

GRANT SQUARE PHASE II SITE IMPROVEMENTS WORCESTER, MASSACHUSETTS

(Worcester County)

Design and Construction Documents
February 18, 2022 - Issued For Bidding

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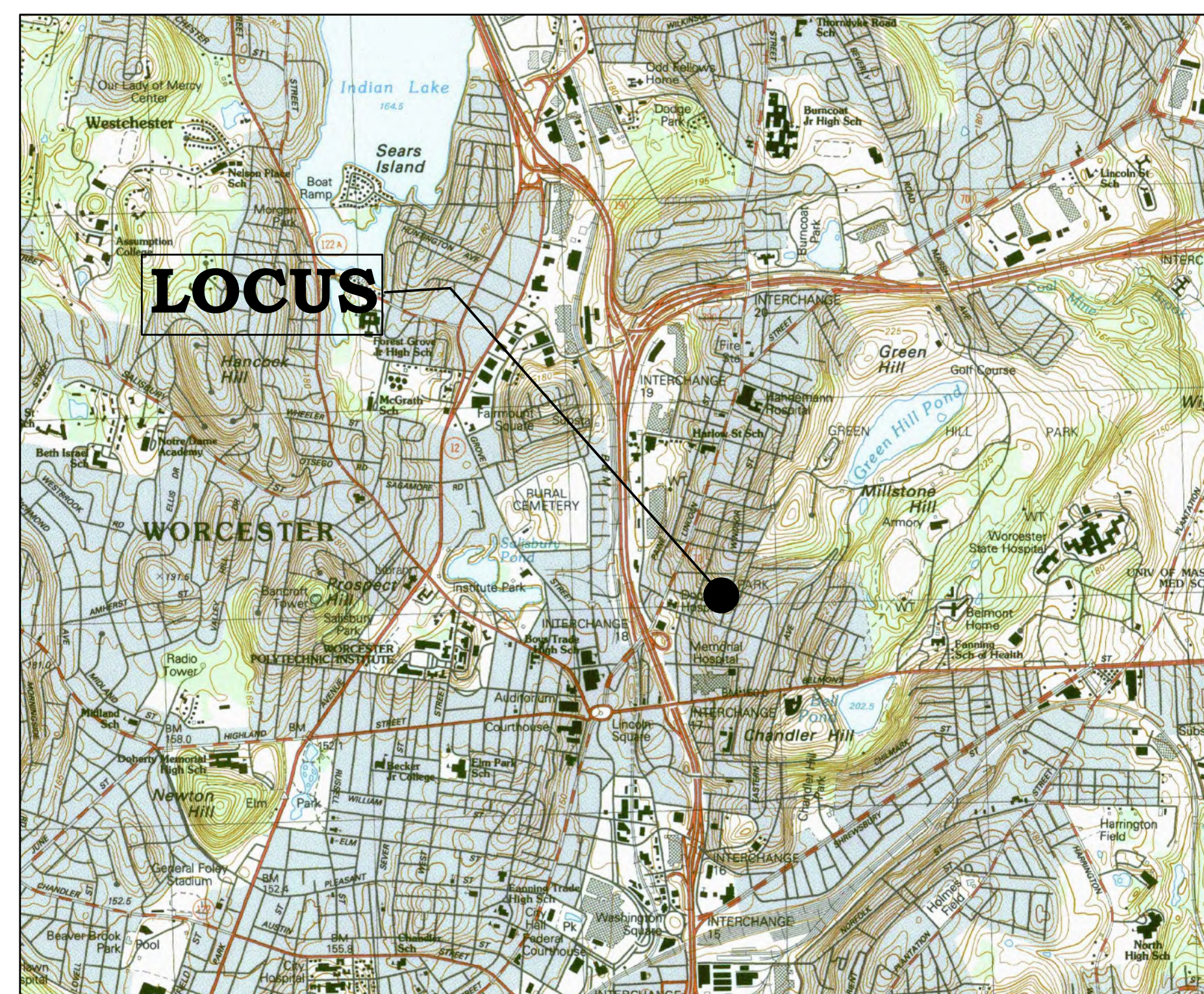
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CIVIL ENGINEER AND LANDSCAPE ARCHITECT

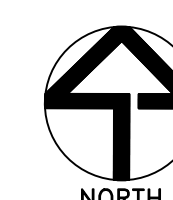
Beals and Thomas, Inc.
144 Turnpike Road
Southborough, Massachusetts 01772

ELECTRICAL ENGINEER

Power Engineers, LLC
37 Fox Den Road
Kingston, Massachusetts 02364



Locus Map
Scale: 1" = 2000'



Edward M. Augustus, Jr.
City Manager

Jay J. Fink, P.E.
Commissioner
Department of Public Works & Parks

Robert C. Antonelli, Jr.
Assistant Commissioner
Department of Public Works & Parks

Job No.: 2464.03
Plan No.: 246400P005B-001

GENERAL NOTES

THE CONTRACTOR SHALL MAKE ALL NECESSARY CONSTRUCTION NOTIFICATIONS AND APPLY FOR AND OBTAIN ALL NECESSARY CONSTRUCTION PERMITS. THE CONTRACTOR SHALL ALSO PAY ALL FEES AND POST ALL BONDS ASSOCIATED WITH THE SAME, AND COORDINATE WITH THE ENGINEER AND ARCHITECT AS REQUIRED.

CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR JOB SITE SAFETY AND ALL CONSTRUCTION MEANS AND METHODS.

LIMIT OF WORK SHALL BE EROSION CONTROL BARRIERS, LIMIT OF GRADING AND SITE PROPERTY LINES AND/OR AS INDICATED ON DRAWINGS.

PORTIONS OF THE ROADWAY, SIDEWALK AND ROADSIDE AREA DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO THEIR CONDITIONS PRIOR TO DISTURBANCE.

CONTRACTOR TO VERIFY UTILITY STUB LOCATIONS AND ELEVATIONS IN THE FIELD PRIOR TO COMMENCING WORK.

ANY ALTERATION TO THESE DRAWINGS MADE IN THE FIELD DURING CONSTRUCTION SHALL BE RECORDED BY THE CONTRACTOR ON RECORD DOCUMENTS.

ANY AREA OUTSIDE THE LIMIT OF WORK THAT IS DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO COST TO OWNER.

EXISTING TREES AND SHRUBS OUTSIDE THE LIMITS OF GRADING SHALL BE REMOVED ONLY UPON PRIOR APPROVAL OF THE OWNER.

FOR DRAWING LEGIBILITY, ALL EXISTING TOPOGRAPHIC FEATURES, EXISTING UTILITIES, PROPERTY BOUNDARIES, EASEMENTS, ETC. MAY NOT BE SHOWN ON ALL DRAWINGS; REFER TO ALL REFERENCED DRAWINGS AND OTHER DRAWINGS IN THIS SET FOR ADDITIONAL INFORMATION.

NEW EXCAVATION AND TRENCH SAFETY REGULATIONS ARE IN EFFECT AS OF MARCH 1, 2011. (REFER TO 520 CMR 14.00) ALL EXCAVATORS OR CONTRACTORS MUST OBTAIN A TRENCH PERMIT PRIOR TO ANY CONSTRUCTION RELATED TRENCHES ON SITE.

EROSION CONTROL AND SEDIMENTATION NOTES

AN EROSION CONTROL BARRIER SHALL BE INSTALLED ALONG THE EDGE OF PROPOSED DEVELOPMENT AS INDICATED IN THE PLAN PRIOR TO THE COMMENCEMENT OF DEMOLITION OR CONSTRUCTION OPERATIONS.

CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES DURING ENTIRE CONSTRUCTION PERIOD.

ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS SHALL BE SWEEPED AT THE END OF EACH WORKING DAY.

ALL STOCKPILE AREAS SHALL BE LOCATED WITHIN LIMIT OF WORK LINE AND STABILIZED TO PREVENT EROSION.

ALL DEBRIS GENERATED DURING SITE PREPARATION ACTIVITIES SHALL BE LEGALLY DISPOSED OF OFF SITE.

PROVIDE CRIBBING AS NECESSARY TO PROTECT EXISTING UTILITY LINES DURING CONSTRUCTION. SITE ELEMENTS TO REMAIN MUST BE PROTECTED FOR DURATION OF PROJECT.

ADDITIONAL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED AS CONDITIONS WARRANT OR AS DIRECTED BY THE OWNER OR OWNER'S REPRESENTATIVE.

ALL POINTS OF CONSTRUCTION EGRESS OR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADS.

SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSPECTED AND MAINTAINED ON A DAILY BASIS DURING CONSTRUCTION TO INSURE THAT CHANNELS, DITCHES AND PIPES ARE CLEAR OF DEBRIS AND THAT THE EROSION CONTROL BARRIERS ARE INTACT.

CONTRACTOR SHALL PROVIDE DUST CONTROL FOR CONSTRUCTION OPERATIONS AS APPROVED BY OWNER.

DUST SHALL BE CONTROLLED BY SPRINKLING OR OTHER APPROVED METHODS AS NECESSARY, OR AS DIRECTED BY THE OWNER OR HIS REPRESENTATIVE.

CLEAN AND MAINTAIN EROSION CONTROL BARRIER AS REQUIRED DURING CONSTRUCTION OPERATIONS TO ENSURE ITS CONTINUED FUNCTIONALITY.

CONTRACTOR TO REMOVE AND DISPOSE OF ALL/ANY EARTHWORKS, MATERIALS AND APPURTENANCES UNSUITABLE FOR FINISHED CONDITIONS.

CONTRACTOR TO PROTECT AND MAINTAIN EXISTING PLAYGROUND EQUIPMENT THROUGHOUT CONSTRUCTION.

TEMPORARY CONSTRUCTION AND TREE PROTECTION FENCING SHALL BE INSTALLED BEFORE DEMOLITION OPERATIONS BEGIN, AND SHALL REMAIN IN PLACE THROUGHOUT CONSTRUCTION UNLESS OTHERWISE NOTED.

TREE PROTECTION FENCING SHALL BE INSTALLED AROUND ALL INDIVIDUAL TREES WITHIN CONTRACT LIMIT LINE.

CONTRACTOR TO COORDINATE WITH CITY FOR STORAGE LOCATION OF ALL SALVAGED MATERIALS.

LAYOUT AND MATERIALS NOTES

ALL LINES AND DIMENSIONS ARE PARALLEL OR PERPENDICULAR TO THE LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE INDICATED.

CONTRACTOR TO INSTALL POURED IN PLACE SAFETY SURFACING IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND TO MEET ALL SAFETY FALL HEIGHT REQUIREMENTS.

ALL PAVEMENT SURFACE FINISHES, INCLUDING TEXTURE AND COLOR, TO BE DETERMINED BY THE LANDSCAPE ARCHITECT AND OWNER.

PROTECT EXISTING PROPERTY MONUMENTS AND ABUTTING PROPERTIES DURING CONSTRUCTION ACTIVITIES.

CONTRACTOR TO ENSURE MINIMUM 6' HORIZONTAL CLEARANCE FROM ALL EXISTING PLAY EQUIPMENT TO EDGE OF POURED-IN-PLACE RUBBER SAFETY SURFACING.

GRADING, DRAINAGE AND UTILITY NOTES

UNDERGROUND UTILITIES WERE COMPILED FROM AVAILABLE RECORD PLANS OF UTILITY COMPANIES AND PUBLIC AGENCIES, ARE APPROXIMATE AND ASSUMED. BEFORE COMMENCING SITE WORK IN ANY AREA, CONTACT "DIG SAFE" AT 1-888-344-7233 TO ACCURATELY LOCATE UNDERGROUND UTILITIES. ANY DAMAGE TO EXISTING UTILITIES OR STRUCTURES SHALL BE THE CONTRACTOR'S RESPONSIBILITY. NO EXCAVATION SHALL BE DONE UNTIL UTILITY COMPANIES ARE PROPERLY NOTIFIED IN ADVANCE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS DO NOT CONFLICT WITH ANY KNOWN EXISTING OR OTHER PROPOSED IMPROVEMENTS. IF ANY CONFLICTS ARE DISCOVERED, THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE ENGINEER PRIOR TO INSTALLATION OF ANY PORTION OF THE SITE WORK WHICH WOULD BE AFFECTED.

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. PITCH EVENLY BETWEEN SPOT GRADES. GRADE ALL AREAS TO DRAIN.

THE CONTRACTOR SHALL VERIFY EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE ENGINEER. 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. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR, AND THE INFORMATION FURNISHED TO THE OWNER AND ENGINEER FOR RESOLUTION.

FINISH GRADES OF PLAYGROUND AREA TO DRAIN AT A MAXIMUM 1.5% PITCH.

MAX 1.5% CROSS PITCH ON PLAYGROUND AND ALL WALKWAYS.

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.

EXCAVATION REQUIRED WITHIN 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.

STOCKPILED TOPSOIL SHALL BE PLACED NEATLY IN AN AREA INDICATED BY THE OWNER.

PITCH EVENLY BETWEEN SPOT GRADES. ALL PAVED AREAS MUST PITCH TO DRAIN AT A MINIMUM OF 1/8" PER FOOT UNLESS SPECIFIED. ANY DISCREPANCIES NOT ALLOWING THIS MINIMUM PITCH SHALL BE REPORTED TO THE ENGINEER PRIOR TO CONTINUING WORK.

THE CONTRACTOR SHALL SCHEDULE HIS WORK TO ALLOW THE FINISHED SUBGRADE ELEVATIONS TO DRAIN PROPERLY WITHOUT PUDDLING.

LEGEND

	DRAIN MAN HOLE
	DRAINAGE LINE
	CATCH BASIN
	SEWER LINE
	SEWER MAN HOLE
	BITUMINOUS CURBING
	EDGE OF PAVEMENT
	GUARD RAIL
	APPROX. WATERLINE
	HYDRANT
	WATERGATE
	APPROX. GAS LINE
	GAS GATE
	UTILITY POLE & GUY WIRE
	CHAIN LINK FENCE
	LIGHTPOST
	HANDICAP SPACE
	ELECTRIC TRANSFORMER
	SIGN
	VERTICAL BENCHMARK
	DECIDUOUS TREE >8"
	CONIFEROUS TREE >8"
	TREELINE
	SPOT GRADE
	WETLAND LINE
	ELECTRIC MAN HOLE
	STONE PILLAR
	TREE-SIZE (INCHES)

MONUMENTS

	STONE BOUND W. DRILL HOLE FOUND
	STONE BOUND FOUND
	IRON PIPE FOUND
	DRILL HOLE/CHISEL SQUARE IN PAVEMENT

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PREPARED FOR:

CITY OF
WORCESTER
DEPARTMENT OF PUBLIC
WORKS AND PARKS
50 SKYLINE DRIVE
WORCESTER, MASSACHUSETTS

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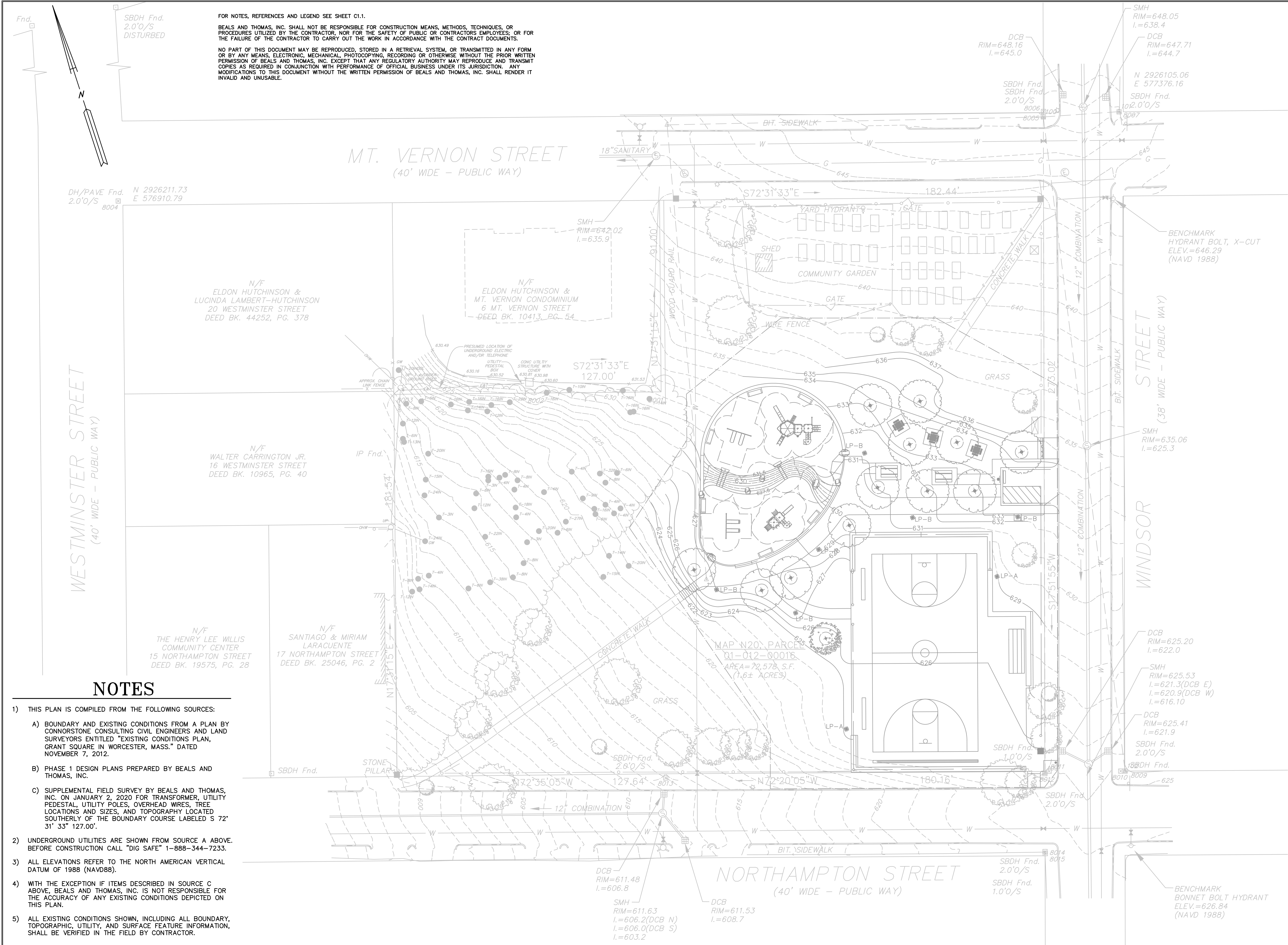
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PROJECT:
GRANT SQUARE
SITE
IMPROVEMENTS
WORCESTER, MASSACHUSETTS

SCALE: NTS DATE: FEBRUARY 18, 2022

NOTES, REFERENCES
AND LEGEND

B+T JOB NO.2464.03	C1.1
B+T PLAN NO. 246400P004B-002	



FOR NOTES, REFERENCES AND LEGEND SEE SHEET C1.1.

