECT NO. T1180

TEC CAD FILE T1180_SECTION

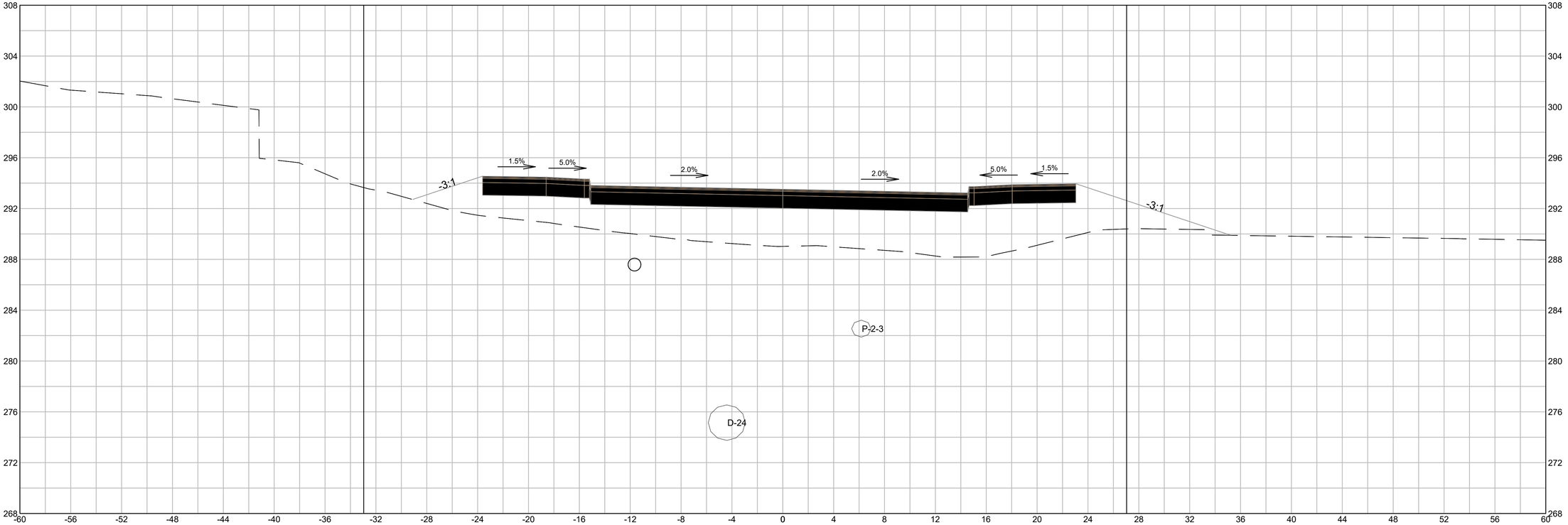
DRAWING NO. C-48

SHEET 48 OF 61

24+00



24+50



HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 24+00 to 24+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

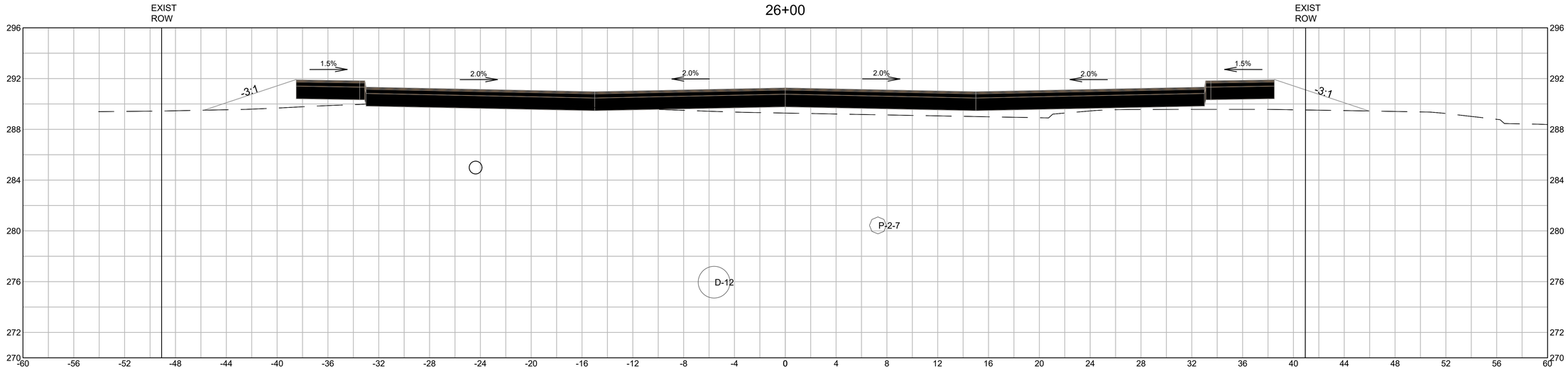
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

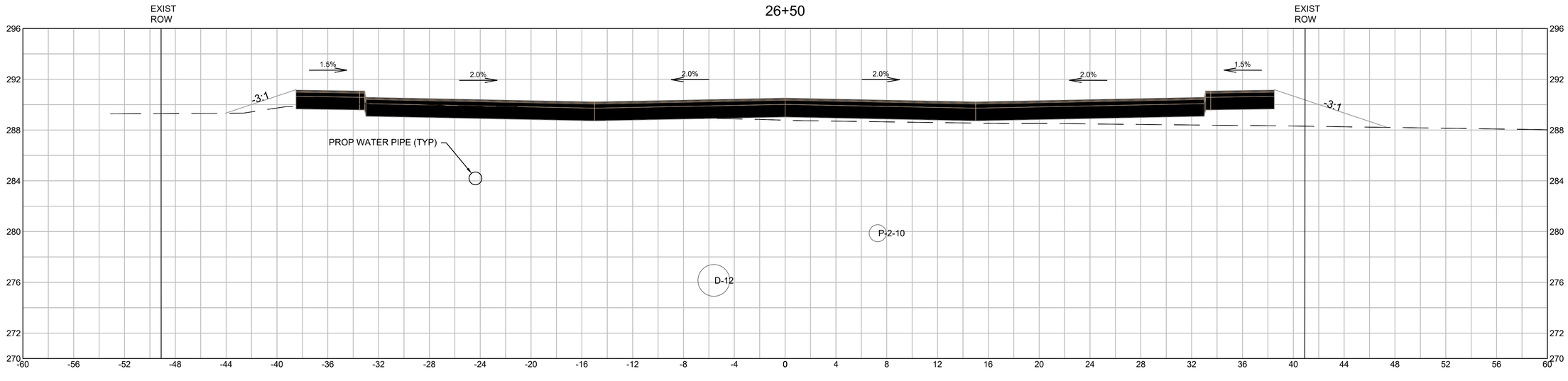
PROJECT NO. T1180

TEC CAD FILE T1180_SECTION

DRAWING NO. C-49

SHEET 49 OF 61





HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 26+00 to 26+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

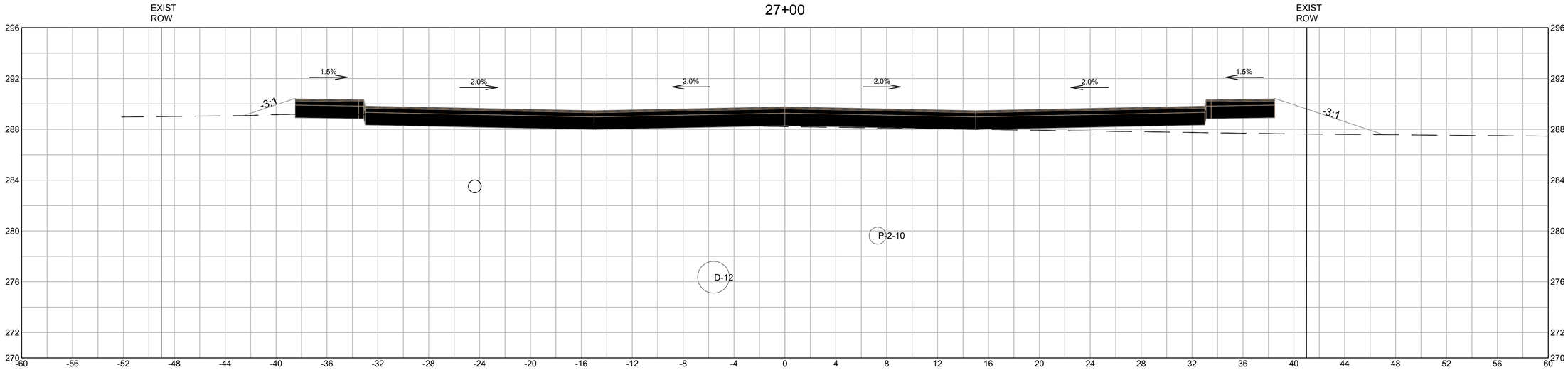
DESIGNER / ENGINEER

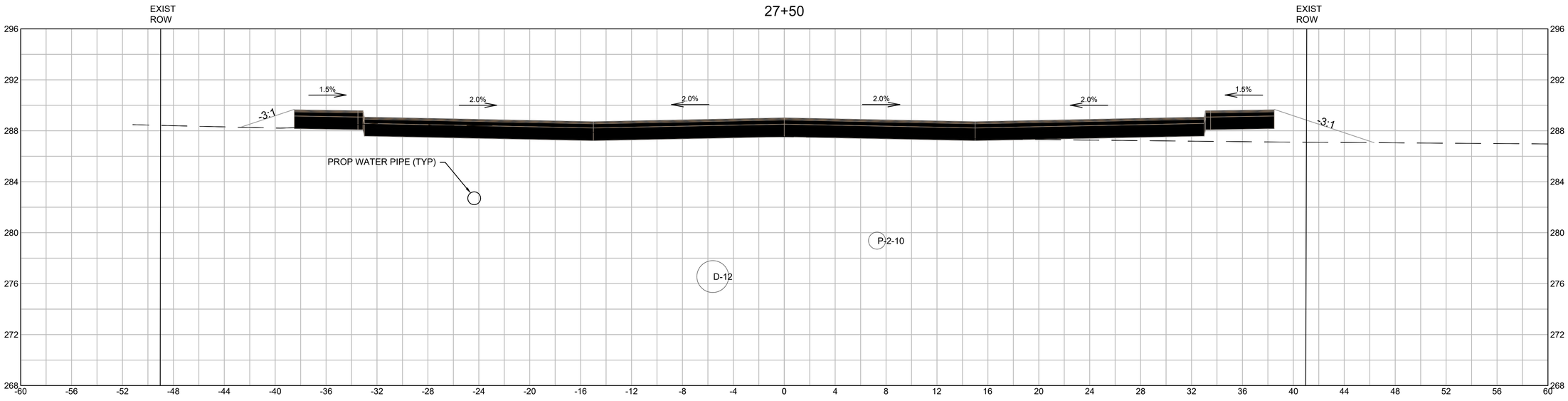
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_SECTION
DRAWING NO. C-50





HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 27+00 to 27+50

SUBDIVISION NAME & LOCATION

King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

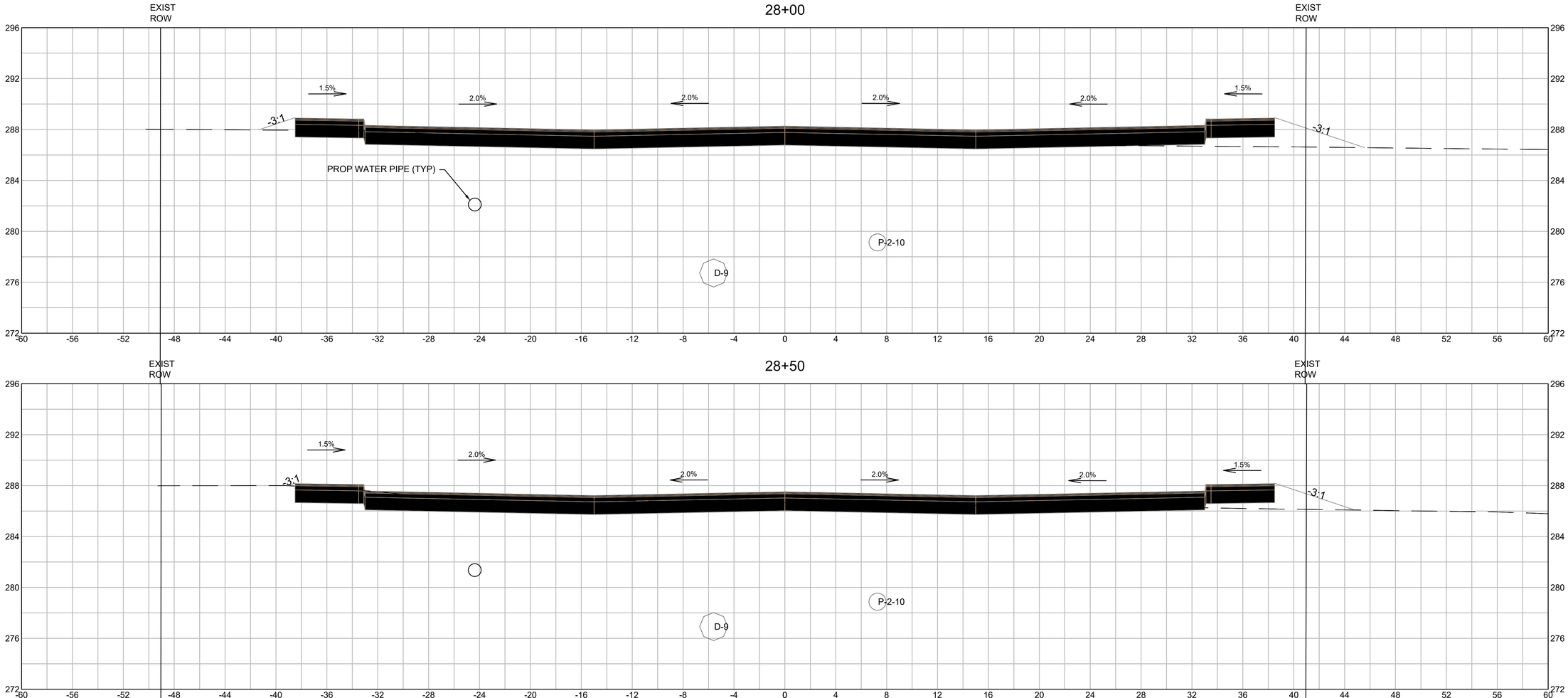
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

