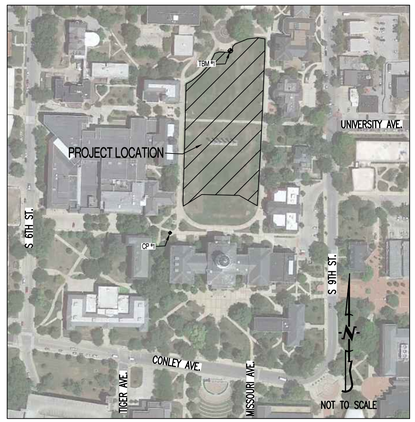
FRANCIS QUADRANGLE - IRRIGATION, DRAINAGE, AND TURF REPLACEMENT

FOR THE CURATORS OF THE UNIVERSITY OF MISSOURI
PROJECT NO. CP241991

LOCATION MAP



FLOOD PLAIN STATEMENT:

NO PART OF THIS TRACT IS LOCATED WITHIN THE 100-YEAR FLOODPLAIN AS PER THE FEME F.I.R.M. PANEL #29019C0280E DATED APRIL 19, 2017.

UTILITY COMPANIES:

LOCATES:
MISSOURI ONE CALL INC.
1022 B NORTHEAST DRIVE
JEFFERSON CITY, MO 65109
1-800-344-7483

NATURAL GAS:
AMEREN MISSOURI
2001 MAGUIRE BLVD.
COLUMBIA, MO 65201
573-876-3030

FIBER:
UNIVERSITY OF MISSOURI, DIVISION OF I.T.
920 S COLLEGE AVE.
COLUMBIA, MO 65211
573-882-5000

WATER/ELECTRIC:
CITY OF COLUMBIA
P.O. BOX 6015
WATER & LIGHT DEPARTMENT
COLUMBIA, MO 65205
573-874-7325

SANITARY SEWER:
CITY OF COLUMBIA
P.O. BOX 6015
UTILITIES DEPARTMENT
COLUMBIA, MO 65205
573-874-7250

WATER/ELECTRIC:
ENERGY MANAGEMENT
417 S. 5TH ST.
COLUMBIA, MO 65211
573-882-3094

STORM/SANITARY SEWER & SECONDARY ELECTRIC:
UNIVERSITY CAMPUS FACILITY OPERATIONS
180 GENERAL SERVICES BUILDING
COLUMBIA, MO 65211
573-882-8211

GENERAL NOTES:

EXISTING UNDERGROUND UTILITIES HAVE BEEN PLOTTED FROM EXISTING RECORDS AND THEIR LOCATIONS ARE APPROXIMATE ONLY. OTHER UTILITIES OR OBSTRUCTIONS MAY ALSO BE ENCOUNTERED. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF ALL EXISTING UNDERGROUND UTILITIES AND TO AVOID DAMAGE TO SAME DURING CONSTRUCTION. IF IT CAN BE DETERMINED BY THE OWNER'S REPRESENTATIVE THAT ANY EXISTING UTILITY HAS BEEN, OR CAN BE ABANDONED, CONTRACTOR SHALL REMOVE SAME, AT HIS EXPENSE, TO FACILITATE CONSTRUCTION. ENDS OF REMAINING CONDUITS OR PIPES SHALL BE PLUGGED OR CAPPED.

EXISTING UTILITIES SHOWN FOR REFERENCE ONLY. FIELD VERIFY UTILITY LOCATIONS, ELEVATIONS, AND SLOPES PRIOR TO CONSTRUCTING NEW UTILITIES.

SUPPORT AND PROTECT UTILITIES CROSSING EXCAVATIONS. RESTORE DAMAGED UTILITIES TO ORIGINAL CONDITIONS PRIOR TO BACKFILLING EXCAVATIONS. OBTAIN INSPECTION AND APPROVAL OF OWNER'S REPRESENTATIVE PRIOR TO BACKFILLING EXCAVATIONS.

DO NOT STORE EQUIPMENT OR MATERIAL IN AREA OF TREES. PROTECT TREES FROM DAMAGE UNLESS NOTED OTHERWISE. OWNER WILL TRIM TREES AS REQUIRED PRIOR TO CONSTRUCTION. COORDINATE WITH OWNER'S REPRESENTATIVE.

INSTALL CONSTRUCTION FENCING AROUND THE DRIP LINES OF ALL TREES IN WORK AREAS.

COORDINATE CONSTRUCTION FENCE LOCATION WITH OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING.

REPLACE ALL PAVING, SIDEWALKS, CURBS, GUTTERS, DRAINAGE STRUCTURES, PAVEMENT MARKING, SIGNS, PARKING METERS, LIGHTS, BIKE RACKS, ETC, REMOVED OR DAMAGED DURING CONSTRUCTION. COMPLY WITH CITY OF COLUMBIA OR MU STANDARDS, AS APPROPRIATE. CONTRACTOR TO PROTECT ALL EXISTING UTILITIES, STRUCTURES, AND PAVEMENT THAT IS TO REMAIN. ALL DAMAGED ITEMS OUTSIDE THE SCOPE OF WORK TO ARE TO BE REPLACED OR REPAIRED TO ORIGINAL CONDITION AT THE CONTRACTORS EXPENSE.

CONTRACTOR SHALL NOT BLOCK ACCESS TO ANY MANHOLE OR VALVE BOX.

THE STORM WATER POLLUTION PREVENTION MEASURES INDICATED ARE THE MINIMUM MEASURES TO BE USED, PROVIDE ADDITIONAL SITE SPECIFIC MEASURES AS NECESSARY TO PREVENT STORM WATER POLLUTION & TO COMPLY WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EROSION CONTROL DEVICES AND REMOVING THEM ONCE THE SITE IS STABILIZED.

CONTRACTOR SHALL COORDINATE SITE LOGISTICS AMONGST ADJACENT CONCURRENT PROJECTS WITH OWNER'S REPRESENTATIVE.

IT IS THE INTENT OF THESE PLANS TO COMPLY WITH THE REQUIREMENTS OF THE MODNR CLEAN WATER COMMISSION.

ALL PAVEMENTS, SIDEWALKS, ABANDONED SEWERS, PIPELINES, EXCESS EARTHWORK, OR OTHER OBSTRUCTIONS TO CONSTRUCTION THAT ARE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS SPECIFICALLY NOTED AND SHALL BE DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH STATE REGULATION 10 CSR 80-2.010 (9)(A)1.

ALL SLOPES ARE 3:1 OR FLATTER UNLESS OTHERWISE NOTED.

ALL DISTURBED AREAS WITHIN THE "LIMITS OF DISTURBANCE" SHALL BE FINE GRADED BY CONTRACTOR AND VEGETATION REESTABLISHED BY OWNER.

ROOT SYSTEM FROM PREVIOUSLY REMOVED TREES REMAIN AND MAY BE ENCOUNTERED DURING GRADING AND INSTALLATION OF UTILITIES. CONTRACTOR TO REMOVE ROOTS IN TOP 6" OF SOIL TO BE AMENDED. ROOTS DEEPER THAN 6" SHALL REMAIN.

CONTRACTOR SHALL ADJUST ALL YARD BOXES, VALVE BOXES, PULL BOXES, CLEANOUTS, MANHOLE LID RINGS, AND OTHER UTILITY STRUCTURES TO FINISHED GRADE.

REMAINS FROM ACADEMIC HALL (BUILDING DESTROYED BY FIRE IN 1892). MAY BE ENCOUNTERED DURING GRADING. ANY ARTIFACTS FOUND SHALL BE RETURNED TO OWNER.

TOTAL DISTURBED AREA ON SITE = 2.61 AC.

SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE	CD SET 03/20/24
CE 0	COVER SHEET	X
CE 1.1	EXISTING CONDITIONS NORTH QUAD	X
CE 1.2	EXISTING CONDITIONS SOUTH QUAD	X
CE 2.1	EROSION CONTROL AND SITE ACCESS PLAN	X
L-100	GRADING AND STORM SEWER PLAN	X
L-200	PLANTING PLAN	X
L-201	PLANTING DETAILS AND SPECIFICATIONS	X
L-300	IRRIGATION PLAN - BASE BID	X
L-301	IRRIGATION PLAN - ADD ALTERNATE #1	X
L-302	IRRIGATION DETAILS	X
L-303	IRRIGATION SPECIFICATIONS	X

PROJECT BENCHMARK:

MCP #005 – 2" DOMED BRONZED CONCRETE SURVEY MARKER LOCATED IN THE SIDEWALK AT THE SOUTHEAST CORNER OF UNIVERSITY AVE. AND HITT ST. INTERSECTION.
NORTHING – 1133490.99
EASTING – 1690054.62
ELEVATION – 764.78

TBM #1 – CHISELED SQUARE LOCATED ON THE SOUTHEASTERN CORNER OF THE CONCRETE PAD APPROXIMATELY 290' NORTH OF THE COLUMNS AND APPROXIMATELY 140' WEST OF REYNOLDS JOURNALISM INSTITUTE.
ELEVATION = 736.76

SURVEY CONTROL POINTS:

CP #1 (PK NAIL) – NORTHING: 1133168.41 (FT.)
EASTING: 1689251.75 (FT.)

COORDINATE SYSTEM NOTES:

COORDINATES SHOWN ARE MODIFIED MISSOURI STATE PLANE COORDINATES (CENTRAL ZONE). MODIFICATION INCLUDES CONVERSION FOR METERS TO U.S. SURVEY FOOT. USING 3.280833 FEET PER METER.