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NOTES

- THIS PLAN IS COMPILED FROM THE FOLLOWING SOURCES:
 - BOUNDARY AND EXISTING CONDITIONS FROM A PLAN BY CONNORSTONE CONSULTING CIVIL ENGINEERS AND LAND SURVEYORS ENTITLED "EXISTING CONDITIONS PLAN, GRANT SQUARE IN WORCESTER, MASS." DATED NOVEMBER 7, 2012.
 - PHASE 1 DESIGN PLANS PREPARED BY BEALS AND THOMAS, INC.
 - SUPPLEMENTAL FIELD SURVEY BY BEALS AND THOMAS, INC. ON JANUARY 2, 2020 FOR TRANSFORMER, UTILITY PEDESTAL, UTILITY POLES, OVERHEAD WIRES, TREE LOCATIONS AND SIZES, AND TOPOGRAPHY LOCATED SOUTHERLY OF THE BOUNDARY COURSE LABELED S 72° 31' 33" 127.00'.
- UNDERGROUND UTILITIES ARE SHOWN FROM SOURCE A ABOVE. BEFORE CONSTRUCTION CALL "DIG SAFE" 1-888-344-7233.
- ALL ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
- WITH THE EXCEPTION IF ITEMS DESCRIBED IN SOURCE C ABOVE, BEALS AND THOMAS, INC. IS NOT RESPONSIBLE FOR THE ACCURACY OF ANY EXISTING CONDITIONS DEPICTED ON THIS PLAN.
- ALL EXISTING CONDITIONS SHOWN, INCLUDING ALL BOUNDARY, TOPOGRAPHIC, UTILITY, AND SURFACE FEATURE INFORMATION, SHALL BE VERIFIED IN THE FIELD BY CONTRACTOR.

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CITY OF WORCESTER

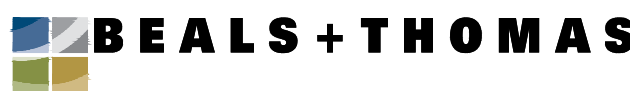
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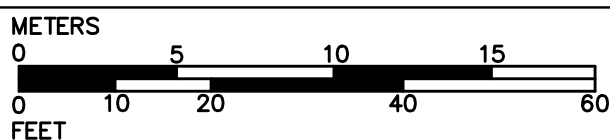
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PROJECT:

GRANT SQUARE SITE IMPROVEMENTS

WORCESTER, MASSACHUSETTS

SCALE: 1" = 20' DATE: FEBRUARY 18, 2022

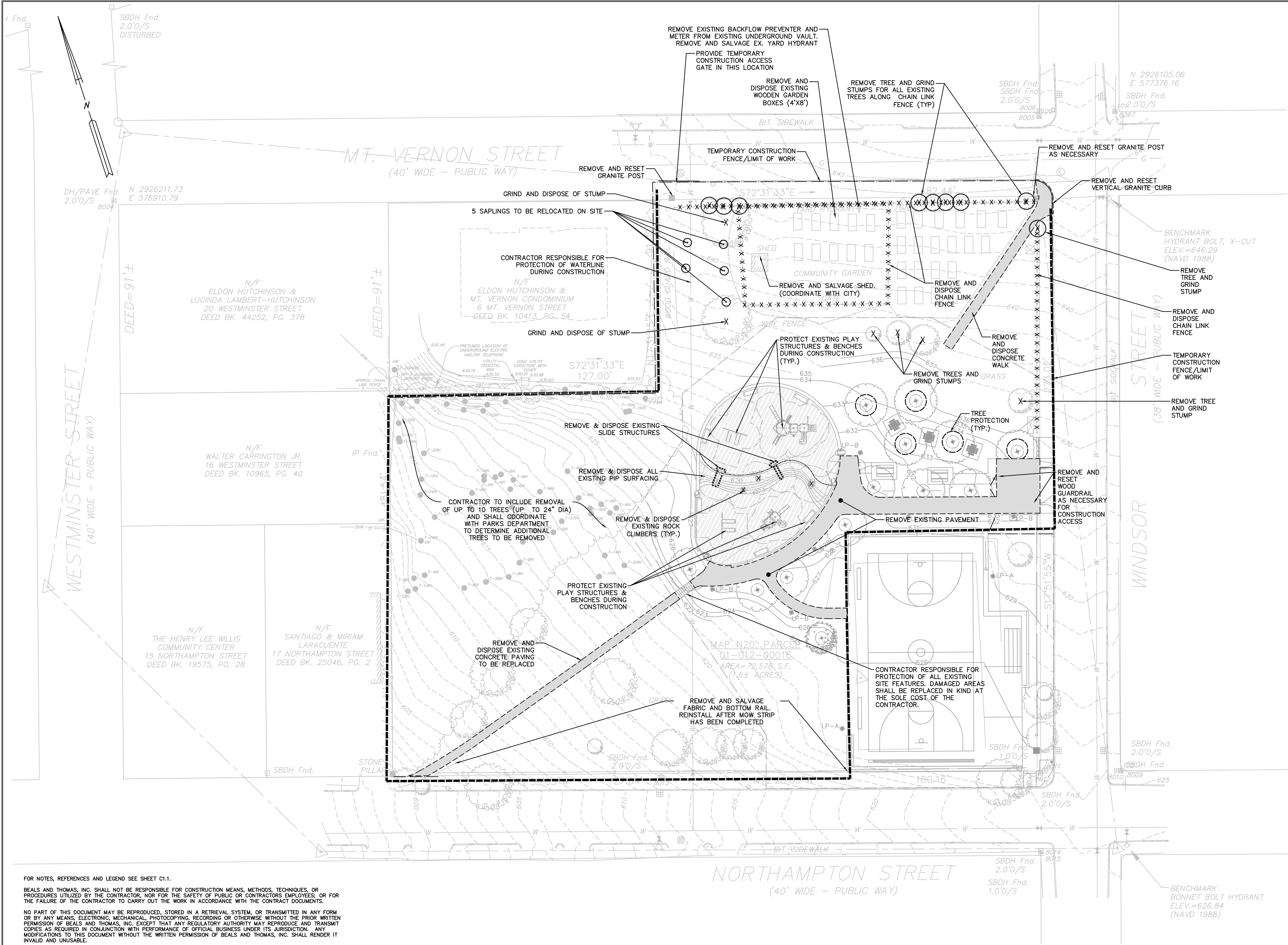


EXISTING CONDITIONS PLAN

B+T JOB NO.2464.03

B+T PLAN NO.
246400P004B-003

C1.2



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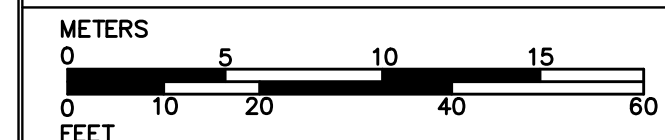
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GRANT SQUARE SITE IMPROVEMENTS

WORCESTER, MASSACHUSETTS

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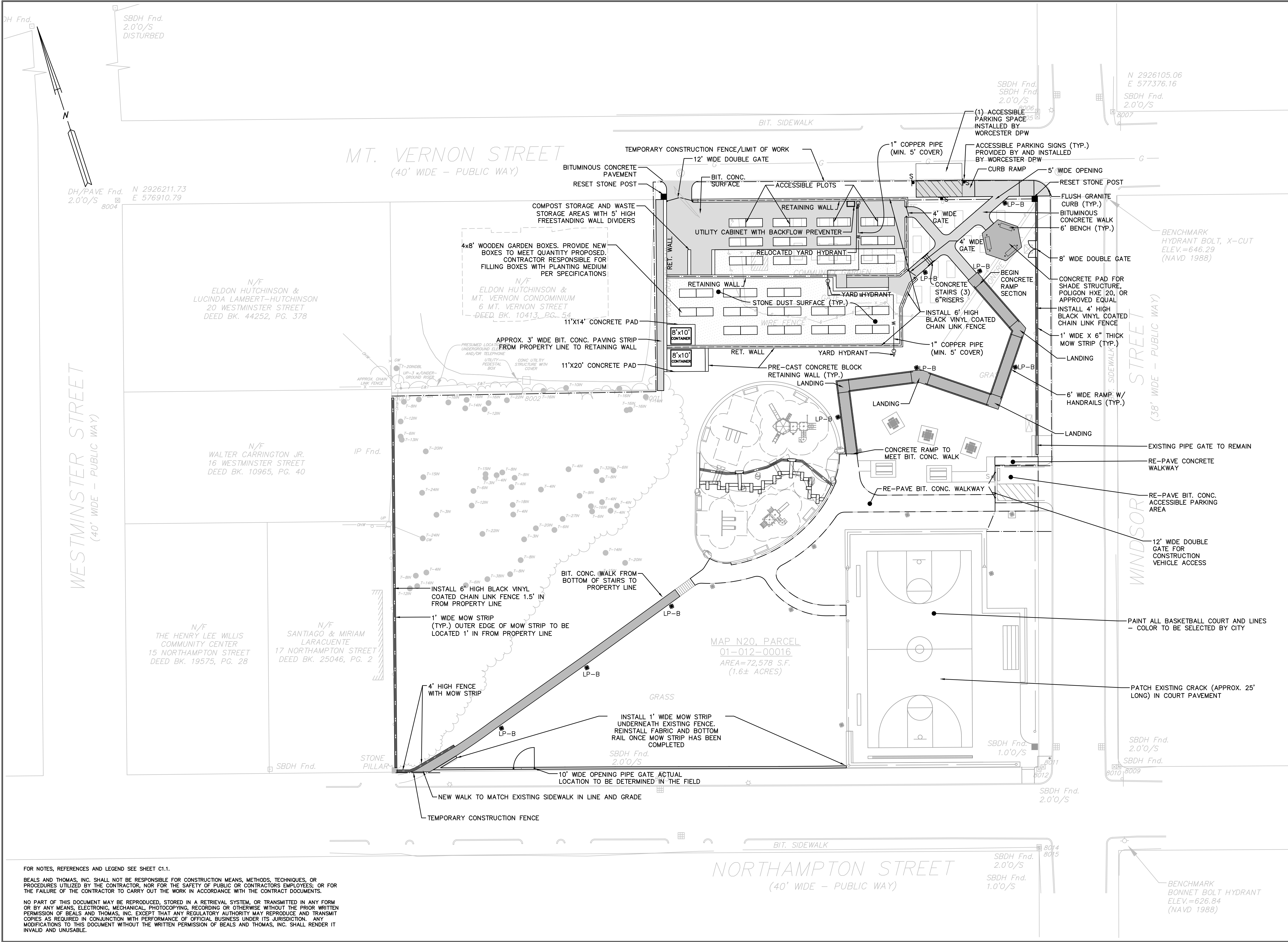


SITE PREPARATION PLAN

B+T JOB NO.2464.03

B+T PLAN NO.
246400P004B-004

C2.1



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PROJECT:

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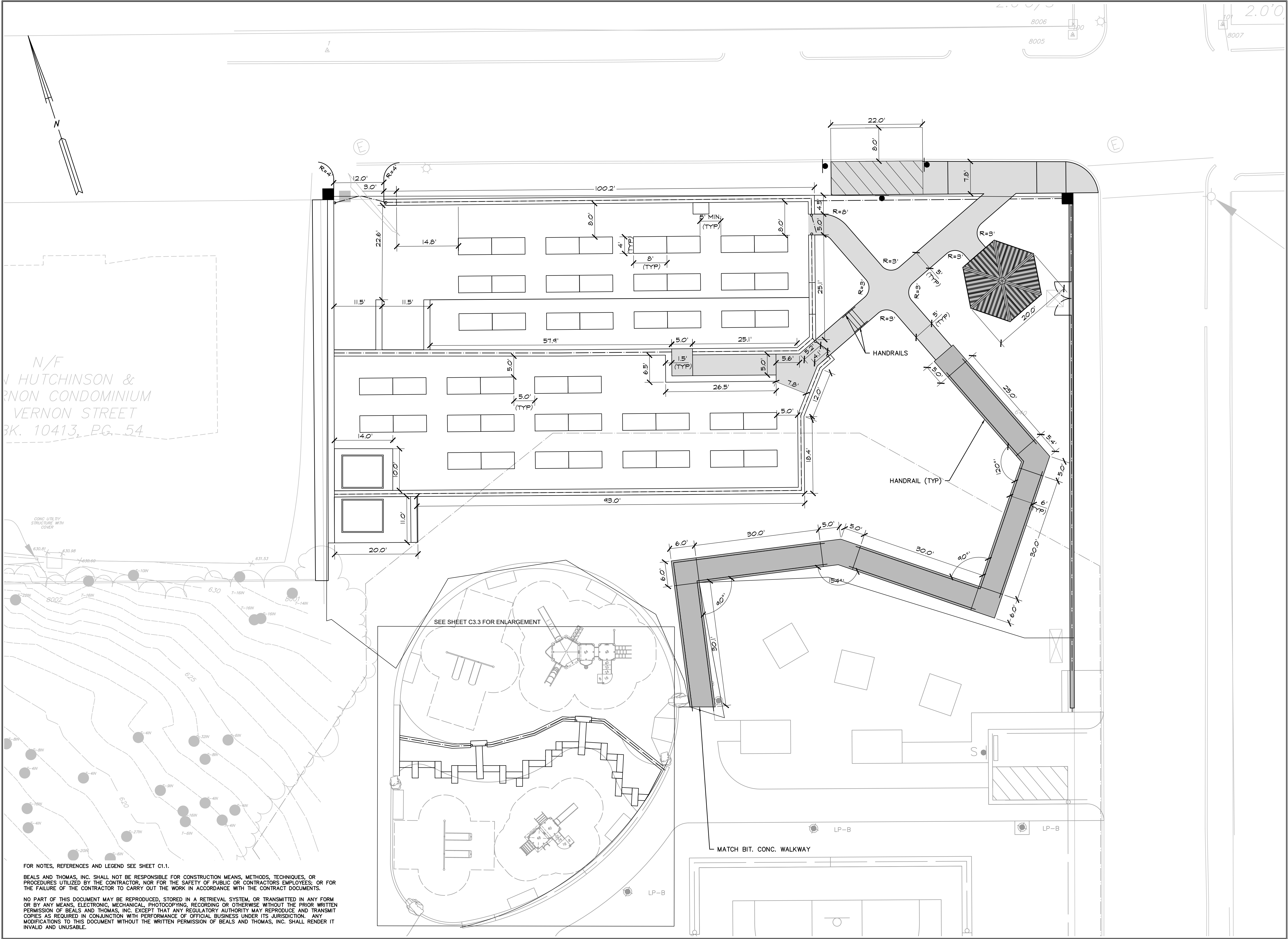
WORCESTER, MASSACHUSETTS

SCALE: 1" = 20' DATE: FEBRUARY 18, 2022

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OVERALL LAYOUT AND MATERIALS PLAN

B+T JOB NO.2464.03	C3.1
B+T PLAN NO. 246400P004B-005	



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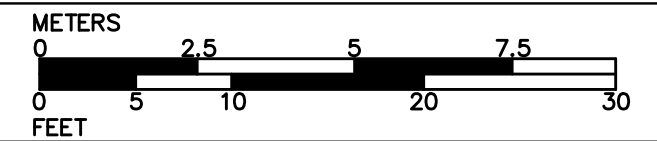
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PROJECT:

**GRANT SQUARE
SITE
IMPROVEMENTS**

WORCESTER, MASSACHUSETTS

SCALE: 1" = 10' DATE: FEBRUARY 18, 2022



**DETAILED
LAYOUT PLAN**

B+T JOB NO.2464.03

B+T PLAN NO.
246400P004B-006

C3.2

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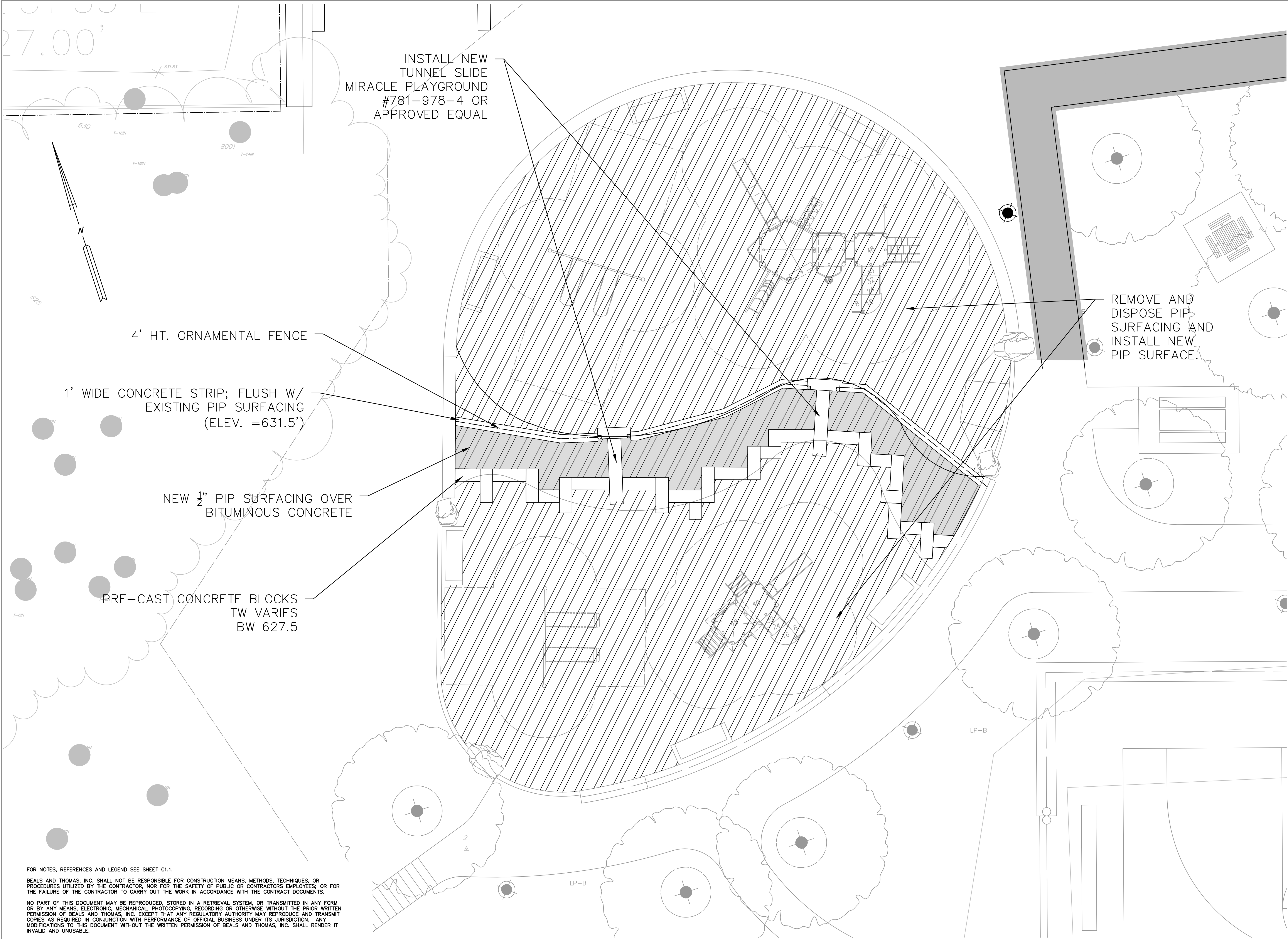
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C3.3