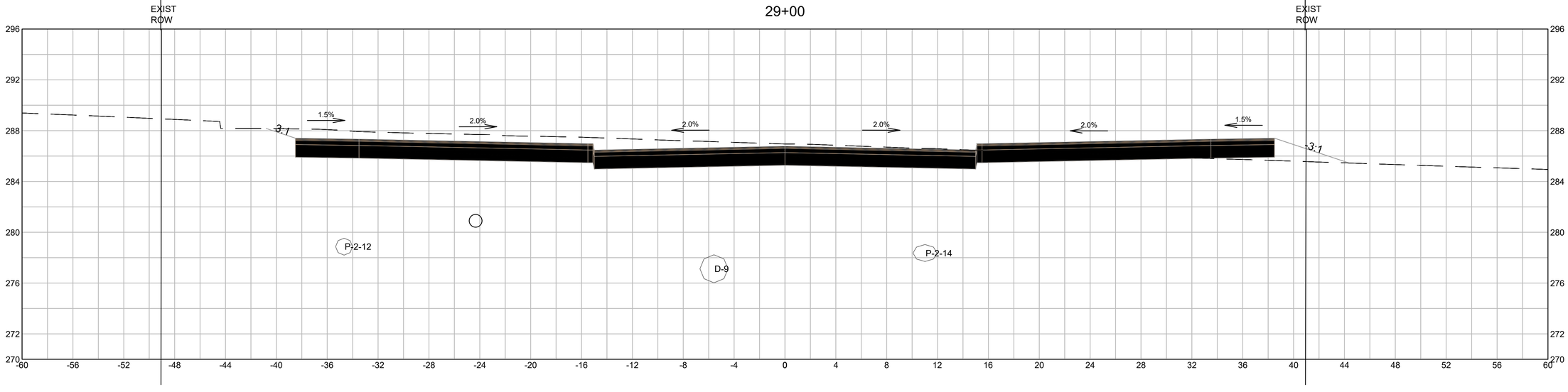
PROJECT NO. T1180

TEC CAD FILE T1180_SECTION

DRAWING NO. C-51

SHEET 51 OF 61





HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections
28+00 to 29+00

SUBDIVISION NAME & LOCATION

King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

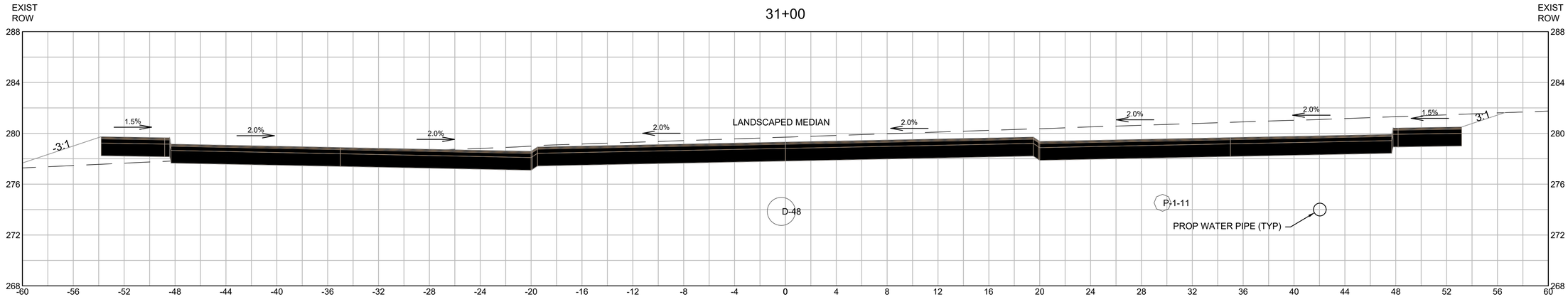
PROJECT NO. T1180

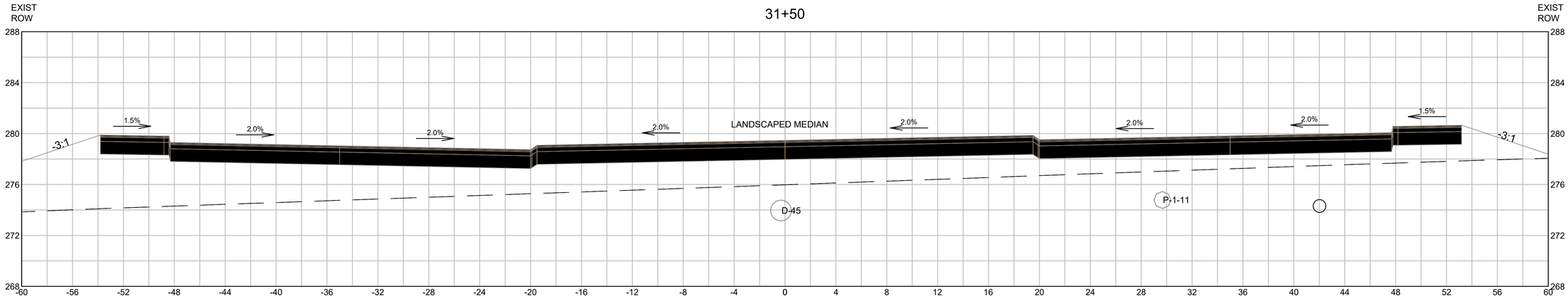
TEC CAD FILE T1180_SECTION

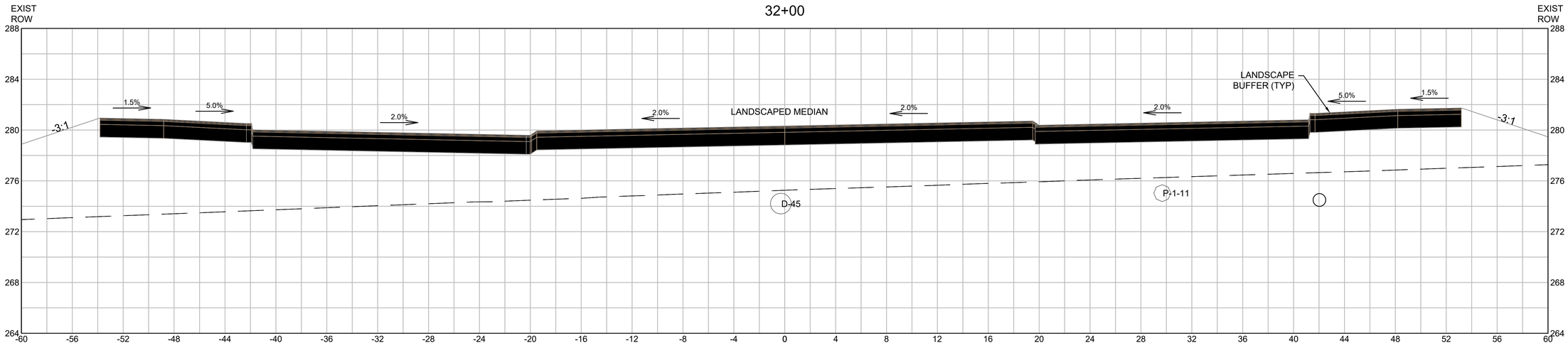
DRAWING NO. C-52

SHEET 52 OF 61

61







HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 31+00 to 32+00

SUBDIVISION NAME & LOCATION

King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

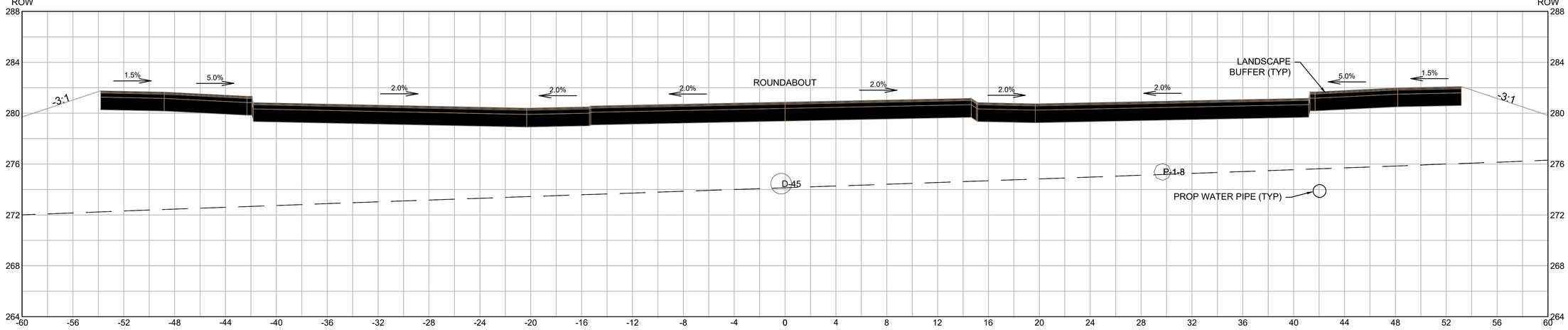
PROJECT NO. T1180

TEC CAD FILE T1180_SECTION

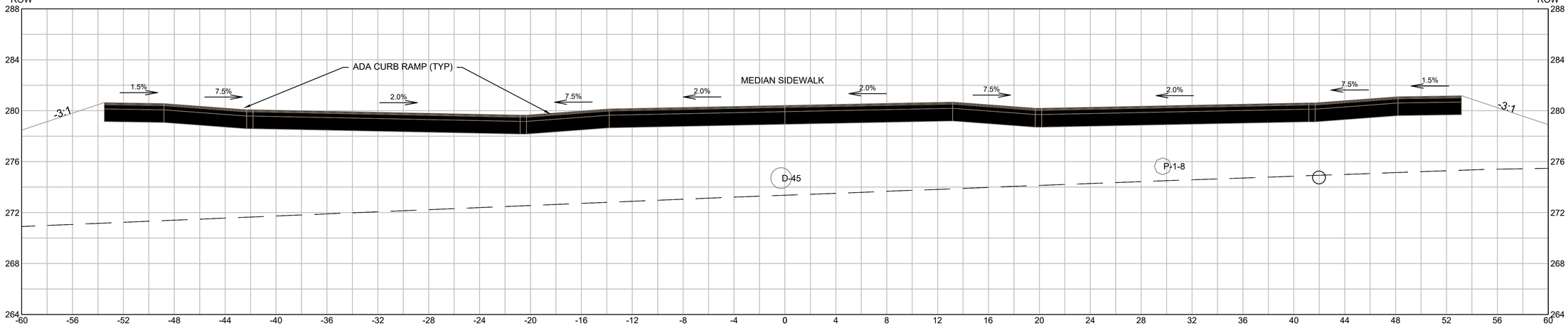
DRAWING NO. C-53

SHEET 53 OF 61

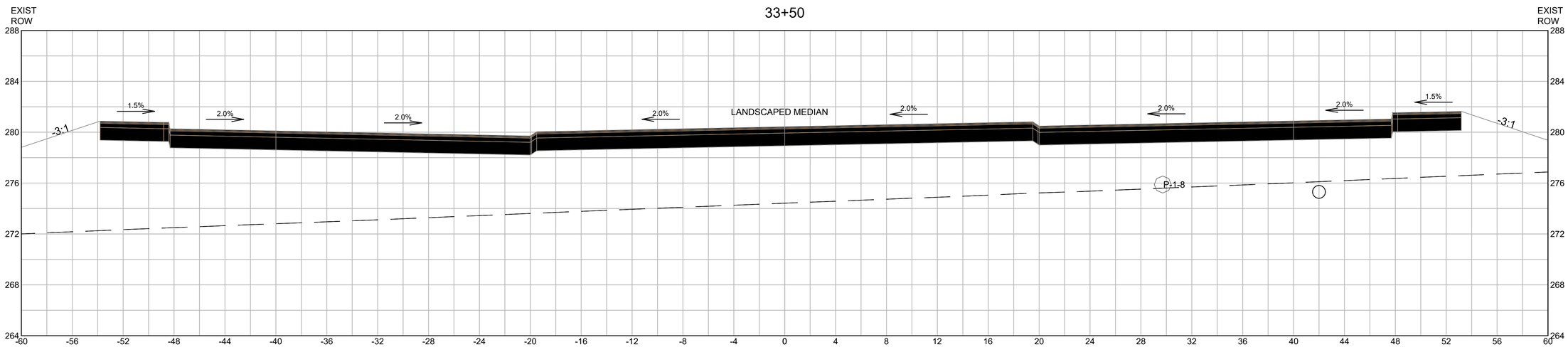
32+50



33+00



33+50



HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 32+50 to 33+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC
The Engineering Corp
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

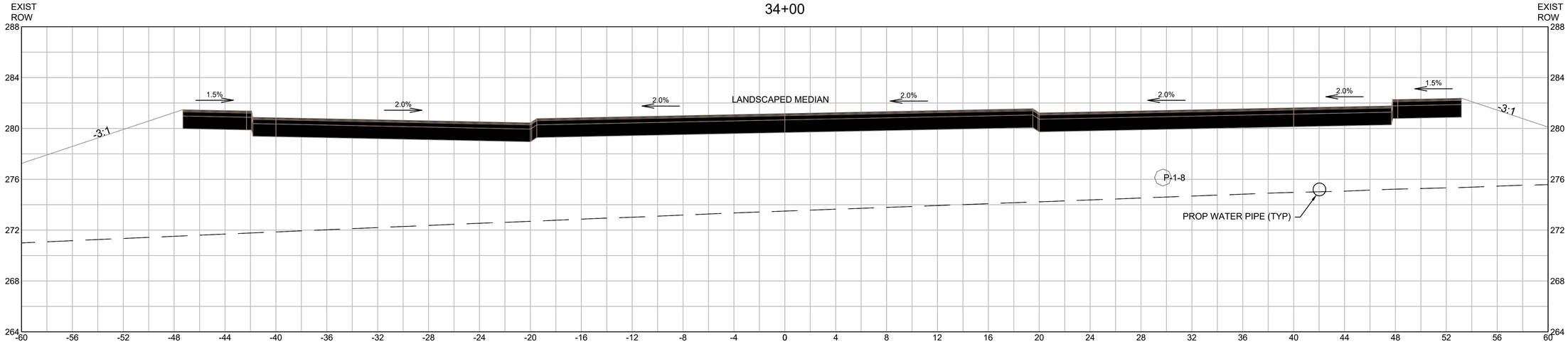
DESIGNED BY	RJF	DATE	8-22-23
CHECKED BY	CPR	SCALE	AS NOTED

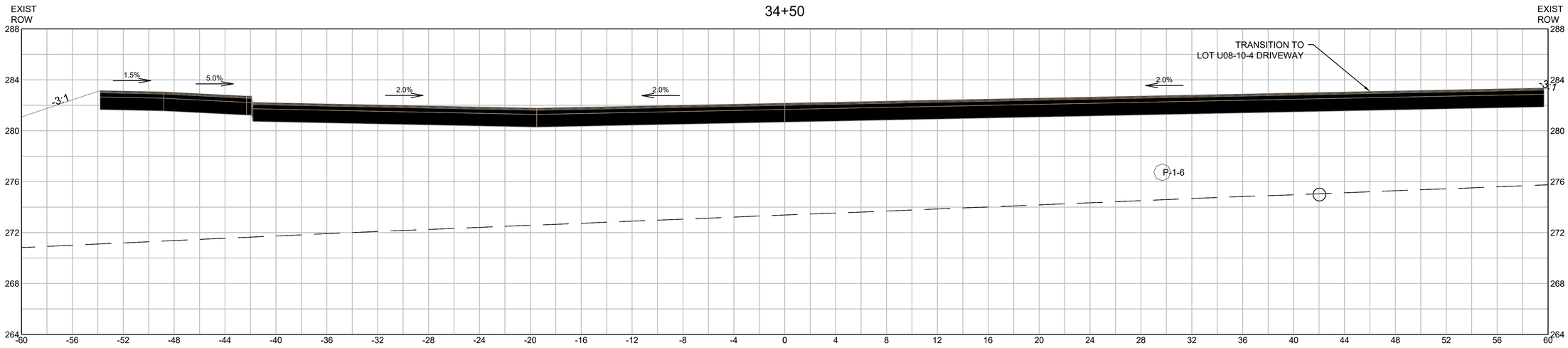
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180