ENGINEER CERTIFICATION:

BY SIGNING AND AFFIXING MY SEAL TO THESE PLANS, I HEREBY CERTIFY THAT THESE DRAWINGS AND/OR SPECIFICATIONS HAVE BEEN PREPARED BY ME, OR UNDER MY SUPERVISION. I FURTHER CERTIFY THAT TO THE BEST OF MY KNOWLEDGE THESE DRAWINGS AND/OR SPECIFICATIONS ARE AS REQUIRED BY AND IN COMPLIANCE WITH THE BUILDING CODES OF THE UNIVERSITY OF MISSOURI.

LEGEND OF SYMBOLS:

("*" INDICATES UTILITY DRAWN FROM MAP PROVIDED BY OWNER)

- EXISTING CURB
- EXISTING WATERLINE
- EXISTING WATERLINE
- EXISTING WATER VALVE
- EXISTING WATER METER
- EXISTING FIRE HYDRANT
- EXISTING GAS LINE
- EXISTING GAS METER
- EXISTING SANITARY SEWER
- STORM/SANITARY MANHOLE
- EXISTING SANITARY SEWER LATERAL
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
- EXISTING STEAM CHASE
- EXISTING STORM SEWER
- BEEHIVE INLET
- PROPOSED CURB
- EXISTING STRUCTURE
- EXISTING MINOR CONTOUR
- EXISTING MAJOR CONTOUR
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EXISTING LIGHT POLE
- EXISTING UTILITY POLE
- EXISTING AIR CONDITIONER
- EXISTING TELEPHONE PEDESTAL
- EXISTING ELECTRICAL TRANSFORMER
- EXISTING ELECTRIC METER
- EXISTING CONCRETE
- EXISTING ASPHALT
- PROPOSED CONCRETE
- EXISTING SIGN
- EXISTING POST AND CHAIN FENCE
- EXISTING BRICK PAVERS

REVISIONS:

NO.	DATE
BID SET	03/20/2024

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

STATE OF MISSOURI
NATHAN THOMAS ECKHOFF
NUMBER PE-2003014960
PROFESSIONAL ENGINEER

NATHAN THOMAS ECKHOFF
MO LICENSE: 2003014960

PREPARED BY:
CROCKETT ENGINEERING CONSULTANTS
1000 W. Nifong Blvd., Bldg. 1
Columbia, MO 65203
(573) 447-0292
www.crockettengineering.com
Crockett Engineering Consultants, LLC
Missouri Certificate of Authority
#2000013901

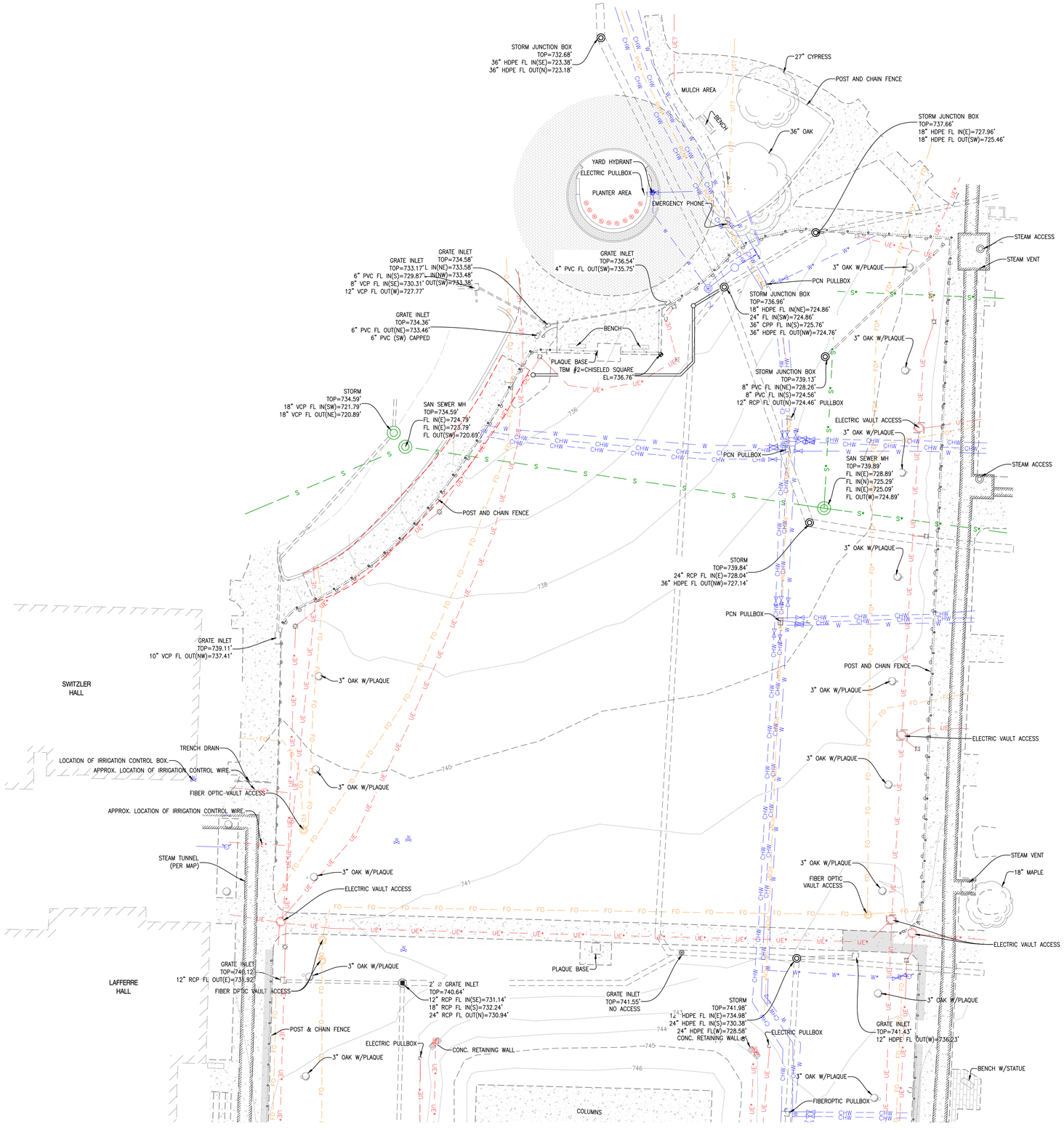
OWNER:
THE CURATORS OF THE UNIVERSITY OF MISSOURI
225 UNIVERSITY HALL
CAMPUS BUSINESS SERVICES
COLUMBIA, MO 65211

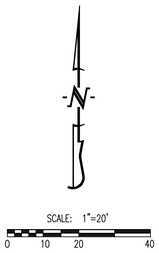
CP241991 - FRANCIS QUADRANGLE
IRRIGATION, DRAINAGE, AND TURF REPLACEMENT
COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:
COVER SHEET

DESIGNED: NTE
DRAWN: NMD
PROJECT NO.: CP241991
SHEET: CE 0

Y:\2024\240006 - CP241991- Francis Quad- Irrigation, Drainage and Turf Replacement\Civil\ACAD Files\Construction Plans\240006 Site Base.dwg





LEGEND OF SYMBOLS:

("*" INDICATES UTILITY DRAWN FROM MAP PROVIDED BY OWNER)

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- EXISTING WATER METER
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- EXISTING GAS LINE
- EXISTING GAS METER
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- STORM/SANITARY MANHOLE
- EXISTING SANITARY SEWER LATERAL
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND FIBER OPTIC
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- EXISTING ASPHALT
- PROPOSED CONCRETE
- EXISTING SIGN
- EXISTING POST AND CHAIN FENCE
- EXISTING BRICK PAVERS

REVISIONS:

NO.	DATE
BID SET	03/20/2024

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

STATE OF MISSOURI
NATHAN THOMAS ECKHOFF
NUMBER PE-2003014960
PROFESSIONAL ENGINEER

NATHAN THOMAS ECKHOFF
MO LICENSE-2003014960

PREPARED BY:
CROCKETT ENGINEERING CONSULTANTS
1000 W. Nifong Blvd., Bldg. I
Columbia, Missouri 65203
(573) 447-0292
www.crockettengineering.com
Crockett Engineering Consultants, LLC
Missouri Certificate of Authority
#2006013901