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PROJECT:

**GRANT SQUARE
SITE
IMPROVEMENTS**

WORCESTER, MASSACHUSETTS

SCALE: 1"=5' DATE: FEBRUARY 18, 2022

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**PLAYGROUND
IMPROVEMENT PLAN**

B+T JOB NO.2464.03

B+T PLAN NO.
246400P004B-008

C4.1

**CITY OF
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WORKS AND PARKS
50 SKYLINE DRIVE
WORCESTER, MASSACHUSETTS

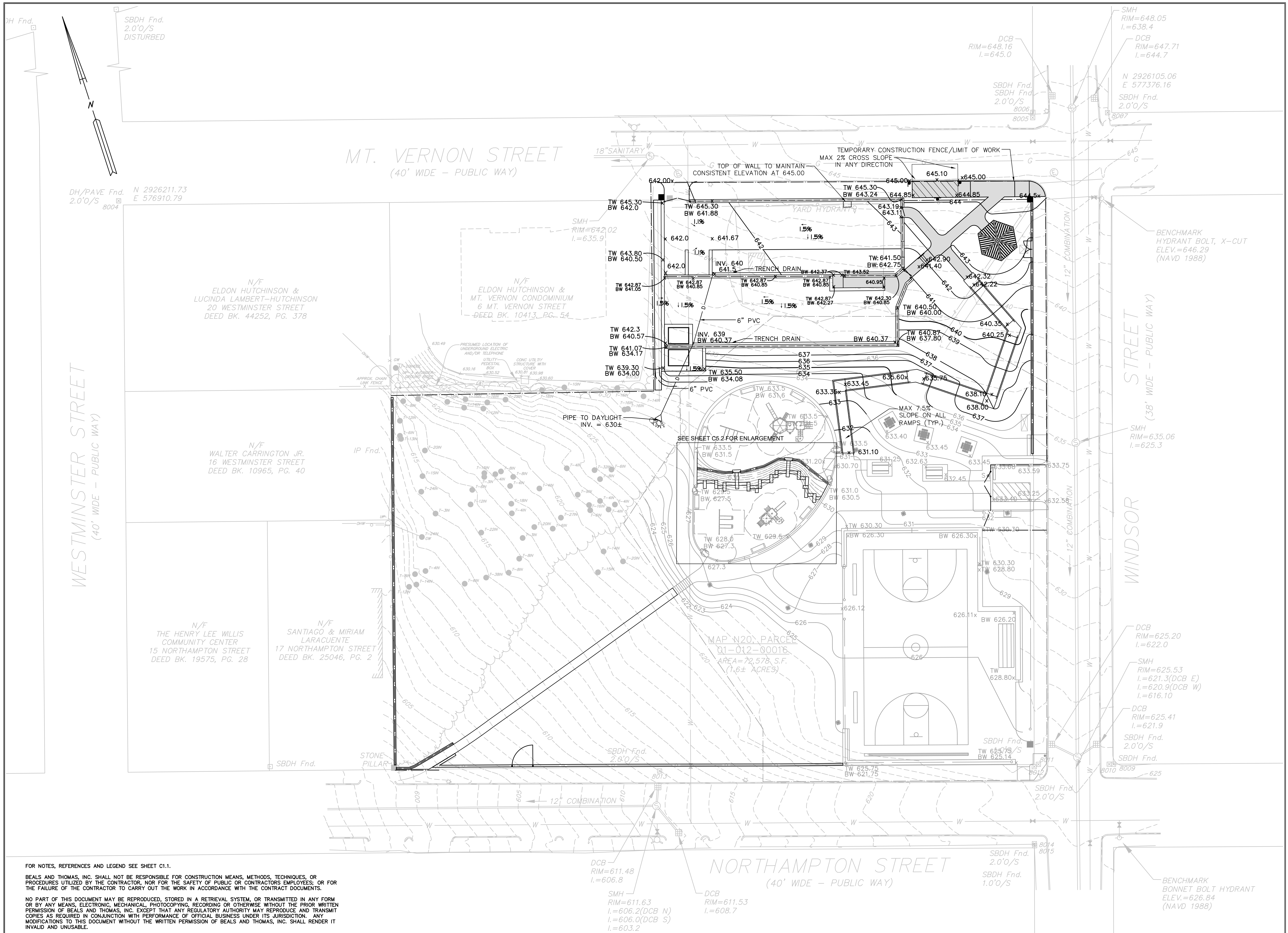
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ISSUE DATE		DESCRIPTION	
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DES	DWN	CHK'D	APP'D

Animal	Meters	Feet
Elephant	15	60
Giraffe	12	48
Kangaroo	10	40
Kangaroo Rat	5	20

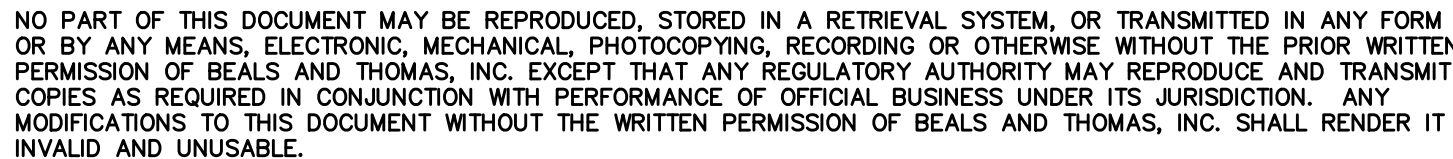
C5.1



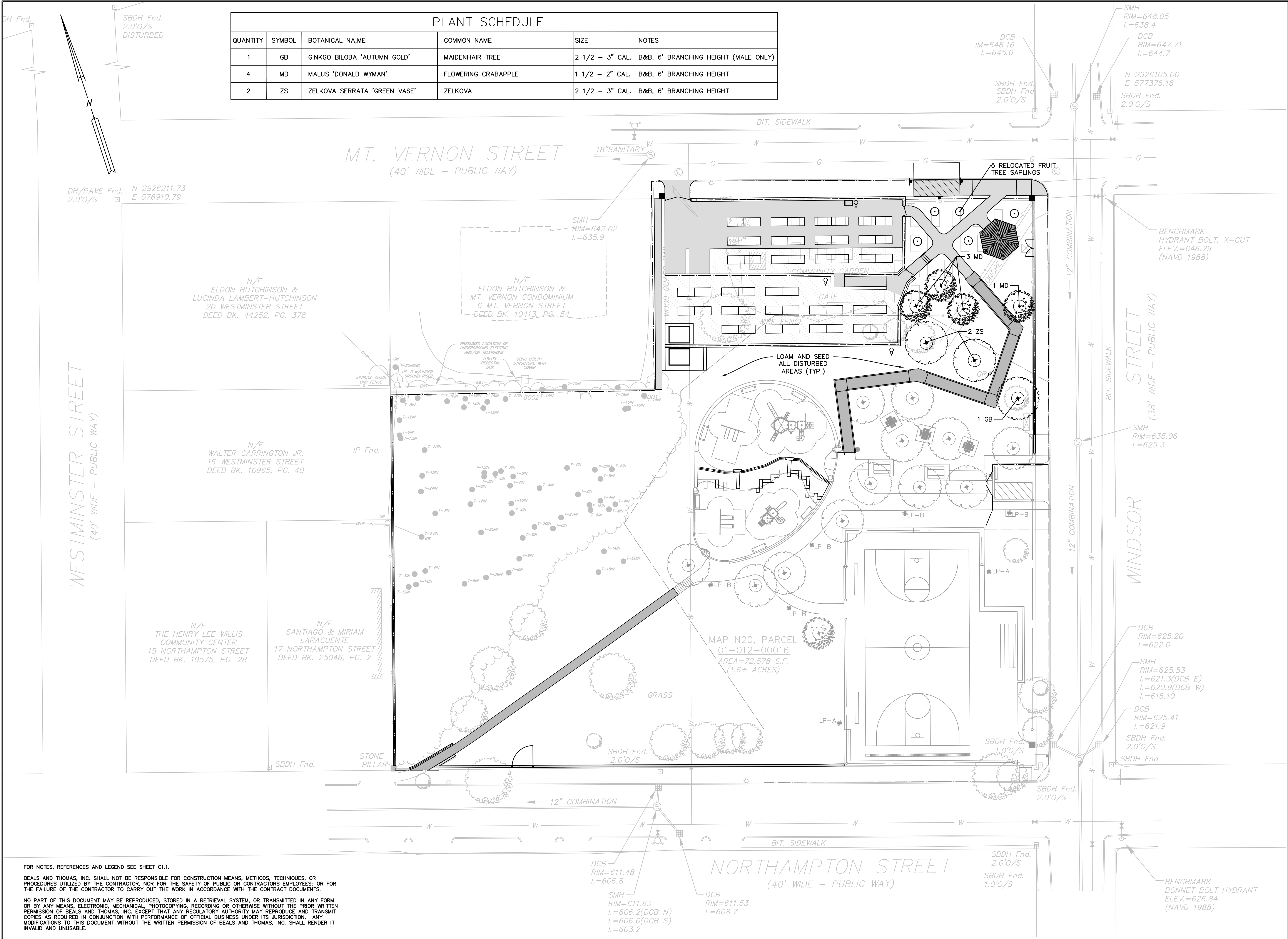
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C5.2



PLANT SCHEDULE					
QUANTITY	SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	NOTES
1	GB	GINKGO BILOBA 'AUTUMN GOLD'	MAIDENHAIR TREE	2 1/2 - 3" CAL.	B&B, 6' BRANCHING HEIGHT (MALE ONLY)
4	MD	MALUS 'DONALD WYMAN'	FLOWERING CRABAPPLE	1 1/2 - 2" CAL.	B&B, 6' BRANCHING HEIGHT
2	ZS	ZELKOVA SERRATA 'GREEN VASE'	ZELKOVA	2 1/2 - 3" CAL.	B&B, 6' BRANCHING HEIGHT

PREPARED FOR:

CITY OF WORCESTER

DEPARTMENT OF PUBLIC WORKS AND PARKS

50 SKYLINE DRIVE
WORCESTER, MASSACHUSETTS

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PROJECT:

GRANT SQUARE SITE IMPROVEMENTS

WORCESTER, MASSACHUSETTS

SCALE: 1" = 20' DATE: FEBRUARY 18, 2022

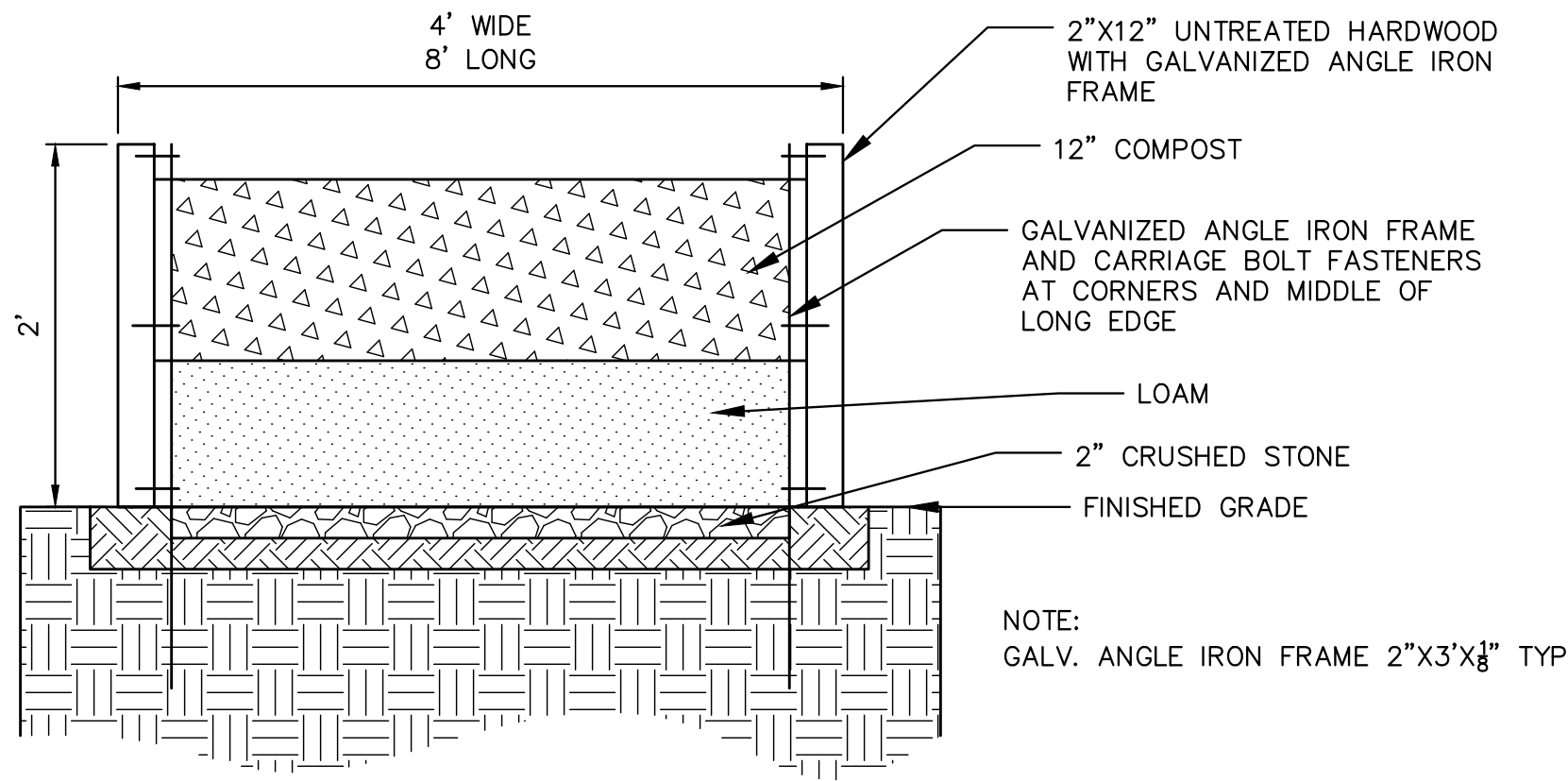
METERS
0 5 10 15 20
FEET
0 10 20 40 60

LANDSCAPE PLAN

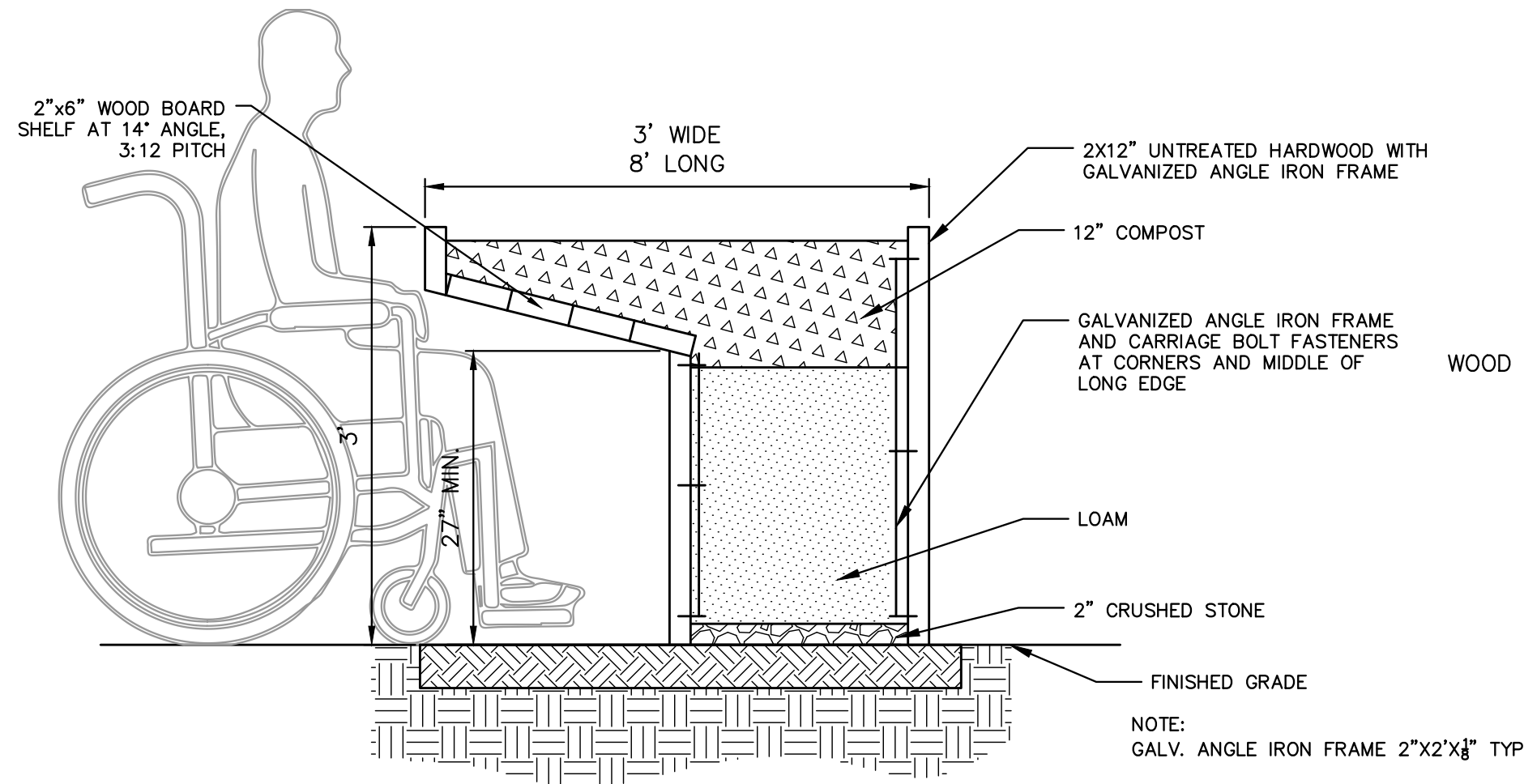
B+T JOB NO.2464.03

B+T PLAN NO. 246400P004A-011

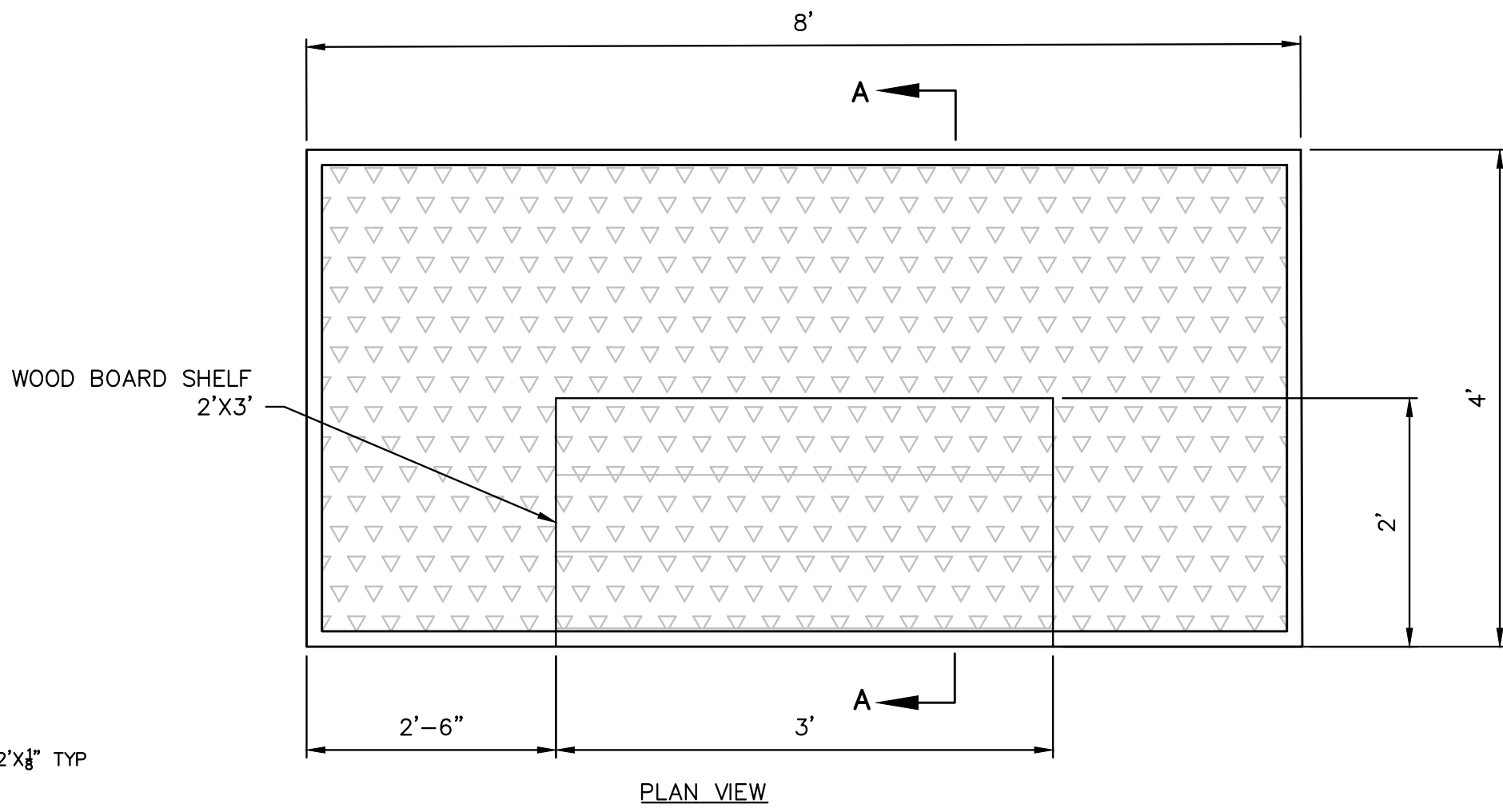
C6.1



RAISED PLANTING BED
NOT TO SCALE

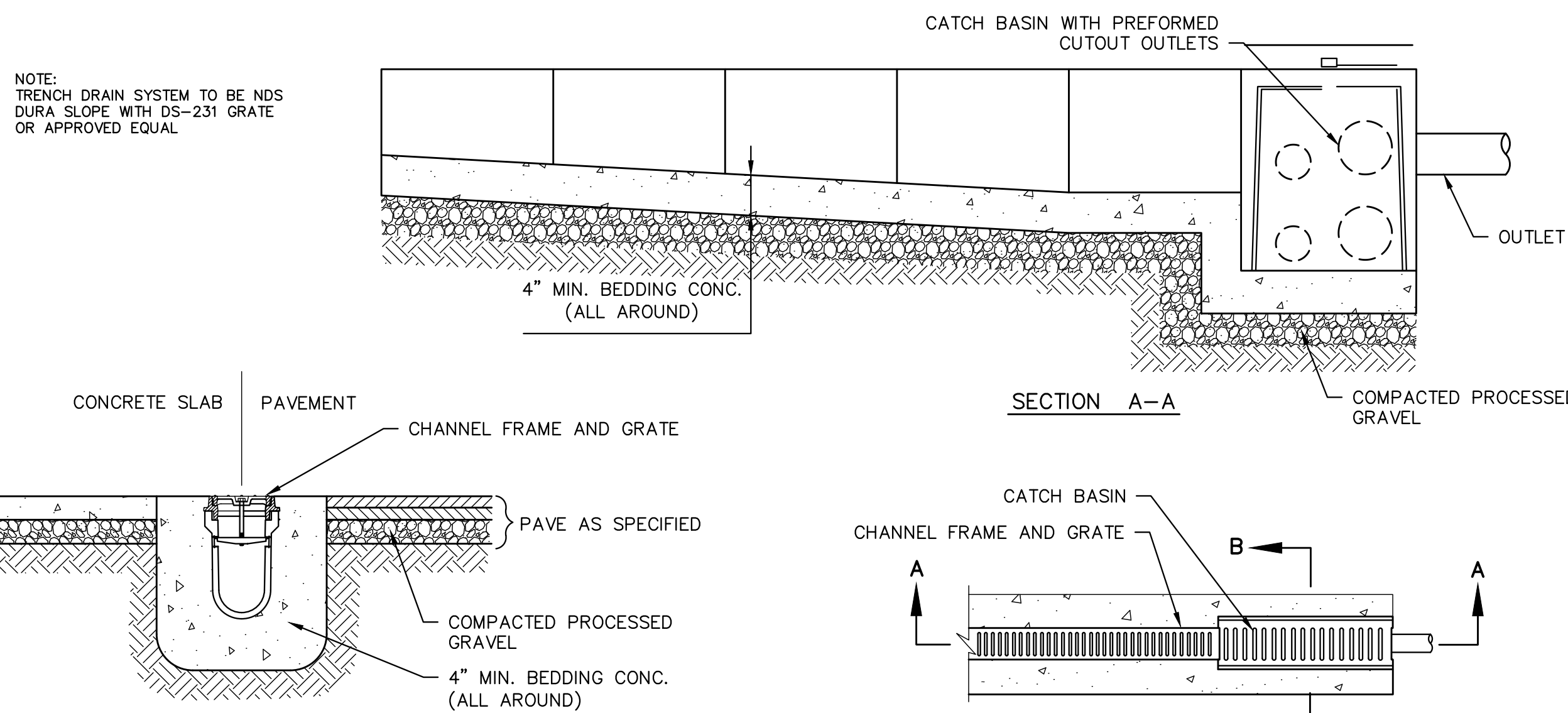


SECTION A



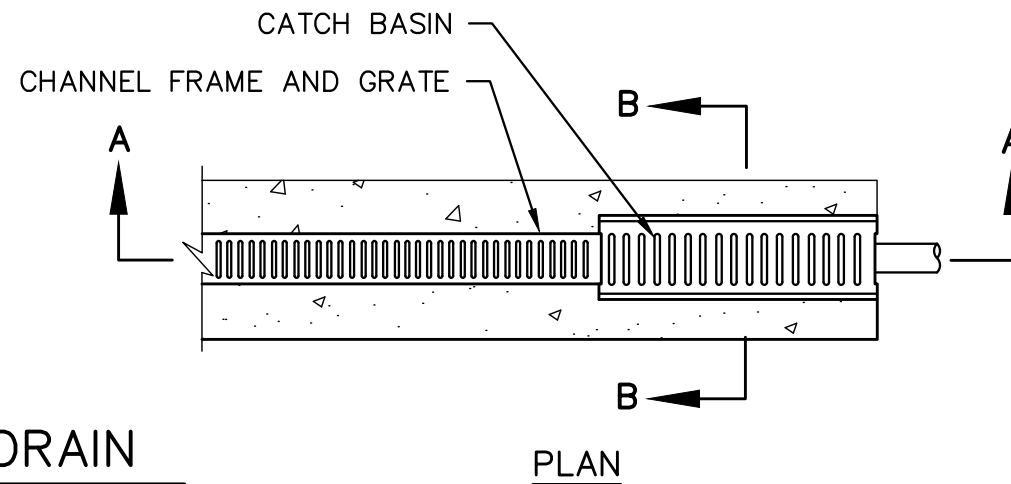
PLAN VIEW

ACCESSIBLE RAISED PLANTING BED
NOT TO SCALE

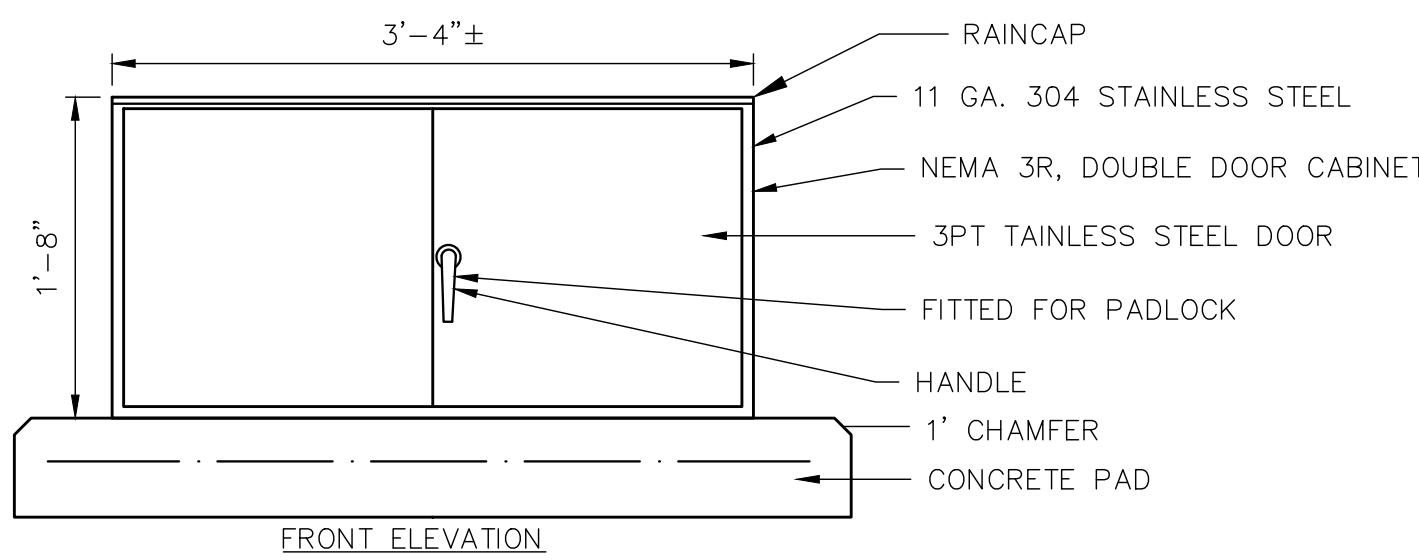


SECTION B-B

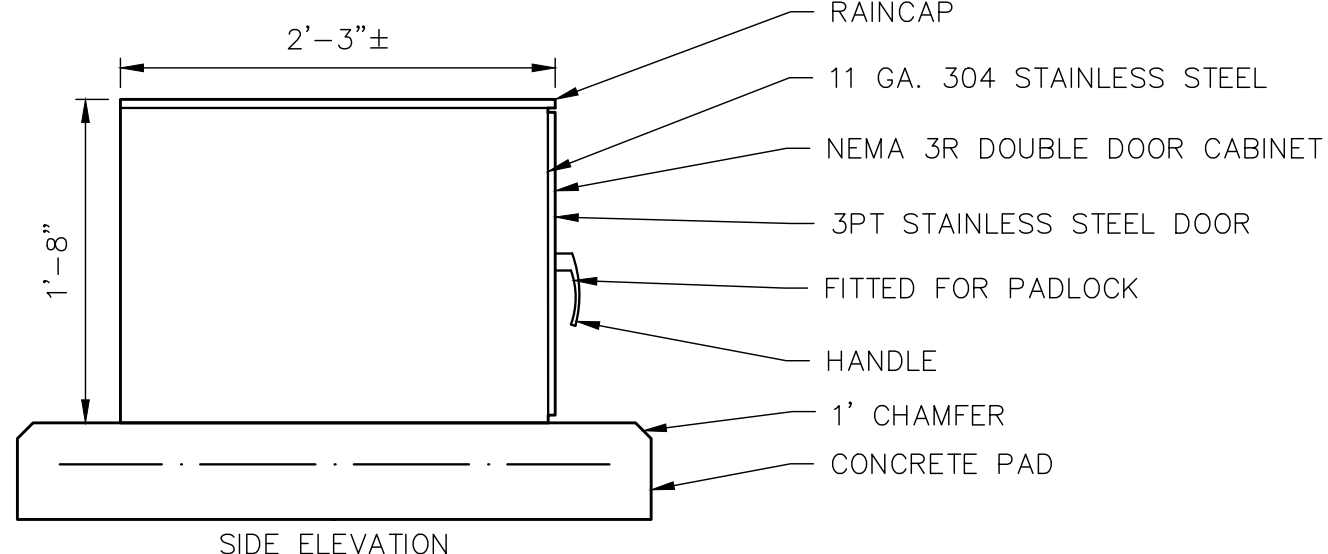
TRENCH DRAIN
NOT TO SCALE



PLAN

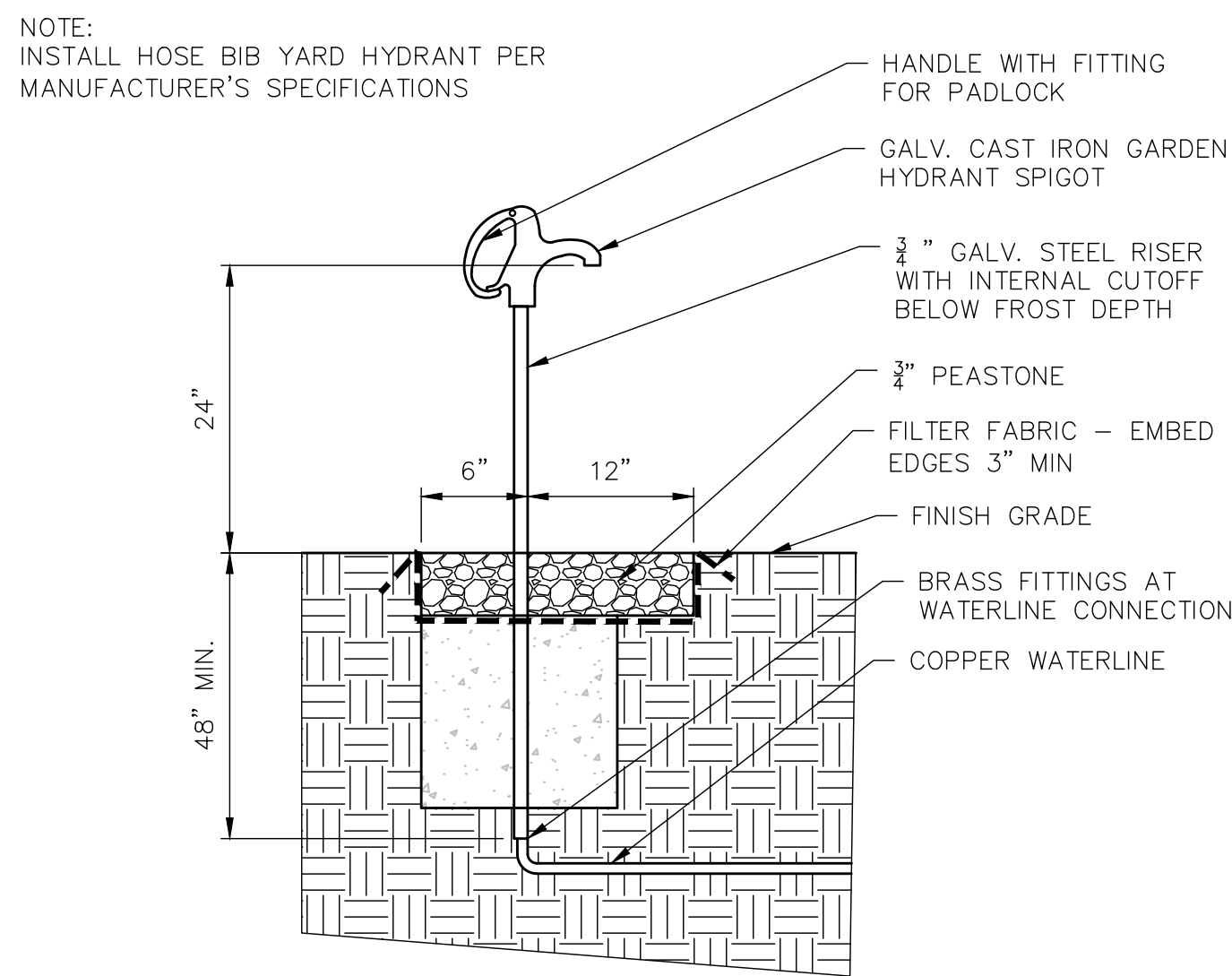


FRONT ELEVATION



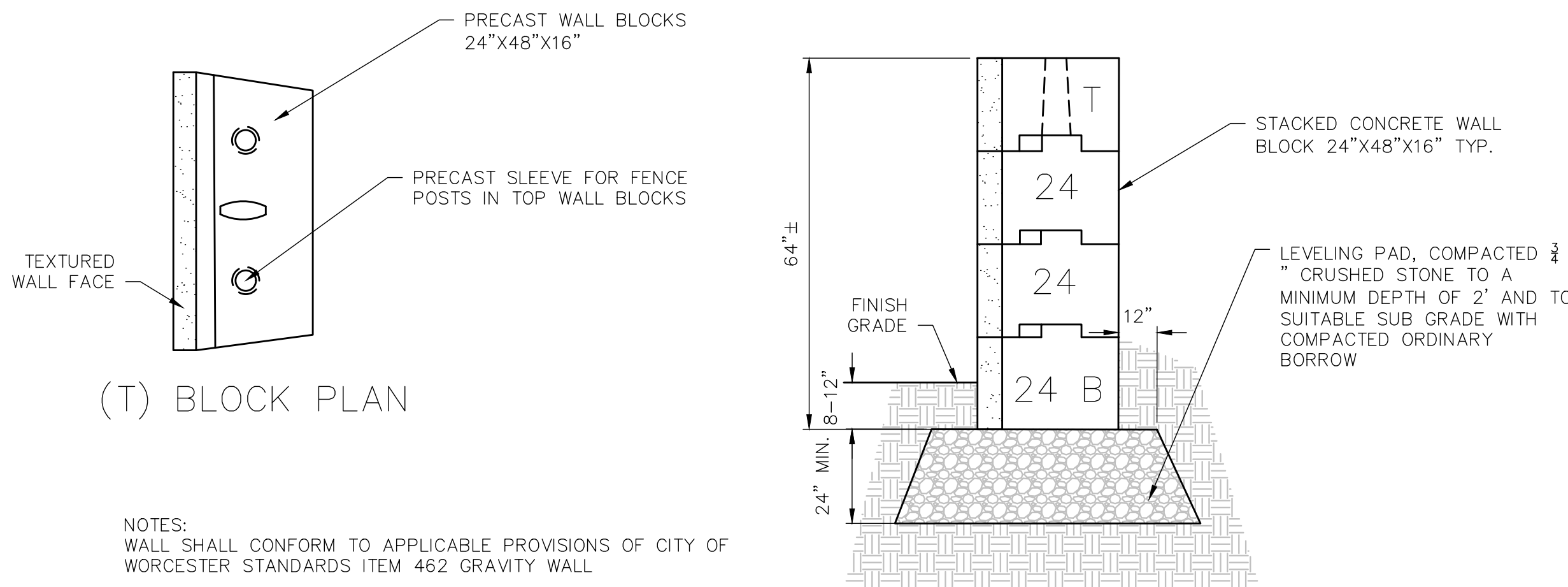
SIDE ELEVATION

UTILITY CABINET (FOR BACKFLOW PREVENTER)
NOT TO SCALE



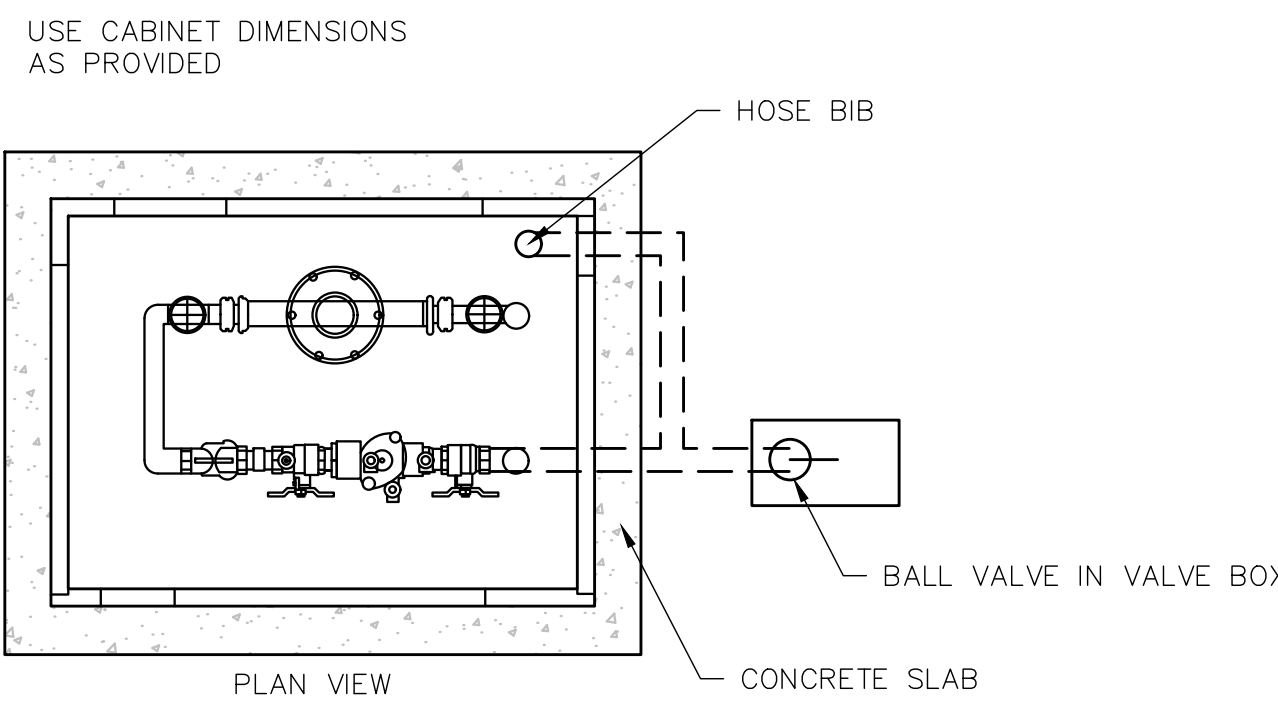
FROST FREE LOCKING YARD HYDRANT

NOT TO SCALE



(T) BLOCK PLAN

FREESTANDING CONCRETE BLOCK WALL
NOT TO SCALE



PLAN VIEW

- NOTES:
1. CABINET DIMENSIONS PROVIDED FOR DESIGN INTENT ONLY AND MUST BE ADJUSTED PER SPECIFIED SPATIAL REQUIREMENTS OF EQUIPMENT.
 2. CABINET TO BE MANUFACTURED FROM A 0.125-INCH THICK MINIMUM STAINLESS STEEL.
 3. CABINET SHALL HAVE CONTINUOUS PIANO HINGES WELDED IN PLACE, AND STAINLESS STEEL PAD LOCKABLE HANDLE.
 4. CONTRACTOR SHALL COORDINATE DIMENSIONS TO PROVIDE A 6" MINIMUM CLEAR WORKSPACE BETWEEN EQUIPMENT AND CABINET.
 5. CONCRETE FOUNDATION SHALL EXTEND 6" BEYOND THE FOOTPRINT OF THE CABINET ON ALL SIDES.
 6. CABINET TO BE PROVIDED WITH ADEQUATE INSULATION TO PROTECT AGAINST FREEZING.
 7. INSTALLER OF BACKFLOW ASSEMBLY SHALL MAKE THE NECESSARY FIELD CHANGES FOR A COMPLETE AND PROPER INSTALLATION.

BACKFLOW PREVENTER ENCLOSURE
NOT TO SCALE

FOR NOTES, REFERENCES AND LEGEND SEE SHEET C1.1.

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PREPARED FOR:

CITY OF WORCESTER

DEPARTMENT OF PUBLIC
WORKS AND PARKS

50 SKYLINE DRIVE
WORCESTER, MASSACHUSETTS

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PROJECT:

GRANT SQUARE SITE IMPROVEMENTS WORCESTER, MASSACHUSETTS

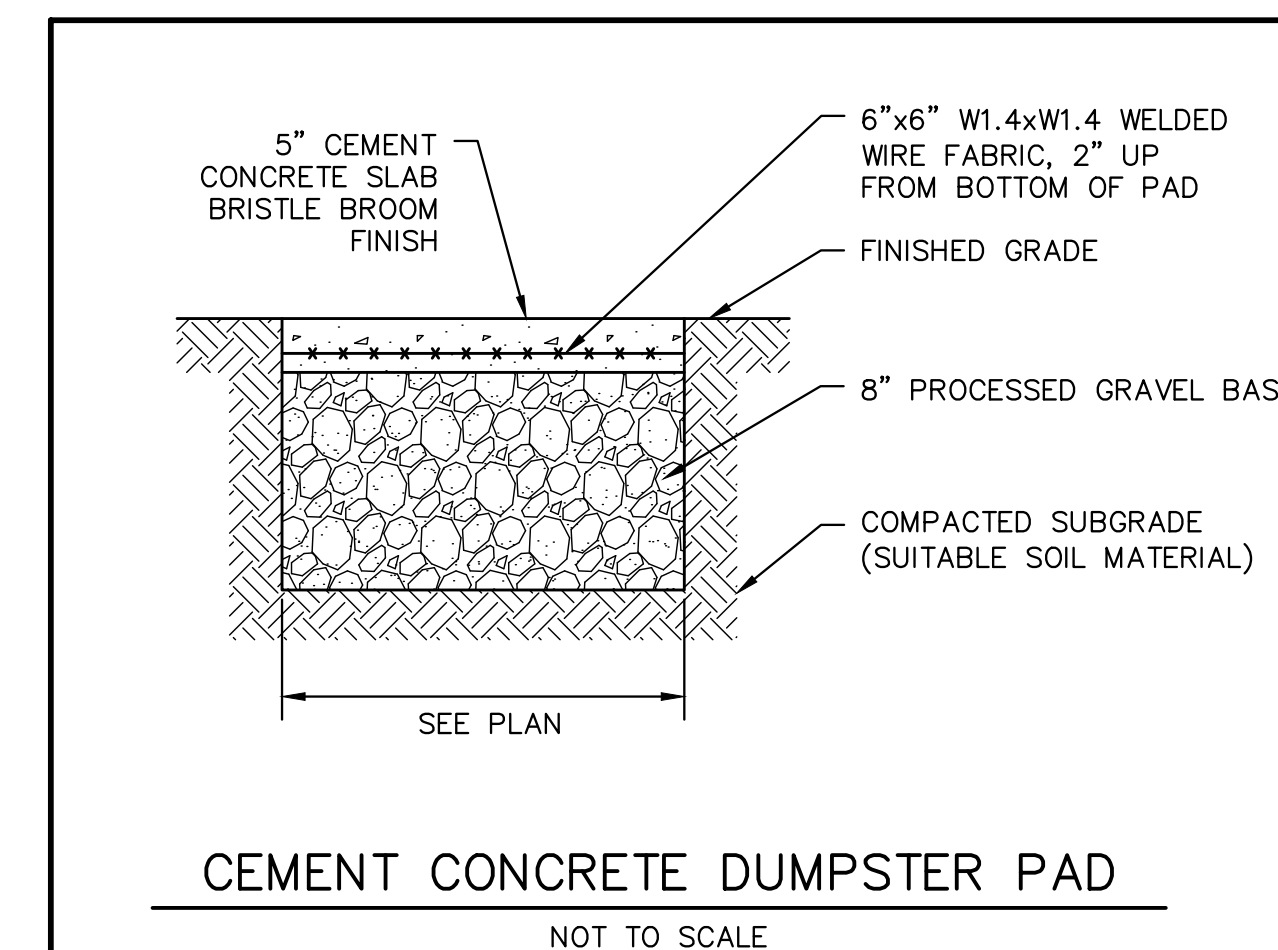
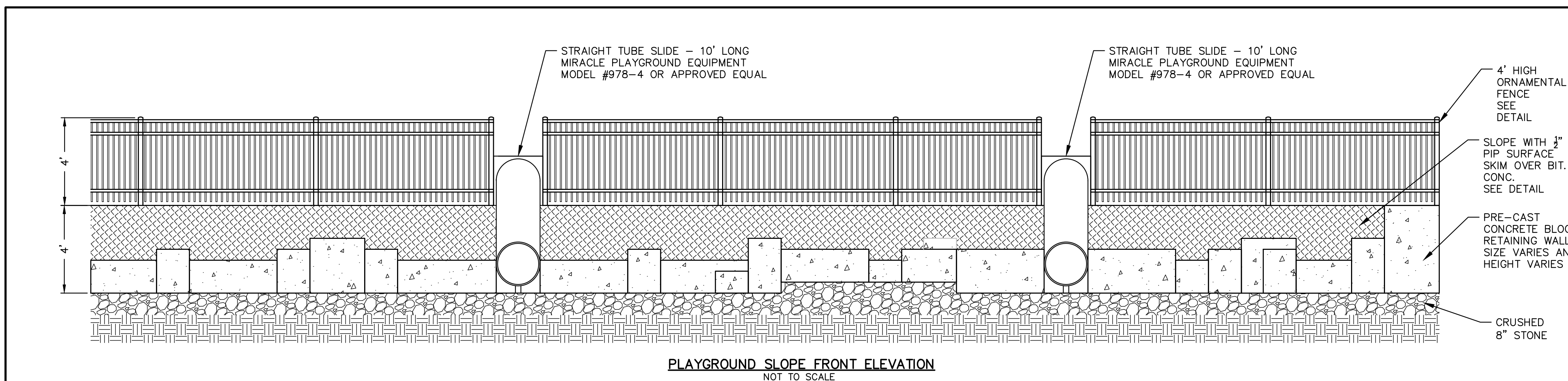
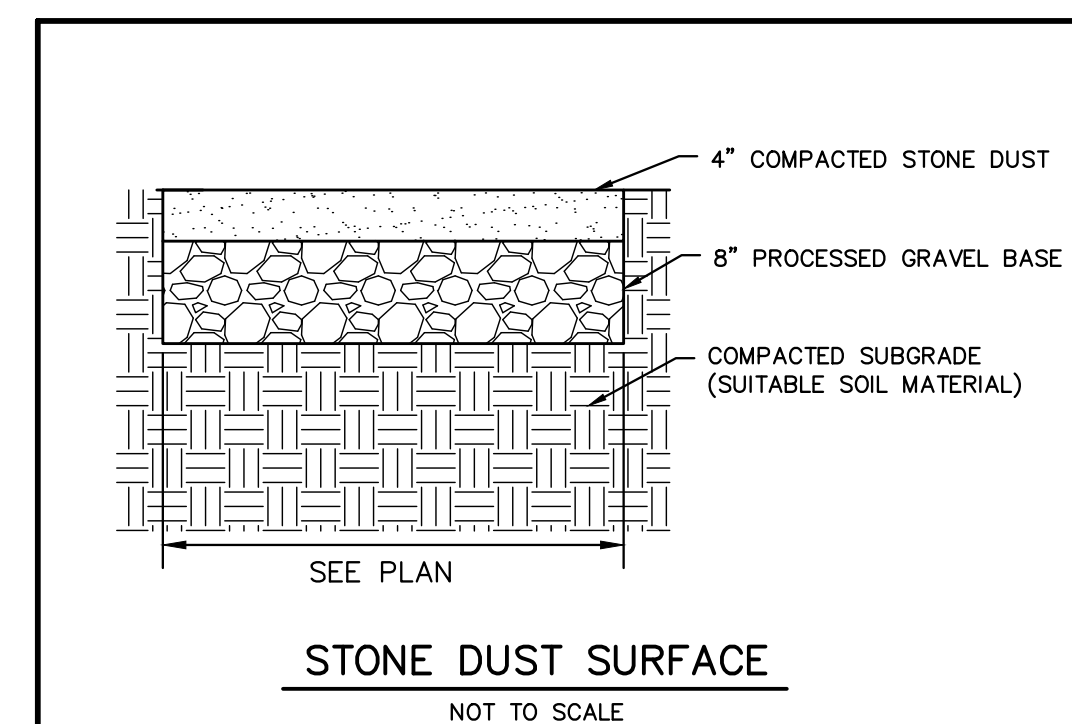
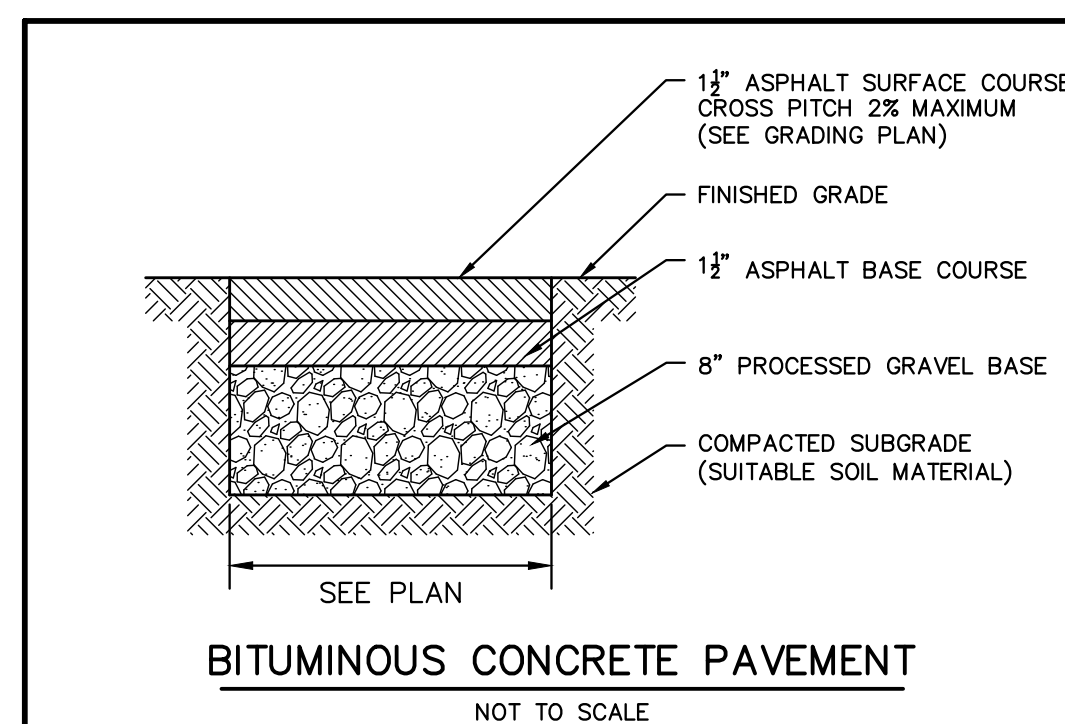
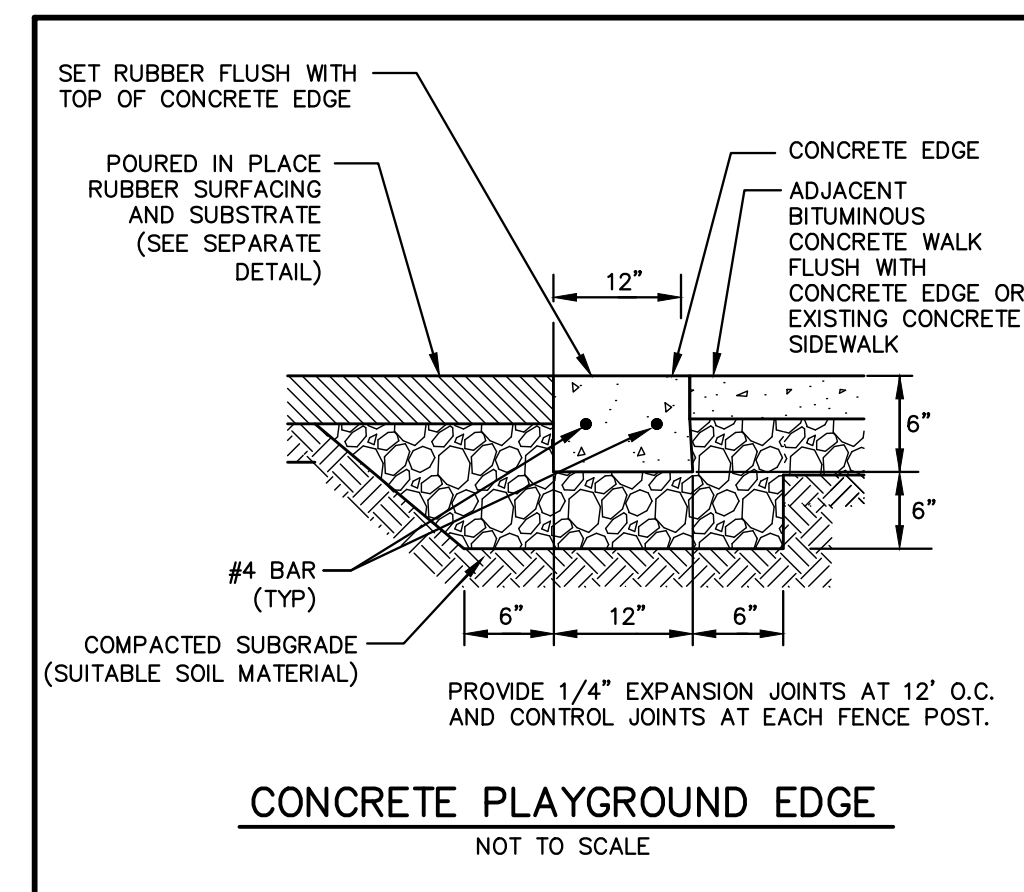
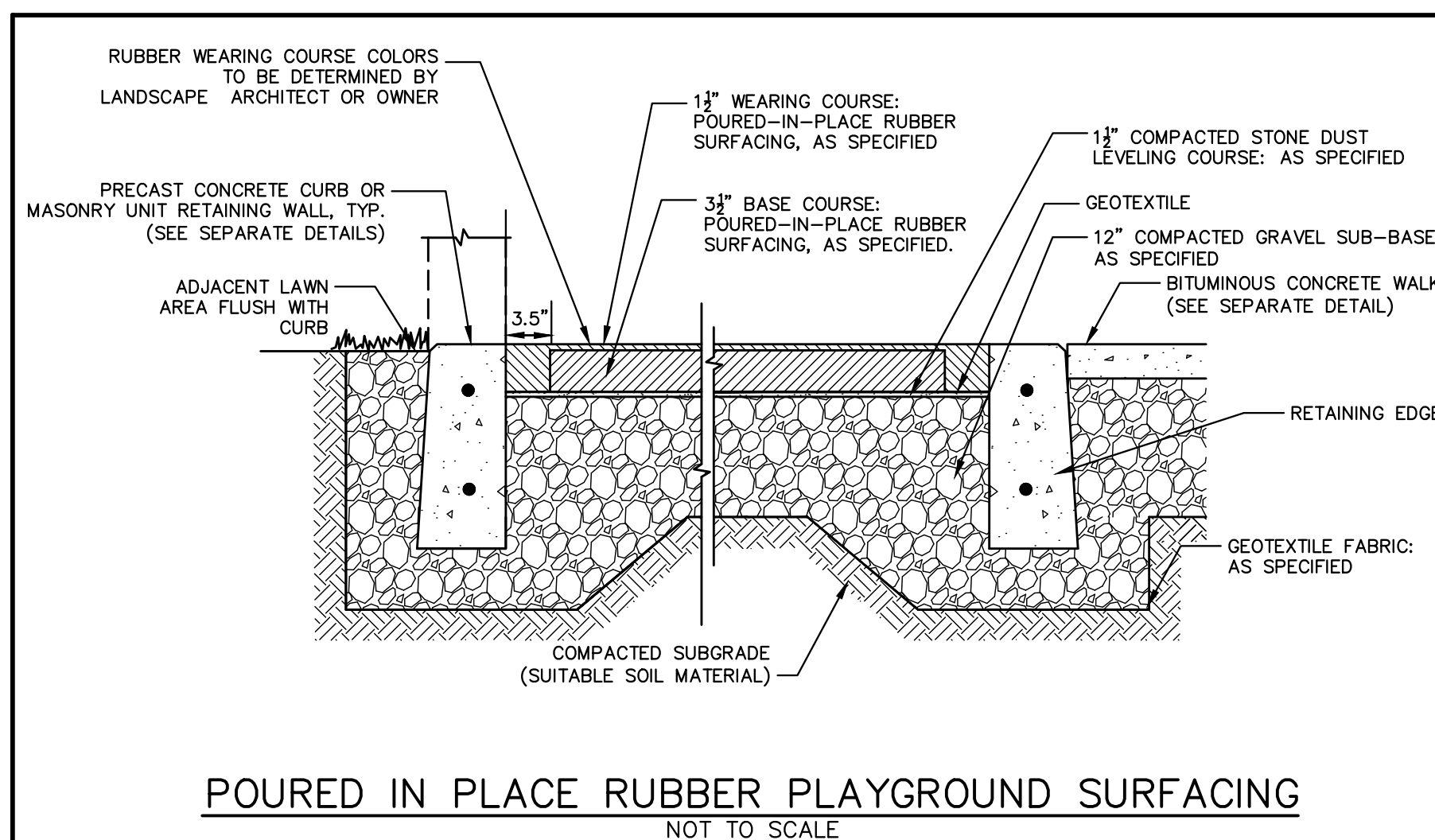
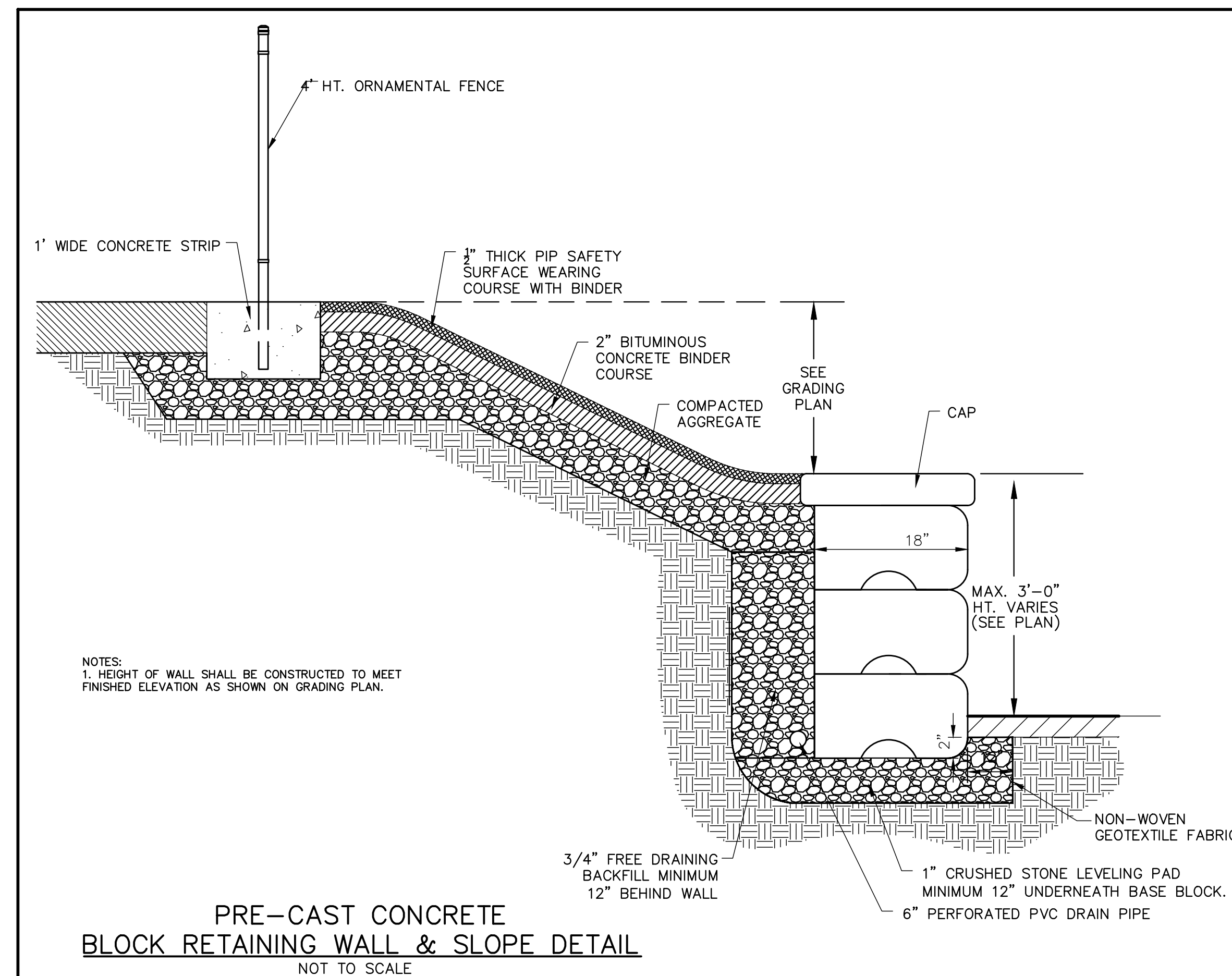
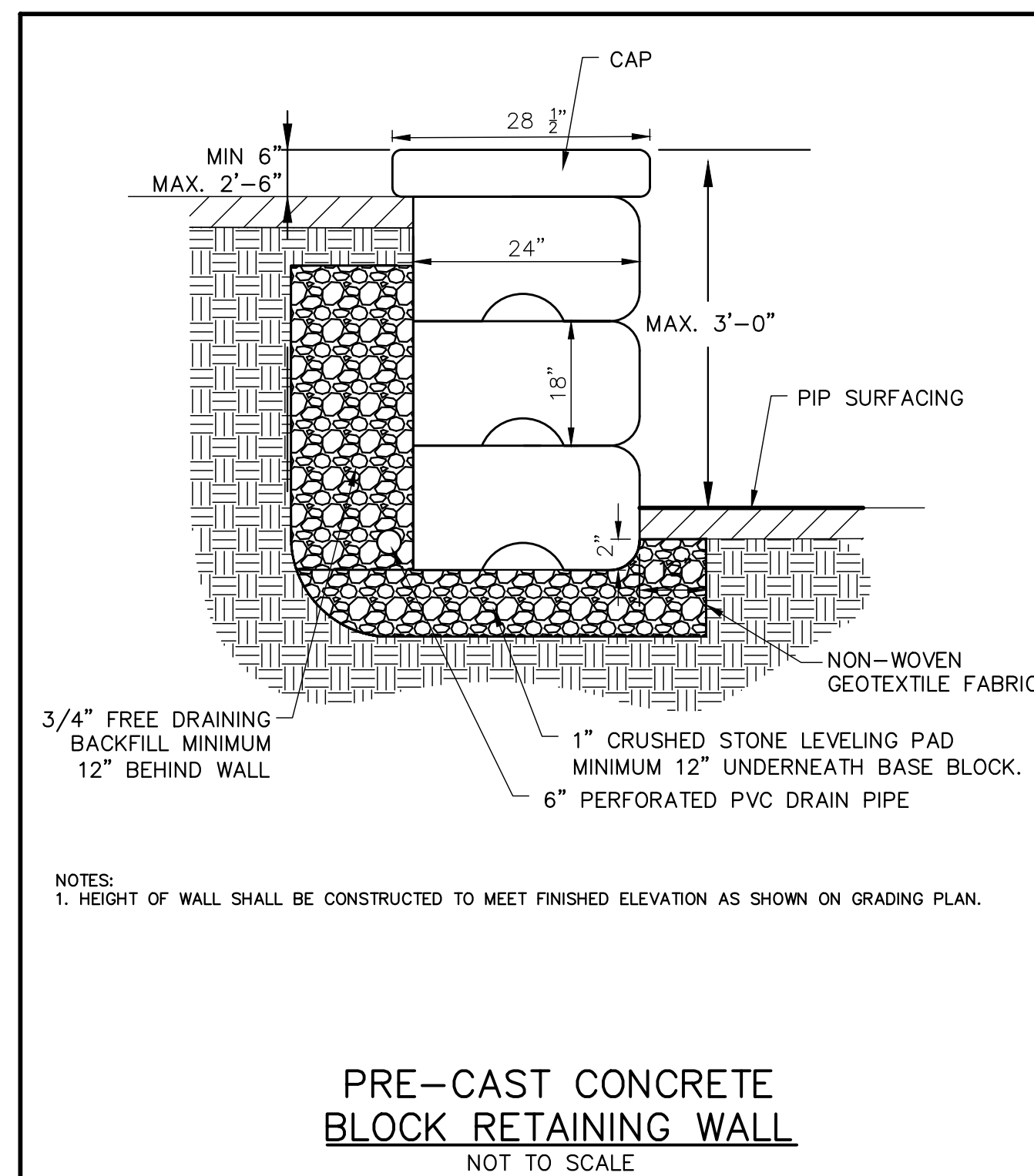
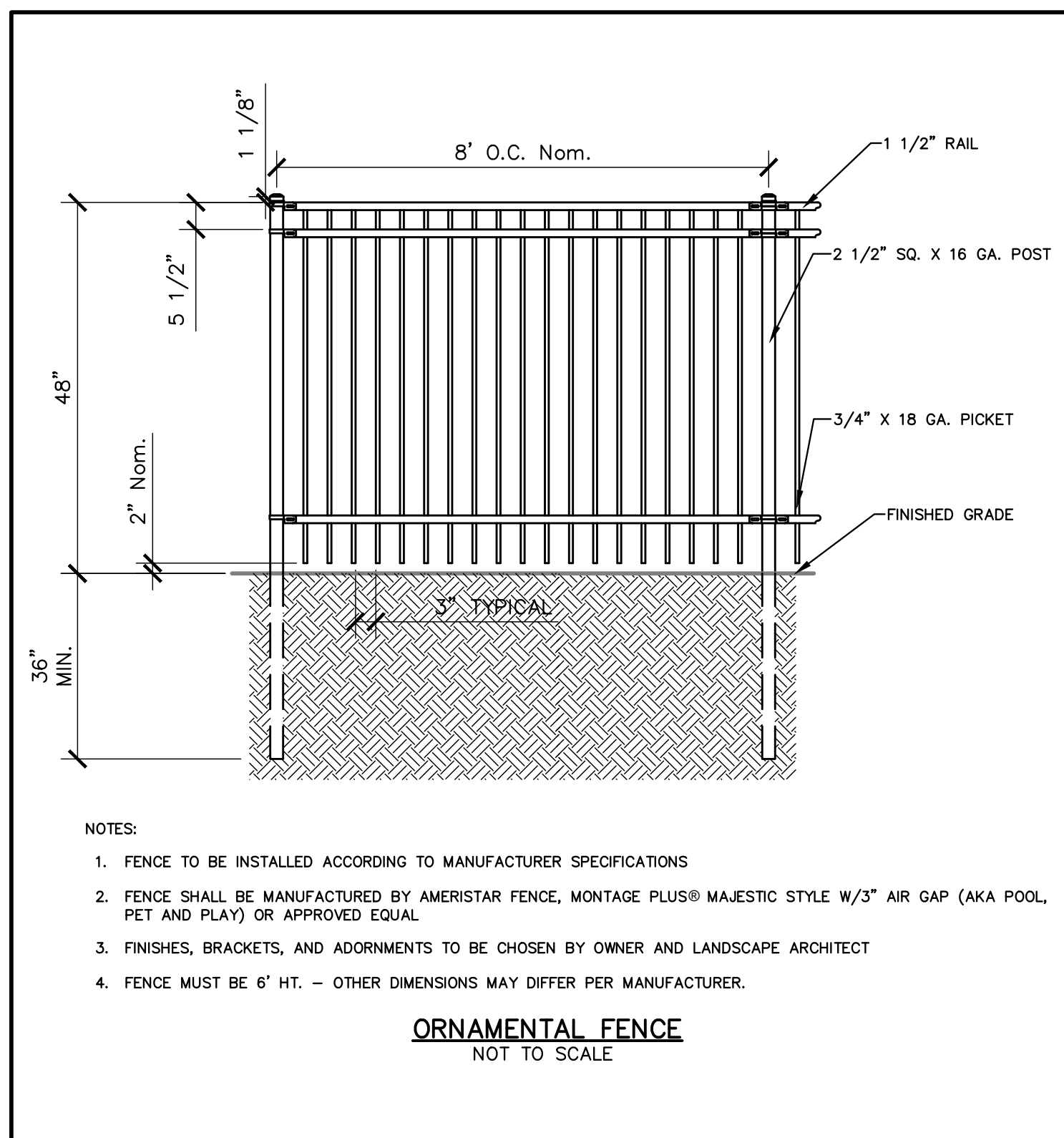
SCALE: AS NOTED DATE: FEBRUARY 18, 2022

SITE DETAILS #2

B+T JOB NO.2464.03

B+T PLAN NO.
246400P004B-013

C7.2



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	DES	DWN	CHK'D
			APP'D

PROJECT:

GRANT SQUARE SITE IMPROVEMENTS

WORCESTER, MASSACHUSETTS

SCALE: AS NOTED DATE: FEBRUARY 18, 2022

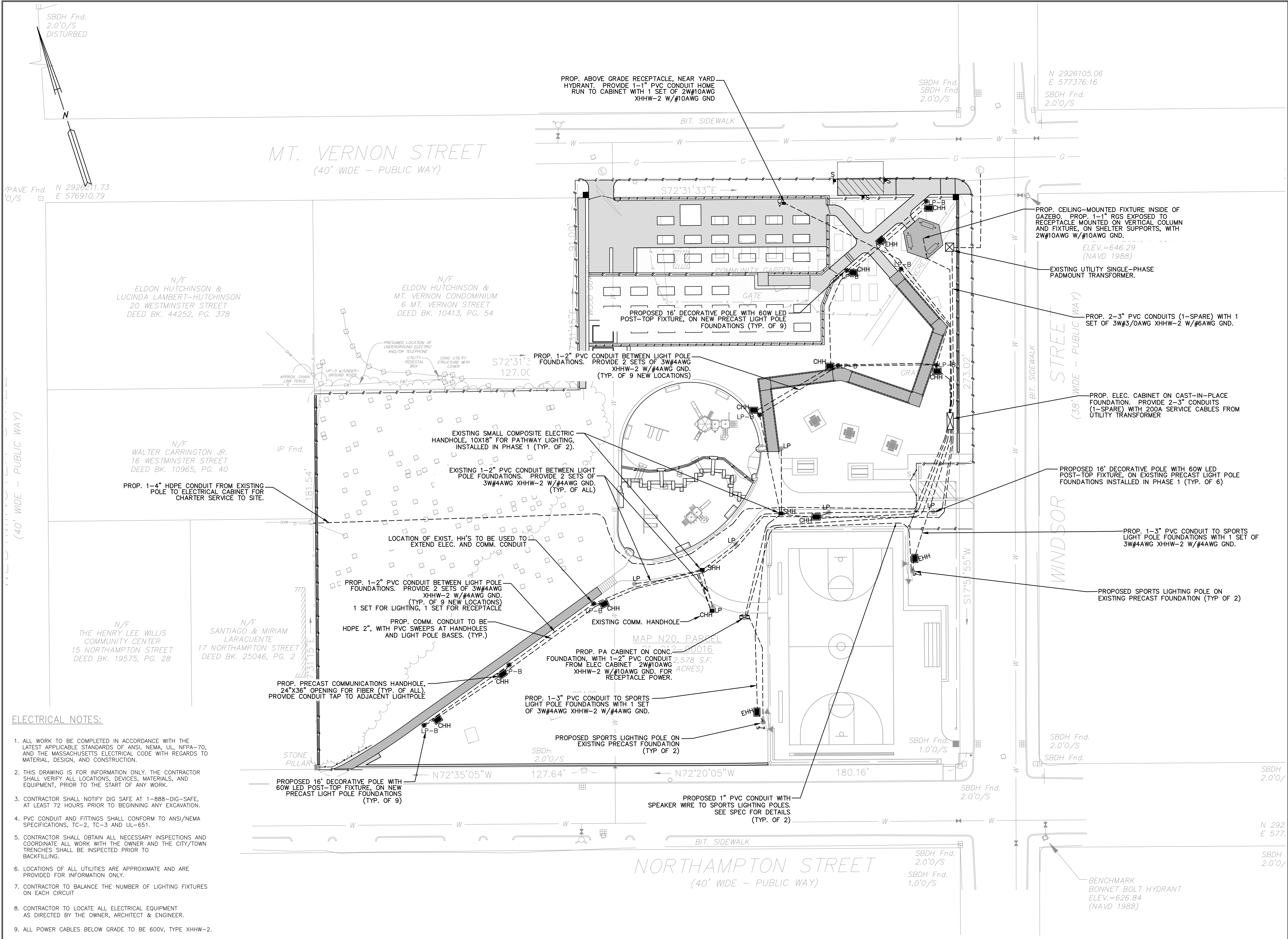
SITE DETAILS

#3

B+T JOB NO.2464.03

B+T PLAN NO.
246400P004B-014

C7.3



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WORCESTER, MASSACHUSETTS

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BEALS + THOMAS
Civil Engineers + Landscape Architects +
Land Surveyors + Planners +
Environmental Specialists