TEC CAD FILE
T1180_SECTION

DRAWING NO.
C-54





HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections
34+00 to 34+50

SUBDIVISION NAME & LOCATION

King Street Commons
550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

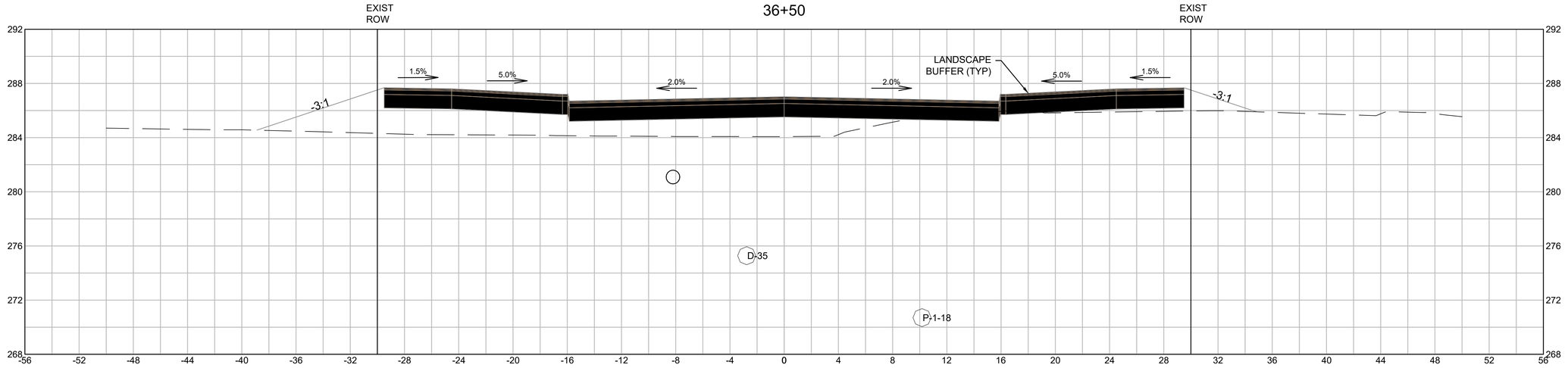
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

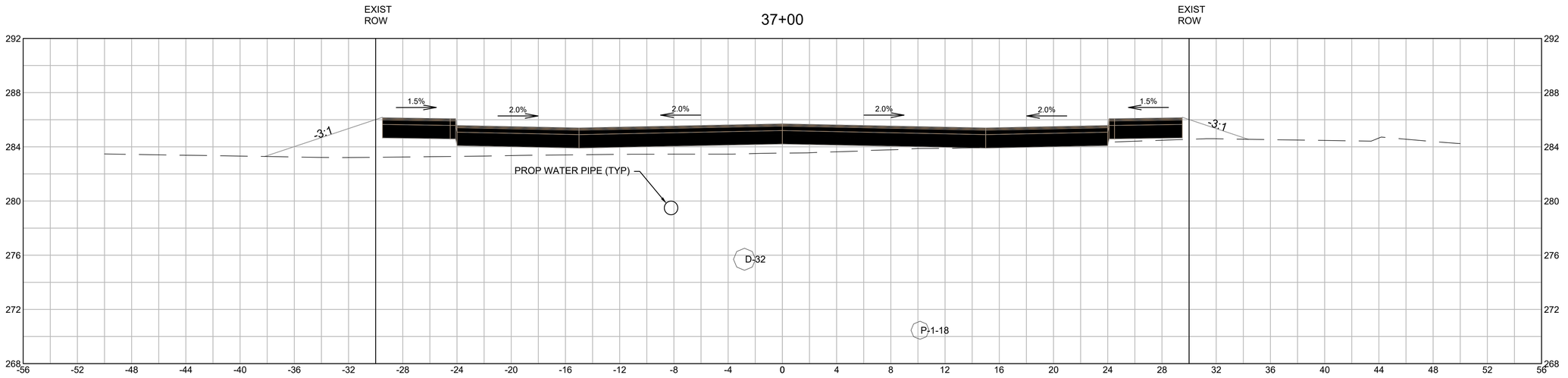
PROJECT NO. T1180

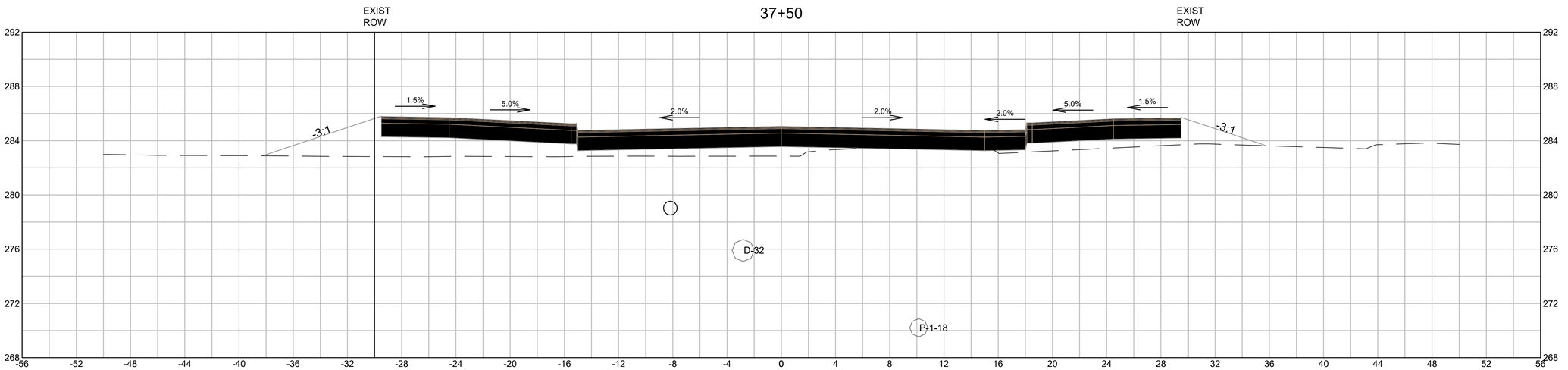
TEC CAD FILE T1180_SECTION

DRAWING NO. C-55

SHEET 55 OF 61







HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 36+50 to 37+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

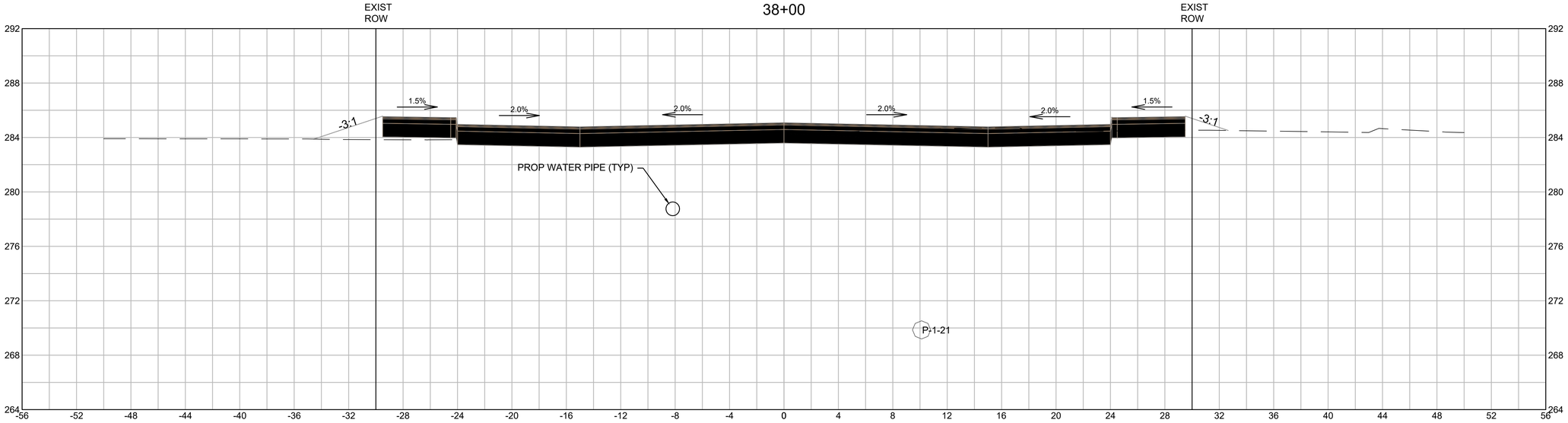
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

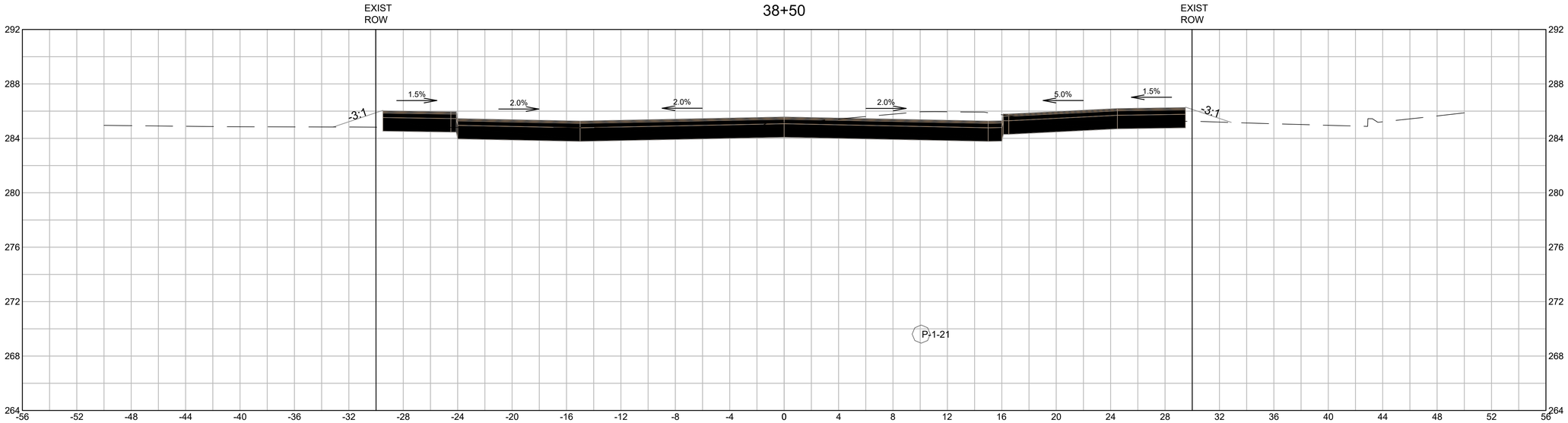
PROJECT NO. T1180

TEC CAD FILE T1180_SECTION

DRAWING NO. C-56

SHEET 56 OF 61





HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 38+00 to 38+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
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Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23