OWNER:
THE CURATORS OF THE UNIVERSITY OF MISSOURI
225 UNIVERSITY HALL
COLUMN BUSINESS SERVICES
COLUMBIA, MO 65211

CP241991 - FRANCIS QUADRANGLE IRRIGATION, DRAINAGE, AND TURF REPLACEMENT

COLUMBIA, BOONE COUNTY, MISSOURI

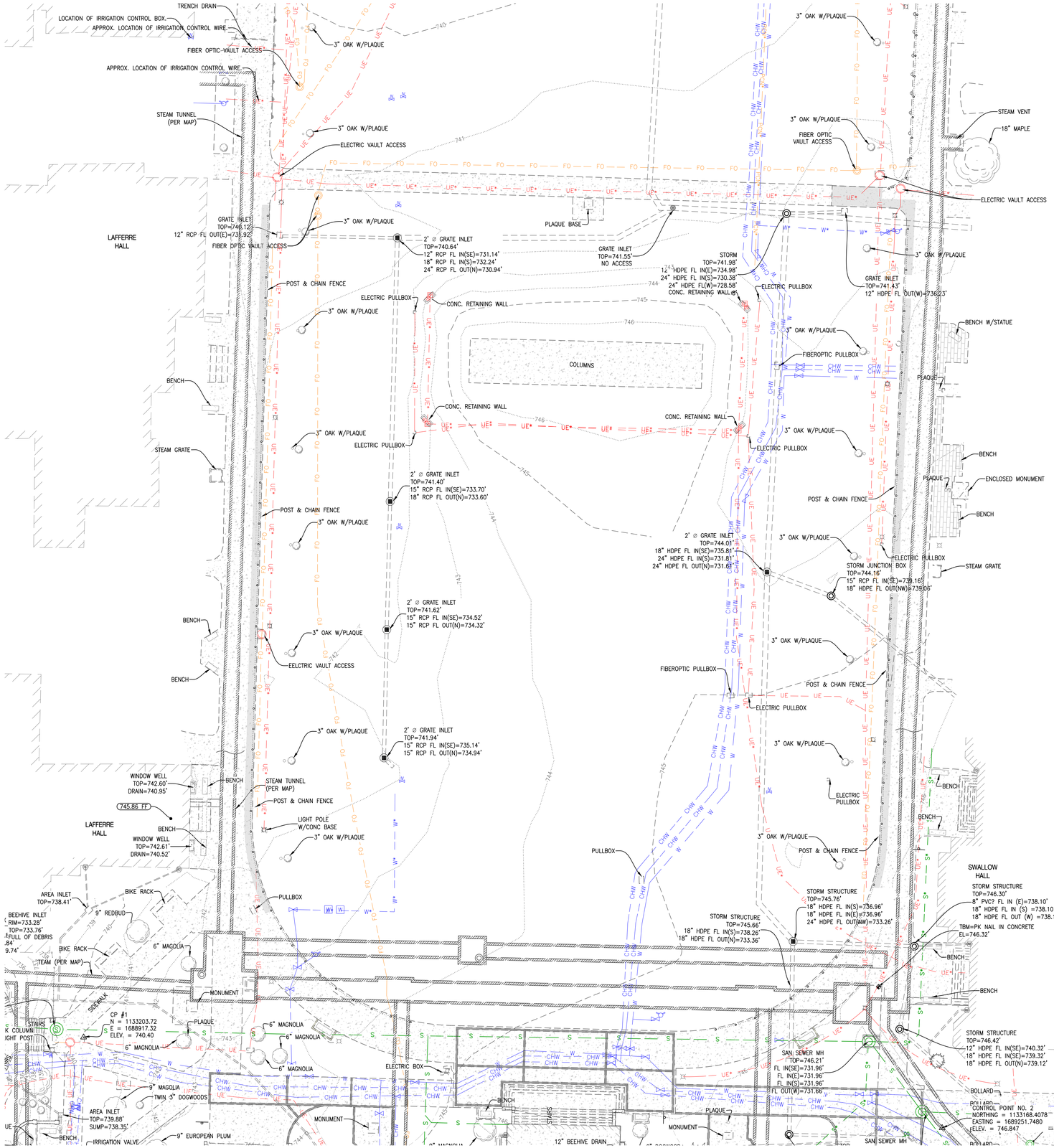
DRAWING INCLUDES:

EXISTING CONDITIONS NORTH QUAD

DESIGNED:	NTE
DRAWN:	NMD
PROJECT NO.:	CP241991

SHEET:
CE 1.1

Y:\2024\240006 - CP241991- Francis Quad- Irrigation, Drainage and Turf Replacement\Civil\ACAD Files\Construction Plans\240006 Site Base.dwg



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REVISIONS:

NO.	DATE
BID SET	05/20/2024

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COLUMBIA, MO 65211

CP241991 - FRANCIS QUADRANGLE IRRIGATION, DRAINAGE, AND TURF REPLACEMENT

COLUMBIA, BOONE COUNTY, MISSOURI

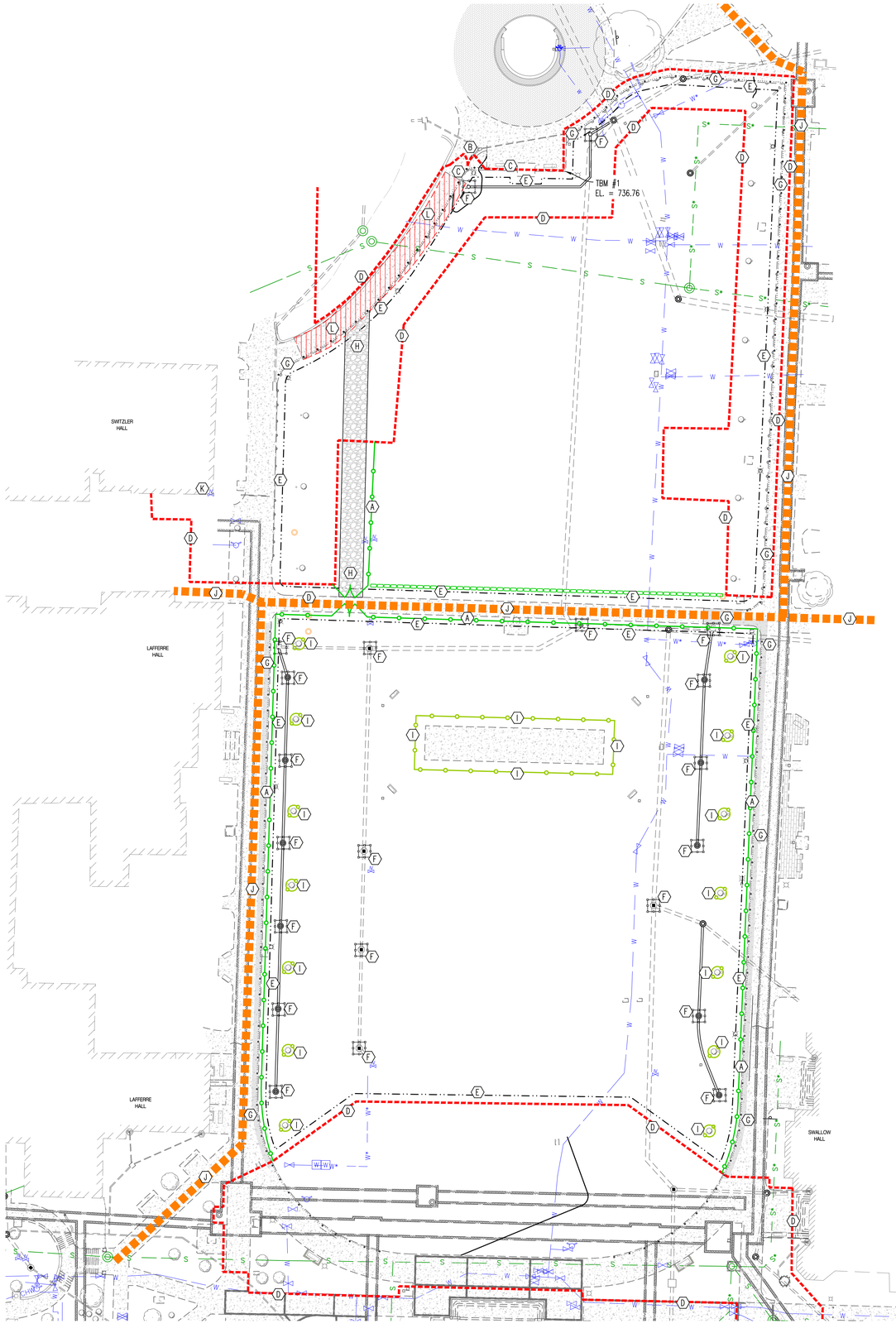
DRAWING INCLUDES:

EXISTING CONDITIONS SOUTH QUAD

DESIGNED: NTE
DRAWN: NMD
PROJECT NO.: CP241991

SHEET: CE 1.2

Y:\2024\240006 - CP241991 - Francis Quad - Irrigation, Drainage and Turf Replacement\Civil\ACAD Files\Construction Plans\240006 Site Base.dwg



SCALE: 1"=30'
0 15 30 60

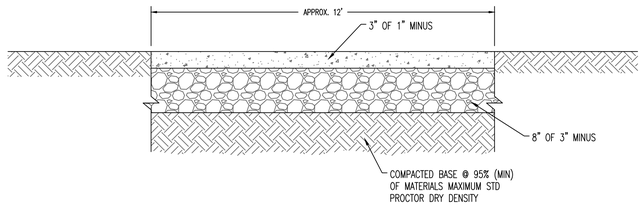
LEGEND OF LABELS

A	CONTRACTOR TO INSTALL TEMPORARY 6' HIGH CHAIN LINK FENCE W/ GATES AND SCREENING ATTACHED AS SHOWN. REFER TO SCREENING PATTERN ON THIS SHEET FOR REFERENCE. THIS IS TO REMAIN FOR THE ENTIRETY OF THE PROJECT.
B	CONTRACTOR TO USE EXISTING PAVING AS CONSTRUCTION ENTRY AND EXIT AND STAGING AREA WITHIN THE FENCE LIMITS. ALL CONSTRUCTION TRAFFIC SHALL UTILIZE THIS ENTRY AND EXIT TO THE PROJECT. ANY DAMAGED PAVEMENT DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR. CONTRACTOR SHALL CLEAN/POWER WASH CONSTRUCTION AREA PAVEMENT ONCE WORK IS COMPLETE.
C	EXISTING BOLLARDS TO BE REMOVED FOR CONSTRUCTION ENTRANCE AS SHOWN ON FRANCIS QUADRANGLE STEAM TUNNEL REPLACEMENT PLANS. CONTRACTOR SHALL COORDINATE SHARING 8TH STREET CONSTRUCTION ENTRANCE WITH FRANCIS QUADRANGLE STEAM TUNNEL AND GEOLOGY STEAM PROJECTS WITH OWNER'S REPRESENTATIVE.
D	APPROXIMATE LOCATION OF TEMPORARY CONSTRUCTION FENCING FOR ADJACENT PROJECT. CONTRACTOR SHALL COORDINATE SITE LOGISTICS AMONGST ADJACENT CONCURRENT PROJECTS WITH OWNER'S REPRESENTATIVE.
E	LIMITS OF DISTURBANCE.
F	INSTALL SILT FENCE AROUND EXISTING INLET DURING ROUGH GRADING.
G	EXISTING SIDEWALK TO BE RECONSTRUCTED AS SHOWN ON FRANCIS QUADRANGLE STEAM TUNNEL REPLACEMENT PLANS. CONTRACTOR TO COORDINATE WORK IN THIS AREA WITH OWNER'S REPRESENTATIVE.
H	INSTALL GRAVEL DRIVE AS SHOWN TO PREVENT RUTTING AND COMPACTION OF EXISTING SOIL.
I	CONTRACTOR TO INSTALL PROTECTION FENCING AROUND TREES AND COLUMNS AS SHOWN. REFER TO DETAIL ON L-201.
J	EXISTING SIDEWALK TO REMAIN OPEN FOR PEDESTRIANS THROUGHOUT DURATION OF PROJECT. ANY DAMAGED PAVEMENT DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR. CONTRACTOR SHALL CLEAN/POWER WASH CONSTRUCTION AREA PAVEMENT ONCE WORK IS COMPLETE.
K	EXISTING CONTROL BOX LOCATED NEAR SOUTHEAST CORNER OF SWITZLER HALL. CONTRACTOR TO REUSE EXISTING WIRE AS PULL WIRE. COORDINATE WITH OWNER'S REPRESENTATIVE.
L	GRAVEL DRIVE INSTALLED BY OTHERS. CONTRACTOR TO COORDINATE SITE LOGISTICS WITH OWNER'S REPRESENTATIVE.

