SOUTH WORCESTER PLAYGROUND IMPROVEMENTS
PHASE III
WORCESTER, MASSACHUSETTS
BID DOCUMENTS
05-23-23

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LOCATION MAP
47 CAMP STREET
WORCESTER, MA 01603

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MASSACHUSETTS
RAYMOND L. DUNETZ
NO. 1015
REGISTERED LANDSCAPE ARCHITECT

Sheet No.: L-0
Sheet Name.: COVER SHEET

Contract No.	
Date	05.23.23
Scale	N/A
Drawn	MS
Checked	RD

Project Name.: SOUTH WORCESTER PLAYGROUND IMPROVEMENTS PHASE III WORCESTER, MA

LIST OF ABBREVIATIONS

@	AT
&	AND
∠	ANGLE
⌒10'	ARC LENGTH
ALT	ALTERNATIVE
APPROX	APPROXIMATE
B&B	BALLED AND BURLAPPED
B.C.	BOTTOM OF CURB
BLDG.	BUILDING
BF	BOTTOM OF FENCE
BOF	BOTTOM OF FOOTING
BW	BOTTOM OF WALL
B/S	BOTH SIDES
BS	BOTTOM OF STEP
B/W	BOTH WAYS
BIT. CONC.	BITUMINOUS CONCRETE
CAL.	CALIPER
C.I.P.	CAST IN PLACE
CB	CATCH BASIN
℄	CENTERLINE
CLF	CHAIN LINK FENCE
CIR.	CIRCLE
CLR.	CLEAR
CNTL.	CONTROL
COMP.	COMPACTED
CONC.	CONCRETE
CONT.	CONTINUOUS
CW	COLD WATER
ØDIA.	DIAMETER
DIM.	DIMENSION
DIMEN.	DIMENSION
E.F.	EACH FACE
EJ	EXPANSION JOINT
EA.	EACH
EL.	ELEVATION
ELEC.	ELECTRICAL LINE
ELEV.	ELEVATION
EQ.	EQUAL
EX	EXISTING
FDN.	FOUNDATION
FG	FINISH GRADE
FIN. GR.	FINISH GRADE
FTG.	FOOTING
FTN.	FOUNTAIN
H.D. GALV.	HOT DIP GALVANIZED
HP	HIGH POINT
HORIZ.	HORIZONTAL
HR	HANDRAIL
HT.	HEIGHT
I.D.	INSIDE DIAMETER
INV.	INVERT ELEVATION
JT.	JOINT
L	LENGTH
L.P.	LIGHT POLE
LOW	APPROXIMATE LIMIT OF WORK
LP	LOW POINT
MAX.	MAXIMUM
MEG.	MATCH EXISTING GRADE
MH	MANHOLE
MIN	MINIMUM
NIC	NOT IN CONTRACT
NO.	NUMBER
NTS	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
OWH	OVERHEAD WIRES
OPP.	OPPOSITE
%	PERCENT
PERF.	PERFORATED
PIP	POURED IN PLACE SURFACE
PLTG.	PLANTING
P.O.B.	POINT OF BEGINNING
PVG.	PAVING
PVMT.	PAVEMENT
R	RADIUS
RP	RADIUS POINT
REINF.	REINFORCEMENT
REQ.	REQUIRED
SC	SAWCUT
SIM.	SIMILAR
SPRD.	SPREAD
SS	STAINLESS STEEL
T	TANGENT
TC	TOP OF CURB
TH	THRESHOLD
TF	TOP OF FENCE
T.O.F.	TOP OF FOOTING
TS	TOP OF STEP
TW	TOP OF WALL
TYP.	TYPICAL
UP	UTILITY POLE
VERT.	VERTICAL
VIF	VERIFY IN FIELD
W	WATER LINE
W/	WITH
W/G	WATER GATE

LEGENDS

SITE PREPARATION PLAN

- LOW — APPROXIMATE LIMIT OF WORK
- REMOVE EX. BIT. CONC. PAVING
- REMOVE EX. CONC. PAVING
- STRIP LAWN AND TOPSOIL
- REMOVE EX. CONC. WALL
- REMOVE EX. CHAIN LINK FENCE
- STRAW WATTLE
- SAWCUT EX. PAVEMENT
- CONSTRUCTION FENCE
- REMOVE EX. TREE

LAYOUT & MATERIAL PLANS

- NEW CONCRETE PAVING
- NEW BIT. CONC. PAVING
- NEW BONDED RUBBER SURFACING
- NEW PEDESTRIAN LIGHT
- NEW SPORTS LIGHT
- NEW 16' HT. CHAIN LINK FENCE
- NEW 10' HT. CHAIN LINK FENCE

GRADING PLAN

- EXISTING CONTOUR
- NEW 1' CONTOUR
- +17.10 NEW SPOT GRADE
- +17.10 EX. SPOT GRADE
- 4.8 % DIRECTION OF SLOPE AND PERCENTAGE

PLANTING PLAN

- NEW SHADE TREE
- NEW SEEDED LAWN

GENERAL NOTES:

1. CONTRACTOR SHALL BECOME FAMILIAR WITH DRAWINGS AND SPECIFICATIONS PRIOR TO SUBMITTING A BID.
2. CONTRACTOR SHALL CONFORM TO ALL FEDERAL, STATE AND LOCAL CODES.
3. CONTRACTOR SHALL SECURE ALL PERMITS THAT MAY BE REQUIRED FROM ALL JURISDICTIONS AFFECTED BY THIS WORK.
4. PRIOR TO COMMENCING ANY WORK, THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN ACCORDANCE WITH THE "DIG SAFE" NOTIFICATION PROCEDURES PROMOTED BY RESPECTIVE UTILITY COMPANIES. THE DIG SAFE TELEPHONE NUMBER FOR MASSACHUSETTS IS 811.
5. CONTRACTOR SHALL INSTALL ALL REQUIRED EROSION AND SEDIMENTATION CONTROL MEASURES PRIOR TO UNDERTAKING SITE DEMOLITION AND REMOVALS. EROSION CONTROL MEASURES SHALL REMAIN IN PLACE DURING CONSTRUCTION.
6. STORAGE AREAS FOR CONTRACTOR'S EQUIPMENT AND MATERIALS SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE.
7. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS. ANY MUD ON PUBLIC WAYS ORIGINATING FROM THE JOB SITE SHALL BE CLEANED BY THE CONTRACTOR.
8. CONTRACTOR'S EQUIPMENT AND VEHICLES SHALL BE PARKED ON PAVED SURFACES ONLY.
9. CONTRACTOR CAN REQUEST ADDITIONAL STAGING AREAS WITHIN THE LIMIT OF WORK. ALL STAGING AREAS REQUESTED BY THE CONTRACTOR, SHALL PROVIDE PROTECTION OF THE GROUND PER THE SPECIFICATIONS. NO ADDITIONAL COST SHALL BE REQUESTED FOR ADDITIONAL STAGING AREAS WITHIN THE LIMIT OF WORK.
10. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL CONDITIONS TO THE OWNER'S REPRESENTATIVE PRIOR TO STARTING WORK.
11. APPROXIMATE LIMIT OF WORK IS SHOWN ON THE DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE DUE TO OPERATIONS INSIDE AND OUTSIDE OF THE CONTRACT LIMIT LINE. ANY AREA OUTSIDE THE LIMIT OF WORK THAT IS DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
12. CONTRACTOR RESPONSIBLE FOR WORK SITE TO BE SECURE DURING CONSTRUCTION.

UTILITIES NOTES:

1. THE LOCATIONS OF ALL UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE DIAGRAMMATIC ONLY. THE CONTRACTOR SHALL CONTACT THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANY TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST.
2. THE GENERAL CONTRACTOR SHALL MAINTAIN OR ADJUST TO NEW FINISH GRADE AS NECESSARY ALL UTILITY AND SITE STRUCTURES SUCH AS MANHOLES, CATCH BASINS, HAND HOLES, WATER AND GAS GATES, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEM UNLESS OTHERWISE NOTED ON THE UTILITY DRAWINGS OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
3. CONTRACTOR TO CLEAN ALL DRAINAGE STRUCTURES AND LINES WITHIN LIMIT OF WORK BEFORE SITE WORK BEGINS AND AT THE END OF THE PROJECT. CONTRACTOR TO PROVIDE SILT SACKS FOR ALL CATCH BASINS.

SITE PREPARATION NOTES:

1. ALL ITEMS REQUIRING REMOVAL SHALL BE REMOVED TO FULL DEPTH TO INCLUDE BASE MATERIAL AND FOOTINGS OR FOUNDATIONS AS APPLICABLE, AND REUSED AS DIRECTED BY THE OWNER OR LEGALLY DISPOSED OF OFF-SITE BY CONTRACTOR.
2. AT ALL LOCATIONS WHERE EXISTING CONCRETE PAVEMENT OR BITUMINOUS CONCRETE PAVEMENT ABUTS NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAWCUT TO A CLEAN, SMOOTH EDGE.
3. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS THAT ARE DUE TO CONSTRUCTION OPERATIONS.
4. CONTRACTOR TO BE AWARE THAT FENCES TO BE REMOVED ARE OF VARYING HEIGHTS.

LAYOUT AND MATERIALS NOTES:

1. ALL NEW SITE IMPROVEMENTS SHALL BE LAID OUT BY A REGISTERED CIVIL ENGINEER OR SURVEYOR ENGAGED BY THE CONTRACTOR.
2. ALL LINES AND DIMENSIONS ARE PARALLEL OR PERPENDICULAR TO THE LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE INDICATED.
3. ALL LAYOUTS FOR COURTS SHALL BE ADEQUATELY STAKED BY THE CONTRACTOR AND APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.
4. THE CONTRACTOR SHALL ESTABLISH PERMANENT CONSTRUCTION BENCHMARKS. MAINTAIN ALL ESTABLISHED BOUNDS AND BENCHMARKS AND REPLACE AS DIRECTED ANY WHICH ARE DESTROYED OR DISTURBED.
5. ALL SITE AMENITIES AND PAVEMENT MARKINGS, TO BE FIELD LOCATED AND APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
6. EQUIPMENT TO BE FIELD LOCATED BY OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.

GRADING NOTES:

1. CONTRACTOR SHALL VERIFY ALL EXISTING GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN EXISTING AND PROPOSED CONDITION TO THE OWNER'S REPRESENTATIVE.
2. COMPACT SUBGRADE PRIOR TO ANY FINISH GRADING. REMOVE ALL SOFT SPOTS OBSERVED OR IDENTIFIED IN FIELD.
3. PITCH EVENLY BETWEEN SPOT GRADES. ALL PAVED AREAS MUST PITCH TO DRAIN AT A MINIMUM SLOPE OF ONE-EIGHTH INCH (1/8") PER FOOT. ANY DISCREPANCIES NOT ALLOWING THIS TO OCCUR SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE PRIOR TO CONTINUING WORK.
4. CONTRACTOR SHALL BLEND NEW EARTHWORK SMOOTHLY INTO EXISTING, PROVIDING VERTICAL CURVES OR ROUNDINGS AT ALL TOP AND BOTTOM OF SLOPES.
5. ALL GRADING SHALL COMPLY WITH THE RULES AND REGULATIONS OF THE OFFICIAL MANUAL OF THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD AND THE AMERICANS WITH DISABILITIES ACT STANDARDS FOR BUILDINGS AND FACILITIES, LATEST EDITION. IN CASE OF CONFLICT BETWEEN REGULATIONS, THE GUIDELINE PROVIDING GREATER ACCESS SHALL APPLY.
6. CONTRACTOR SHALL MAINTAIN OR ADJUST TO PROPOSED FINISH GRADE AS NECESSARY ALL UTILITY AND SITE STRUCTURES SUCH AS MANHOLES, CATCH BASINS, HAND HOLES, WATER AND GAS GATES, HYDRANTS, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED ON UTILITY DRAWINGS OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
7. MAINTAIN THE INTEGRITY OF THE EXISTING DRAINAGE SYSTEM AT ALL TIMES, UNLESS OTHERWISE NOTED ON DRAWINGS.
8. MAXIMUM CROSS PITCH OF ALL WALKS IS 2%. ANY DISCREPANCIES NOT ALLOWING THIS TO OCCUR SHALL BE REPORTED TO THE OWNER'S REPRESENTATIVE.

PLANTING NOTES:

1. PROVIDE 6" DEPTH OF NEW OR EXISTING TOPSOIL AT ALL LAWN AREAS.
2. SEED ALL DISTURBED AREAS.
3. DISCREPANCIES EXIST BETWEEN THE NUMBER OF PLANTS DRAWN ON THE PLANTING PLAN AND THE NUMBER OF PLANTS IN THE PLANT SCHEDULE, THE PLANTING PLAN SHALL GOVERN.
4. ALL NEW PLANT MATERIAL SHALL CONFORM TO THE MINIMUM GUIDELINES ESTABLISHED FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC. IN ADDITION, ALL NEW PLANT MATERIAL FOR THE PROJECT SHALL BE OF SPECIMEN QUALITY.
5. ALL NEW PLANTS TO BE BALLED AND BURLAPPED OR CONTAINER-GROWN, UNLESS OTHERWISE NOTED ON THE PLANT SCHEDULE.
6. THE CONTRACTOR SHALL SUPPLY ALL NEW PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING SHOWN ON THE DRAWINGS.
7. ANY PROPOSED SUBSTITUTIONS OF PLANT SPECIES SHALL BE MADE WITH PLANTS OF EQUIVALENT OVERALL FORM, HEIGHT, BRANCHING HABIT, FLOWER, LEAF, COLOR, FRUIT AND CULTURE. ALL SUBSTITUTIONS SHALL REQUIRE WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
8. ALL NEW PLANTS SHALL BE TAGGED AND APPROVED BY THE OWNER'S REPRESENTATIVE AT THE NURSERY PRIOR TO DIGGING OR DELIVERY TO THE SITE.
9. CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LINES PRIOR TO PLANTING AND SHALL REPORT ANY CONFLICTS TO THE OWNERS REPRESENTATIVE.
10. CONTRACTOR SHALL STAKE LOCATION OF ALL PROPOSED PLANTING FOR APPROVAL BY OWNER'S REPRESENTATIVE PRIOR TO THE COMMENCEMENT OF PLANTING.
11. NEW TREES SHALL BE SET 3" HIGHER THAN PREVIOUS GRADE. NO TREE SHALL BE PLANTED BEFORE ACCEPTANCE OF ROUGH GRADING.
12. CONTRACTOR SHALL PROVIDE FULL DEPTHS OF LOAM AS NOTED ON DETAILS AND AS SPECIFIED, FOR ALL PLANTING.
13. IN AREAS WHERE EXISTING PAVEMENTS ARE REMOVED AND ARE PROPOSED AS TURF, THE CONTRACTOR SHALL REMOVE THE PAVEMENT AND BASE, DECOMPACT EXISTING SOILS, PROVIDE FILL AS REQUIRED, AND 6" TOPSOIL PRIOR TO SEEDING.
14. CONTRACTOR SHALL PROVIDE PRUNING BY CERTIFIED ARBORIST. PRUNING SHALL BE REVIEWED WITH OWNER'S REPRESENTATIVE PRIOR TO WORK.

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05-23-23 BID DOCUMENTS
DATE

REVISIONS

NORTH

STAMP

SOUTH WORCESTER PLAYGROUND IMPROVEMENTS PHASE III
WORCESTER, MA
PROJECT

NOTES, LEGENDS & ABBREVIATIONS
DRAWING TITLE

CONTRACT NO.	
DATE	05.23.23
DRAWN	MS
CKD	RD
SCALE	AS SHOWN

N-1
SHEET NO.

LEGEND

▦	CATCH BASIN
Ⓓ	DRAIN MANHOLE
Ⓔ	ELECTRIC MANHOLE
Ⓜ	MISCELLANEOUS MANHOLE
Ⓢ	SEWER MANHOLE
Ⓦ	WATER MANHOLE
WG	WATER GATE
	FIRE HYDRANT
UP	UTILITY POLE
UP W/ UE	UTILITY POLE WITH CONDUIT LINE TO GROUND
	LIGHT POLE
HH	HAND HOLE
TC	TRASH CAN
S	SIGN POST
TRSG	TRAFFIC SIGNAL
12"	DECIDUOUS TREE WITH TRUNK DIAMETER
472x33	SPOT ELEVATION
CLF	CHAIN LINK FENCE
VGC	VERTICAL GRANITE CURB
WCR	WHEELCHAIR RAMP
R=	RIM ELEVATION EQUALS
I=	INVERT ELEVATION EQUALS
DWP	DETECTABLE WARNING PANEL
D	UNDERGROUND DRAIN LINE
S	UNDERGROUND SEWER LINE
W	UNDERGROUND WATER LINE
OHW	OVERHEAD WIRES
	BENCH MARK

NOTES

1. THIS DOCUMENT IS AN INSTRUMENT OF SERVICE OF NITSCH ENGINEERING. IT IS ISSUED TO RDLA FOR PURPOSES RELATED DIRECTLY AND SOLELY TO NITSCH ENGINEERING'S SCOPE OF SERVICES UNDER CONTRACT WITH RDLA FOR SOUTH WORCESTER PLAYGROUND. ANY USE OR REUSE OF THIS DOCUMENT FOR ANY REASON BY ANY PARTY FOR PURPOSES UNRELATED DIRECTLY AND SOLELY TO SAID CONTRACT AND PROJECT SHALL BE AT THE USER'S SOLE AND EXCLUSIVE RISK AND LIABILITY, INCLUDING LIABILITY FOR VIOLATION OF COPYRIGHT LAWS, UNLESS WRITTEN AUTHORIZATION IS GIVEN THEREFOR BY NITSCH ENGINEERING.