CHECKED BY CPR SCALE AS NOTED

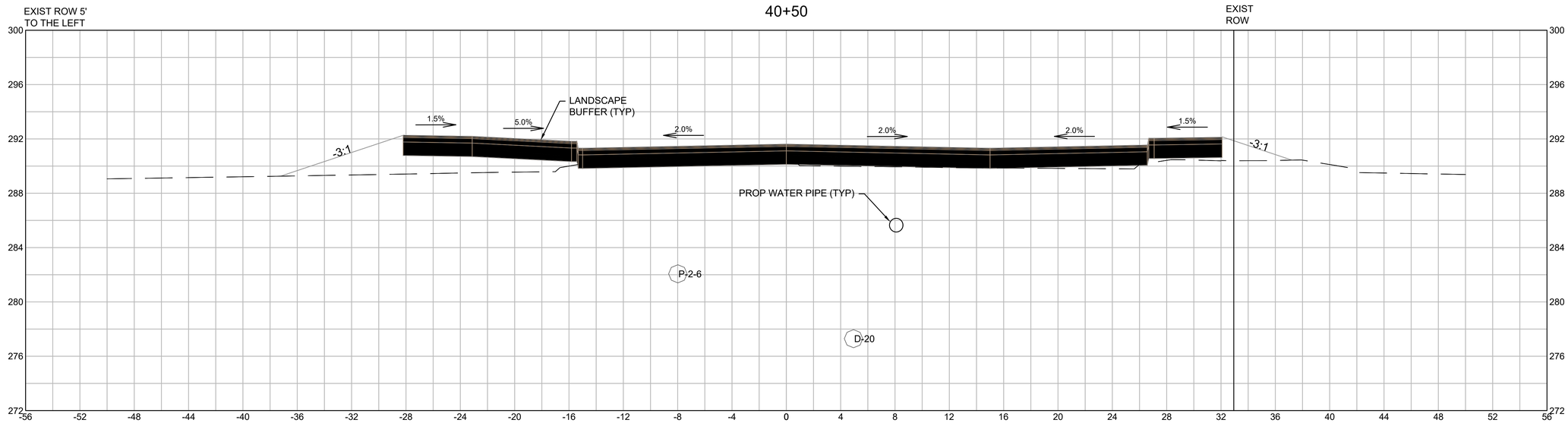
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

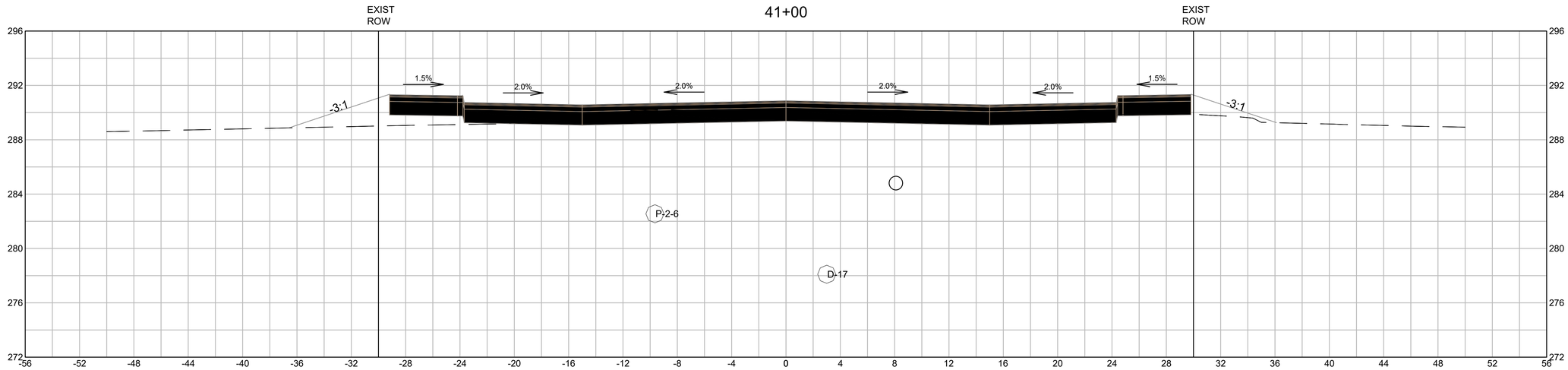
PROJECT NO. T1180

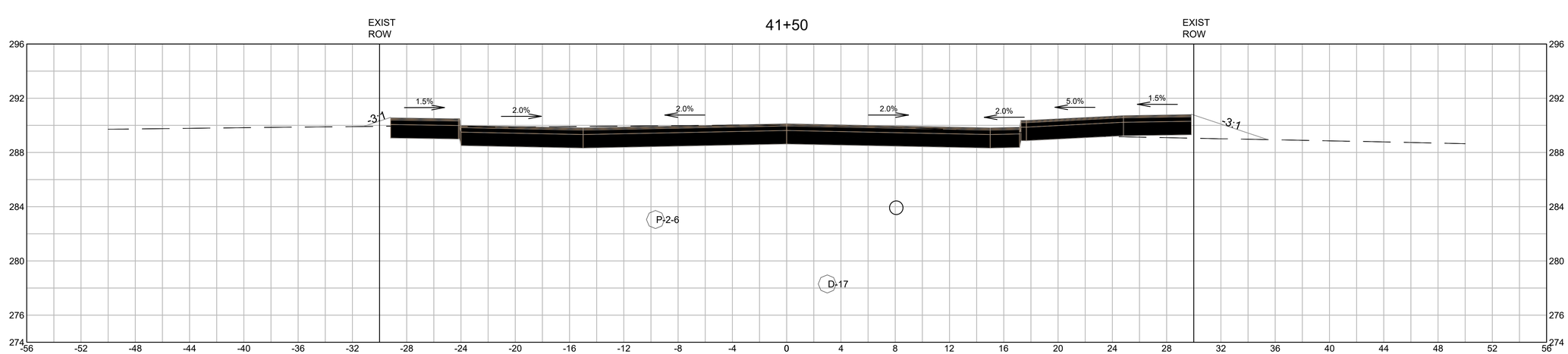
TEC CAD FILE T1180_SECTION

DRAWING NO. C-57

SHEET 57 OF 61







HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 40+50 to 41+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

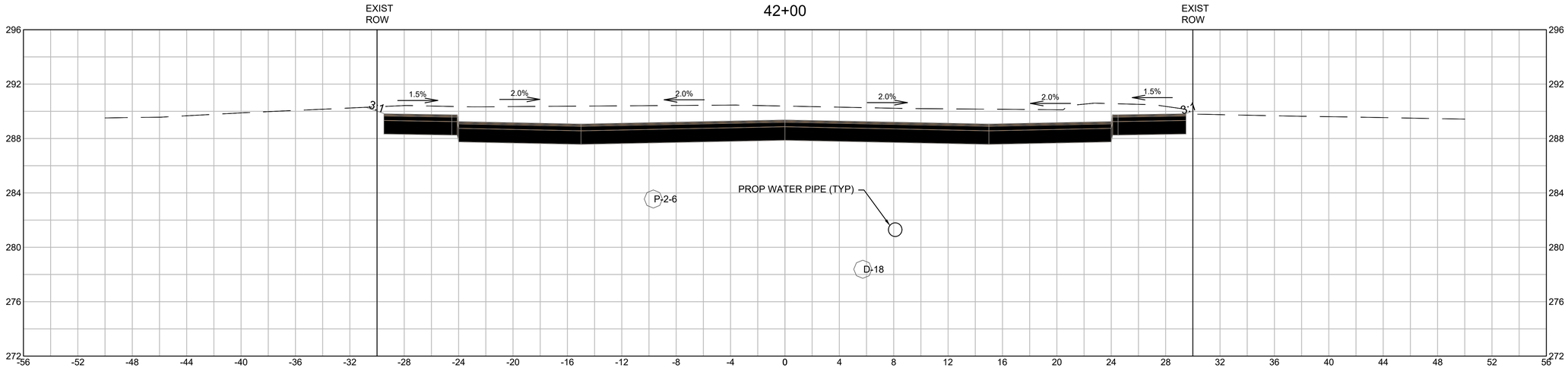
DESIGNER / ENGINEER

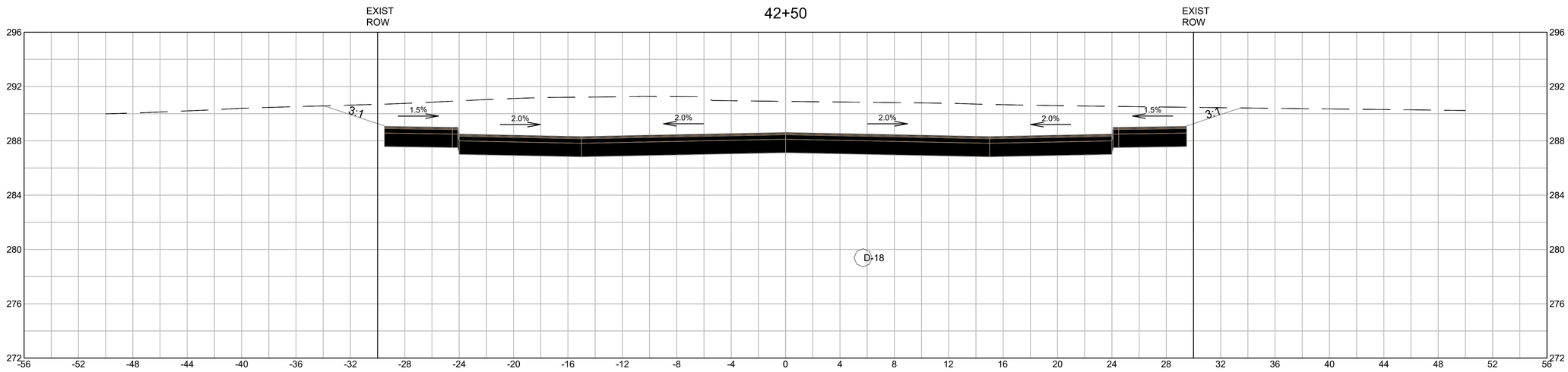
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_SECTION
DRAWING NO.
C-58
SHEET 58 OF 61





HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 42+00 to 42+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