TIGER STRIPE FENCE SCREENING PATTERN

LEGEND:

- FENCE TO BE INSTALLED BY CONTRACTOR OF THIS PROJECT.
- FENCE TO BE INSTALLED BY OTHERS FOR ADJACENT PROJECTS. CONTRACTOR TO COORDINATE WITH OWNER'S REPRESENTATIVE.
- FENCE TO BE INSTALLED BY OWNER FOR THIS PROJECT ONLY.
- PROTECTIVE FENCING TO BE INSTALLED FOR TREES AND COLUMNS BY CONTRACTOR OF THIS PROJECT.
- PEDESTRIAN ACCESS ROUTE TO REMAIN OPEN AT ALL TIMES.



TYPICAL TEMPORARY ACCESS DRIVE AND LAY DOWN AREA CROSS-SECTION

REVISIONS:

NO.	DATE
BID SET	03/20/2024

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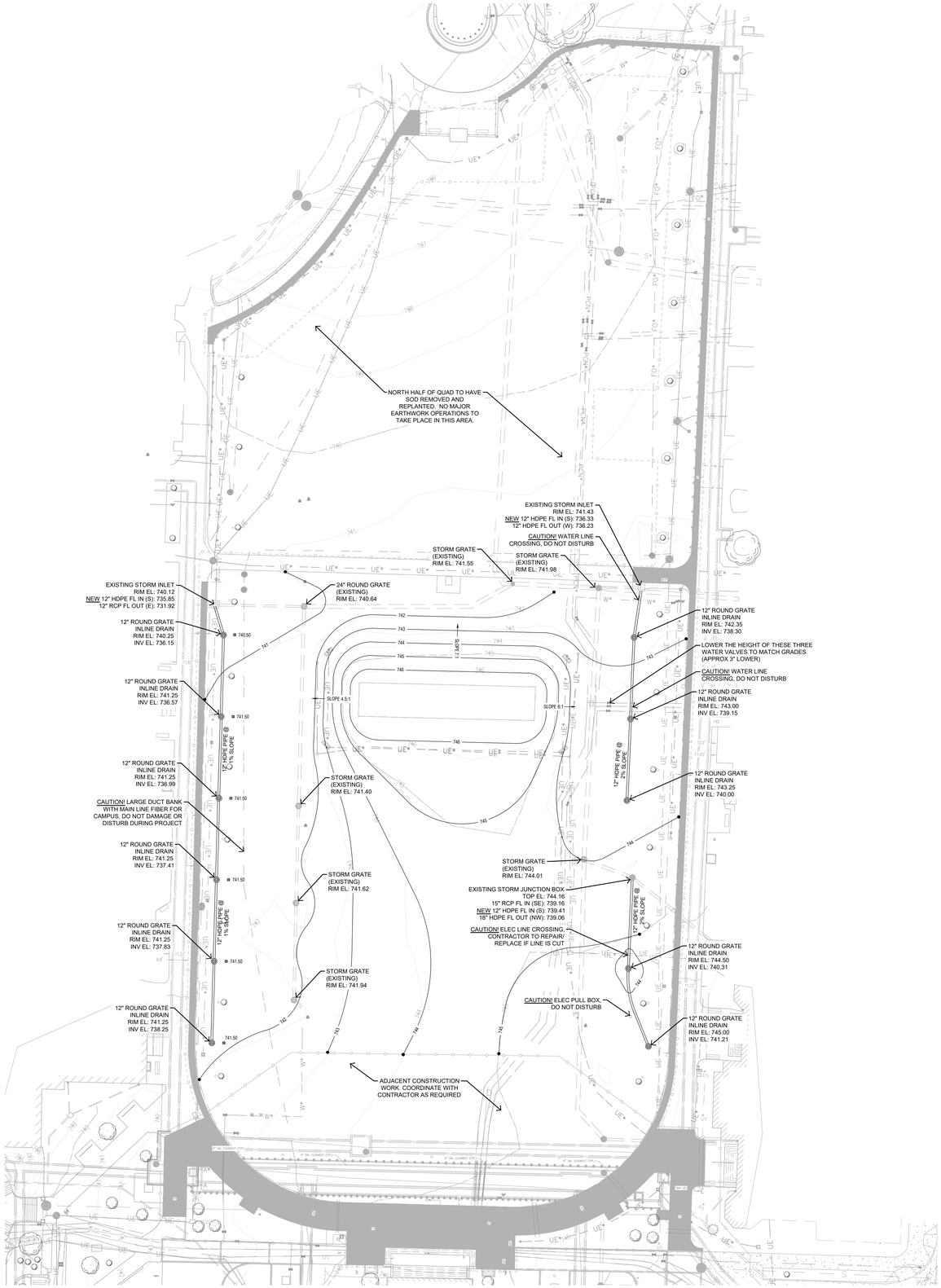
CP241991 - FRANCIS QUADRANGLE IRRIGATION, DRAINAGE, AND TURF REPLACEMENT
COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:
EROSION CONTROL AND SITE ACCESS PLAN

DESIGNED: NTE
DRAWN: NMD
PROJECT NO.: CP241991

SHEET:
CE 2.1



GRADING LEGEND:

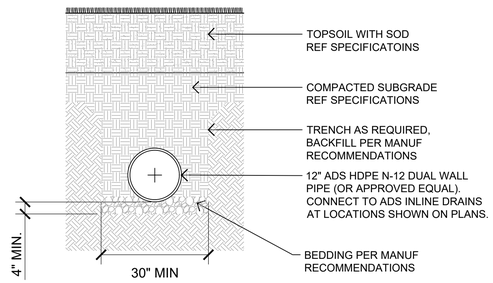
XXX.XX — PROPOSED SPOT ELEVATION

XXX — PROPOSED CONTOUR

PROPOSED 12" HDPE STORM PIPE WITH ADS INLINE DRAIN AND GRATE

GRADING NOTES:

1. STRIP 6" EXISITNG TOPSOIL IN AREAS OF MAJOR EARTHWORK OPERATIONS IN THE SOUTH HALF OF THE QUAD AS OUTLINED IN SOD SPECIFICATIONS.
2. REMOVE EXISTING TURF MATERIAL IN NORTH HALF OF QUAD FOR INSTALLATION OF NEW SOD.
3. ALL EARTHWORK OPERATIONS TO COMPLY WITH SOIL AMENDMENTS AND SOD PREP REQUIREMENTS AS OUTLINED IN SOD SPECIFICATIONS.
4. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING SITE CONDITIONS SHOWN ON PLAN. ANY DISCREPANCIES NOTED IN THE FIELD SHALL BE RELAYED TO THE OWNER PRIOR TO COMMENCEMENT OF WORK.
5. UNDERGROUND IMPROVEMENTS MAY VARY FROM SURVEY AND CONTRACTOR SHALL USE CAUTION DURING ANY EARTHWORK OPERATIONS NEAR EXISTING UTILITIES. ANY UTILITIES DAMAGED BY CONTRACTOR SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE.
6. ROOT SYSTEMS FROM REMOVED TREES MAY STILL EXIST WITHIN TOP 6" OF SOIL TO BE REMOVED. THESE ROOTS SHALL BE REMOVED. USE CAUTION AS TO NOT DAMAGE UTILITIES DURING THE REMOVAL PROCESS.
7. CONTRACTOR TO REPAIR ANY DAMAGE TO WIRING ASSOCIATED WITH SITE LIGHTING OR SECURITY CAMERAS WITHIN 12 HOURS.
8. PROVIDE POSITIVE DRAINAGE AT ALL TIMES WITHIN THE CONSTRUCTION AREA. CONTRACTOR SHALL GRADE ALL LOW SPOTS TO DRAIN.
9. ALL NEW STORM PIPES TO BE 12" ADS HDPE WITH INLINE DRAIN BASINS AND 12" GRATES (OR APPROVED EQUAL)
10. DEMO AND REMOVE EXISTING IRRIGATION SYSTEM TO BE REPLACED IN SOUTH HALF OF QUAD. IF ADD ALTERNATE FOR NEW IRRIGATION SYSTEM IN NORTH HALF OF QUAD IS TAKEN, EXISTING IRRIGATION IN THAT AREA SHALL BE REMOVED AS WELL.