2. THE PURPOSE OF THIS PLAN IS TO SHOW EXISTING CONDITIONS AS THE RESULT OF AN ON-THE-GROUND INSTRUMENT SURVEY WHICH OCCURRED MAY 2022.

3. HORIZONTAL BEARINGS REFER TO MASSACHUSETTS STATE PLANE COORDINATE SYSTEM (NAD83) BASED ON GPS OBSERVATIONS.

4. ELEVATION REFERS TO NORTH AMERICAN VERTICAL DATUM (NAVD88) VERTICAL BASED ON GPS OBSERVATIONS.

5. THE INFORMATION CONTAINED ON THE DISK OR ELECTRONIC DRAWING FILE ACCOMPANYING THIS PLAN MUST BE COMPARED TO THE SEALED AND SIGNED HARD COPY OF THE PLAN TO ENSURE THE ACCURACY OF ALL INFORMATION AND TO ENSURE NO CHANGES, ALTERATIONS, OR MODIFICATIONS HAVE BEEN MADE. RELIANCE SHALL NOT BE MADE ON A DOCUMENT TRANSMITTED BY COMPUTER OR OTHER ELECTRONIC MEANS UNLESS FIRST COMPARED TO THE ORIGINAL SEALED DOCUMENT ISSUED AT THE TIME OF THE SURVEY. DUE TO THE CRITICAL NATURE OF SURVEYING, DATA ACQUISITION, AND AUTOCAD PLAN DEVELOPMENT, IF CRITICAL DIMENSIONAL INFORMATION IS NEEDED AND IS NOT SPECIFICALLY SHOWN ON THE ELECTRONIC DRAWING FILE, PLEASE CONTACT NITSCH ENGINEERING.

UTILITY INFORMATION STATEMENT

1. THE SUB-SURFACE UTILITY INFORMATION SHOWN HEREON IS COMPILED BASED ON FIELD SURVEY INFORMATION, RECORD INFORMATION AS SUPPLIED BY THE APPROPRIATE UTILITY COMPANIES, AND PLAN INFORMATION SUPPLIED BY THE CLIENT, IF ANY; THEREFORE WE CANNOT GUARANTEE THE ACCURACY OF SAID COMPILED SUB-SURFACE INFORMATION TO ANY CERTAIN DEGREE OF STATED TOLERANCE. ONLY PHYSICALLY LOCATED SUB-SURFACE UTILITY FEATURES FALL WITHIN NORMAL STANDARD OF CARE ACCURACIES.

2. THE LOCATIONS OF UNDERGROUND PIPES, CONDUITS, AND STRUCTURES HAVE BEEN DETERMINED FROM SAID INFORMATION, AND ARE APPROXIMATE ONLY. COMPILED LOCATIONS OF ANY UNDERGROUND STRUCTURES, NOT VISIBLY OBSERVED AND LOCATED, CAN VARY FROM THEIR ACTUAL LOCATIONS.

3. ADDITIONAL BURIED UTILITIES/STRUCTURES MAY BE ENCOUNTERED.

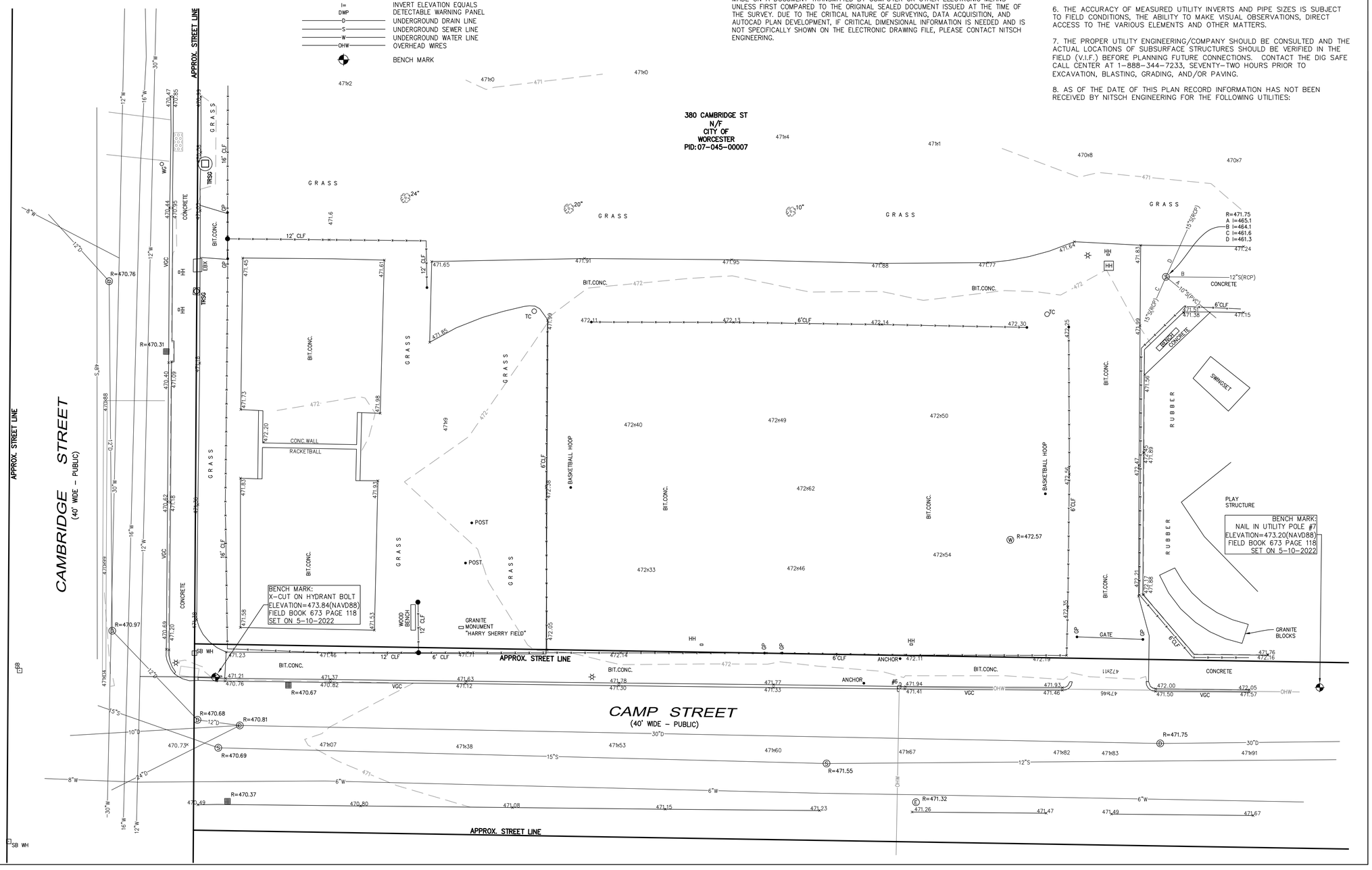
4. THE STATUS OF UTILITIES, WHETHER ACTIVE, ABANDONED, OR REMOVED, IS AN UNKNOWN CONDITION AS FAR AS OUR COMPILATION OF THIS INFORMATION.

5. IT IS INCUMBENT UPON INDIVIDUALS USING THIS INFORMATION TO UNDERSTAND THAT COMPILING UTILITY INFORMATION IS NOT EXACT, AND IS SUBJECT TO CHANGE BASED UPON VARYING PLAN INFORMATION RECEIVED AND ACTUAL LOCATIONS.

6. THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES IS SUBJECT TO FIELD CONDITIONS, THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS AND OTHER MATTERS.

7. THE PROPER UTILITY ENGINEERING/COMPANY SHOULD BE CONSULTED AND THE ACTUAL LOCATIONS OF SUBSURFACE STRUCTURES SHOULD BE VERIFIED IN THE FIELD (V.I.F.) BEFORE PLANNING FUTURE CONNECTIONS. CONTACT THE DIG SAFE CALL CENTER AT 1-888-344-7233, SEVENTY-TWO HOURS PRIOR TO EXCAVATION, BLASTING, GRADING, AND/OR PAVING.

8. AS OF THE DATE OF THIS PLAN RECORD INFORMATION HAS NOT BEEN RECEIVED BY NITSCH ENGINEERING FOR THE FOLLOWING UTILITIES:



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- Civil Engineering
- Land Surveying
- Transportation Engineering
- Structural Engineering
- Green Infrastructure
- Planning
- GIS

05-23-23 BID DOCUMENTS
DATE

REVISIONS

NORTH

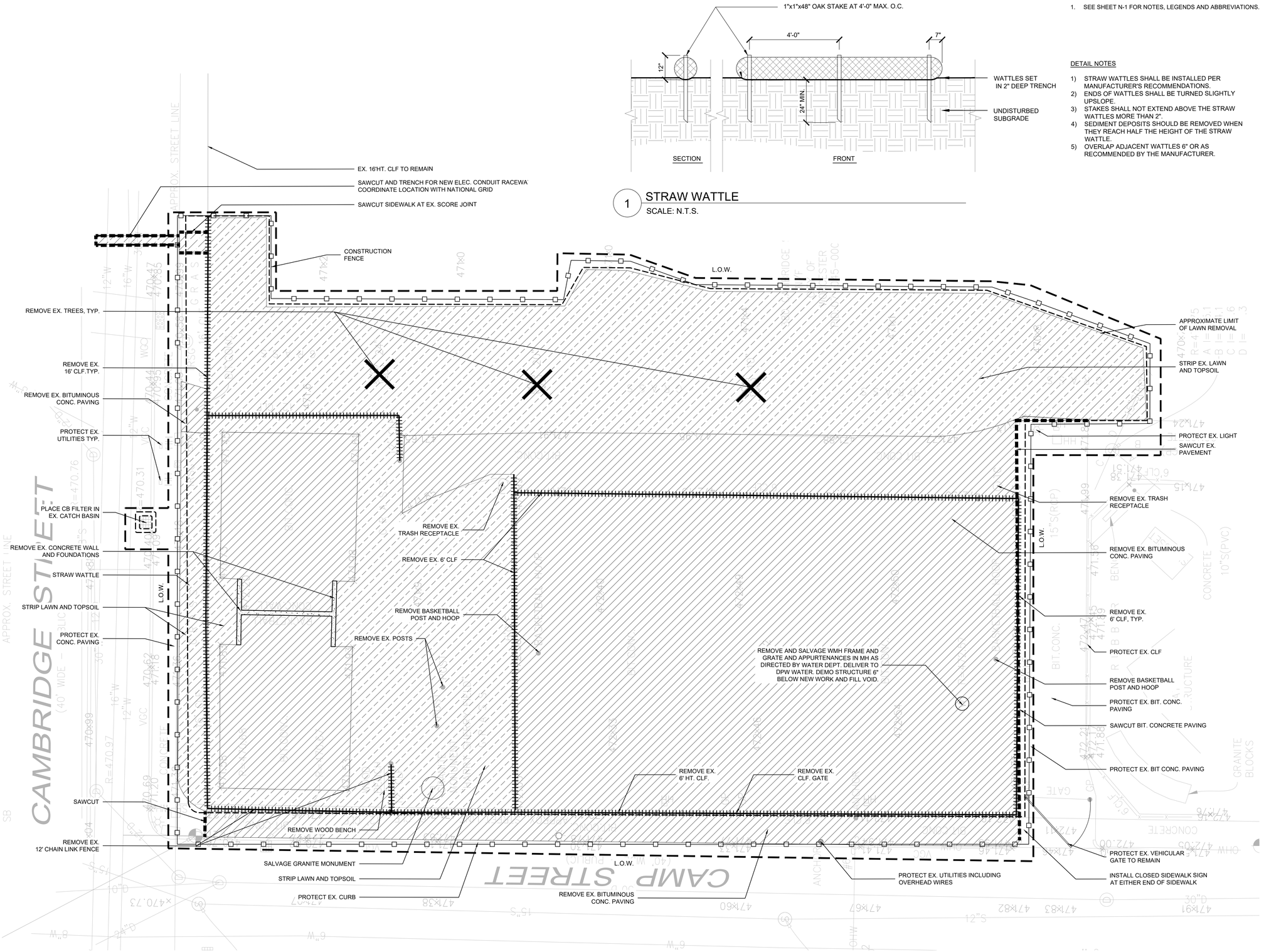
COMMONWEALTH OF MASSACHUSETTS
MARK E. VIOLETTE #40768
PROFESSIONAL LAND SURVEYOR
Mark Violette 5.23.23
STAMP

SOUTH WORCESTER PLAYGROUND IMPROVEMENTS PHASE III
WORCESTER, MA
PROJECT

EXISTING CONDITIONS
DRAWING TITLE

CONTRACT NO.	
DATE	05.23.23
DRAWN	CPH
CKD	MEV
SCALE	1"=10'

EX-1
SHEET NO.



1 STRAW WATTLE
SCALE: N.T.S.

1 SITE PREPARATION PLAN
SCALE: 1" = 10'-0"

NOTES:

1. SEE SHEET N-1 FOR NOTES, LEGENDS AND ABBREVIATIONS.

DETAIL NOTES

1) STRAW WATTLES SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
2) ENDS OF WATTLES SHALL BE TURNED SLIGHTLY UPSLOPE.
3) STAKES SHALL NOT EXTEND ABOVE THE STRAW WATTLES MORE THAN 2".
4) SEDIMENT DEPOSITS SHOULD BE REMOVED WHEN THEY REACH HALF THE HEIGHT OF THE STRAW WATTLE.
5) OVERLAP ADJACENT WATTLES 6" OR AS RECOMMENDED BY THE MANUFACTURER.

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WORCESTER, MA
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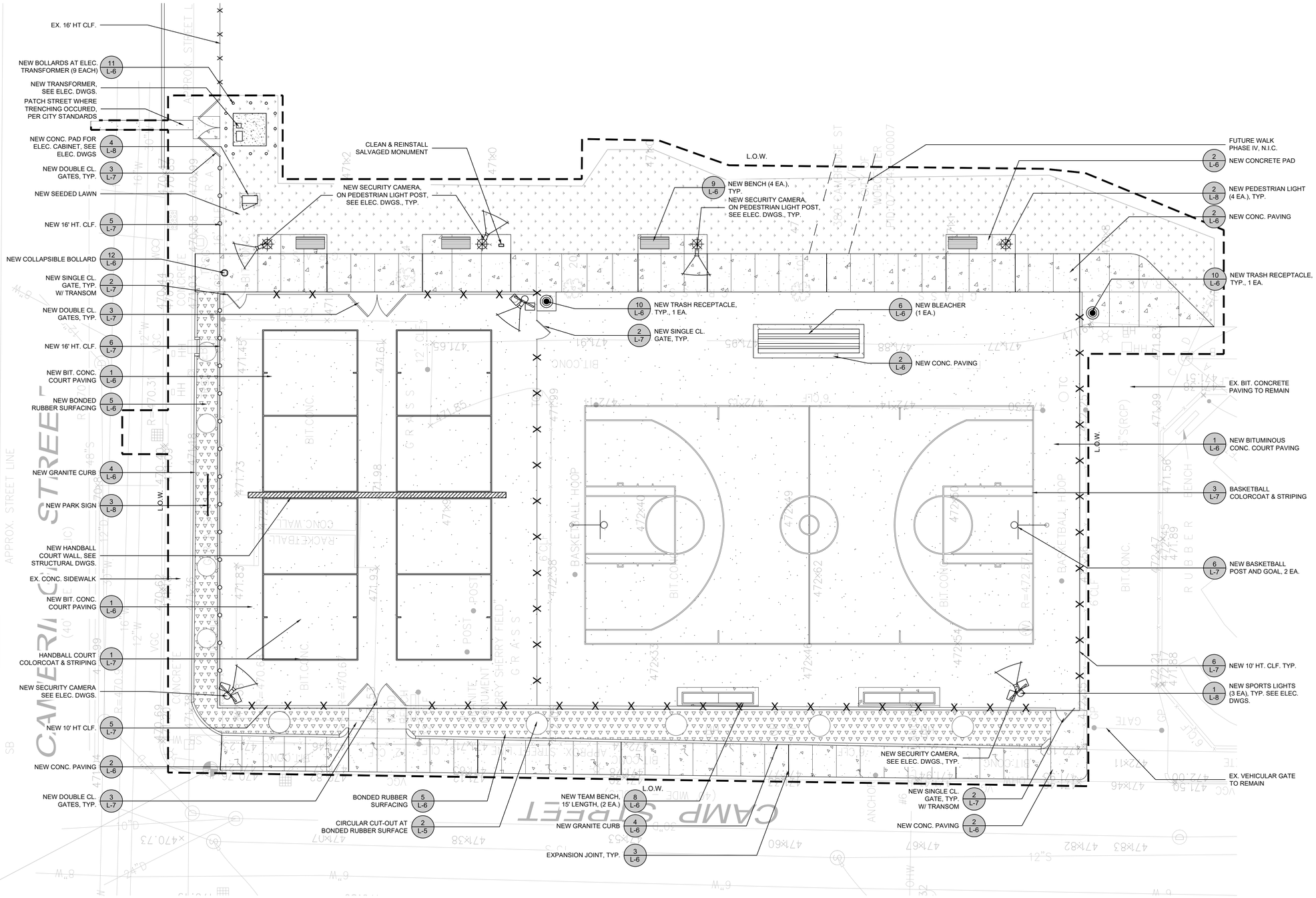
SITE PREPARATION PLAN
DRAWING TITLE

CONTRACT NO.	
DATE	05.23.23
DRAWN	MS
CKD	RD
SCALE	AS SHOWN

SHEET NO. L-1

NOTES:

1. SEE SHEET N-1 FOR NOTES, LEGENDS AND ABBREVIATIONS.
2. SEE ELECTRICAL DRAWINGS FOR HANDHOLE LOCATIONS.



1 MATERIALS PLAN
SCALE: 1" = 10'-0"

GRAPHIC SCALE IN FEET
0 10' 20' 40'

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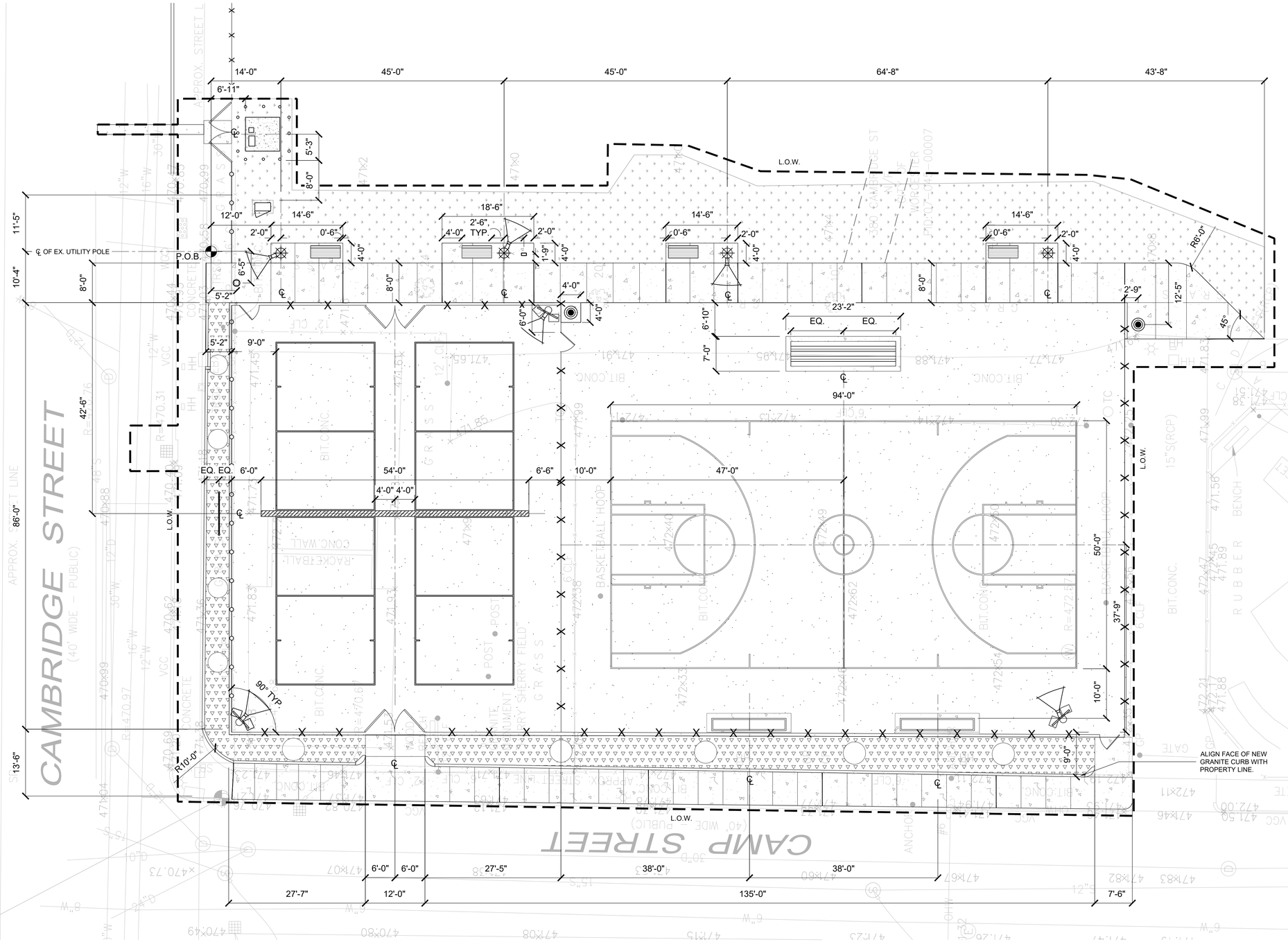
MATERIALS PLAN
DRAWING TITLE

CONTRACT NO.	
DATE	05.23.23
DRAWN	MS
CKD	RD
SCALE	AS SHOWN

L-2
SHEET NO.

NOTES:

1. SEE SHEET N-1 FOR NOTES, LEGENDS AND ABBREVIATIONS.



1 LAYOUT PLAN
SCALE: 1" = 10'-0"

GRAPHIC SCALE IN FEET
0 10' 20' 40'

WORCESTER
A TOWN JUNE 14, 1722 A CITY FEBY. 29, 1848

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WORCESTER, MA
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LAYOUT PLAN
DRAWING TITLE

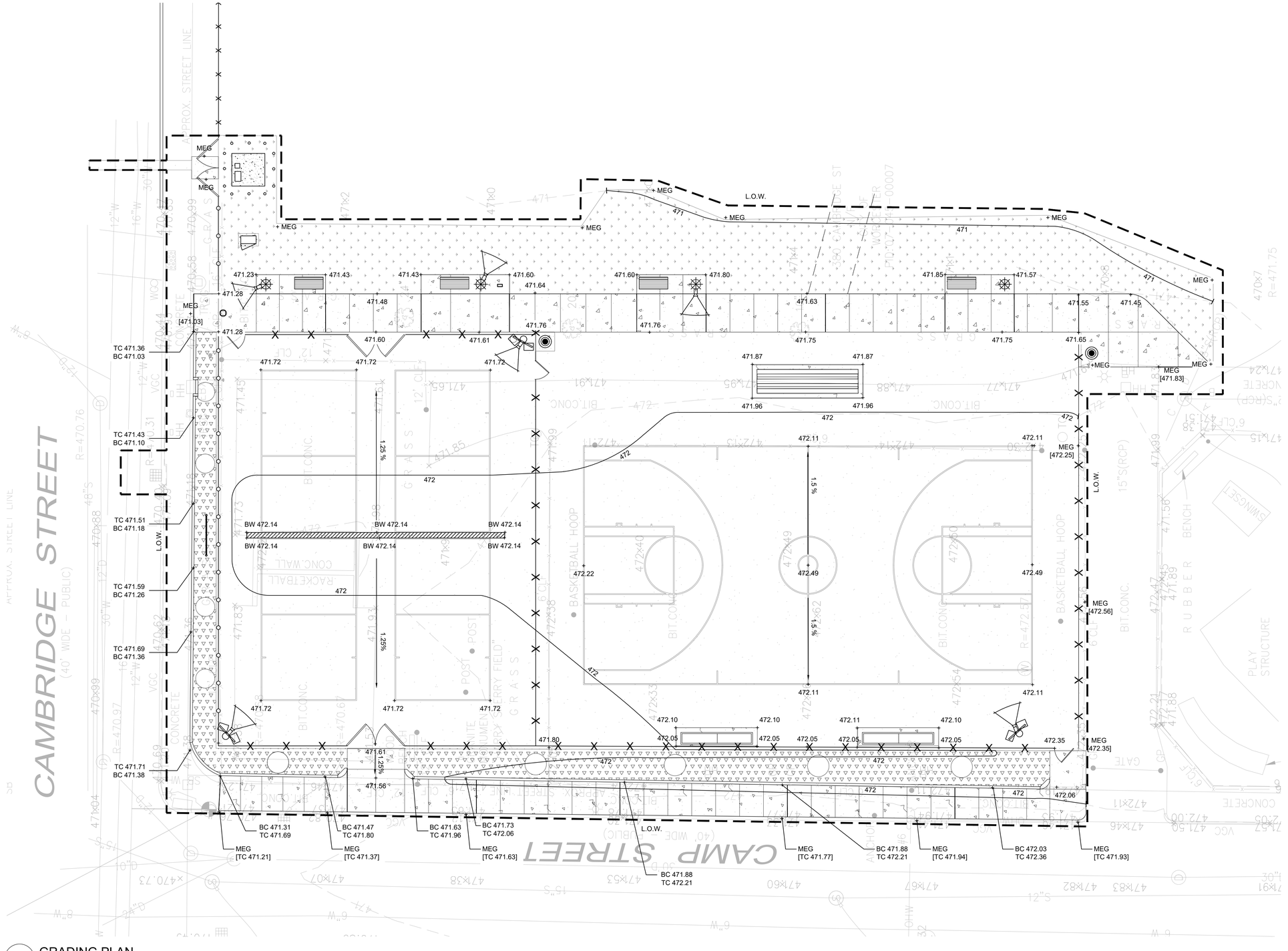
CONTRACT NO.

DATE 05.23.23
DRAWN MS
CKD RD
SCALE AS SHOWN

SHEET NO. L-3

NOTES:

1. SEE SHEET N-1 FOR NOTES, LEGENDS AND ABBREVIATIONS.



1 GRADING PLAN

SCALE: 1" = 10'-0"

GRAPHIC SCALE IN FEET

0 10' 20' 40'

WORCESTER A TOWN JUNE 14, 1722 A CITY FEBY. 29, 1848

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NORTH

STAMP

SOUTH WORCESTER PLAYGROUND IMPROVEMENTS PHASE III
WORCESTER, MA

PROJECT

GRADING PLAN

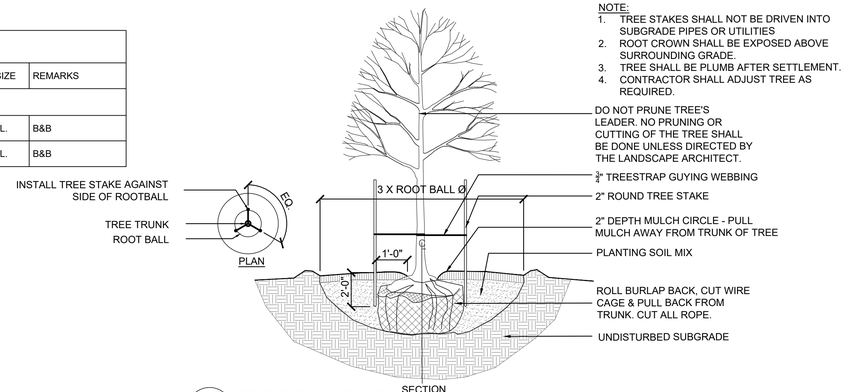
DRAWING TITLE

CONTRACT NO.	
DATE	05.23.23
DRAWN	MS
CKD	RD
SCALE	AS SHOWN

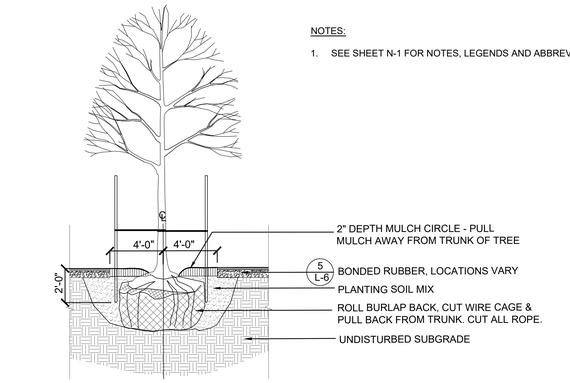
L-4

SHEET NO.

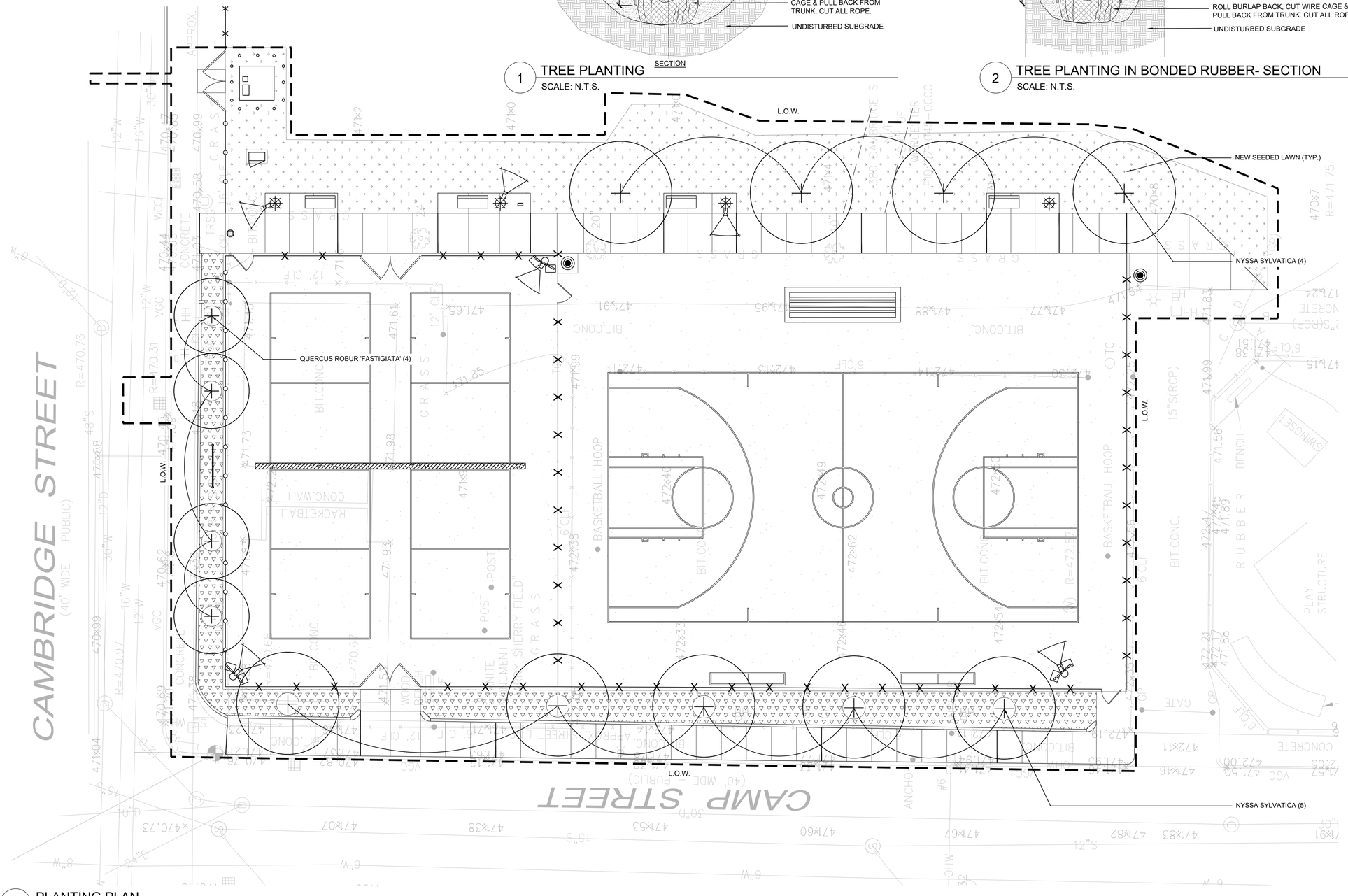
PLANT LIST					
	QTY	BOTANICAL NAME	COMMON NAME	MIN SIZE	REMARKS
TREES					
	9	NYSSA SYLVATICA	BLACK TUPELO	3" CAL.	B&B
	4	QUERCUS ROBUR 'FASTIGIATA'	UPRIGHT ENGLISH OAK	3" CAL.	B&B



1 TREE PLANTING
SCALE: N.T.S.



2 TREE PLANTING IN BONDED RUBBER- SECTION
SCALE: N.T.S.



1 PLANTING PLAN
SCALE: 1" = 10'-0"

GRAPHIC SCALE IN FEET
0 10' 20' 40'

RAY DUNETZ LANDSCAPE ARCHITECTURE, INC.
179 GREEN STREET
BOSTON, MA 02130
T: 617-524-6265

05-23-23 BID DOCUMENTS
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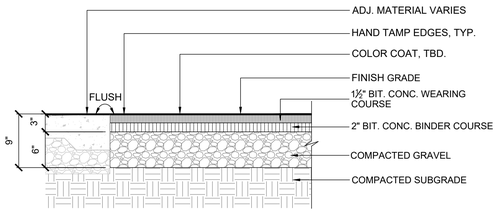
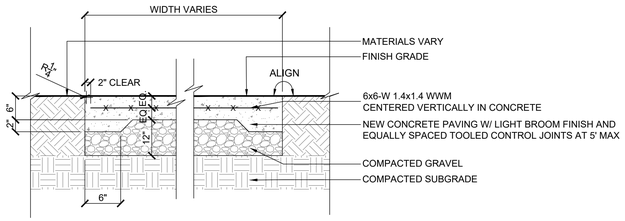
CKD	RD
SCALE	AS SHOWN

L-5
SHEET NO.