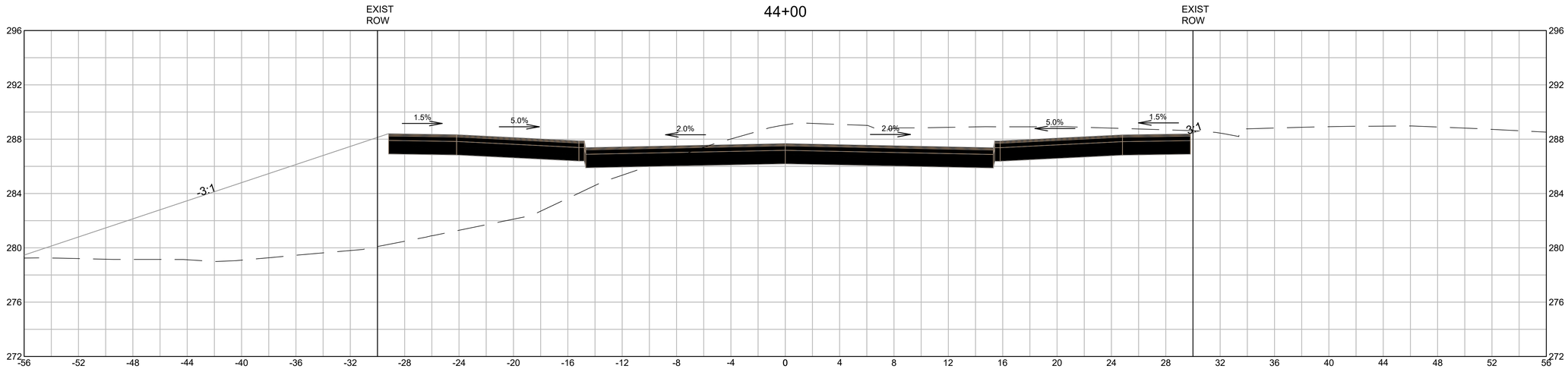
DESIGNER / ENGINEER

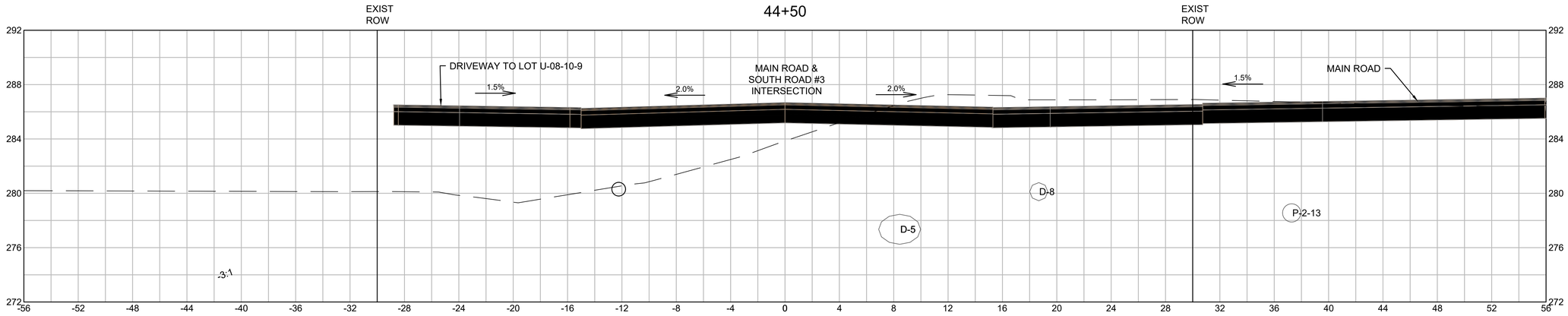
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

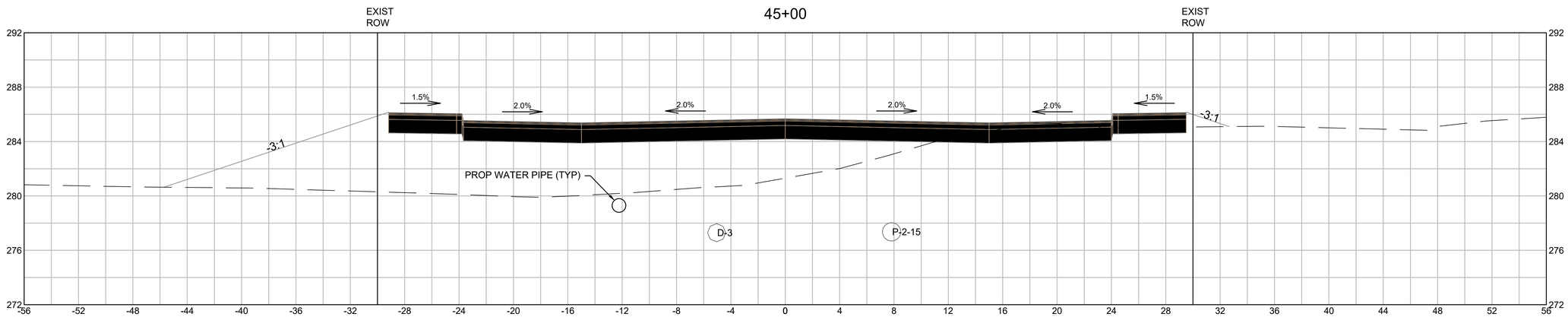
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_SECTION
DRAWING NO.
C-59







HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 44+00 to 45+00

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

DESIGNER / ENGINEER

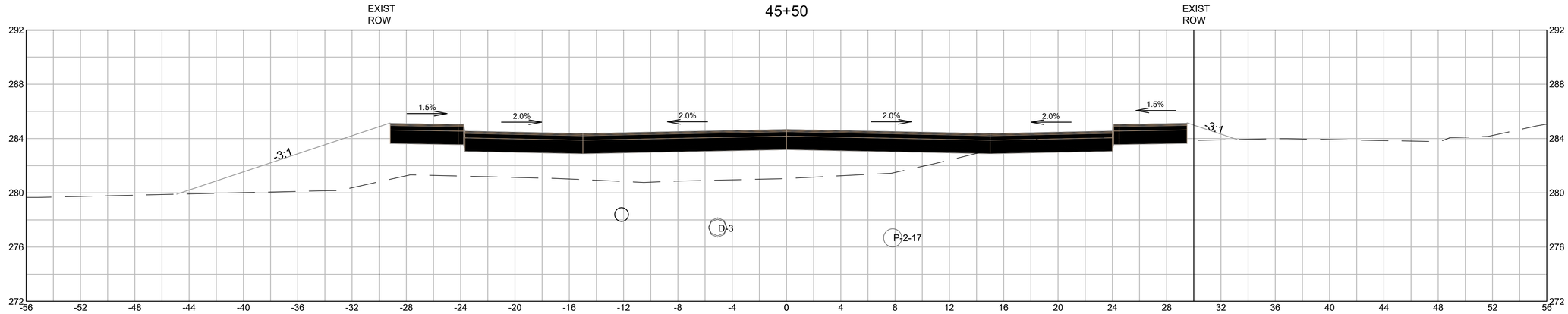
TEC The Engineering Corp
TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

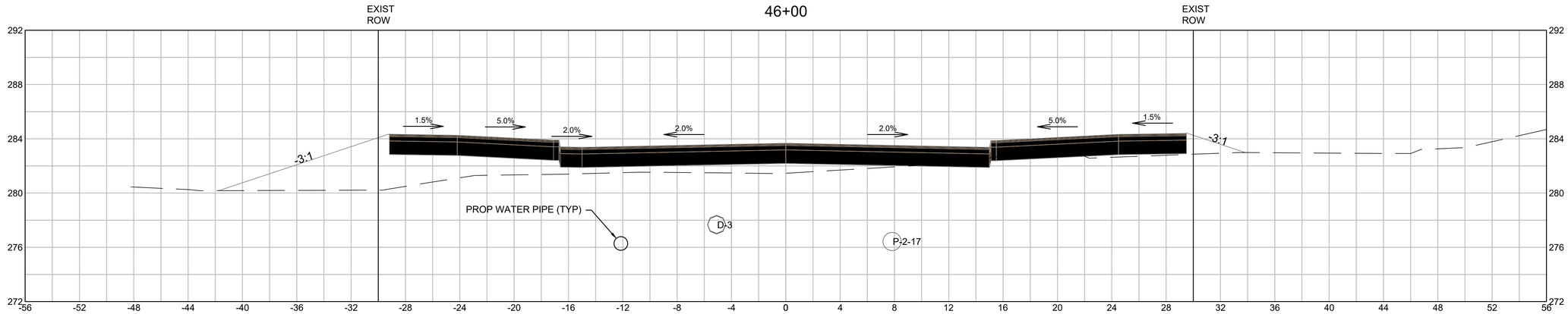
DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

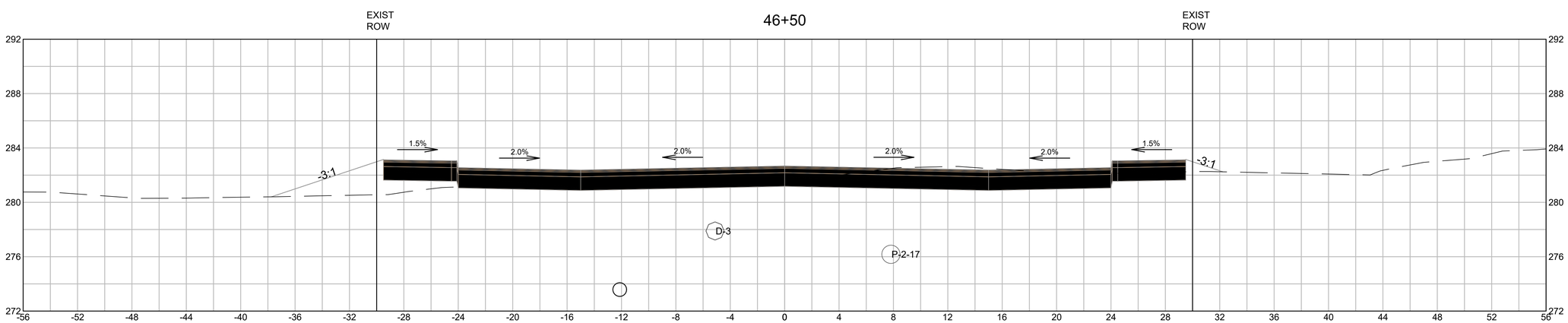
COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO.
T1180
TEC CAD FILE
T1180_SECTION
DRAWING NO.
C-60
SHEET 60 OF 61

61







HORIZONTAL AND VERTICAL SCALE

4 0 4 8

SCALE IN FEET

REVISIONS

1. 2-21-24 PEER REVIEW
2. 3-29-24 PEER REVIEW
3.