NOTES:

1. REFER TO PLAN FOR INVERT ELEVATION INFORMATION.
2. CONNECT TO INLINE DRAINS PER MANUFACTURER RECOMMENDATOINS AS SHOWN ON PLANS.
3. SLOPE ALL PIPES TO HAVE POSITIVE DRAINAGE WITH MIN. 1% SLOPE.
4. CONNECT INTO EXISTING INLETS AS SHOWN ON PLANS. SEAL NEW CONNECTION POINTS AS REQUIRED.

A — 12" HDPE PIPE
3/4" = 1'-0"

GRAPHIC SCALE IN FEET
0 15 30 60

NORTH

No.	REVISIONS	DATE	BY

Kimley»Horn
805 PENNSYLVANIA AVENUE, SUITE 150
KANSAS CITY, MO 64105
PHONE: 816-652-03501
WWW.KIMLEY-HORN.COM

MO CERTIFICATE OF AUTHORITY #000572, EXPIRES 12/31/22

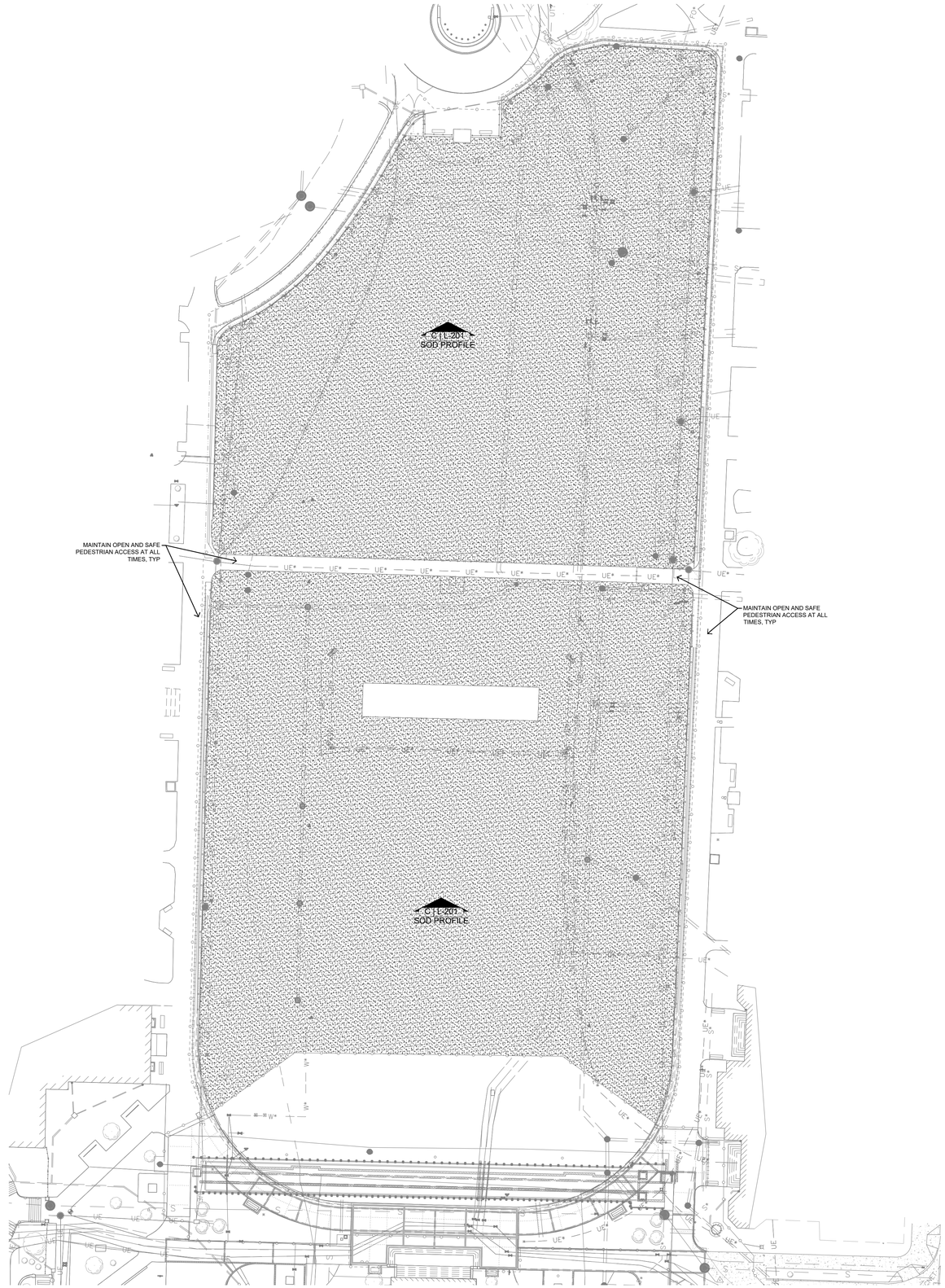
STATE OF MISSOURI
SEAN ALBERT RAY
NUMBER LA-2012026597
LANDSCAPE ARCHITECT
03/20/2024

KHA PROJECT 266842000
DATE 03/20/2024
SCALE: AS SHOWN
DESIGNED BY: JDK
DRAWN BY: DLL
CHECKED BY: SAR

CP241991 FRANCIS QUADRANGLE IRRIGATION, DRAINAGE, AND TURF REPLACEMENT

GRADING AND STORM SEWER PLAN

SHEET NUMBER
L-100



PLANT SCHEDULE

SYMBOL	CODE	QTY	BOTANICAL / COMMON NAME	REMARKS
GROUND COVERS				
	FI	114,233 SF	FESTUCA ARUNDINACEA 'BLACK BEAUTY' / BLACK BEAUTY TALL FESCUE	SOD TO HAVE TIGHT, SAND-FILLED JOINTS, ROLLED. SOD TO BE FREE OF WEEDS, PESTS, AND DISEASE.

TREE PRESERVATION NOTES:

1. CONTRACTOR SHALL ADHERE TO ALL TREE PRESERVATION REQUIREMENTS LISTED HEREIN.
2. CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION PROCEDURES WITH THE OWNER PRIOR TO BEGINNING WORK.
3. ANY DEMOLITION OR EXCAVATION WITHIN THE DRIP LINE OF AN EXISTING TREE SHALL PROCEED WITH EXTREME CARE EITHER BY THE USE OF HAND TOOLS, DIRECTIONAL BORING, AIR KNIFE EXCAVATION, AND/OR WITH OTHER LOW IMPACT EQUIPMENT THAT WILL NOT CAUSE DAMAGE TO THE TREE, ROOTS, OR SOIL; CONTRACTOR SHALL COORDINATE SUCH PROCEDURES WITH THE PROJECT ARBORIST.
4. EXISTING TREE LOCATIONS AND SIZES ARE ESTIMATES BASED ON A SURVEY PROVIDED BY THE OWNER SELECTED SURVEYOR.
5. NO SIGNS, BUILDING PERMITS, WIRES, OR OTHER ATTACHMENTS OF ANY KIND SHALL BE ATTACHED TO ANY TREE. GUY WIRES DESIGNED TO PROTECT TREES ARE EXCLUDED FROM THIS PROHIBITION.
6. DO NOT INSTALL CONDUIT, DRAIN OR IRRIGATION LINE, OR ANY UTILITY LINE WITHIN THE TREE PROTECTION ZONE WITHOUT THE APPROVAL OF THE OWNER. IF LINES MUST TRAVERSE THE PROTECTION AREA, THEY SHALL BE TUNNELED OR BORED UNDER THE TREE UNLESS OTHERWISE NOTED—REFERENCE TREE PRESERVATION DETAILS.
7. CONSTRUCTION ACTIVITY SHALL NOT DESTROY OR IRREVERSIBLY HARM THE ROOT SYSTEM OF PROTECTED TREES. POST HOLES AND TRENCHES LOCATED CLOSE TO PROTECTED TREES SHALL BE ADJUSTED TO AVOID DAMAGE TO MAJOR ROOTS.
8. IF TREE ROOT ZONE IS TO BE DISTURBED, AFFECTED ROOTS MUST BE SEVERED BY CLEAN PRUNING CUTS AT THE POINT WHERE CONSTRUCTION IMPACTS THE ROOTS.
9. ROOT PRUNING/TRENCHING LOCATIONS SHALL BE PERFORMED BY OWNER'S REPRESENTATIVE.
10. IF ANY DAMAGE TO TREE PROTECTION FENCING SHOULD OCCUR BY ACCIDENT OR NEGLIGENCE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMMEDIATE REPAIRS.
11. CONTRACTOR'S ACCESS TO FENCED TREE PROTECTION AREAS SHALL BE PERMITTED ONLY WITH APPROVAL OF THE OWNER.
12. NO MATERIALS, EQUIPMENT, SPOIL, WASTE, OR WASHOUT WATER MAY BE DISPOSED, STORED, OR PARKED WITHIN 20 FEET OF ANY TREE PROTECTION ZONE.
13. CONTRACTOR SHALL COORDINATE WITH THE OWNER PRIOR TO REMOVAL OF TREE PROTECTION FENCING.