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Electric Power Engineering
www.PowerEngineersLLC.com

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3	3/14/2022	REVISED HANDHOLES
2	2/2/2022	ISSUED FOR CONSTRUCTION
1	12/28/2021	ISSUED FOR REVIEW
0	10/20/2021	ISSUED FOR REVIEW
ISSUE DATE		DESCRIPTION
DES	DWN	CHK'D APP'D

PROJECT:

GRANT SQUARE SITE IMPROVEMENTS

WORCESTER, MASSACHUSETTS

SCALE: 1" = 20' DATE: OCTOBER 20, 2021

METERS
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ELECTRICAL SITE PLAN

B+T JOB NO.2464.03

B+T PLAN NO.
246400P004B-006

E1

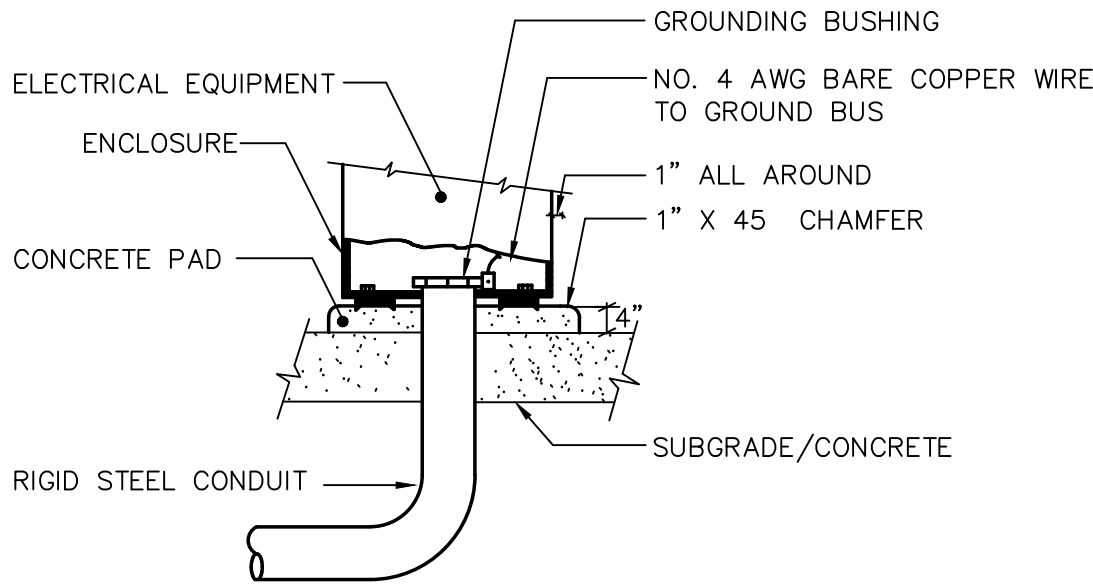
ELECTRICAL NOTES:

1. ALL WORK TO BE COMPLETED IN ACCORDANCE WITH THE LATEST APPLICABLE STANDARDS OF ANSI, NEMA, UL, NFPA-70, AND THE MASSACHUSETTS ELECTRICAL CODE WITH REGARDS TO MATERIAL, DESIGN, AND CONSTRUCTION.
2. THIS DRAWING IS FOR INFORMATION ONLY. THE CONTRACTOR SHALL VERIFY ALL LOCATIONS, DEVICES, MATERIALS, AND EQUIPMENT, PRIOR TO THE START OF ANY WORK.
3. CONTRACTOR SHALL NOTIFY DIG SAFE AT 1-888-DIG-SAFE, AT LEAST 72 HOURS PRIOR TO BEGINNING ANY EXCAVATION.
4. PVC CONDUIT AND FITTINGS SHALL CONFORM TO ANSINEMA SPECIFICATIONS, TC-2, TC-3 AND UL-651.
5. CONTRACTOR SHALL OBTAIN ALL NECESSARY INSPECTIONS AND COORDINATE ALL WORK WITH THE OWNER AND THE CITY OF WORCESTER. TRENCHES SHALL BE INSPECTED PRIOR TO BACKFILLING.
6. LOCATIONS OF ALL UTILITIES ARE APPROXIMATE AND ARE PROVIDED FOR INFORMATION ONLY.
7. CONTRACTOR TO BALANCE THE NUMBER OF LIGHTING FIXTURES ON EACH CIRCUIT
8. CONTRACTOR TO LOCATE ALL ELECTRICAL EQUIPMENT AS DIRECTED BY THE OWNER, ARCHITECT & ENGINEER.

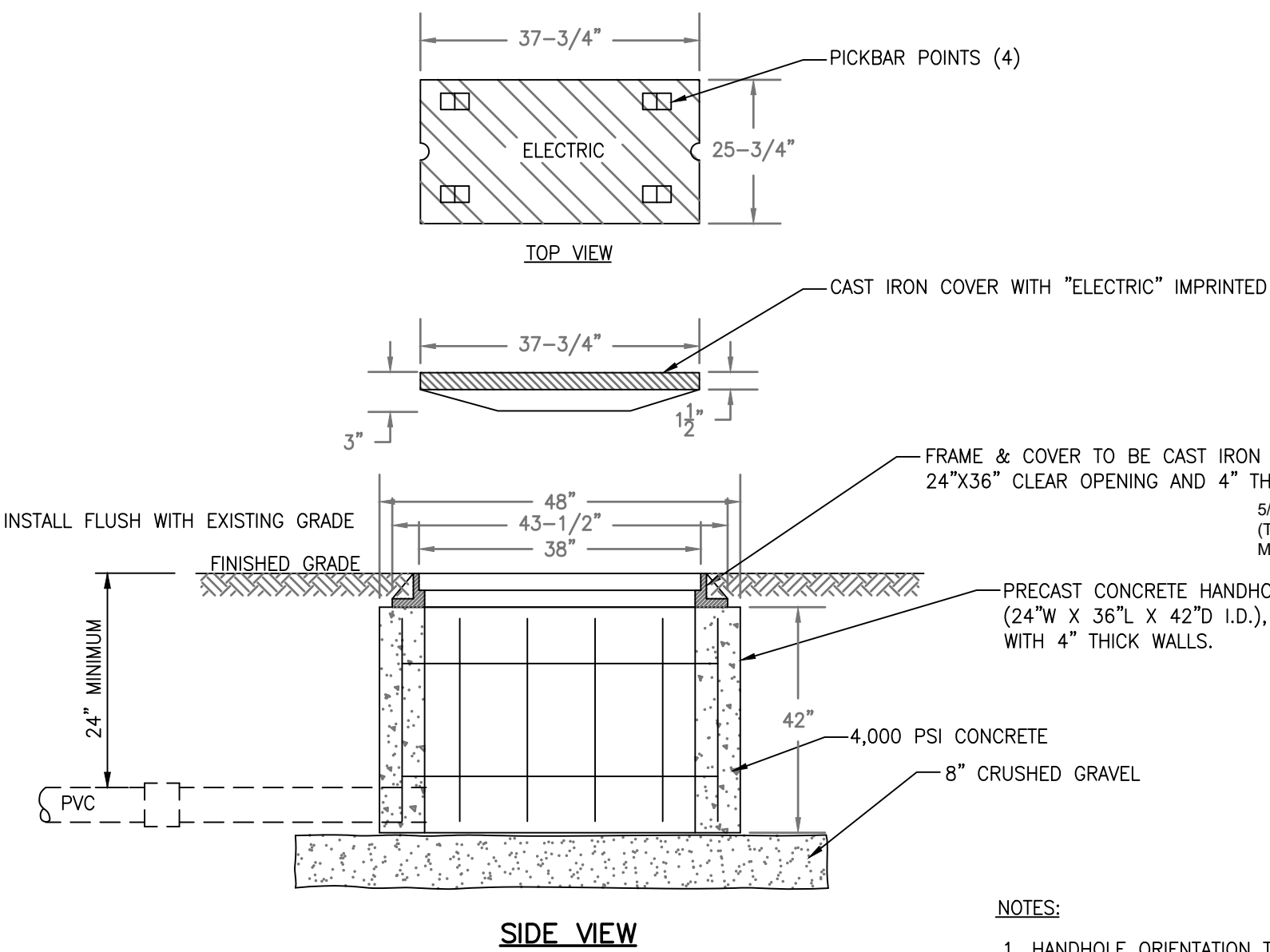
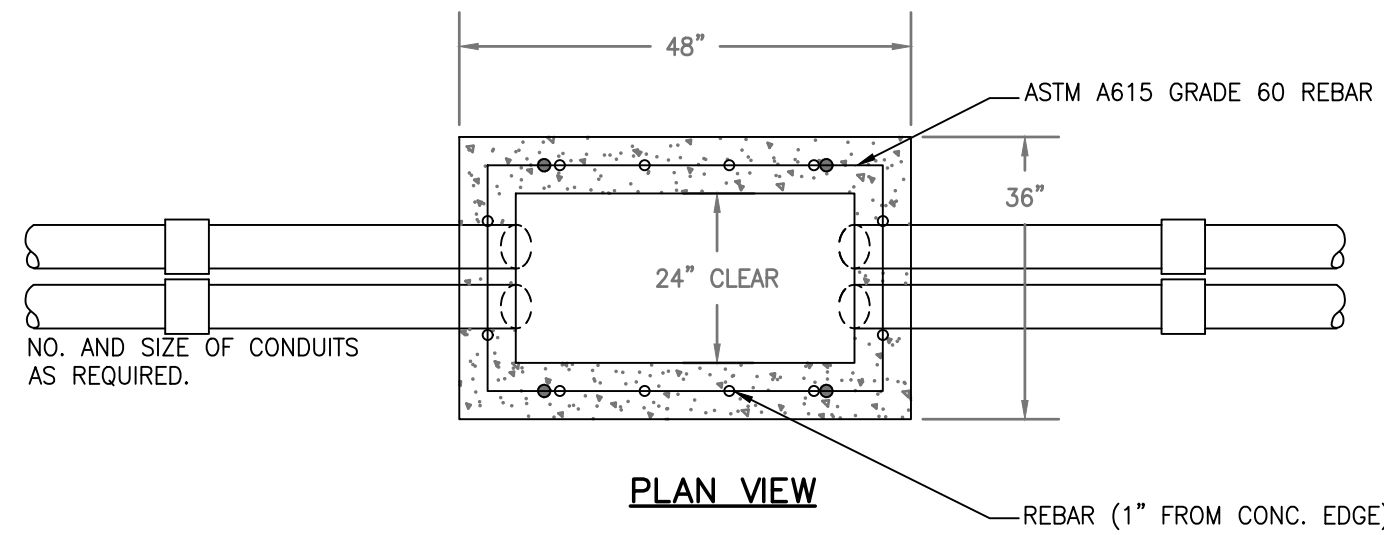
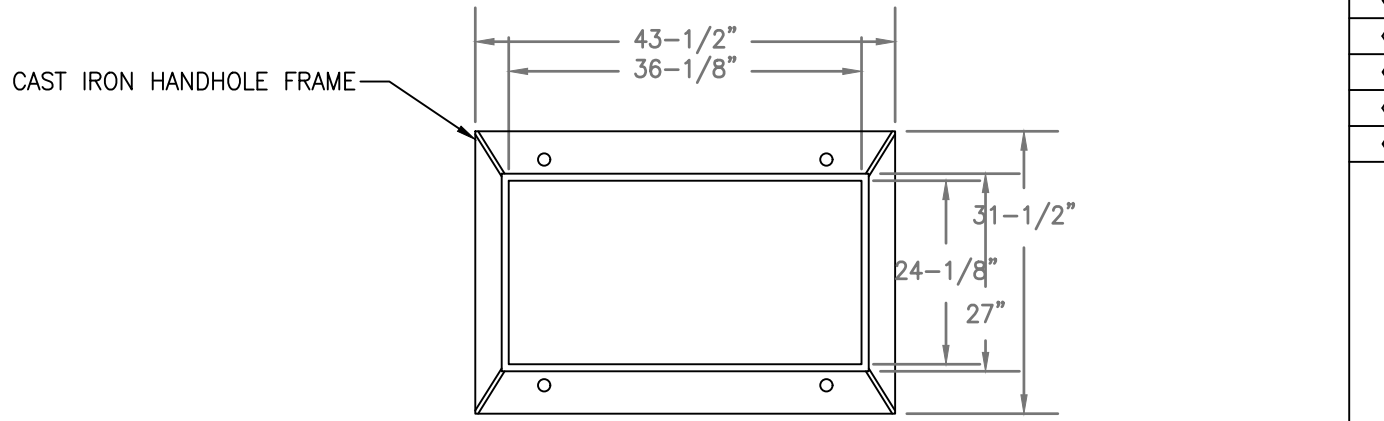
LEGEND OF FEEDER SIZES - COPPER CONDUCTORS					
FEEDER SYMBOL	CONDUCTORS (3 PHASE, 3 WIRE) WITH GROUND	MINIMUM RACEWAY SIZE	CONDUCTORS (3 PHASE, 4 WIRE) WITH GROUND	MINIMUM RACEWAY SIZE	NOMINAL AMPERE RATING
①	3-6 AWG & 1-10 AWG GND.	3/4"	4-6 AWG & 1-10 AWG GND.	1"	60
②					
③	3-4 AWG & 1-8 AWG GND.	1"	4-4 AWG & 1-8 AWG GND.	1 1/4"	70
④					
⑤	3-1 AWG & 1-8 AWG GND.	1 1/4"	4-1 AWG & 1-8 AWG GND.	1 1/2"	100
⑥					
⑦	3-1 AWG & 1-6 AWG GND.	1 1/2"	4-1 AWG & 1-6 AWG GND.	2"	125
⑧					
⑨	3-1/0 AWG & 1-6 AWG GND.	1 1/2"	4-1/0 AWG & 1-6 AWG GND.	2"	150
⑩					
⑪	3-2/0 AWG & 1-6 AWG GND.	2"	4-2/0 AWG & 1-6 AWG GND.	2"	175
⑫					
⑬	3-3/0 AWG & 1-6 AWG GND.	2"	4-3/0 AWG & 1-6 AWG GND.	2"	200
⑭					
⑮	3-4/0 AWG & 1-4 AWG GND.	2"	4-4/0 AWG & 1-6 AWG GND.	2 1/2"	225
⑯					
⑰	3-250 KCMIL & 1-4 AWG GND.	2 1/2"	4-250 KCMIL & 1-4 AWG GND.	3"	250
⑱					
⑲	3-350 KCMIL & 1-4 AWG GND.	3"	4-350 KCMIL & 1-4 AWG GND.	3"	300
㉑					
㉒	3-500 KCMIL & 1-3 AWG GND.	3"	4-500 KCMIL & 1-3 AWG GND.	4"	350
㉓					
㉔	3-600 KCMIL & 1-3 AWG GND.	3"	4-600 KCMIL & 1-3 AWG GND.	4"	400
㉕					
㉖	6-250 KCMIL & 2-2 AWG GND.	2-2 1/2"	8-250 KCMIL & 2-2 AWG GND.	2-3"	500
㉗					
㉘	6-350 KCMIL & 2-1 AWG GND.	2-3"	8-350 KCMIL & 2-1 AWG GND.	2-3 1/2"	600
㉙					
㉚	6-600 KCMIL & 2-1/0 AWG GND.	2-3 1/2"	8-600 KCMIL & 2-1/0 AWG GND.	2-4"	800
㉛					
㉜	9-400 KCMIL & 3-2/0 AWG GND.	3-3"	12-400 KCMIL & 3-2/0 AWG GND.	3-3 1/2"	1000
㉝					
㉞	9-600 KCMIL & 3-3/0 AWG GND.	3-3 1/2"	12-600 KCMIL & 3-3/0 AWG GND.	3-3 1/2"	1200
㉟					
㊱	12-800 KCMIL & 4-4/0 AWG GND.	4-3 1/2"	16-800 KCMIL & 4-4/0 AWG GND.	4-3 1/2"	1600
㊲					
㊳	15-600 KCMIL & 5-250 KCMIL GND.	5-3 1/2"	20-600 KCMIL & 5-250 KCMIL GND.	5-3 1/2"	2000
㊴					
㊵	18-600 KCMIL & 6-350 KCMIL GND.	6-3 1/2"	24-600 KCMIL & 6-350 KCMIL GND.	6-3 1/2"	2500
㊶					
㊷	24-500 KCMIL & 8-400 KCMIL GND.	8-3 1/2"	32-500 KCMIL & 8-400 KCMIL GND.	8-4"	3000
㊸					
㊹	24-600 KCMIL & 8-500 KCMIL GND.	8-3 1/2"	32-600 KCMIL & 8-500 KCMIL GND.	8-3 1/2"	3200
㊺					
㊻	27-600 KCMIL & 9-500 KCMIL GND.	9-3 1/2"	36-600 KCMIL & 9-500 KCMIL GND.	9-3 1/2"	3500
㊼					
㊽	30-600 KCMIL & 10-500 KCMIL GND.	10-3 1/2"	40-600 KCMIL & 10-500 KCMIL GND.	10-3 1/2"	4000
㊾					
■ DENOTES ADDITIONAL INSULATED/ISOLATED GROUND WIRE REQUIRED FOR ALL FEEDERS TO PANELBOARDS SERVING ISOLATED GROUND RECEPTABLES REFER TO ISOLATED GROUNDING DETAIL FOR ADDITIONAL INFORMATION					
* DENOTES ADDITIONAL NEUTRAL CONDUCTOR REQUIRED (2009) FOR ALL FEEDERS TO PANELBOARD					
EXAMPLES					
■ ② 4-6 AWG, 1-10 AWG IG & 1-10 AWG GND. - 1" CONDUIT					
* ② 3-6 AWG, 1-1 AWG NEUTRAL & 1-10 AWG GND. - 1 1/2" CONDUIT					