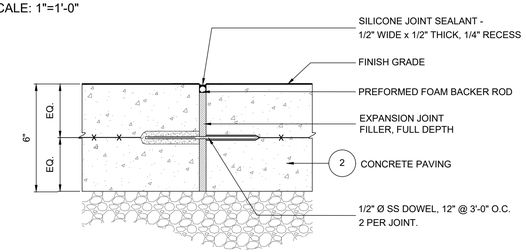
1 BITUMINOUS CONCRETE COURT PAVING - SECTION

SCALE: 1"=1'-0"



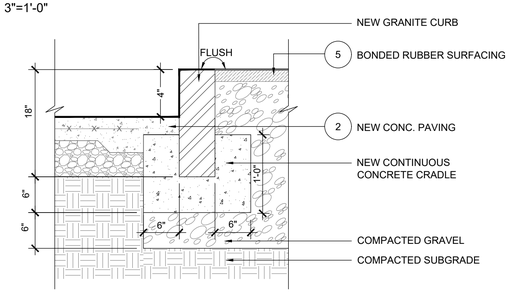
2 CONCRETE PAVING - SECTION

SCALE: 1"=1'-0"



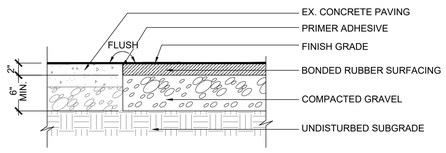
3 EXPANSION JOINT - SECTION

SCALE: 3"=1'-0"



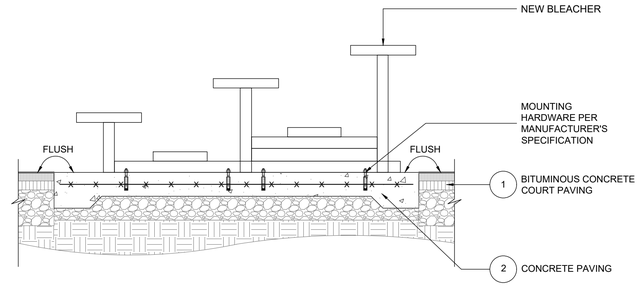
4 GRANITE CURB - SECTION

SCALE: 1"=1'-0"



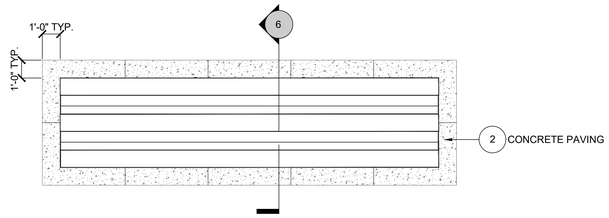
5 BONDED RUBBER SURFACING

SCALE: 1"=1'-0"



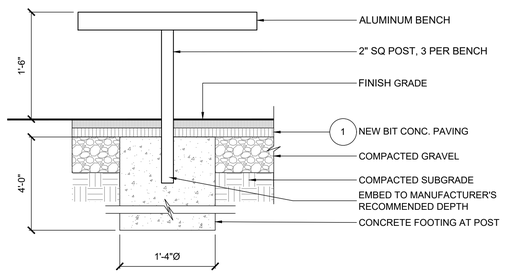
6 BLEACHER - SECTION

SCALE: 1"=1'-0"



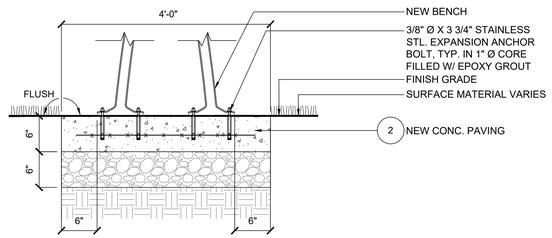
7 BLEACHER - PLAN

SCALE: N.T.S.



8 TEAM BENCH - SECTION

SCALE: 1"=1'-0"

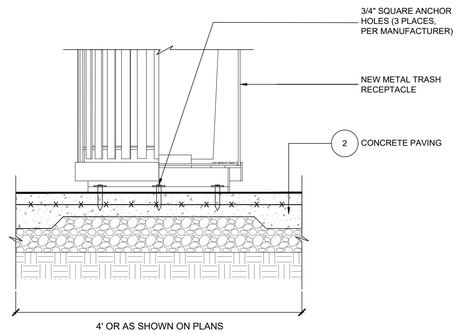


9 BENCH ON CONCRETE PAD - SECTION

SCALE: 1"=1'-0"

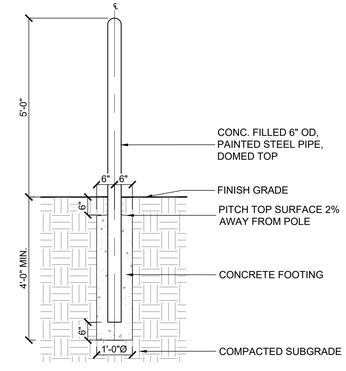
NOTES:

1. SEE SHEET N-1 FOR NOTES, LEGENDS AND ABBREVIATIONS.



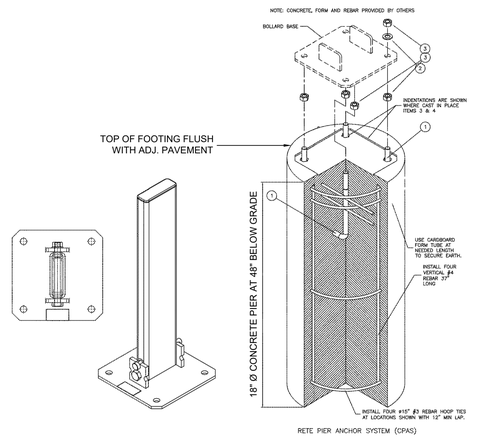
10 TRASH/RECYCLING RECEPTACLE - SECTION

SCALE: 1"=1'-0"



11 BOLLARD AT ELEC. TRANSFORMER - SECTION

SCALE: 1/2"=1'-0"



12 COLLAPSIBLE BOLLARD

SCALE: N.T.S.

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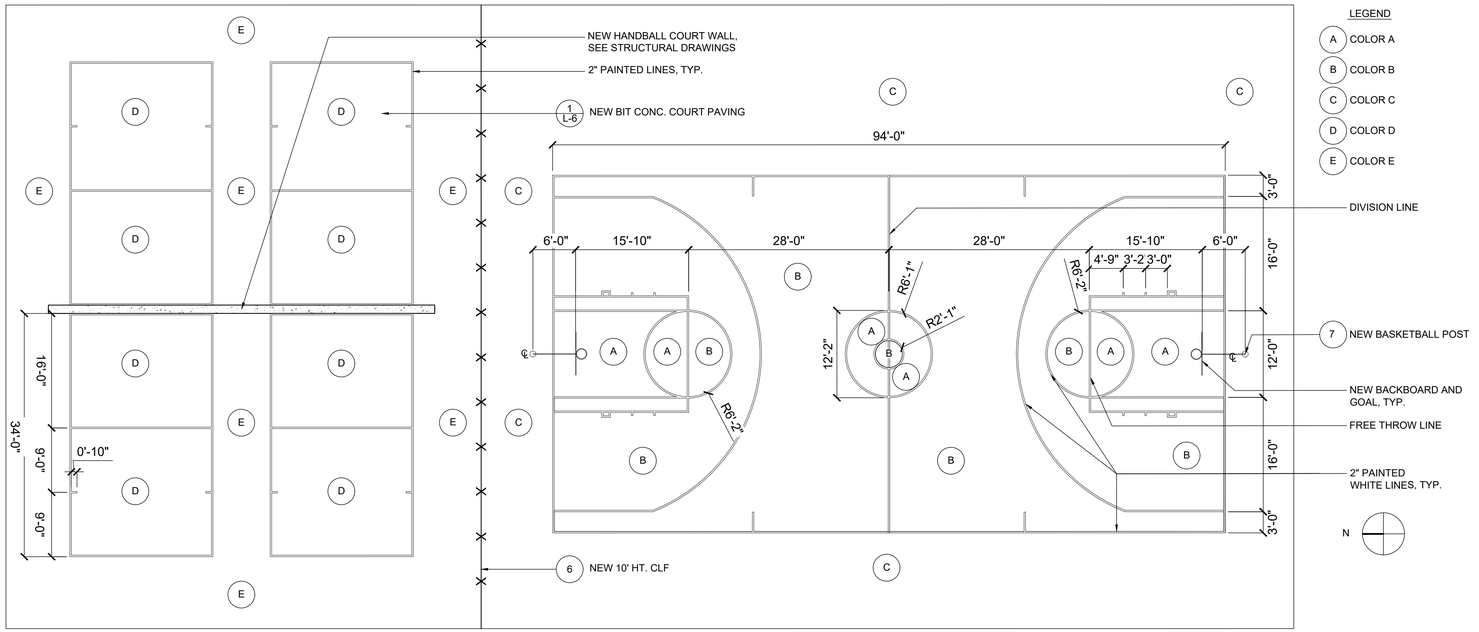
L-6
SHEET NO.



LEGEND

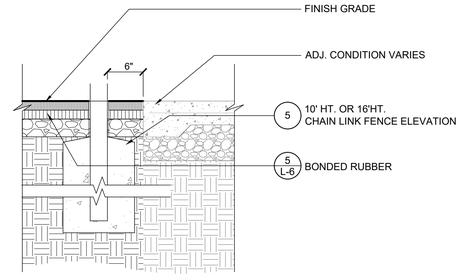
- A COLOR A
- B COLOR B
- C COLOR C
- D COLOR D
- E COLOR E

1 HANDBALL AND BASKETBALL COURT STRIPING - PLAN

SCALE: 1"=10'-0"

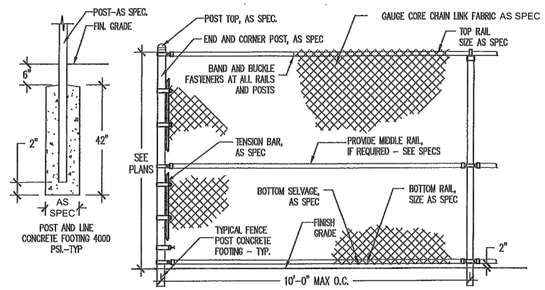
NOTES:

1. SEE SHEET N-1 FOR NOTES, LEGENDS AND ABBREVIATIONS.



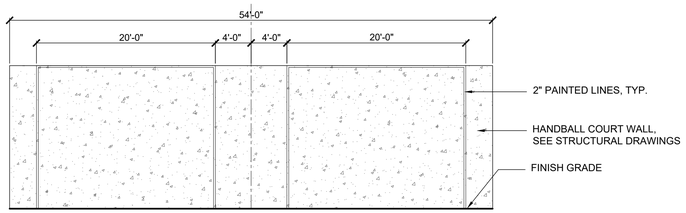
5 CHAIN LINK GATE POST AT ADJ. MATERIAL - SECTION

SCALE: 1"=1'-0"



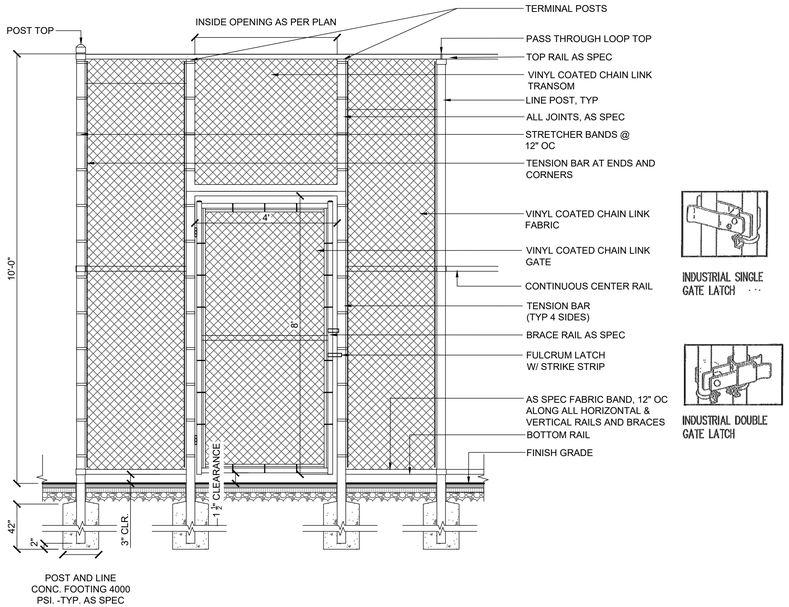
6 10' HT. OR 16' HT. CHAIN LINK FENCE - ELEVATION

SCALE: N.T.S.

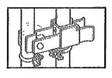


4 HANDBALL COURT WALL - ELEVATION

SCALE: 1/8"=1'-0"

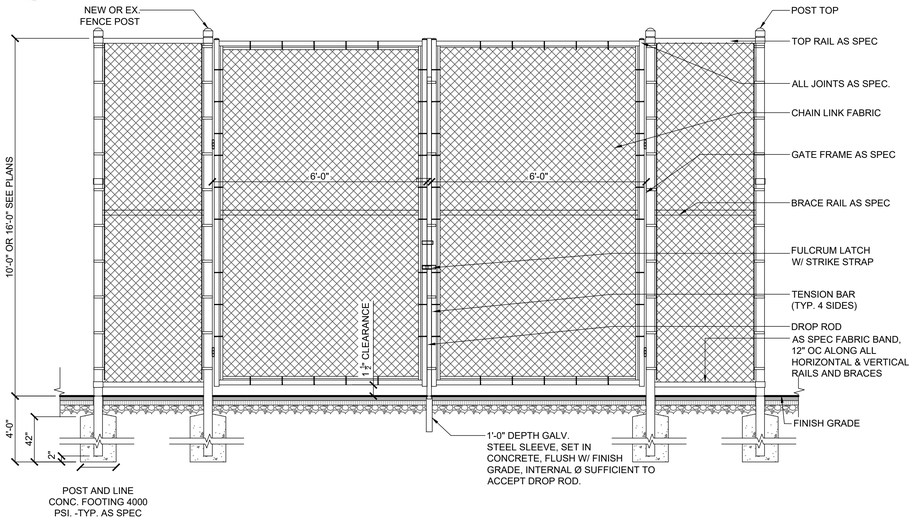


INDUSTRIAL SINGLE GATE LATCH


INDUSTRIAL DOUBLE GATE LATCH

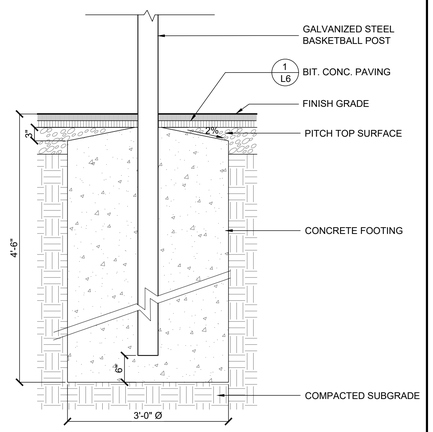
2 CHAIN LINK GATE - ELEVATION

SCALE: 3/4"=1'-0"



3 DOUBLE CHAINLINK GATE - ELEVATION

SCALE: 1/2"=1'-0"



7 BASKETBALL POST FOOTING - SECTION

SCALE: 3/4"=1'-0"

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WORCESTER, MA
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L-7
SHEET NO.

POLE FOUNDATION SCHEDULE

POLE DESIGNATION	FORCES (1.)			DRILLED PIER			
	MOMENT (M) FT-LBS	SHEAR (V) LBS	VERTICAL (P) LBS	DIAMETER INCHES	EMBEDMENT DEPTH (4.)	SUSPENSION "Y" (2.)	CONCRETE BACKFILL YD^3 (3.)
A1, A2	35,248	998	1,147	36	13'-0"	3'-0"	2.7
B1, B2	66,012	1,587	2,061	48	14'-0"	NA	5.0
C1, C2	45,308	1,218	1,486	48	12'-0"	NA	4.3
P1	15,023	587	561	36	11'-0"	3'-0"	2.3
P2	31,450	984	1,086	36	12'-0"	2'-0"	2.4
P3	22,845	804	855	36	12'-0"	2'-0"	2.4

1. ASD LOAD COMBINATION D + 0.6W.
   VERTICAL FORCE IS WEIGHT OF DRESSED POLE (DOES NOT INCLUDE PRECAST BASE WEIGHT)
2. SUSPEND PRECAST BASE "Y" OFF THE BOTTOM OF THE EXCAVATION DURING MONOLITHIC CONCRETE BACKFILL PLACEMENT AND CURING. NA = NOT APPLICABLE, SUSPENSION NOT REQUIRED.
3. MINIMUM CONCRETE BACKFILL VOLUME, SITE CONDITIONS MAY REQUIRE ADDITIONAL BACKFILL.
4. POTENTIAL FOR ENCOUNTERING ROCK BEFORE REACHING EMBEDMENT DEPTH. ROCK AUGERING EQUIPMENT MAY BE REQUIRED.

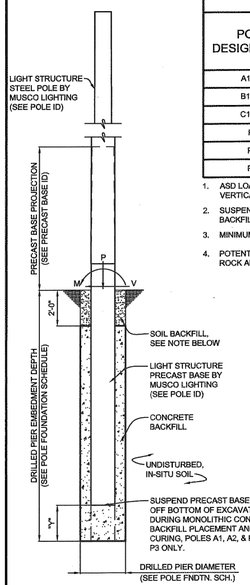
PRECAST BASE IDENTIFICATION

PRECAST BASE TYPE	PRECAST BASE WEIGHT	PRECAST BASE LENGTH	PROJECTION ABOVE GRADE	STANDARD EMBEDMENT	OUTSIDE DIAMETER
1B	920 LBS	15'-2"	7'-2"	8'-0"	9.56"
2B	1,690 LBS	17'-3"	7'-3"	10'-0"	12.00"
3B	2,470 LBS	20'-0"	8'-0"	12'-0"	13.38"
4B	3,490 LBS	22'-0"	8'-0"	14'-0"	15.75"

POLE IDENTIFICATION

POLE DESIGNATION	POLE TYPE	PRECAST BASE TYPE	FIXTURE CONFIGURATION (FIX. PER XARM)	FIXTURE AND ACCESSORIES EPA (FT^2)
A1, A2	LSS60A	2B	5 (3)	9.8
B1, B2	LSS70C	4B	7 (5)	12.8
C1, C2	LSS60B	3B	7 (5)	13.3
P1	LSS40A	1B	3 (2)	6.2
P2	LSS50B	2B	5 (4)	9.7
P3	LSS50AB	2B	3 (2)	5.0

- EACH POLE HAS (1) CREE OSQ FIXTURE AT 25'-0" AGL, INCLUDED ABOVE.
- EACH A, B, & C POLE HAS (1) LED FIXTURE AT 15'-6" AGL, INCLUDED ABOVE.