PLANTING NOTES:

1. CONTRACTOR TO SOD TO LIMITS OF DISTURBANCE, REFER TO SPECIFICATIONS.
2. ALL PLANT MATERIAL SHALL BE INSTALLED ACCORDING TO SOUND NURSERY PRACTICES AND SHALL MEET ALL STANDARDS AS STATED IN THE LATEST EDITION OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
3. NO SUBSTITUTIONS IN PLANT MATERIALS SHALL BE MADE WITHOUT WRITTEN AUTHORIZATION FROM OWNER OR LANDSCAPE ARCHITECT. IN THE EVENT OF DISCREPANCIES BETWEEN DRAWING AND PLANT LIST, THE DRAWING SHALL PREVAIL.
4. LOCATE ALL UTILITIES PRIOR TO ANY DIGGING OPERATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES TO EXISTING UTILITIES INCURRED BY HIS WORK.
5. LAY SOD FOR PROPOSED LAWN AREAS TO ALL EDGES OF PAVEMENT AND/ OR LIMITS OF DISTURBANCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL LANDSCAPING UNTIL FINAL ACCEPTANCE. ALL REQUIRED LANDSCAPING SHALL BE MAINTAINED IN A NEAT AND ORDERLY MANNER AT ALL TIMES. THE WORK SHALL INCLUDE, BUT NOT TO BE LIMITED TO, MOWING, EDGING, PRUNING, FERTILIZING, WATERING, WEEDING, AND OTHER SUCH ACTIVITIES COMMON TO THE MAINTENANCE OF LANDSCAPING. ALL PLANT MATERIALS SHALL BE MAINTAINED IN A HEALTHY AND GROWING CONDITION AS IS APPROPRIATE FOR THE SEASON OF THE YEAR. PLANT MATERIAL THAT DIES SHALL BE REPLACED WITH PLANT MATERIAL OF SIMILAR SIZE AND VARIETY.
6. ALL SOD AREAS TO RECEIVE 6" DEPTH (MIN.) TOPSOIL PRIOR TO INSTALLATION. TOPSOIL SHALL BE NATURAL, FRIABLE, AND FERTILE; POSSES A pH RANGE OF 7.0-7.5; AND BE FREE OF TRASH, DEBRIS, STONES, WEEDS, AND TWIGS/BRANCHES. REFER TO SPECIFICATIONS.

GRAPHIC SCALE IN FEET
0 15 30 60

NORTH

No.	REVISIONS	DATE	BY

Kimley»Horn
805 PENNSYLVANIA AVENUE, SUITE 150
KANSAS CITY, MO 64105
PHONE: 816-652-03501
WWW.KIMLEY-HORN.COM

MO CERTIFICATE OF AUTHORITY #000172, EXPIRES 12/31/22

STATE OF MISSOURI
SEAN ALBERT RAY
NUMBER LA-2012026597
LANDSCAPE ARCHITECT
03/20/2024

KHA PROJECT	268642000
DATE	03/20/2024
SCALE:	AS SHOWN
DESIGNED BY:	JDK
DRAWN BY:	DLL
CHECKED BY:	SAR

CP241991
FRANCIS QUADRANGLE
IRRIGATION, DRAINAGE, AND TURF REPLACEMENT

PLANTING PLAN

SHEET NUMBER
L-200

SECTION 32 9210: LAWNS AND GRASSES

PART 1 - GENERAL

1.1 SECTION INCLUDES
- A. FURNISH ALL LABOR, MATERIAL, EQUIPMENT RELATED SERVICES AND SUPERVISION NECESSARY FOR OR INCIDENTAL TO THE INSTALLATION OF THE LAWNS AND GRASSES AS SHOWN OR INDICATED ON THE DRAWINGS AND/OR AS SPECIFIED.
- B. WORK INCLUDED:
  1. SOIL PREPARATION AND FINE GRADING.
  2. FERTILIZATION.
  3. GRASS SODDING
  4. SEEDING

1.2 SUBMITTALS
- A. DELIVERY RECEIPTS AND INVOICES: SUBMIT ORIGINAL DELIVERY RECEIPTS AND INVOICES FOR MATERIALS USED.
- B. PRODUCT DATA: SUBMIT SAMPLE LABEL OR SPECIFICATION OF FERTILIZER.
- C. CERTIFICATE: SUBMIT STATE CERTIFICATE STATING VARIETY AND PURITY OF GRASS SOD.
- D. SOIL FERTILITY TEST REPORTS:
  1. SUBMIT ANALYSIS, TEST RESULTS AND CORRECTIVE RECOMMENDATIONS TO THE OWNER'S REPRESENTATIVE.
  2. ONE TEST PER MEDIAN IS REQUIRED OF EXISTING SOIL TAKEN AT DIFFERENT LOCATIONS ON THE PROJECT SITE AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

1.3 PROTECTION
- A. PROTECT PAVING SURFACES, CURBS, UTILITIES, PLANT MATERIALS, AND OTHER EXISTING IMPROVEMENTS FROM DAMAGE BY HEAVY EQUIPMENT.
- B. LOCATE AND STAKE IRRIGATION HEADS, VALVE RISERS AND EQUIPMENT PRIOR TO BEGINNING SOIL PREPARATION WORK.
- C. DURING WORK AND MAINTENANCE PERIOD, MAINTAIN TOPSOIL IN PLACE AT ESTABLISHED GRADES. REPLACE TOPSOIL AND GRASS LOSSES DUE TO EROSION.
- D. PROTECT IN PLACE WORK FROM DAMAGE BY HEAVY EQUIPMENT. PREPARE, GRADE, LEVEL, AND REPLANT DAMAGED AREAS.

1.4 SUBSTANTIAL COMPLETION & PROJECT CLOSEOUT
- A. A CERTIFICATE OF SUBSTANTIAL COMPLETION WILL BE ISSUED WHEN THE WORK PERFORMED UNDER THE CONTRACT HAS BEEN REVIEWED AND FOUND, TO THE OWNER'S REPRESENTATIVE'S BEST KNOWLEDGE, INFORMATION, AND BELIEF, TO BE SUBSTANTIALLY COMPLETE. SUBSTANTIAL COMPLETION IS THE STAGE IN THE PROGRESS OF THE WORK WHEN THE WORK OR DESIGNATED PORTION THEREOF IS SUFFICIENTLY COMPLETE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS SO THE OWNER CAN OCCUPY OR UTILIZE THE WORK FOR ITS INTENDED USE. THE DATE OF SUBSTANTIAL COMPLETION OF THE PROJECT OR PORTION THEREOF IS ALSO THE DATE OF COMMENCEMENT OF APPLICABLE GUARANTEES AS SPECIFIED.
- B. A LIST OF ITEMS TO BE COMPLETED OR CORRECTED WILL BE ATTACHED TO THE CERTIFICATE OR SUBSTANTIAL COMPLETION. THE FAILURE TO INCLUDE ANY ITEMS ON SUCH LIST DOES NOT ALTER THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE ALL WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- C. THE CONTRACTOR WILL COMPLETE OR CORRECT THE WORK ON THE LIST OF ITEMS WITHIN A SPECIFIC NUMBER OF DAYS AS SHOWN ON THE CERTIFICATE OF SUBSTANTIAL COMPLETION.
- D. UPON COMPLETION AND RE-INSPECTION OF ALL CORRECTED ITEMS LISTED, THE OWNER'S REPRESENTATIVE WILL RECOMMEND TO THE OWNER THAT THE WORK OF THIS SECTION IS READY FOR FINAL ACCEPTANCE.

1.5 QUALITY ASSURANCE
- A. GENERAL: COMPLY WITH APPLICABLE FEDERAL, STATE, COUNTY AND LOCAL REGULATIONS GOVERNING LANDSCAPE MATERIALS AND WORK.
- B. PERSONNEL: EMPLOY ONLY EXPERIENCED PERSONNEL WHO ARE FAMILIAR WITH THE REQUIRED WORK. PROVIDE SUPERVISION BY A QUALIFIED FOREMAN.

1.6 GUARANTEE
- A. GUARANTEE LAWNS AND GRASSES FOR ONE YEAR AFTER DATE OF FINAL ACCEPTANCE AT THE END OF THIS GUARANTEE PERIOD, ALL LAWN AND GRASS AREAS WILL HAVE ACHIEVED COVERAGE OF THE SPECIFIED GRASS AT A DENSITY OF 100% COVERAGE, FREE OF WEEDS, UNDESIRABLE GRASS SPECIES, DISEASE, AND INSECTS. REPLACE DEAD MATERIALS AND MATERIALS NOT IN VIGOROUS, THRIVING CONDITION AS SOON AS WEATHER PERMITS AND ON NOTIFICATION BY THE OWNER'S REPRESENTATIVE.
- B. REPLACE LAWNS AND GRASSES WITH SAME KIND AS ORIGINALLY PLANTED, AT NO COST TO THE OWNER. PROTECT IRRIGATION SYSTEM AND OTHER PIPING, CONDUIT, OR OTHER WORK DURING REPLACEMENT. REPAIR DAMAGE IMMEDIATELY.

1.7 JOB CONDITIONS
- A. DO NOT INSTALL SOD OR SEED ON SATURATED OR FROZEN SOIL.
- B. SOD AND SEED INSTALLATION SHALL BE SUBJECT TO SUITABILITY OF THE WEATHER AND OTHER CONDITIONS AFFECTING SOD GROWTH.

1.8 PROGRESS MEETINGS
- A. CONTRACTOR SHALL ATTEND ALL PROGRESS MEETINGS AS REQUESTED BY THE OWNER'S REPRESENTATIVE DURING INSTALLATION.

1.9 QUANTITY VERIFICATION
- A. THE BIDDING CONTRACTOR IS RESPONSIBLE FOR THE INCLUSION OF ALL MATERIALS, LABOR AND EQUIPMENT AS OUTLINED IN THE PLANS AND SPECIFICATION. THE PLANT LIST IS PROVIDED TO THE BIDDING CONTRACTOR AS A CONVENIENCE AND THE QUANTITIES ARE APPROXIMATE. VERIFICATION OF ALL QUANTITIES IS THE SOLE RESPONSIBILITY OF THE BIDDING CONTRACTOR. ANY DISCREPANCIES MUST BE REPORTED TO THE OWNER'S REPRESENTATIVE PRIOR TO SUBMITTAL OF BID.