DRAWING TITLE

Roadway Cross Sections 45+50 to 46+50

SUBDIVISION NAME & LOCATION

King Street Commons

550 King Street
Littleton, MA 01460

OWNER / APPLICANT / SUBDIVIDER

Lupoli Companies
290 Merrimack Street
Lawrence, MA 01840

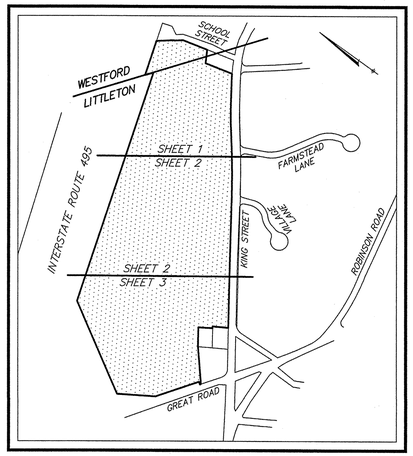
DESIGNER / ENGINEER

TEC, Inc.
282 Merrimack Street, 2nd Floor
Lawrence, Massachusetts 01843
978.794.1792
www.TheEngineeringCorp.com
Lawrence | Hampton | Worcester

DESIGNED BY RJF DATE 8-22-23
CHECKED BY CPR SCALE AS NOTED

COMMONWEALTH OF MASSACHUSETTS
RICHARD J. FRIBERG JR.
CIVIL
No. 47850
REGISTERED PROFESSIONAL ENGINEER

PROJECT NO. T1180
TEC CAD FILE T1180_SECTION
DRAWING NO. C-61
SHEET 61 OF 61
61



KEY SHEET
SCALE: 1" = 500'

I CERTIFY THAT THIS PLAN CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.

DATE PROFESSIONAL LAND SURVEYOR

APPROVAL BY THE TOWN OF LITTLETON PLANNING BOARD

DATE:

I, TOWN CLERK OF THE TOWN OF LITTLETON, HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND THAT NO NOTICE OF APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE.

DATE TOWN CLERK

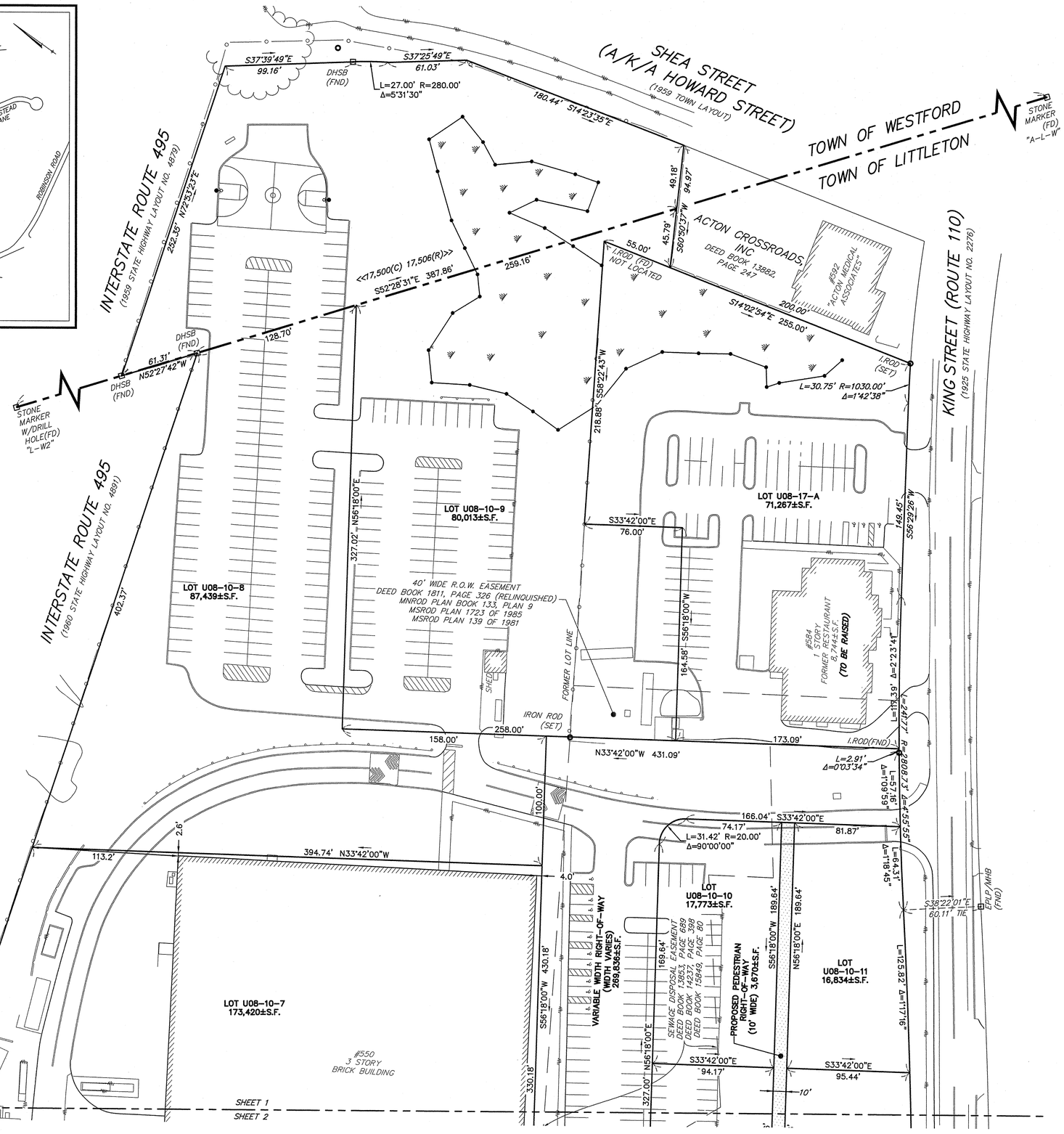
ASSESSORS:
PARCEL ID# U08-10-0 (#550)
PARCEL ID# U08-17-4 (#584)

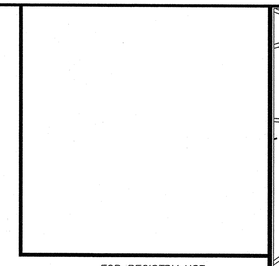
RECORD OWNER:
550 KING STREET LLC

REFERENCES:
MIDDLESEX SOUTH REGISTRY OF DEEDS
DEED BOOK 78708, PAGE 547
DEED BOOK 80208, PAGE 416
DEED BOOK 80418, PAGE 83 (DECISION)
PLAN 538 OF 2006
PLAN 82 OF 2008

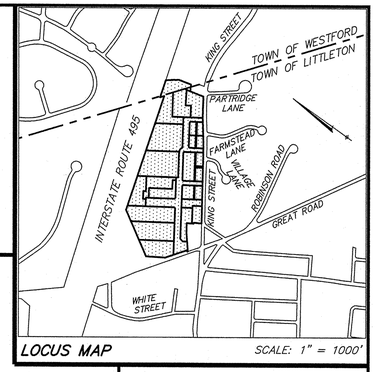
MIDDLESEX NORTH REGISTRY OF DEEDS
DEED BOOK 36259, PAGE 193
DEED BOOK 37124, PAGE 89 (AFFIDAVIT)
PLAN BOOK 221, PLAN 46

ZONING:
KING STREET COMMON
VILLAGE COMMON





FOR REGISTRY USE



LOCUS MAP SCALE: 1" = 1000'

MASSACHUSETTS COORDINATE SYSTEM, NAD 1983, MAINLAND ZONE

NOTES:
1) THE HORIZONTAL DATUM FOR THIS SURVEY IS THE MASSACHUSETTS COORDINATE SYSTEM, NAD 1983, MAINLAND ZONE. THE VERTICAL DATUM FOR THIS SURVEY IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). SAID DATUMS WERE ESTABLISHED VIA GPS OBSERVATIONS.

2) UNDERGROUND UTILITIES ARE SHOWN HEREON FROM FIELD LOCATIONS OF SURFACE VISIBLE STRUCTURES AND FROM AVAILABLE RECORD INFORMATION ON FILE AT THE TOWN OF LITTLETON DEPARTMENT OF PUBLIC WORKS, AND PRIVATE UTILITY COMPANIES. OTHER UNDERGROUND UTILITIES MAY EXIST. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION, SIZE & ELEVATION OF ALL UTILITIES WITHIN THE AREA OF PROPOSED WORK AND TO CONTACT "DIG-SAFE" AT 811 AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION, DEMOLITION OR CONSTRUCTION.

3) THE LIMIT OF BORDERING VEGETATED WETLANDS SHOWN HEREON WAS DELINEATED BY HANCOCK ASSOCIATES IN DECEMBER OF 2021 AND LOCATED VIA FIELD SURVEY.

4) THE SURVEYED PREMISES AS SHOWN HEREON IS NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD AREA, OR OTHER FLOOD AREA, AS SHOWN ON FEMA NATIONAL FLOOD INSURANCE PROGRAM (NFIP) FLOOD INSURANCE RATE MAP (FIRM) NUMBER 25017C0236F, HAVING AN EFFECTIVE DATE OF JULY 7, 2014.

5) THIS PLAN IS THE RESULT OF AN ON-THE-GROUND INSTRUMENT SURVEY PERFORMED BY HANCOCK ASSOCIATES THROUGH FEBRUARY OF 2022 IN CONJUNCTION WITH PHOTOGRAMMETRIC INFORMATION PROVIDED BY EASTERN TOPOGRAPHICS.