POLE FOUNDATION ELEV.

SCALE: NOT TO SCALE

SOIL BACKFILL NOTE:
THE TOP TWO FEET OF ANNULUS SHALL BE BACKFILLED WITH SOIL, WITH A CLASSIFICATION OF CLASS 5 (TABLE 1806.2) OR BETTER. COMPACTION, 95% FOR COHESIVE SOIL AND 98% FOR A COHESIONLESS SOIL BASED UPON STANDARD PROCTOR TESTING (ASTM D698).

DESIGN NOTES

DESIGN PARAMETERS:
WIND: V_{ult} = 124 MPH, V_{asd} = 96 MPH (EXPOSURE C, RISK CATEGORY II) PER MASSACHUSETTS STATE BUILDING CODE - 780 CMR, 9TH EDITION (IBC 2015 / ASCE 7-10).

GEOTECHNICAL PARAMETERS:
ALLOWABLE END BEARING SOIL PRESSURE: 4 TSF (NATIVE SOIL)
ALLOWABLE LATERAL SOIL BEARING PRESSURE: 0 PSF/FT (GRADE TO -2'-0");
50 PSF/FT (-2'-0" TO -8'-0"); 300 PSF/FT (BELOW -8'-0")
IN ACCORDANCE WITH MASSACHUSETTS STATE BUILDING CODE - 780 CMR, 9TH EDITION, CHAPTER 18.

DESIGN SOIL PARAMETERS ARE AS NOTED. ACTUAL ALLOWABLE SOIL PARAMETERS MUST BE VERIFIED ON SITE. REFERENCE SOILS AND FOUNDATION REPORT, NO. 22-2221, PREPARED BY OHI ENGINEERING, INC; MANSFIELD, MA.

A GEOTECHNICAL ENGINEER OR REPRESENTATIVE OF IS RECOMMENDED (NOT REQUIRED) TO BE AVAILABLE AT THE TIME OF THE FOUNDATION INSTALLATION TO VERIFY THE SOIL DESIGN PARAMETERS AND TO PROVIDE ASSISTANCE IF ANY PROBLEMS ARISE IN FOUNDATION INSTALLATION.

ENCOUNTERING SOIL FORMATIONS THAT WILL REQUIRE SPECIAL DESIGN CONSIDERATIONS OR EXCAVATION PROCEDURES MAY OCCUR. POLE FOUNDATIONS WILL NEED TO BE ANALYZED ACCORDING TO THE SOIL CONDITIONS THAT EXIST. IF ANY DISCREPANCIES OR INCONSISTENCIES ARISE, NOTIFY THE ENGINEER OF SUCH DISCREPANCIES. FOUNDATIONS WILL THEN BE REVISED ACCORDINGLY. REVISIONS WILL BE ANALYZED PER RECOMMENDATIONS DIRECTED BY A REGISTERED ENGINEER.

ALL EXCAVATIONS MUST BE FREE OF LOOSE SOIL AND DEBRIS PRIOR TO FOUNDATION INSTALLATION AND CONCRETE BACKFILL PLACEMENT. TEMPORARY CASINGS OR DRILLERS SLURRY MAY BE USED TO STABILIZE THE EXCAVATION DURING INSTALLATION. CASINGS MUST BE REMOVED DURING CONCRETE BACKFILL PLACEMENT. CONCRETE BACKFILL MUST BE PLACED WITH A TREMIE WHEN SLURRY OR WATER IS PRESENT WITHIN THE EXCAVATION OR WHEN THE FREE DROP EXCEEDS 6'-0".

CONTRACTOR MUST BE FAMILIAR WITH THE COMPLETE SOIL INVESTIGATION REPORT AND BORINGS, AND CONTACT THE GEOTECHNICAL FIRM (IF NECESSARY) TO UNDERSTAND THE SOIL CONDITIONS AND THE POSSIBILITY OF GROUND WATER PUMPING AND EXCAVATION STABILIZATION OR BRACING DURING PRECAST BASE INSTALLATION AND PLACEMENT OF CONCRETE BACKFILL.

CONCRETE:
CONCRETE SHALL BE AIR-ENTRAINED AND HAVE A MINIMUM COMPRESSIVE DESIGN STRENGTH AT 28 DAYS OF 3,000 PSI. 3,000 PSI CONCRETE SPECIFIED FOR EARLY POLE ERECTION, ACTUAL REQUIRED MINIMUM ALLOWABLE CONCRETE STRENGTH IS 1,500 PSI. ALL PIERS AND CONCRETE BACKFILL MUST BEAR ON AND AGAINST FIRM UNDISTURBED SOIL.

GENERAL NOTES:
FIXTURES MUST BE LOCATED TO MAINTAIN 10'-0" MINIMUM HORIZONTAL CLEARANCE FROM ANY OBSTRUCTION. ENGINEER MUST BE NOTIFIED IF FOUNDATIONS ARE NEAR ANY RETAINING WALLS OR WITHIN / NEAR ANY SLOPES STEEPER THAN 3H : 1V. POLES, FIXTURES, PRECAST BASES, ELECTRICAL ITEMS AND INSTALLATION PER MUSCO LIGHTING.

COMMONWEALTH OF MASSACHUSETTS
KYLE G. LACINA
No. 46148
REGISTERED PROFESSIONAL ENGINEER
7-15-2022

SOUTH WORCESTER PLAYGROUND
FIELD LIGHTING
WORCESTER, MA

MUSCO LIGHTING
CORPORATE: 100 1st AVE. WEST OSKALOOSA, IA 52577 (800) 825-6030

STRUCTURAL ENGINEERS, P.C.
114 NICHOLAS DRIVE
MARSHALLTOWN, IOWA 50158
PHONE NUMBER: 641-752-8334
EMAIL: MSL.INFO@SSPC.biz

DRAWING TITLE: POLE AND FOUNDATION
SCALE: SEE PLAN
NOTES: SCAN #214516C

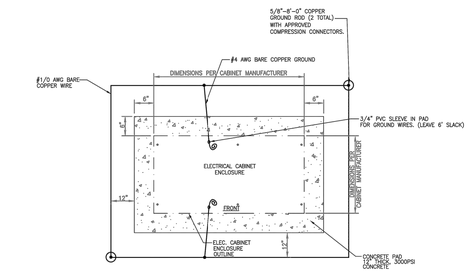
PROJECT NUMBER 214516

DATE 15 JULY 2022

DRAWING NUMBER C1

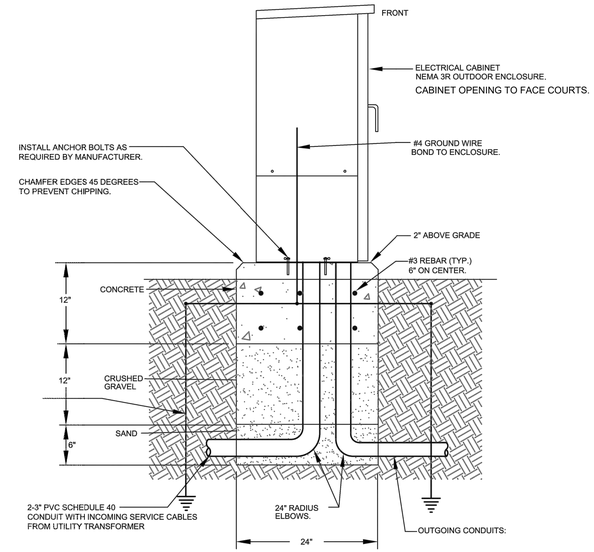
OF ONE

1 SPORTS LIGHT POLE FOUNDATION
SCALE: N.T.S.

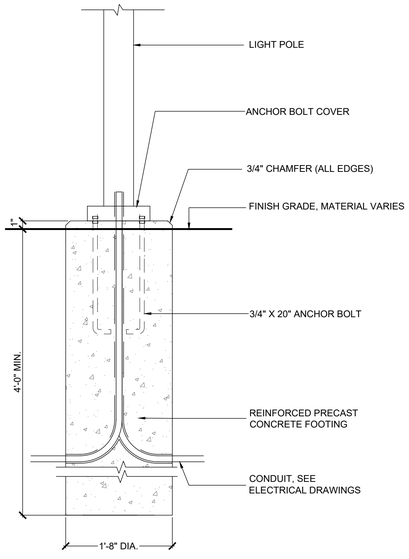


NOTES:

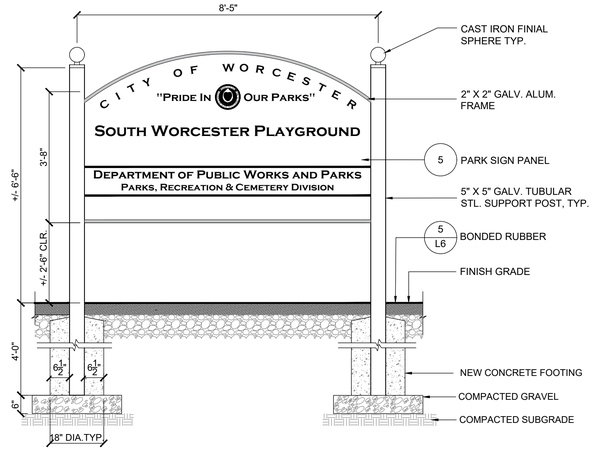
1. SEE SHEET N-1 FOR NOTES, LEGENDS AND ABBREVIATIONS.



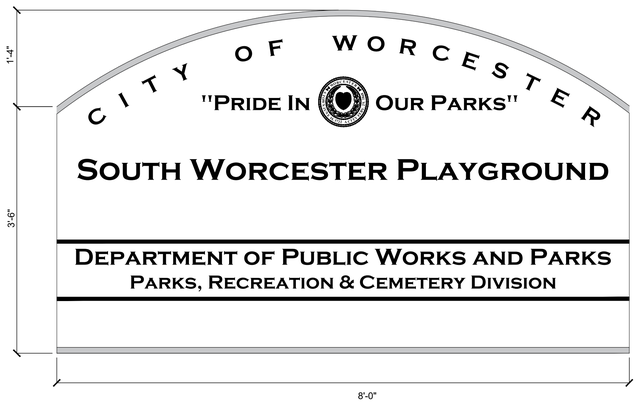
4 NEMA CABINET - PLAN AND SECTION
NOT TO SCALE



2 PEDESTRIAN LIGHT POLE BASE - SECTION
SCALE: 1"=1'-0"



3 PARK SIGN - ELEVATION
SCALE: 1"=1'-0"



NOTES:
- ALL LETTERING AND GRAPHICS ARE TO BE COMPUTER CUT WHITE VINYL.
- INSTALL A FULL LEXAN SHIELD 1/4" THICK.
- SIGN TO BE SINGLE SIDED.
- 1/2" THICK WHITE PVC PLASTIC RAISED LETTERS - PARK TITLE ONLY.
- 3/4" MDO PLYWOOD, PRIMED AND PAINTED HUNTER GREEN, BOTH SIDES.

5 PARK SIGN PANEL - ELEVATION
SCALE: 1"=1'-0"

WORCESTER — A TOWN JUNE 14, 1722 A CITY FEBY. 29, 1848

RAY DUNETZ LANDSCAPE ARCHITECTURE, INC.
179 GREEN STREET
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LIGHTING FIXTURES

(REFER TO SCHEDULE FOR TYPE AND MOUNTING)

A1-2 ▭▭ 32b	FIXTURE KEYING SYSTEM A1 = FIXTURE TYPE 32= CIRCUIT # b= SWITCH CONTROL

WIRE AND RACEWAYS

—////— G	WIRING AND RACEWAY - NO. OF DIAGONAL LINES INDICATES NO. #12 AWG. ABSENCE OF LINES INDICATES 2 #12 AWG - UNLESS NOTED OTHERWISE, "G" INDICATES INSULATED GROUND WIRE.
——►►	HOMERUN TO PANEL - NO. OF ARROWS INDICATES NO. OF 20AMP/ 1 POLE CIRCUITS TO PANEL - UNLESS NOTED OTHERWISE.

SITE SYMBOLS

●■	POLE MOUNTED LIGHTING FIXTURE- SINGLE HEAD
■●■	POLE MOUNTED LIGHTING FIXTURE- DOUBLE HEAD
MH	ELECTRIC MANHOLE
TMH	TELEPHONE MANHOLE
HH	ELECTRIC HAND HOLE
HH C	COMMUNICATIONS HAND HOLE

MECHANICAL EQUIPMENT

J Ⓙ	JUNCTION BOX - SIZE AS REQUIRED.
Ⓙ~	JUNCTION BOX - WITH FLEXIBLE CONNECTION TO EQUIPMENT.
⊠ 3R	NEMA 3R HEAVY DUTY DISCONNECT SWITCH FUSED DISCONNECT SWITCH
⊠ 20	← INDICATES TIME DELAY FUSE SIZE.
30	← INDICATES SAFETY SWITCH SIZE

POWER

▬	120/208 VOLT, 3 PHASE, 4 WIRE PANELBOARD. (SURFACE MOUNTED)
Ⓜ	METER
⏚	SERVICE GROUND
⊢G⊣	GROUND BAR
CB	CIRCUIT BREAKER
SPD	SURGE PROTECTION DEVICE

RECEPTACLES (MOUNTED 18" A.F.F. TO ℄ - U.N.O.)

GFC WP	20AMP, 120VOLT DUPLEX - GROUND FAULT INTERRUPTER TYPE MTD. 42" UP OR ABOVE COUNTER, "WP" INDICATES GFCI WITH WEATHER PROOF COVER MTD. 18" UP.

MISCELLANEOUS

▭◁	CLOSED CIRCUIT TV CAMERA

EXISTING EQUIPMENT

[ ]	DOTTED DENOTES EXISTING EQUIPMENT.
X	EXISTING EQUIPMENT TO BE REMOVED AND CIRCUIT PULLED BACK TO NEXT ACTIVE OUTLET/BACK TO PANEL.
XM	EXISTING EQUIPMENT TO REMAIN.
XR	EXISTING EQUIPMENT TO BE REMOVED AND RELOCATED.
XL	NEW LOCATION OF RELOCATED EXISTING EQUIPMENT.
XN	EXISTING EQUIPMENT TO BE REMOVED AND NEW EQUIPMENT TO BE INSTALLED IN SAME LOCATION.

120/208V, 3Ø, 4W

PANEL SCHEDULE

PANEL NO.	LOCATION	MTG	MAIN BUS AMPS	MAIN CB	KAIC RATING	BRANCH CKT BREAKER (AMPS). KAIC RATING OF THE BRANCH C.B.'S WILL MATCH KAIC RATING OF PANEL																											TOTAL POLES	OTHERS
						1 POLE						1 POLE ARC FAULT		1 POLE GRD FAULT		1 POLE ARC/GFI		2 POLE						3 POLE								
						15	20	30	40	50	60	15	20	15	20	15	20	15	20	30	40	50	60	15	20	30	40	50	60	100		
PP1	XX	s	200	200	22		11																		6	2					42	20/3 SPD, NEMA 3R

NOTES:

① BRANCH CIRCUIT BREAKERS KAIC SHALL MATCH THE KAIC RATING OF THE PANEL BOARD.

② PANEL BOARD PP1 SHALL BE A NEMA-3R ENCLOSURE.

LIGHTING FIXTURE SCHEDULE

ALL FIXTURES SHALL BE FURNISHED COMPLETE WITH ALL HARDWARE, LAMPS, HANGERS, FITTING, ETC., FOR A COMPLETE AND PROPER INSTALLATION.