PART 2 PRODUCTS

2.1 GRASS
- A. GENERAL:
  1. SOD SHALL BE NURSERY GROWN ON CULTIVATED AGRICULTURAL SOILS. SOD SHALL HAVE BEEN MOWED REGULARLY AND CAREFULLY AND OTHERWISE MAINTAINED FROM PLANTING TO HARVEST.
  2. SOD SHALL BE OF SPECIES INDICATED.
  3. THICKNESS OF CUT: SOD SHALL BE CUT TO THE SUPPLIER'S STANDARD WIDTH AND LENGTH. MAXIMUM ALLOWABLE DEVIATION FROM STANDARD WIDTHS AND LENGTHS SHALL BE PLUS OR MINUS .25 INCHES ON WIDTH AND PLUS OR MINUS 5% ON LENGTH.
  4. BROKEN STRIPS AND TORN OR UNEVEN ENDS WILL NOT BE ACCEPTED.
  5. STRENGTH OF SOD STRIPS: SOD STRIPS SHALL BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE IF SUSPENDED VERTICALLY WHEN GRASPED IN THE UPPER 10% OF THE SECTION.
  6. MOISTURE CONTENT: SOD SHALL NOT BE HARVESTED OR TRANSPLANTED WHEN MOISTURE CONTENT (EXCESSIVELY WET OR DRY) MAY ADVERSELY AFFECT ITS SURVIVAL. SOD SHALL BE STORED IN A COMPACT GROUP TO PREVENT DRYING OUT OR FREEZING.
  7. TIME LIMITATIONS: SOD SHALL BE HARVESTED, DELIVERED, AND TRANSPLANTED WITHIN A 30-HOUR PERIOD UNLESS A SUITABLE PRESERVATION METHOD IS APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO DELIVERY. SOD NOT TRANSPLANTED WITHIN THIS PERIOD SHALL BE INSPECTED FOR APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO ITS INSTALLATION.
  8. THATCH: SOD SHALL BE FREE OF THATCH.
  9. DISEASES, NEMATODES AND INSECTS: SOD SHALL BE FREE OF DISEASES, NEMATODES, AND SOIL-BORNE INSECTS.
  10. WEEDS: SOD SHALL BE FREE OF OBJECTIONABLE GRASSY AND BROADLEAF WEEDS.
- B. SOD:
  1. BLACK BEAUTY TALL FESCUE (UNNETTED)

2.3 TOPSOIL
- A. GENERAL TOPSOIL
  1. ALL TOPSOIL MATERIALS SHALL BE STRIPPED AND REDISTRIBUTED ON-SITE AS DESCRIBED HEREIN. STOCKPILING OF TOPSOIL MATERIAL SHALL NOT LAST LONGER THAN 60 DAYS, AND TOPSOIL STOCKPILE HEIGHT SHALL NOT EXCEED 60 INCHES. ALL EXISTING TURF, ROCK, AND OTHER DELETERIOUS MATERIALS GREATER THAN TWO INCHES (2") IN DIAMETER SHALL BE REMOVED FROM THE TOPSOIL TO ACCOMMODATE THE INSTALLATION OF SOIL PREP MATERIALS

2.4 COMPOST
- A. GENERAL COMPOST
  1. ALL COMPOST MATERIAL SHOULD BE OBTAINED THROUGH THE CITY OF COLUMBIA OR APPROVED EQUAL SUPPLIER. PROVIDE A CURRENT COMPOSTING ANALYSIS REPORT TO BE APPROVED BY THE OWNER PRIOR TO INSTALLATION.

2.5 FERTILIZER
- A. GENERAL:
  1. FERTILIZER SHALL BE COMMERCIAL PRODUCT, UNIFORM IN COMPOSITION, FREE FLOWING, AND SUITABLE FOR APPLICATION WITH APPROVED EQUIPMENT.
  2. DELIVER FERTILIZER TO SITE IN FULLY LABELED ORIGINAL CONTAINERS.
  3. FERTILIZER WHICH HAS BEEN EXPOSED TO HIGH HUMIDITY AND MOISTURE HAS BECOME CAKED OR OTHERWISE DAMAGED, MAKING IT UNSUITABLE FOR USE, WILL NOT BE ACCEPTABLE.
- B. APPLICATION: AS DETERMINED IN SOIL TESTING ANALYSIS AS DESCRIBED HEREIN

PART 3 EXECUTION

3.1 GENERAL
- A. EXECUTE GRASS PLANTING OPERATIONS ACROSS SLOPE AND PARALLEL TO FINISHED GRADE CONTOURS.

3.2 PRE-PLANT WEED CONTROL
- A. IRRIGATED AND NON-IRRIGATED GRASS AREAS:
  1. IF GRASSY OR BROADLEAF WEEDS EXIST ON SITE AT THE BEGINNING OF WORK, SPRAY WITH A NON-SELECTIVE SYSTEMIC CONTACT HERBICIDE, AS RECOMMENDED AND APPLIED BY AN APPROVED LICENSED LANDSCAPE PEST CONTROL ADVISOR AND APPLICATOR. LEAVE SPRAYED PLANTS INTACT FOR AT LEAST 15 DAYS TO ALLOW SYSTEMIC KILL.
  2. CLEAR AND REMOVE THESE EXISTING WEEDS BY MOWING OR GRUBBING OFF ALL PLANT PARTS AT LEAST 0.25 INCHES BELOW THE SURFACE OF THE SOIL OVER THE ENTIRE AREA TO BE PLANTED.
- B. IRRIGATED GRASS AREAS ONLY:
  1. AFTER IRRIGATION SYSTEM IS OPERATIONAL, APPLY WATER FOR 5 TO 10 DAYS AS NEEDED TO ACHIEVE WEED GERMINATION. APPLY CONTACT HERBICIDES AND WAIT AS NEEDED BEFORE PLANTING. REPEAT AS NEEDED.
  2. MAINTAIN LAWN AND GRASS AREAS WEED FREE UNTIL FINAL ACCEPTANCE BY OWNER'S REPRESENTATIVE UTILIZING MECHANICAL AND CHEMICAL TREATMENT.

3.3 SOIL PREPARATION
- A. GRADING:
  1. CUT AND FILL ALL AREAS TO ELEVATIONS AND TOLERANCES SPECIFIED. LEAVE GRADED SURFACE CLEAN, FREE FROM RUBBISH AND LARGE CLODS AND REASONABLE SMOOTH.
  2. ROOTS FROM PREVIOUSLY-REMOVED TREES MAY BE ENCOUNTERED AND SHOULD BE REMOVED IF THEY ARE WITHIN 6" OF FINISHED GRADE ELEVATIONS. BRICKS, BUILDING STONE, OR OTHER BUILDING MATERIALS SHALL ALSO BE REMOVED FROM TOP 6" OF SOIL PROFILE.
  3. COMPOST SHALL BE REVERSE TINE TILLED INTO THE EXISTING TOPSOILS AS FOLLOWS: ADD THREE CUBIC YARDS PER 1,000 SQUARE FEET OF SODDED AREA. SPREAD EVENLY TO THE ROUGH GRADED SURFACE AND REVERSE TINE TILL TO A DEPTH OF 6".
  4. FINISH GRADE AND COMPACT SOILS PER THIS SPECIFICATION.
  5. AFTER FINISH GRADES HAVE BEEN SET, COORDINATE WITH OWNER FOR APPROVAL PRIOR TO SOD INSTALLATION. OWNER WITH CONTRACT WITH A THIRD-PARTY SURVEYOR TO CONFIRM GRADES MATCH PLANS AS REQUIRED.
- B. COMPACTION:
  1. COMPACT SUBGRADE AND EACH LAYER OF TOPSOIL TO PROVIDE SOIL MASS WITH DENSITIES NOT LESS THAN THE VALUES SPECIFIED BELOW. PERFORM COMPACTION USING EQUIPMENT AND METHODS AS NEEDED TO PRODUCE A SOIL MASS WITH SPECIFIED DENSITIES WITHOUT DAMAGE TO EXISTING STRUCTURES.
  2. DENSITY REQUIREMENTS: DETERMINE MAXIMUM DRY DENSITY OF SOIL IN ACCORDANCE WITH ASTM D698. COMPACT SOIL DRY DENSITIES TO NOT LESS THAN 98% IN UTILITY TRENCH BACKFILL AREAS AND 92% IN FINISH GRADE FOR LAWNS (TOP 6"). DETERMINE DENSITY OF IN-PLACE METERIAL IN ACCORDANCE WITH ASTM D1556 OR D6938.
  3. MOISTURE CONTROL: BEFORE COMPACTION, MOISTEN OR AERATE SUBGRADE AND EACH LAYER OF FILL/BACKFILL AS NECESSARY TO BRING THE MOISTURE CONTENT OF THE SOIL TO BE COMPACTED TO ITS OPTIMUM MOISTURE CONTENT. DETERMINE OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH ASTM D698.
- C. FINE GRADING:
  1. AFTER TILLAGE AND PLACEMENT OF TOPSOIL, LEVEL, FINE GRADE, AND DRAG WITH A WEIGHTED SPIKE HARROW OR FLOAT DRAG.
  2. ELIMINATE RUTS, DEPRESSIONS, HUMPS, AND OBJECTIONABLE SOIL CLODS.