BRANCH CIRCUITS SCHEDULE	
120 OR 277 VOLT 1Ø, 2W. CIRCUITS	
CIRCUIT BREAKER	CONDUCTOR
30A-1P	2#10+1#10 GND. - 3/4"C
40A-1P	2#8+1#10 GND. - 3/4"C
50A-1P	2#6+1#10 GND. - 3/4"C
60A-1P	2#6+1#10 GND. - 3/4"C
208 VOLT 1Ø, 2W. CIRCUITS	
CIRCUIT BREAKER	CONDUCTOR
20A-2P	2#12+1#12 GND. - 3/4"C
30A-2P	2#10+1#10 GND. - 3/4"C
40A-2P	2#8+1#10 GND. - 3/4"C
50A-2P	2#6+1#10 GND. - 3/4"C
60A-2P	2#6+1#10 GND. - 3/4"C
208/120 VOLT, 1Ø, 3W CIRCUITS	
CIRCUIT BREAKER	CONDUCTOR
20A-2P	3#12+1#12 GND. - 3/4"C
30A-2P	3#10+1#10 GND. - 3/4"C
40A-2P	3#8+1#10 GND. - 3/4"C
50A-2P	3#6+1#10 GND. - 3/4"C
60A-2P	3#6+1#10 GND. - 3/4"C
208 OR 480 VOLTS, 3Ø, 3W CIRCUITS	
CIRCUIT BREAKER	CONDUCTOR
20A-3P	3#12+1#12 GND. - 3/4"C
30A-3P	3#10+1#10 GND. - 3/4"C
40A-3P	3#8+1#10 GND. - 3/4"C
50A-3P	3#6+1#10 GND. - 3/4"C
60A-3P	3#6+1#10 GND. - 3/4"C
208Y/120 & 480Y/277 VOLT, 3Ø,4W CIRCUITS	
CIRCUIT BREAKER	CONDUCTOR
20A-3P	4#12+1#12 GND. - 3/4"C
30A-3P	4#10+1#10 GND. - 3/4"C
40A-3P	4#8+1#10 GND. - 3/4"C
50A-3P	4#6+1#10 GND. - 1"C
60A-3P	4#6+1#10 GND. - 1"C

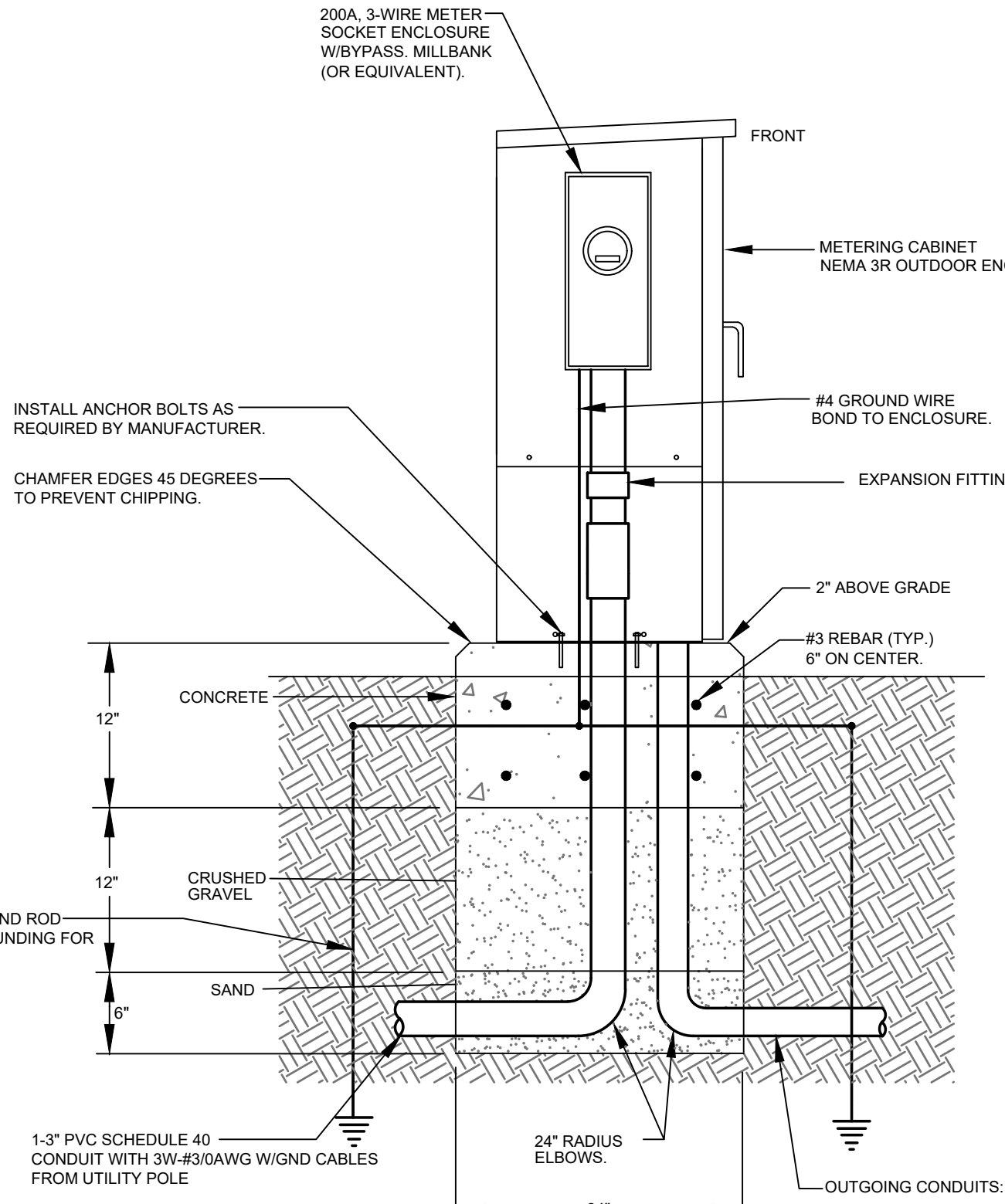
DISTRIBUTION PANEL SCHEDULE - ELEC CABINET PANEL (30CKT MIN.)					
PHASE: 1		WIRES: 3	VOLTAGE: 120/240V	MAINS: 200A. MAIN C.B.	
CIRCUIT	BREAKER		TRIP	DESCRIPTION OF LOAD	REMARKS
	FRAME	POLES(N-NEUTRAL)			
M	200	2P	200	MAIN CIRCUIT BREAKER	3W#3/0AWG W/#6GND IN 3" PVC
1	20	2P	20	PATHWAY LIGHTING	3W#4AWG W/#4GND IN 2" PVC
2	30	2P	30	BASKETBALL #1 LIGHTING	3W#4AWG W/#4GND IN 3" PVC
3	30	2P	30	BASKETBALL #2 LIGHTING	3W#4AWG W/#4GND IN 3" PVC
4	20	1P	20	GFCI IN CABINET & LIGHT	2W-#12 W/GND IN 3/4" EMT
5	20	1P	20	SPORTLIGHTING CONTROLLER POWER	2W-#12 W/GND IN 3/4" EMT
6	20	1P	20	GAZEBO LIGHT AND RECEPTACLE	2W-#10 W/GND IN 1" PVC/RGS
7	20	1P	20	COMMUNITY GARDEN RECEPTACLE	2W-#10 W/GND IN 1" PVC
8	20	1P	20	PATHWAY LIGHTING (POLE TOP RECEPTABLES)	3W#4AWG W/#4GND IN 2" PVC
9					
10					



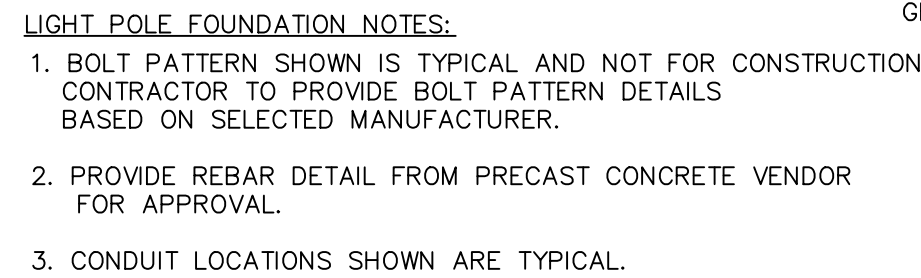
CONDUIT ENTRANCE FROM BELOW
NOT TO SCALE



TYPICAL HANDHOLE INSTALLATION DETAIL
SCALE: NOT TO SCALE



50 SKYLINE DRIVE
WORCESTER, MASSACHUSETTS

E3

Grant Park Basketball

Worcester, MA

Lighting System

Pole / Fixture Summary						
Pole ID	Pole Height	Mtg Height	Fixture Qty	Luminaire Type	Load	Circuit
P1-P2	40'	40'	2	TLC-LED-600	1.16 kW	A
		40'	1	TLC-LED-900	0.89 kW	A
		25'	1	CREE OSQ	0.10 kW	B
2			8		4.31 kW	

Circuit Summary				
Circuit	Description		Load	Fixture Qty
A	Basketball		4.1 kW	6
B	Security		0.21 kW	2

Fixture Type Summary							
Type	Source	Wattage	Lumens	L90	L80	L70	Quantity
TLC-LED-900	LED 5700K - 75 CRI	890W	89,600	>120,000	>120,000	>120,000	2
TLC-LED-600	LED 5700K - 75 CRI	580W	65,600	>120,000	>120,000	>120,000	4
CREE OSQ	LED 5700K - 70 CRI	104W	15,939	--	--	--	2

Light Level Summary

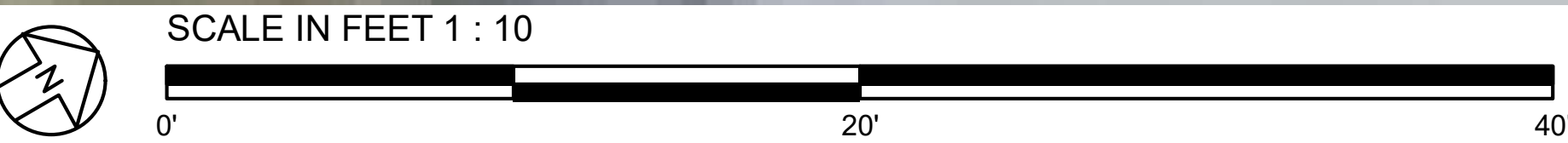
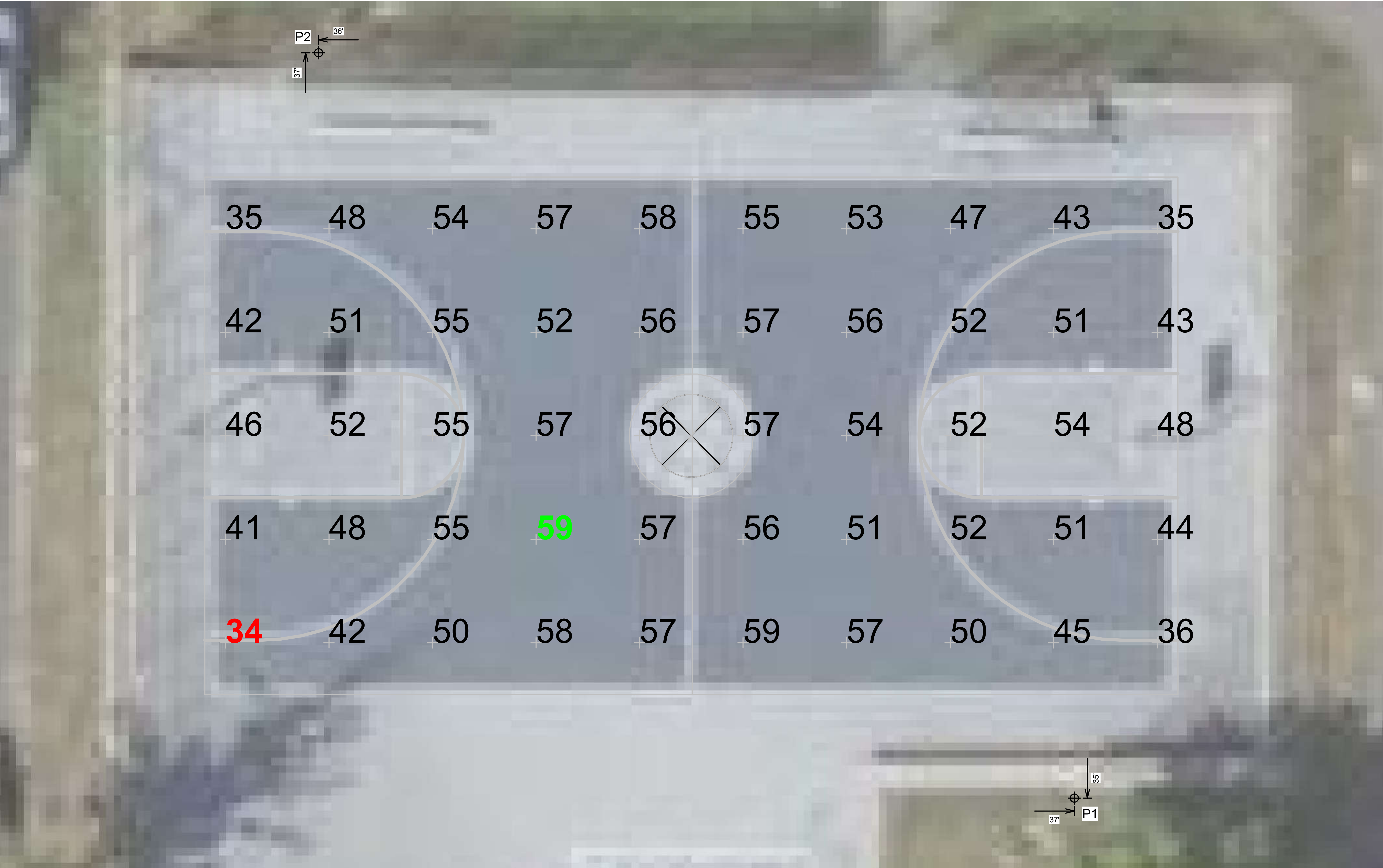
Calculation Grid Summary									
Grid Name	Calculation Metric	Illumination					Circuits	Fixture Qty	
		Ave	Min	Max	Max/Min	Ave/Min			
Basketball	Horizontal Illuminance	50.7	34	59	1.76	1.49	A	6	

From Hometown to Professional



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EQUIPMENT LIST FOR AREAS SHOWN								
Pole				Luminaires				
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE	THIS GRID	OTHER GRIDS
2	P1-P2	40'	-	40'	TLC-LED-600	2	2	0
				25'	CREE OSQ	1	0	1
				40'	TLC-LED-900	1	1	0
2	TOTALS					8	6	2



Pole location(s) ⦿ dimensions are relative to 0,0 reference point(s) ⊗

Grant Park Basketball

Worcester, MA

GRID SUMMARY	
Name:	Basketball
Size:	94' x 50'
Spacing:	10.0' x 10.0'
Height:	3.0' above grade

ILLUMINATION SUMMARY	
MAINTAINED HORIZONTAL FOOTCANDLES	
	Entire Grid
Guaranteed Average:	50
Scan Average:	50.7
Maximum:	59
Minimum:	34
Avg / Min:	1.50
Guaranteed Max / Min:	2
Max / Min:	1.76
UG (adjacent pts):	1.36
CU:	0.54
No. of Points:	50
LUMINAIRE INFORMATION	
Applied Circuits:	A
No. of Luminaires:	6
Total Load:	4.1 kW

Guaranteed Performance: The ILLUMINATION described above is guaranteed per your Musco Warranty document and includes a 0.95 dirt depreciation factor.

Field Measurements: Individual field measurements may vary from computer-calculated predictions and should be taken in accordance with IESNA RP-6-15.

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.



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ILLUMINATION SUMMARY

Grant Park Basketball

Worcester, MA

EQUIPMENT LAYOUT

INCLUDES:

· Basketball

Electrical System Requirements: Refer to Amperage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.

Installation Requirements: Results assume ± 3% nominal voltage at line side of the driver and structures located within 3 feet (1m) of design locations.

EQUIPMENT LIST FOR AREAS SHOWN

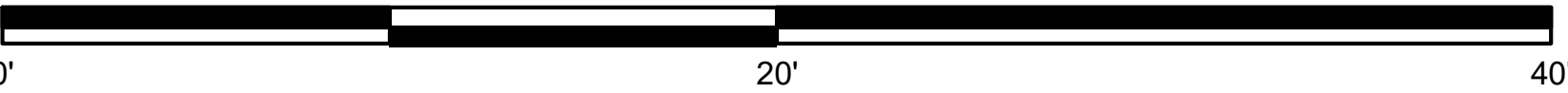
Pole				Luminaires		
QTY	LOCATION	SIZE	GRADE ELEVATION	MOUNTING HEIGHT	LUMINAIRE TYPE	QTY / POLE
2	P1-P2	40'	-	40'	TLC-LED-600	2
				25'	CREE OSQ	1
				40'	TLC-LED-900	1
2	TOTALS					8

SINGLE LUMINAIRE AMPERAGE DRAW CHART

Ballast Specifications (.90 min power factor)	Line Amperage Per Luminaire (max draw)						
	208 (60)	220 (60)	240 (60)	277 (60)	347 (60)	380 (60)	480 (60)
Single Phase Voltage	5.3	5.0	4.6	4.0	3.2	2.9	2.3
TLC-LED-900	3.4	3.2	3.0	2.6	2.0	1.9	1.5
TLC-LED-600	-	-	-	-	0.3	-	0.2
Cree OSQ	-	-	-	-	-	-	-



SCALE IN FEET 1 : 10



ENGINEERED DESIGN By: · File #170528A · 10-Mar-22

Pole location(s) ⚓ dimensions are relative to 0,0 reference point(s) ⊗



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