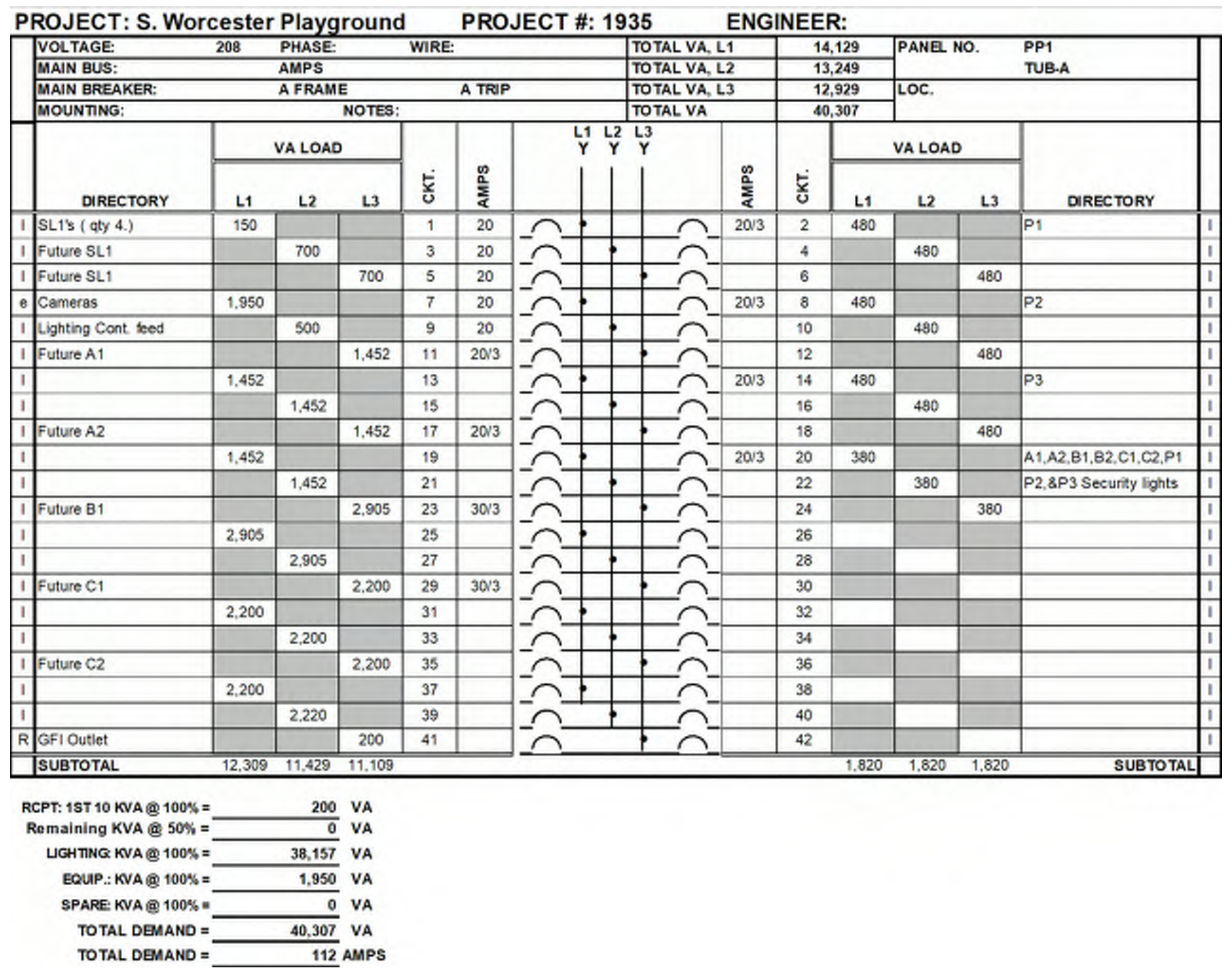
TYPE	MANUFACTURER	CATALOG NO.	MTG.	MTG HEIGHT	VOLTAGE	INPUT WATTS	LUMENS	LAMPS			REMARKS
								No.	WATTAGE	TYPE	
P1	MUSCO	TLC-LED-400	P	40'	208	400	-	-	-	LED	THREE PHASE LIGHT
P2	MUSCO	TLC-LED-400	P	50'	208	400	-	-	-	LED	THREE PHASE LIGHT
P3	MUSCO	TLC-LED-400	P	50'	208	400	-	-	-	LED	THREE PHASE LIGHT
SL1	HALOPHANE	NORTH YORKSHIRE SERIES POLE - POLE NYA16SLSL5J17SCOBK-ABGRP156A FG BK BA 100P 24 IN 1A BO SL5 AC BK BA100P 24 IN 1A BO SL5 AC BK ASSY 4685 GDP3P2040KMVOLTMSBKSTTBKPR7PCLL	P	19	120	-	-	1	-	LED	PROVIDE MCAP-2B AND BRAD 3 ADAPTER FOR THE LIGHT FIXTURE. FOR MOUNTING THE NEMA 3R ENCLOSURES FOR THE CAMERA NETWORK JB ON TO THE POLES, INSTALL TNUT3/8-100SM.

LIGHTING FIXTURE GENERAL NOTES:

1. ALL BALLASTS SHALL BE OF THE ENERGY SAVINGS, HIGH POWER FACTOR TYPE, AND THD LESS THAN 10%.
2. FURNISH FIXTURES WITH ALL REQUIRED MOUNTING HARDWARE. WHERE RECESSED LIGHTING FIXTURES ARE TO BE INSTALLED IN PLASTER, ACOUSTIC TILE OR GYPSUM BOARD, PLASTER FRAMES, FINISH TRIM, FITTINGS AND SUPPORTS SHALL BE FURNISHED AND INSTALLED TO MEET THE ARCHITECTURAL AND STRUCTURAL CONDITIONS AT EACH LOCATION.
3. ALL LIGHTING FIXTURES SHALL BE PROVIDED WITH THE REQUIRED LAMPS AND SHALL BE RATED 120-VOLTS UNLESS OTHERWISE NOTED. LAMPS SHALL BE SP35 (3500K) UNLESS OTHERWISE NOTED.
4. E.C. IS RESPONSIBLE FOR OBTAINING ALL THE CORRECT HARDWARE TO MOUNT ALL THE SECURITY CAMERAS TO THE NEW LIGHT POLES. MODIFY THE POLES TO ACCEPT THE CAMERAS AND THE WIRING.
5. THE LIGHT POLE IS TO MEET CITY OF WORCESTER STANDARDS. PLUS, HAVE COMPARTMENTS FOR LOW VOLTAGE AND POWER. ORDER SLAUXWIREL5BK RFD- 319317 AUXILIARY CHANNEL KIT. ALSO, MUST GET MOUNTING STUDS TO SUPPORT THE SIEMENS NEMA 3R ENCLOSURE. ENCLOSURE BY SIEMENS AND MOUNTING OF THE ENCLOSURE IS BY E.C.

ABBREVIATIONS

A	AMPERES OR ANTENNA
AFG	ABOVE FINISH GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AIC	AMPERE INTERRUPTING CAPACITY
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
C	CONDUIT
CAT	CATALOG
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TV
CKT	CIRCUIT
℄	CENTERLINE
CLG	CEILING
COL	COLUMN
COOR	COORDINATE
CT	CURRENT TRANSFORMER
CU	COPPER
DIA	DIAMETER
DN	DOWN
DWG	DRAWING
E.C.	ELECTRICAL CONTRACTOR
EMT	ELECTRICAL METALLIC TUBING
EQ	EQUAL
EX	EXISTING
F	FUSE
F&I	FURNISHED AND INSTALLED
FA	FIRE ALARM
FLA	FULL LOAD AMPERES
FM	FACTORY MUTUAL
FT	FEET
GC	GENERAL CONTRACTOR
GFI	GROUND FAULT INTERRUPTER
GND,G	GROUND OR GROUNDING
HD	HAND DRYER
H&L	HORN/LIGHT
IMC	INTERMEDIATE METAL CONDUIT
INT	INTERLOCK
KAIC	THOUSAND AMPERE INTERRUPTING CAPACITY
KCMIL	THOUSAND CIRCULAR MILS
KVA	KILOVOLT AMPERES
KW	KILOWATTS
LTG	LIGHTING
LFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MP	MEGA PIXELS
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
P	POLE
PH	PHASE
PNL	PANEL
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
PW	POWER
QTY	QUANTITY
R	RECESSED
S	SURFACE
SP	SPARE
SPD	SURGE PROTECTION DEVICE
SW	SWITCH
TC	TIME CLOCK
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VD	VOLTAGE DROP
W/	WITH
WP	WEATHER PROOF
XFMR	TRANSFORMER
Δ	DELTA
Y	WYE
Ø	PHASE

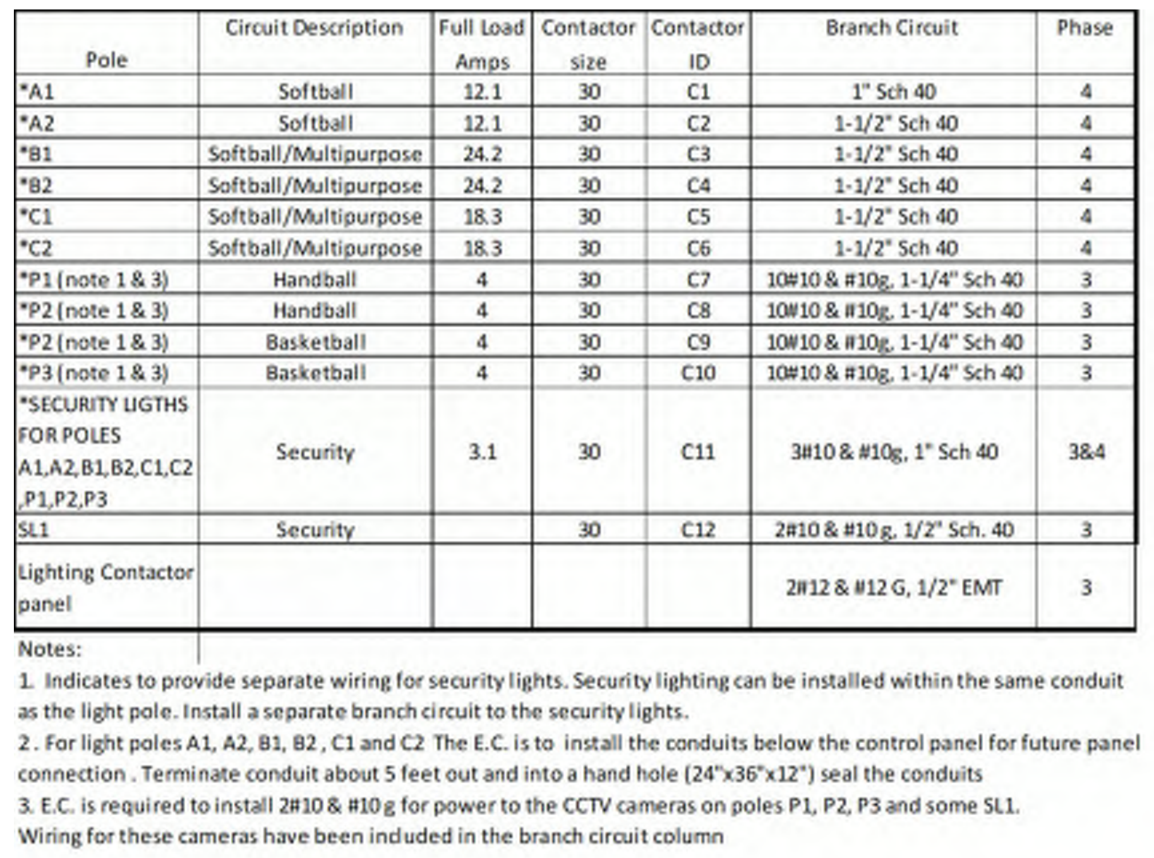


PROJECT: S. Worcester Playground **PROJECT #: 1935** **ENGINEER:**

VOLTAGE: 208 PHASE: WIRE:	TOTAL VA, L1	14,129	PANEL NO. PP1
MAIN BUS: AMPS	TOTAL VA, L2	13,249	TUB-A
MAIN BREAKER: A FRAME A TRIP	TOTAL VA, L3	12,929	LOC.
MOUNTING: NOTES:	TOTAL VA	40,307	

	DIRECTORY	VA LOAD L1	VA LOAD L2	VA LOAD L3	CKT.	AMPS	AMPS	CKT.	VA LOAD L1	VA LOAD L2	VA LOAD L3	DIRECTORY	
I	SL1's (qty 4.)	150			1	20	20/3	2	480			P1	I
I	Future SL1		700		3	20		4		480			I
I	Future SL1			700	5	20		6			480		I
e	Cameras	1,950			7	20	20/3	8	480			P2	I
I	Lighting Cont. feed		500		9	20		10		480			I
I	Future A1			1,452	11	20/3		12			480		I
I		1,452			13		20/3	14	480			P3	I
I			1,452		15			16		480			I
I	Future A2			1,452	17	20/3		18			480		I
I		1,452			19		20/3	20	380			A1,A2,B1,B2,C1,C2,P1	I
I			1,452		21			22		380		P2,&P3 Security lights	I
I	Future B1			2,905	23	30/3		24			380		I
I		2,905			25			26					I
I			2,905		27			28					I
I	Future C1			2,200	29	30/3		30					I
I		2,200			31			32					I
I			2,200		33			34					I
I	Future C2			2,200	35			36					I
I		2,200			37			38					I
I			2,220		39			40					I
R	GFI Outlet			200	41			42					I
	SUBTOTAL	12,309	11,429	11,109					1,820	1,820	1,820	SUBTOTAL	

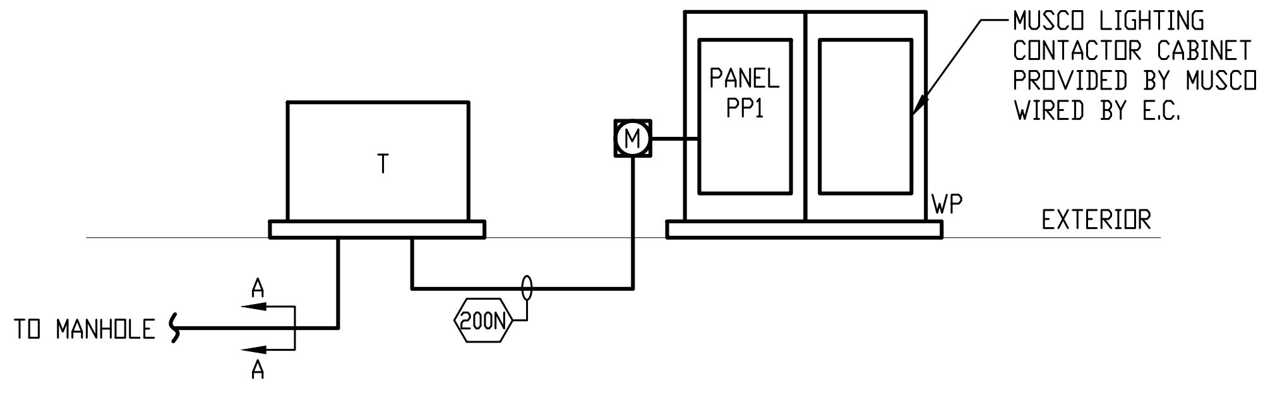
RCPT: 1ST 10 KVA @ 100% =	200	VA
Remaining KVA @ 50% =	0	VA
LIGHTING: KVA @ 100% =	38,157	VA
EQUIP.: KVA @ 100% =	1,950	VA
SPARE: KVA @ 100% =	0	VA
TOTAL DEMAND =	40,307	VA
TOTAL DEMAND =	112	AMPS



Pole	Circuit Description	Full Load Amps	Contactor size	Contactor ID	Branch Circuit	Phase
*A1	Softball	12.1	30	C1	1" Sch 40	4
*A2	Softball	12.1	30	C2	1-1/2" Sch 40	4
*B1	Softball/Multipurpose	24.2	30	C3	1-1/2" Sch 40	4
*B2	Softball/Multipurpose	24.2	30	C4	1-1/2" Sch 40	4
*C1	Softball/Multipurpose	18.3	30	C5	1-1/2" Sch 40	4
*C2	Softball/Multipurpose	18.3	30	C6	1-1/2" Sch 40	4
*P1 (note 1 & 3)	Handball	4	30	C7	10#10 & #10g, 1-1/4" Sch 40	3
*P2 (note 1 & 3)	Handball	4	30	C8	10#10 & #10g, 1-1/4" Sch 40	3
*P2 (note 1 & 3)	Basketball	4	30	C9	10#10 & #10g, 1-1/4" Sch 40	3
*P3 (note 1 & 3)	Basketball	4	30	C10	10#10 & #10g, 1-1/4" Sch 40	3
*SECURITY LIGTHS FOR POLES A1,A2,B1,B2,C1,C2 ,P1,P2,P3	Security	3.1	30	C11	3#10 & #10g, 1" Sch 40	3&4
SL1	Security		30	C12	2#10 & #10g, 1/2" Sch. 40	3
Lighting Contactor panel					2#12 & #12 G, 1/2" EMT	3

Notes:

1. Indicates to provide separate wiring for security lights. Security lighting can be installed within the same conduit as the light pole. Install a separate branch circuit to the security lights.
2 . For light poles A1, A2, B1, B2 , C1 and C2 The E.C. is to install the conduits below the control panel for future panel connection . Terminate conduit about 5 feet out and into a hand hole (24"x36"x12") seal the conduits
3. E.C. is required to install 2#10 & #10 g for power to the CCTV cameras on poles P1, P2, P3 and some SL1. Wiring for these cameras have been included in the branch circuit column

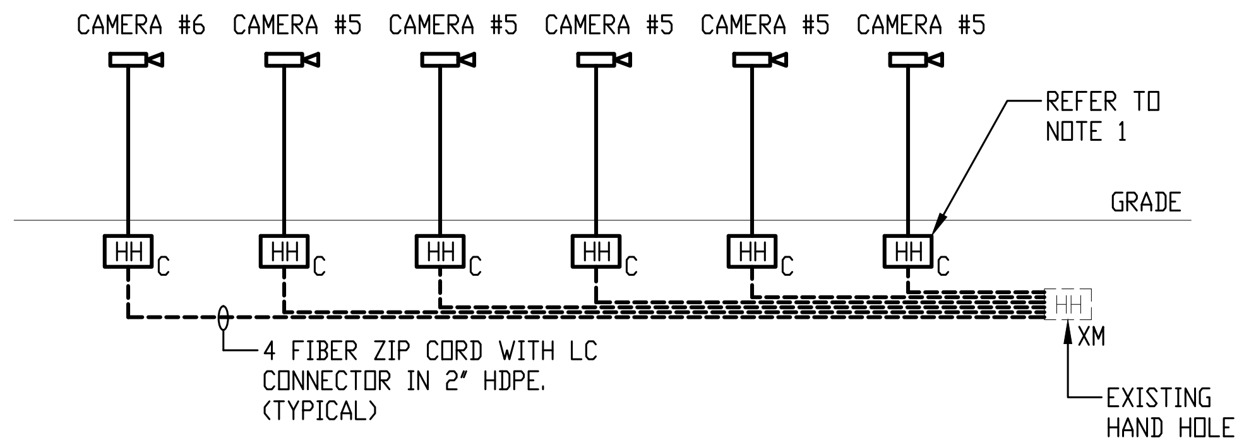


① ONE-LINE RISER DIAGRAM

SCALE: NTS

NOTES:

1. E.C. TO PROVIDE ARC FLASH LABEL IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) SECTION 110.16
2. COORDINATE SHORT CIRCUIT RATING OF ELECTRICAL EQUIPMENT WITH LOCAL UTILITY.
3. PROVIDE LABEL ON ELECTRICAL SERVICE PANEL OF AVAILABLE FAULT CURRENT. PER ARTICLE 110.24 IN THE 2023 NATIONAL ELECTRICAL CODE. COORDINATE THIS WITH LOCAL UTILITY COMPANY.
4. PROVIDE SURGE SUPPRESSORS FOR ALL NEW ELECTRIC PANELS AT THE MAIN SERVICE. WIRE PER MANUFACTURERS RECOMMENDATIONS.
5. E.C. IS TO VERIFY HOT OR COLD METER SEQUENCE WITH THE UTILITY.
6. E.C. IS TO INSTALL TWO (2) 3/4" X 10 FOOT GROUND RODS. CONNECT PANEL PP1 WITH #6 COPPER WIRE.
7. INSTALL WEATHER PROOF GFI OUTLET WITHIN THE ENCLOSURE. CONNECT TO CIRCUIT 41 IN PANEL PP1.