LEGEND
- CHAIN LINK FENCE
- METAL GUARDRAIL
- EDGE OF PAVEMENT
- EDGE OF WOODED AREA
- RETAINING WALL
- EDGE OF GRAVEL ROAD
- LIMIT OF BORDERING VEGETATED WETLAND
- EXISTING UTILITY POLE WITH DESIGNATION
- LIGHT POLE
- DHCB — DRILL HOLE IN CONCRETE BOUND
- DHSB — DRILL HOLE IN STONE BOUND
- MHB — MASS HIGHWAY BOUND
- EPLP — ESCUTCHEON PIN IN A LEAD PLUG
- I.ROD — IRON ROD
- (FND) — FOUND
- CLF — CHAIN LINK FENCE
- BASKETBALL HOOP
- BOLLARD
- FP — FLAG POLE
- SPEED BUMP

SCALE: 1" = 40'
0 40 80 160

SITE ADDRESS:
#550 KING STREET
Littleton, Massachusetts

PREPARED FOR:
LUPOLI COMPANIES, LLC
290 Merrimack Street
Lawrence, Massachusetts 01843

HANCOCK ASSOCIATES
Civil Engineers
Land Surveyors
Wetland Scientists
34 CHELMSFORD ST., CHELMSFORD, MA 01824
VOICE (978) 244-0110, FAX (978) 244-1133
WWW.HANCOCKASSOCIATES.COM

8-1-23
COMMONWEALTH OF MASSACHUSETTS GREGORY G. GOULD No. 51280 REGISTERED LAND SURVEYOR

NO.	BY	APP	DATE	ISSUE/REVISION DESCRIPTION

DATE: 8/1/2023 DRAWN BY: JAR
SCALE: 1"=40' CHECK BY: JMO

DEFINITIVE SUBDIVISION PLAN OF LAND IN LITTLETON, MASSACHUSETTS

PLOT DATE: Aug 17, 2023 3:24 pm
PATH: X:\25579-Lupoli-Littleton\Surv\DWG\

DWG: 25579df.dwg
LAYOUT: DF Phase2
SHEET: 1 OF 3
PROJECT NO.: 25579

FOR REGISTRY USE

I CERTIFY THAT THIS PLAN CONFORMS TO THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.

DATE PROFESSIONAL LAND SURVEYOR

APPROVAL BY THE TOWN OF LITTLETON PLANNING BOARD

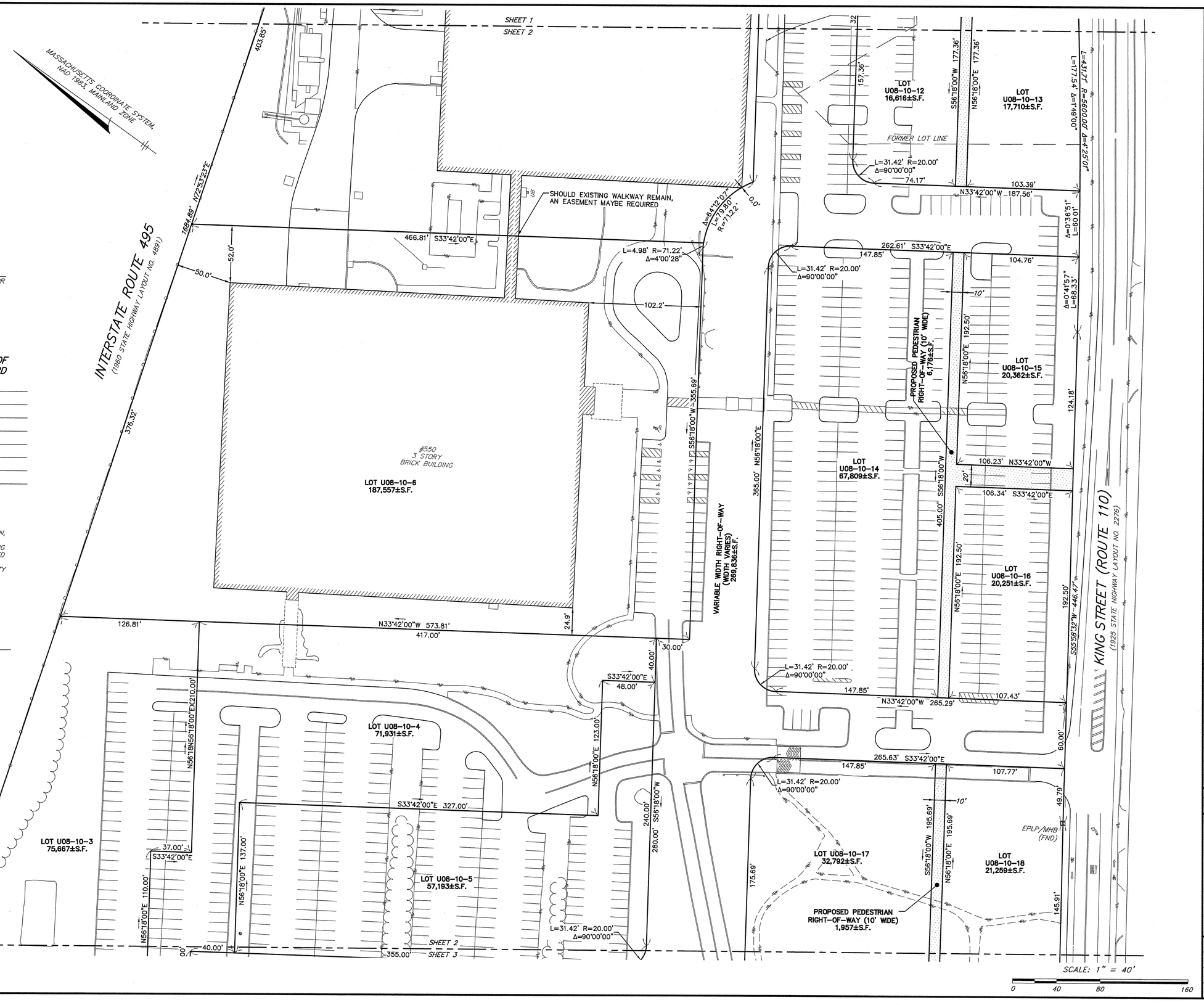
DATE:

I, TOWN CLERK OF THE TOWN OF LITTLETON, HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND THAT NO NOTICE OF APPEAL WAS RECEIVED DURING THE TWENTY DAYS NEXT AFTER SUCH RECEIPT AND RECORDING OF SAID NOTICE.

DATE TOWN CLERK

NOTE:

1) SEE SHEET 1 OF 3 FOR NOTES, LEGEND, AND REFERENCES.



SITE ADDRESS:

#550 KING STREET

Littleton, Massachusetts

PREPARED FOR:

LUPOLI COMPANIES, LLC

290 Merrimack Street
Lawrence, Massachusetts 01843

HANCOCK ASSOCIATES

Civil Engineers

Land Surveyors

Wetland Scientists

34 CHELMSFORD ST., CHELMSFORD, MA 01824
VOICE (978) 244-0110, FAX (978) 244-1133
WWW.HANCOCKASSOCIATES.COM

8-1-23

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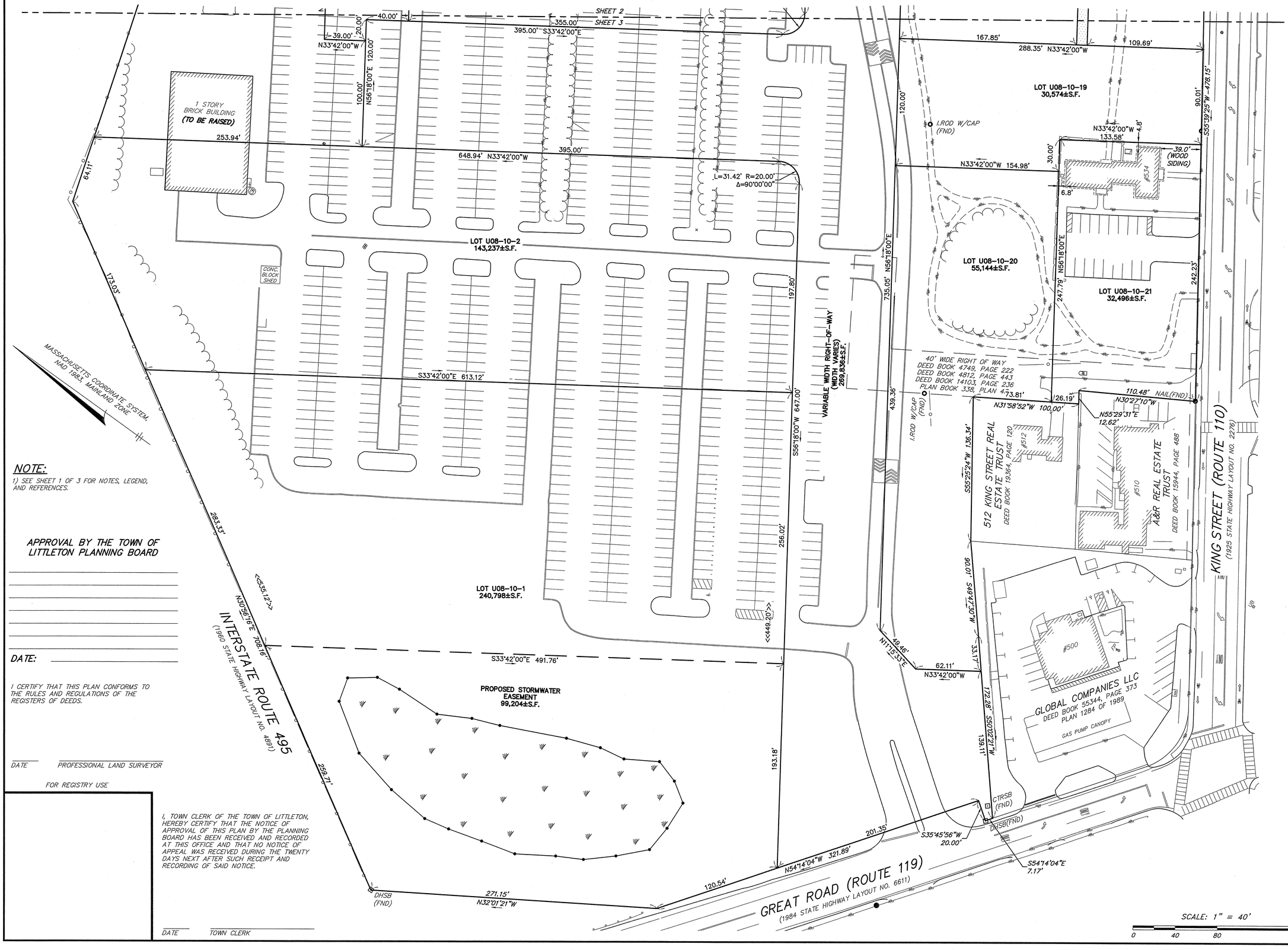
DWG: 25579df.dwg	
LAYOUT: DF Phase2	
SHEET: 2 OF 3	
PROJECT NO.:	25579



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APPROVAL BY THE TOWN OF LITTLETON PLANNING BOARD

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DWG: 25579df.dwg	
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SHEET: 3 OF 3	
PROJECT NO.:	25579