② CAMERA RISER DIAGRAM

SCALE: NTS

NOTES:

1. E.C. IS TO CONVERT HPPE CONDUIT TO SCHEDULE 40 PVC. INSTALL ONE COMMUNICATION HAND HOLE AT THE BASE OF EACH POLE AS SHOWN ON THE DRAWINGS. INSTALL 3/4" SCH.40 PVC CONDUIT FROM HAND HOLE TO NEW LIGHT POLE. WIRE PER CITY OF WORCESTER REQUIREMENTS.
2. E.C. IS TO PROVIDE COYOTE SPLICE ENCLOSURE IN THE EXISTING HAND HOLE. SPLICE ALL FIBERS WITHIN THE EXISTING HANDHOLE.

FEEDER SIZE SCHEDULE

(COPPER CONDUCTORS)

FEEDER SYMBOL	CONDUCTORS (3 PHASE, 3 WIRE) WITH GROUND	RACEWAY SIZE CONDUIT	NOMINAL AMPERE RATING
60	3#4 & 1#10G.	1"	60
60N	4#4 & 1#10G.	1 1/4"	
70	3#4 & 1#8G.	1"	70
70N	4#4 & 1#8G.	1 1/4"	
100	3#1 & 1#8G.	1 1/2"	100
100N	4#1 & 1#8G.	1 1/2"	
125	3#1/0 & 1#6G.	1 1/2"	125
125N	4#1/0 & 1#6G.	2"	
150	3#1/0 & 1#6G.	1 1/2"	150
150N	4#1/0 & 1#6G.	2"	
175	3#2/0 & 1#6G.	2"	175
175N	4#2/0 & 1#6G.	2"	
200	3#3/0 & 1#6G.	2"	200
200N	4#3/0 & 1#6G.	2"	

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05-23-23 BID DOCUMENTS
DATE
REVISIONS

NORTH

JOHN J. MURPHY, JR. ELECTRICAL No. 45498
STAMP

SOUTH WORCESTER
PLAYGROUND IMPROVEMENTS
PHASE III
WORCESTER, MA
PROJECT

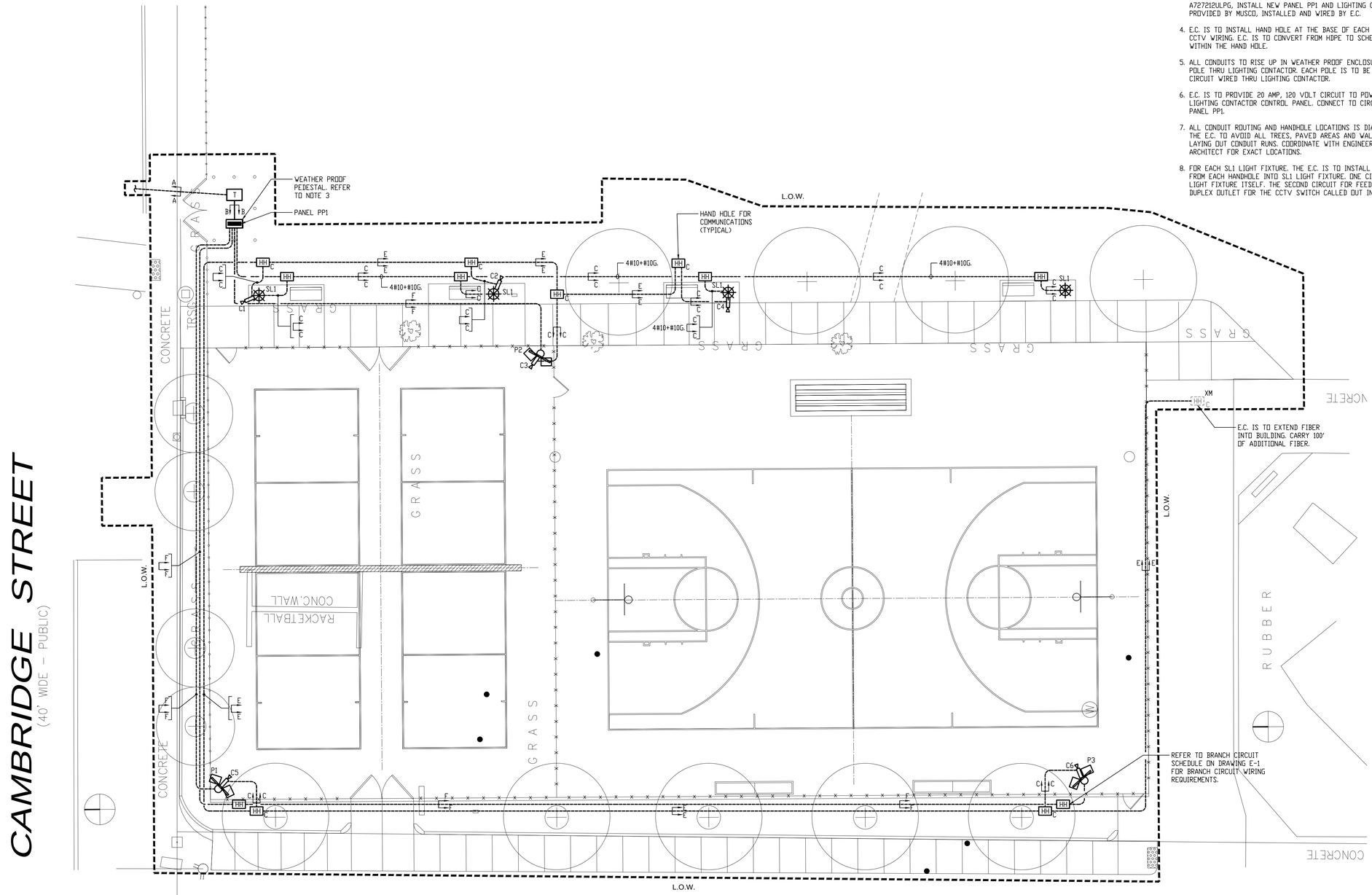
ELECTRICAL LEGEND
DRAWING TITLE

CONTRACT NO.	
DATE	05.23.23
DRAWN	MTG
CKD	JJM
SCALE	AS SHOWN

SHEET NO. E-1

NOTES:

1. REFER TO DETAILS 7 AND 8 FOR HANDHOLE DETAILS.
2. E.C. IS TO INSTALL ONE DUPLEX OUTLET AT EACH LIGHT POLE TO POWER CCTV SWITCH DEDICATED FOR THE CAMERAS. INSTALL 2#10 # #10 G IN 3/4" SCH 40 PVC CONDUIT 24 " BELOW GRADE.
3. E.C. IS TO INSTALL WEATHER PROOF PEDESTAL HOFFMAN, MODEL A72721210LPG, INSTALL NEW PANEL PP1 AND LIGHTING CONTACTOR PROVIDED BY MUSCO, INSTALLED AND WIRED BY E.C.
4. E.C. IS TO INSTALL HAND HOLE AT THE BASE OF EACH LIGHT FOR CCTV WIRING. E.C. IS TO CONVERT FROM HDPE TO SCHEDULE 40 PVC WITHIN THE HAND HOLE.
5. ALL CONDUITS TO RISE UP IN WEATHER PROOF ENCLOSURE. WIRE EACH POLE THRU LIGHTING CONTACTOR. EACH POLE IS TO BE A DEDICATED CIRCUIT WIRED THRU LIGHTING CONTACTOR.
6. E.C. IS TO PROVIDE 20 AMP, 120 VOLT CIRCUIT TO POWER UP LIGHTING CONTACTOR CONTROL PANEL. CONNECT TO CIRCUIT 9 IN PANEL PP1.
7. ALL CONDUIT ROUTING AND HANDHOLE LOCATIONS IS DIAGRAMMATIC. THE E.C. TO AVOID ALL TREES, PAVED AREAS AND WALKWAYS WHEN LAYING OUT CONDUIT RUNS. COORDINATE WITH ENGINEER AND ARCHITECT FOR EXACT LOCATIONS.
8. FOR EACH SL1 LIGHT FIXTURE. THE E.C. IS TO INSTALL 4#10'S & #10 G FROM EACH HANDHOLE INTO SL1 LIGHT FIXTURE. ONE CIRCUIT FOR THE LIGHT FIXTURE ITSELF. THE SECOND CIRCUIT FOR FEEDING THE DUPLEX OUTLET FOR THE CCTV SWITCH CALLED OUT IN NOTE 2.



1 ELECTRICAL SITE PLAN
SCALE: 1" = 10'-0"

GRAPHIC SCALE IN FEET
0 10' 20' 40'

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05-23-23 BID DOCUMENTS
DATE
REVISIONS

NORTH

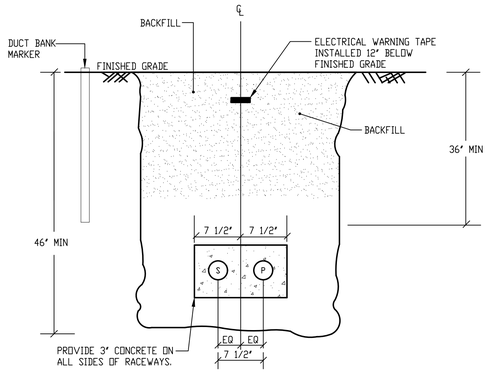
STAMP

SOUTH WORCESTER PLAYGROUND IMPROVEMENTS PHASE III
WORCESTER, MA
PROJECT

ELECTRICAL SITE PLAN
DRAWING TITLE

CONTRACT NO.	
DATE	05.23.23
DRAWN	MTG
CKD	JJM
SCALE	AS SHOWN

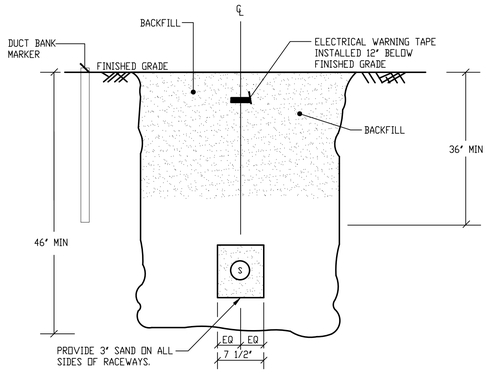
E-2
SHEET NO.



1 DUCT BANK SECTION A-A
SCALE: NTS

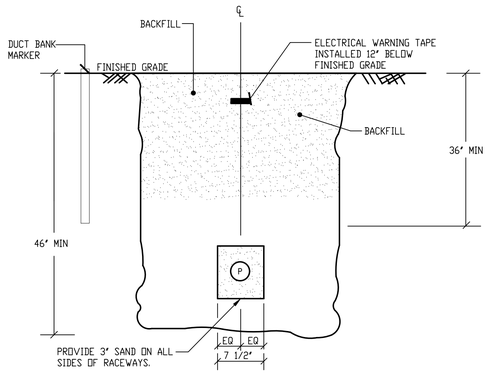
(P) 4" PRIM. ELEC. - SCHED 40 PVC

(S) 4" SPARE - SCHED 40 PVC



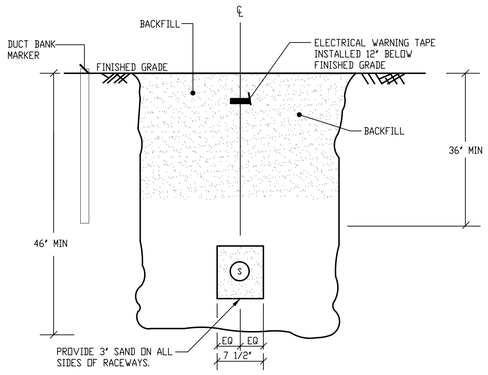
4 DUCT BANK SECTION D-D
SCALE: NTS

(S) 1" COMMUNICATIONS - HDPE



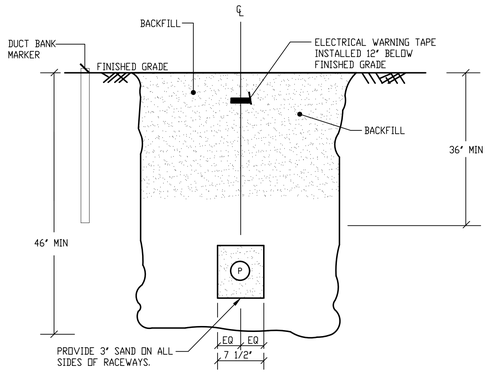
2 DUCT BANK SECTION B-B
SCALE: NTS

(P) 2" ELEC. - SCHED 40 PVC



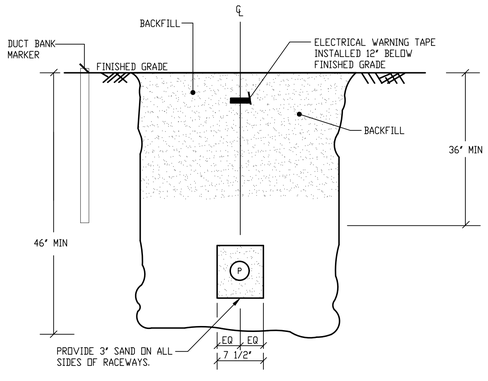
5 DUCT BANK SECTION E-E
SCALE: NTS

(S) 2" COMMUNICATIONS - HDPE



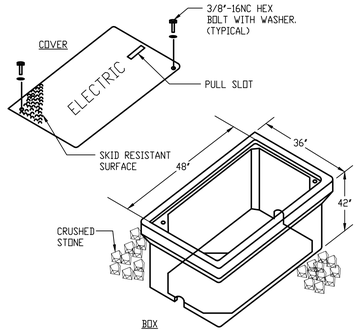
3 DUCT BANK SECTION C-C
SCALE: NTS

(P) 3/4" ELEC. - SCHED 40 PVC



6 DUCT BANK SECTION F-F
SCALE: NTS

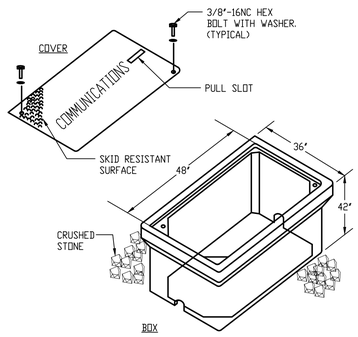
(P) 1-1/4" ELEC. - SCHED 40 PVC



7 TYPICAL (ELECTRIC) HANDHOLE PULLBOX DETAIL
SCALE: NTS

NOTES:

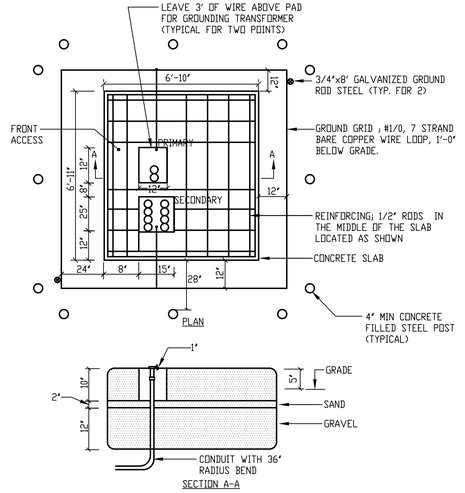
1. PHENIX PRECAST PRODUCTS 24"X36"X36" PULL BOX WITH HEAVY DUTY COVER CAT.#46665022 OR APPROVED EQUAL.
2. HANDHOLE BOX AND COVER SHALL BE FLUSH WITH SURROUNDING GRADE.
3. ENCLOSURES AND COVERS SHALL BE CONCRETE GRAY COLOR AND RATED FOR NO LESS THAN 8000 LBS. OVER A 10"x10" AREA AND BE DESIGNED AND TESTED TO TEMPERATURES OF -50° F.
4. MATERIAL COMPRESSIVE STRENGTH SHOULD BE NO LESS THAN 11,000 P.S.I.
5. COVERS SHALL HAVE A MINIMUM COEFFICIENT OF FRICTION OF 0.5.



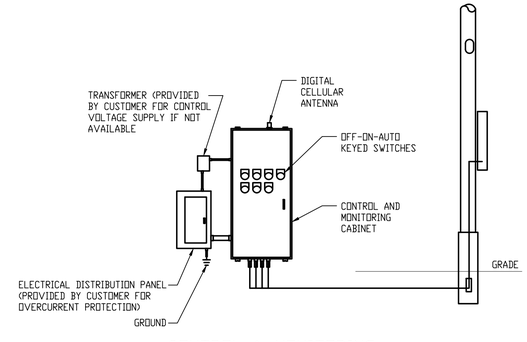
8 TYPICAL (COMMUNICATIONS) HANDHOLE PULLBOX DETAIL
SCALE: NTS

NOTES:

1. PHENIX PRECAST PRODUCTS 24"X36"X36" PULL BOX WITH HEAVY DUTY COVER CAT.#46665022 OR APPROVED EQUAL.
2. HANDHOLE BOX AND COVER SHALL BE FLUSH WITH SURROUNDING GRADE.
3. ENCLOSURES AND COVERS SHALL BE CONCRETE GRAY COLOR AND RATED FOR NO LESS THAN 8000 LBS. OVER A 10"x10" AREA AND BE DESIGNED AND TESTED TO TEMPERATURES OF -50° F.
4. MATERIAL COMPRESSIVE STRENGTH SHOULD BE NO LESS THAN 11,000 P.S.I.
5. COVERS SHALL HAVE A MINIMUM COEFFICIENT OF FRICTION OF 0.5.



9 PADMOUNTED TRANSFORMER FOUNDATION DETAIL
SCALE: NTS



10 CONTROL & MONITORING SYSTEM DETAIL
SCALE: NTS

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05-23-23 BID DOCUMENTS
DATE
REVISIONS

NORTH

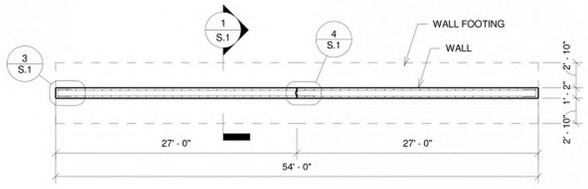
STAMP

SOUTH WORCESTER PLAYGROUND IMPROVEMENTS PHASE III
WORCESTER, MA
PROJECT

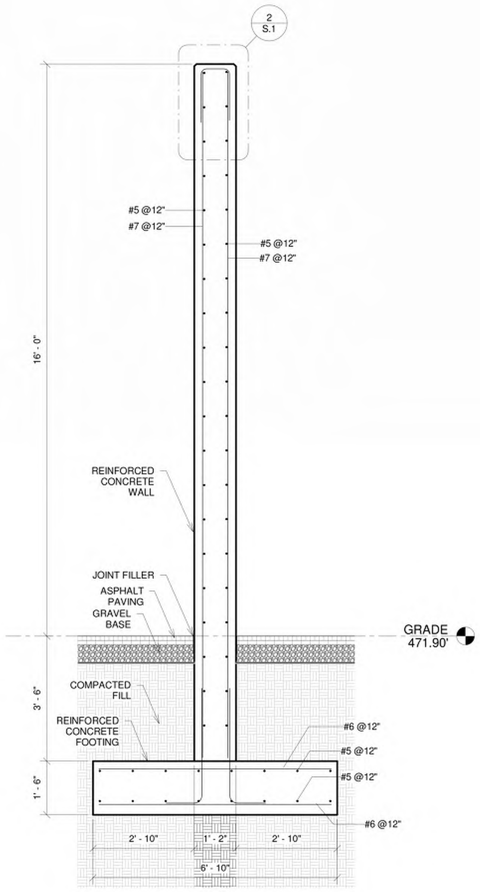
ELECTRICAL DETAILS
DRAWING TITLE

CONTRACT NO.	
DATE	05.23.23
DRAWN	MTG
CKD	JJM
SCALE	AS SHOWN

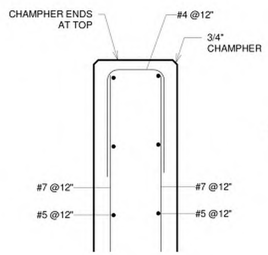
E-3
SHEET NO.



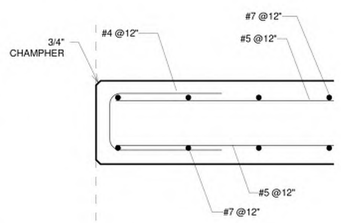
A WALL LAYOUT PLAN
1/8" = 1'-0"



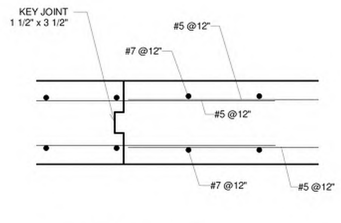
1 HANDBALL COURT WALL SECTION
1/2" = 1'-0"



2 HANDBALL COURT WALL SECTION TOP
1" = 1'-0"



3 WALL ENDS
1" = 1'-0"



4 WALL CONSTRUCTION JOINT
1" = 1'-0"

01100 - GENERAL REQUIREMENTS

1. Drawing notes and specifications apply generally to all the work unless more specific information is shown elsewhere on the drawings or written in the specifications. In the event of conflicting instructions, the Architect shall determine what controls.
2. Conform to The Massachusetts State Building Code, Ninth Edition and any amendments adopted by the local governing authority.
3. Refer to the project manual for general contract requirements and specifications.
4. Coordinate work with that shown on the architectural, site, and approved shop drawings.
5. Grades and plan dimensions for existing work are approximate and for planning reference only. Contractor shall take field measurements of existing conditions, review discrepancies with the architect, and build to approved work points.
6. Take dimensions to faces of walls.
7. Coordinate dimensions shown on the contract drawings with fabrication drawings and field conditions and report any inconsistencies to the Architect before proceeding with work.
8. Review, approve, and stamp shop drawing and product literature submittals to the Architect for review and approval.
9. The structural design is based on the interaction of all the parts of the completed building. The Contractor shall solely bear the risk for providing adequate stability and safety of the structure during construction.
10. Details shown on drawings are to be considered typical for all similar conditions.
11. Submit for approval shop drawings, manufacturer's product literature, test reports, and certifications electronically in Adobe Acrobat format.

01300 - DESIGN LOADS

1. Risk Category (IBC2015-1604.5) II
   In addition to self-weight, the structure is designed to carry the following.

Wind Load

Basic Wind Speed Risk Cat II (Vult)	124 mph
Wind Exposure	B
Method: Part 2 Simplified Directional, Class 1	

Earthquake Data

Seismic Importance Factor (Ie)	1.00
Spectral Response (Ss)	0.180
Spectral Response (S1)	0.066
Site Class	D
Spectral Response Coef. (Sds)	0.192
Spectral Response Coef. (Sd1)	0.106
Seismic Design Category	B
Response Mode (R)	1.5
Period (T)	0.276s
Seismic Coefficient (Cs)	0.128

01450 - STRUCTURAL TESTS AND SPECIAL INSPECTIONS

1. Structural work is subject to the testing and inspection provisions of Chapter 17 of the Code. The program of testing and inspection shall be prepared by the Structural Engineer of Record (SER) when documents are submitted for permit. The program of testing and inspections shall be carried out by an Independent Testing Agency (ITA) approved by the SER. The cost of the independent testing agency is borne by the Owner. The SER may choose to perform some inspections. The inspections and testing shall meet the standards referenced in the Code and comply with the contract documents and approved submittals.
2. The testing and inspections shall include but is not limited to the following:
   a. Soils.
      1. Visually inspect soils under footings meets soil requirements in contract documents.
      2. Test fill materials for gradation and soil constituent.
      3. Test compaction of bearing fills.
   b. Concrete.
      1. Inspect reinforcing placement.
      2. Inspect concrete placement, slump, segregation, and consolidation.
      3. Prepare test cylinders and test compressive strength.

02300 - CONSTRUCTION SAFEGUARDS

1. Provide a plan of action for the safe operations of the construction site. Include the storage of materials, construction egress, fire safety, public walkways, barricades, railings, barriers, and protections of the building and abutting property.

02450 - EXCAVATION

1. Remove soft or organic materials under and adjacent to footings and slabs-on-grade.
2. Slope sides or sheet, shore, or brace excavations to ensure stability.
3. Drain excavations to remove water and place concrete in the dry.
4. Elevations shown on the drawings are minimum required depths. Excavate deeper if needed to reach soil with specified bearing strength or increase footing size at the direction of the Architect/Engineer.

02482 - FOUNDATIONS AND RETAINING WALLS

1. The Architect assumes no responsibility on the correctness of the subsurface conditions presented on the drawings and in boring or test pit reports. The data are intended for the preparation of bids and subsequent construction. They represent conditions only at those specific locations at the time they were made.
2. The design assumes the following soil lateral pressures and bearing capacities (Tables IBC 1610.1 and IBC 1806.1) and the June, 27, 2022 Geotechnical Report by OHI Engineering, Inc:
   A. Active Pressure: 30 psf
   B. At-Rest Pressure: 60 psf
   C. Vertical Foundation Pressure: 4,000 psf
   D. Lateral Bearing Pressure: 200 psf
   E. Lateral Sliding Resistance coeff: 0.35
3. Carry footings down four inches into undisturbed soil having a minimum bearing capacity of 4,000 pounds per square foot.
4. Do not excavate for footings below a line inclined down 30 degrees from nearby footings unless the evacuation is adequately braced or approved by the Architect.
5. Inform the Architect to inspect the completed excavations for acceptability of the soil before constructing concrete forms.
6. Carry exterior foundations down at least 4 feet below exterior grade.
7. Finish footing excavations with hand tools.
8. Prevent soils supporting foundations from freezing. Remove any frozen soil and replace with concrete if under footings or with compacted granular fill if under slabs-on-grade.
9. Prepare subgrade by proof rolling with fully loaded gravel trucks or mechanical compactors. Choke fine sand on site with 12 inches of crushed stone.
10. Backfill under footings and under Base Course Fill with an approved Select Granular fill placed in 12-inch layers.
11. Backfill beside foundation walls with an approved Clean Granular Fill placed in 12-inch layers.
12. Compact each layer to 95% maximum density at optimum water content with at least four (4) passes of a vibratory roller, multiple-wheel pneumatic-tired roller or other approved compaction equipment. Inform the Architect before starting for inspection of backfill operations. Approved clean excavated materials meeting the specifications may be used for backfill.
13. **Gravel Fill Gradation Specifications**
    MHD M1.03.0 Type B
    Percent Passing by Weight

Sieve Size	Gravel Granular Fill
3"	100
1/2"	50-85
No. 4	40-75
No. 50	8-28
No. 100	0-8

14. **Crushed Stone Gradation Specifications**
    MHD M2.01.4
    Percent Passing by Weight

Sieve Size	Gravel Granular Fill
1"	100
3/4"	90-100
1/2"	10-50
3/8"	0-20
No. 4	0-5

15. Below ground water level, provide (1) 12-inches of crushed stone base under basement slabs-on-grade and footings and (2) a perimeter perforated drain pipe in a bed of crushed stone covered with a filter fabric.

03100 - FORMWORK

1. Concrete surfaces exposed to view in final construction shall be formed with new high density plastic overlaid Grade A Douglas Fir Plywood not less than 5/8" thick.
2. Form ties for use at exposed walls shall have 1-1/2" outside diameter wood or plastic cones 1-1/2" deep. and 1" from interior surfaces.
3. Forms shall be coated before initial pour and between subsequent pours with form release.
4. Design of formwork shall comply with ACI 347, and wind loads as specified by the State Building Code.
5. Formwork shall be constructed plumb, true, water and mortar tight; sufficiently rigid and strong to prevent sagging between supports and to maintain true position and shape during and after placing concrete, without waves or bulges.
6. Temporary openings shall be provided at the base of wall forms and at other points where necessary to facilitate cleaning and observations immediately before concrete is deposited.
7. Use side forms at footings not cast directly against existing foundations.
8. Form reglet joints in concrete where indicated.
9. All forms shall be thoroughly cleaned before reuse. Replace portions of plywood forms which become damaged or otherwise present an unacceptable surface.
10. Notify Architect 24 hours before placing footing forms for examination of bearing materials.
11. Construct forms for sample panels as indicated or directed by the Architect using all materials and techniques as they will be used in actual construction.
12. Contractor shall be solely responsible for safety of construction during and after form removal, and no act of Architect shall relieve him of this responsibility.
13. Formwork for walls, sides of beams and slabs, and other parts not supporting the weight of the concrete may be removed a soon as the concrete has hardened sufficiently to resist damage from removal operations.
14. Exercise care in form removal to prevent chipping of corners or other damage to concrete.

03200 - REINFORCING STEEL

1. Conform to the Manual of Standard Practice for Detailing Reinforced Concrete Structures, ACI 315; the Standard Specification for Structural Concrete in Buildings, ACI 301; and the Building Code Requirements for Reinforced Concrete, ACI 318.
2. Submit shop drawings for concrete work to the Architect for approval prior to fabrication.
3. Provide reinforcing steel meeting the standards of ASTM A615 Grade 60.
4. [All reinforcing steel to be hot dipped galvanized meeting ASTM A767.]
5. Run reinforcing bars continuously. Lap at cold construction joints. Stagger splices wherever possible.
6. Provide dowels in foundations for each supported vertical reinforcement bar.
7. Provide and schedule on shop drawings accessories to hold reinforcing in position. Space high chairs shall no more than 4'-0" apart, wire to bottom reinforcing. Provide # 5 support bars on high chairs. Space slab bolsters no more than 3'-6" apart.
8. Clearance of main reinforcing bars from adjacent concrete surfaces shall be:

Structural Element and Condition	**Cover**
Concrete cast against and permanently exposed to earth	3"
Concrete exposed to earth or weather	
#6 through #18 bars	2"
#5 bar, W31 or D31 wire or smaller	1 1/2"

9. Place temperature bars perpendicular to all main reinforcing bars and lap 36 bar diameters. Place temperature bars in upper layer for bottom steel and in lower layer for top steel.
10. Do not cut or displace reinforcing steel to accommodate the installation of embedded items without the approval of the Architect.

03300 - CONCRETE

1. Comply with the latest edition of the Standard Specification for Structural Concrete in Buildings, ACI 301, and the Building Code Requirements for Reinforced Concrete, ACI 318.
2. Submit product literature on concrete materials, design mixes, embedments, grout, fasteners, chemical treatments, and additives.
3. Center footings under supported members unless shown otherwise.
4. Brace retaining walls during backfilling and tamping operations. Leave bracing in position until permanent restraints are installed.
5. Install only steel, cast iron pipe, or PVC pipe sleeves in concrete slabs, beams, and walls.
6. Proportioned, mix and place concrete under the supervision of an approved concrete control engineer.
7. Provide normal weight 3/4" stone concrete with 28-day compressive strengths for the following uses:

Use (Exposure classes and categories)	**psi**
Lean concrete mud mat	2000
Footings and interior slabs on grade (F0, W1, & C1)	4000
Foundation and retaining walls (F2, W1, & C1)	4000
Concrete freezing while moist walls and slabs. (F2, W1, & C1)	4500

   Refer to Table 19.3.1.1 for exposure classes and categories.

8. Meet Table 19.3.2.1 - Requirements for concrete by exposure class to proportion water cement ratios, minimum 28 day strength, air content, Cementitious materials, and chloride content.
9. Provide 6% air entrained concrete exposed to earth or weather.
10. Wet cure walls for 7 continuous days.
11. Do not omit, relocate, or add construction joints unless approved by the Engineer.
12. Provide dowels and keyways at all construction joints. Allow 48 hours to elapse between adjacent wall pours.
13. Provide keyed construction joints no greater than 40 feet apart in walls. Apply approved adhesive to previous pour equivalent to neat Portland cement paste.
14. Provide reinforcing steel in for walls as follows: Provide dowels to footings to match vertical bars.
15. Provide 3/8" thick Asphalt Expansion Joint filler at all grade paving to wall edges against concrete walls equal to W.R. Meadows Asphalt Expansion Joint.
16. Leave shoring in place until concrete has attained 75% of its 28-day strength.
17. Notify the Architect at least 24 hours in advance of pouring concrete for inspection of reinforcing steel placement. Cast no concrete until the inspection has been made or waived by the Architect.
18. Place all form ties in a symmetrical uniform grid. Submit layout to Architect for approval.
19. All vertical and horizontal corners shall be chamfered 3/4".
20. Place concrete in continuous lifts a maximum of four feet high thoroughly vibrating the mix to eliminate voids. Place all concrete in a single day between vertical construction joints.
21. Upon stripping forms, fill all tie cone holes with mortar mixed with sand to blend well with the concrete. Trowel filled holes flat and in plane with the face of concrete.
22. Patch any voids with same mortar mix and trowel flat and in plane to wall.
23. Use rubbing stones to grind any excess concrete such as form joint fins and void patches.
24. The intent is to produce a truly flat wall with a smooth surface with no irregularities that would affect handball rebound.

WORCESTER
A TOWN JUNE 14, 1722 A CITY FEBY. 29, 1848

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STRUCTURAL ENGINEERS
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BELMONT, MA 02478
T: 617-484-4733

BID DOCUMENTS

5/23/2023

NO	DATE	REVISION
REVISIONS		

PLAN NORTH

ARTHUR H. MacLEOD No. 35479 REGISTERED PROFESSIONAL ENGINEER

STAMP

SOUTH WORCESTER PLAYGROUND HANDBALL COURT WALL

PROJECT 47 Camp St., Worcester, MA 01603

HANDBALL COURT WALL STRUCTURE

DRAWING TITLE

JOB NO:	2022.08
DATE	05/23/23
DRAWN	AHM
CKD	AHM
SCALE	As indicated

S.1

SHEET NO.