3.4 SOIL TESTING AND FERTILIZING
- A. GENERAL: AFTER PLACEMENT OF TOPSOIL BUT PRIOR TO PLACEMENT OF SOD, PERFORMANCE OF FOUR SOIL TESTS SHALL BE COMPLETED. TWO SAMPLES SHALL BE COLLECTED FROM RE-GRADED LAWN IN THE SOUTH HALF OF FRANCIS QUAD, AND TWO SAMPLES SHALL BE COLLECTED FROM THE NORTH HALF OF THE LAWN WHERE EARTHWORK OPERATIONS ARE NOT TO OCCUR AS A PART OF THIS PROJECT. ALL SAMPLES SHALL BE SUBMITTED TO THE UNIVERSITY OF MISSOURI EXTENSION OFFICES AT THE CONTRACTOR'S EXPENSE FOR REGULAR SOIL ANALYSIS. A DETERMINATION OF ANY ADDITIONAL SOIL AMENDMENTS OR FERTILIZATION REQUIREMENTS WILL BE MADE AFTER REVIEW OF THE RESULTS.
- B. THE FERTILIZER TYPES AND RATES SHALL BE DETERMINED BY THE SOIL FERTILITY TEST CORRECTIVE RECOMMENDATIONS, BUT ARE INCLUDED IN THE CONTRACTOR'S BASE BID, AS DESCRIBED HEREIN.
- C. TYPICAL SOD FERTILIZATION SCHEDULE:
  1. INITIAL APPLICATION: APPLY NO MORE THAN 5 DAYS PRIOR TO COMMENCEMENT OF SODDING OPERATIONS AT A RATE OF 20 POUNDS PER 1,000 SQUARE FEET. INCORPORATE INTO SOIL WITH A CHAIN HARROW.
  2. SECOND AND THIRD APPLICATIONS: APPLY EVERY 25 DAYS AFTER SODDING AT A RATE OF 10 POUNDS PER 1,000 SQUARE FEET.
  3. IRRIGATE THE AREA WITH A MINIMUM OF .25 INCHES OF WATER TO PROPERLY INCORPORATE THE FERTILIZER INTO THE TURF.

3.5 PLANTING SOD
- A. WEATHER CONDITIONS:
  1. SCHEDULE WORK FOR PERIODS OF FAVORABLE WEATHER.
  2. SOD PLACEMENT ON DAYS WHICH, IN THE JUDGMENT OF THE OWNER'S REPRESENTATIVE, ARE TOO HOT, COLD, SUNNY, DRY, OR WINDY FOR OPTIMAL INSTALLATION MAY BE PROHIBITED.
- B. PLACEMENT PATTERN:
  1. THE FIRST ROW SHALL BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PARALLEL TO THE FIRST ROW AND TIGHTLY ABUTTING EACH OTHER.
  2. LATERAL JOINTS SHALL BE STAGGERED. CARE SHALL BE EXERCISED TO ENSURE THAT THE SOD IS NEITHER STRETCHED NOR OVERLAPPED. JOINTS MUST BE BUTTED TIGHTLY TO PREVENT VOIDS THAT COULD PERMIT AIR TO DRY OUT ROOT.
  3. IMMEDIATELY AFTER PLACING, SOD SHALL BE PRESSED FIRMLY INTO CONTACT WITH BED BY TAMPING OR ROLLING TO ELIMINATE AIR POCKETS. FOLLOWING TAMPING, SCREENED TOPSOIL SHALL BE USED TO FILL ALL CRACKS AND EXCESS SOIL SHALL BE WORKED INTO THE SOD WITH RAKES OR OTHER SUITABLE EQUIPMENT. SOD SHALL NOT BE SMOTHERED WITH EXCESS FILL SOIL.
  4. ON SLOPES STEEPER THAN 3 TO 1, SOD SHALL BE SECURED BY GALVANIZED PINS, WOOD PEGS OR OTHER METHODS APPROVED BY THE OWNER'S REPRESENTATIVE.
  5. IMMEDIATELY AFTER SODDING OPERATIONS HAVE BEEN COMPLETED, THE ENTIRE SURFACE SHALL BE COMPACTED WITH A ROLLER OR OTHER APPROVED EQUIPMENT. THE COMPLETED AREA AFTER SODDING SHALL BE UNIFORMLY EVEN, FIRM, AND TRUE TO FINISHED GRADE LINES.
- C. WATERING:
  1. INITIAL INSTALLATION: WATER MUST BE APPLIED WITHIN 2 HOURS OF EXPOSURE OF THE SOD TO SUN OR WIND. WATER NEWLY LAID SOD UNTIL SATURATION OF THE ENTIRE AREA IS APPARENT. AS A RESULT OF INITIAL IRRIGATION, STANDING WATER MAY BE PRESENT AND MODERATE TO HEAVY RUN OFF MAY OCCUR. CONTINUE TO IRRIGATE DAILY IN SHORTER DURATIONS SO THE ENTIRE AREA STAYS THOROUGHLY WET BUT WITHOUT STANDING WATER. THE LENGTH OF IRRIGATION TIME AND FREQUENCY OF APPLICATIONS WILL VARY AT DIFFERENT LOCATIONS DUE TO WEATHER CONDITIONS AND INDIVIDUAL SITE CHARACTERISTICS.
  2. AFTER 7 TO 10 DAYS: CHECK FOR NEW ROOT GROWTH BY LIFTING CORNERS OF SOD BLOCKS. IF CONSISTENT ROOT GROWTH OVER THE ENTIRE SITE IS OBSERVED, WATER APPLICATIONS CAN BE REDUCED TO ONCE EVERY OTHER DAY.
  3. AFTER 12 TO 14 DAYS: RECHECK FOR ADDITIONAL ROOTING. IF SOD BLOCKS ARE DIFFICULT TO PULL UP OR ADDITIONAL NEW ROOTS ARE PRESENT ALLOW THE AREA TO DRY TO THE EXTENT THAT MOWING CAN BE PERFORMED.

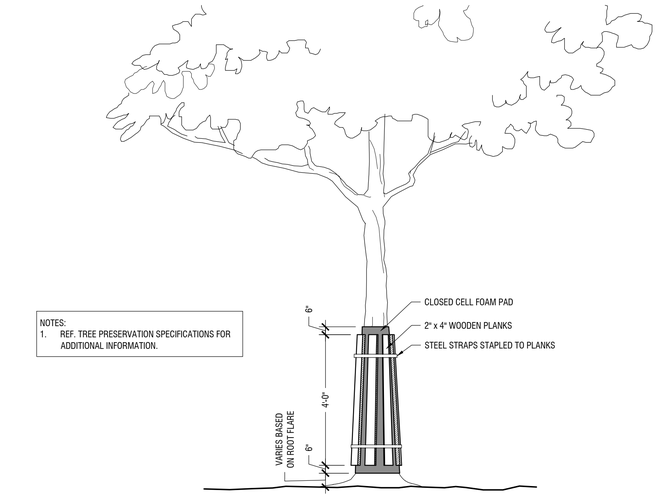
3.7 GRADING
- A. MAINTAIN EXISTING ESTABLISHED GRADES, PROTECT TRUE AND EVEN DURING OPERATIONS.

3.8 EROSION CONTROL
- A. DURING WORK AND MAINTENANCE PERIOD, MAINTAIN TOPSOIL IN PLACE AT ESTABLISHED GRADES. REPLACE TOPSOIL AND TURF GRASS LOSSES DUE TO EROSION.

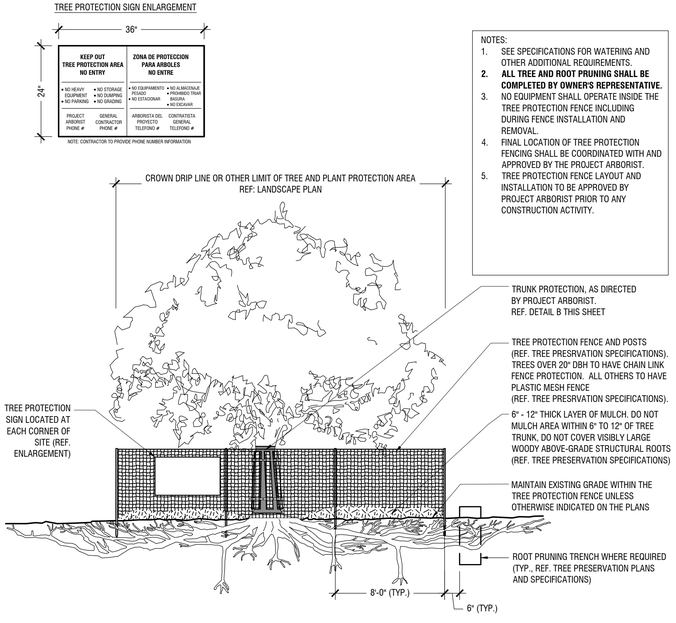
3.9 CLEAN-UP
- A. REMOVE EXCESS MATERIAL AND DEBRIS FROM SITE.

3.10 MAINTENANCE
- A. PROTECTION OF GRADED AREAS: PROTECT NEWLY GRADED AREAS FROM TRAFFIC AND EROSION. KEEP FREE OF TRASH AND DEBRIS. REPAIR AND RE-ESTABLISH GRADES IN SETTLED, ERODED, AND RUTTED AREAS.
- B. RECONDITIONING OF COMPACTED AREAS: WHERE COMPLETED COMPACTED AREAS ARE DISTURBED BY SUBSEQUENT CONSTRUCTION OPERATIONS OR ADVERSE WEATHER, SCARIFY THE SURFACE, RE-SHAPE, AND COMPACT TO REQUIRED DENSITY PRIOR TO FURTHER CONSTRUCTION.
- C. SETTLING: WHERE SETTLING IS MEASURABLE OR OBSERVABLE AT BACKFILLED OR FILLED AREAS DURING THE GENERAL PROJECT WARRANTY PERIOD, REMOVE SOD, ADD APPROPRIATE BACKFILL MATERIAL, COMPACT, AND REPLACE SOD. RESTORE APPEARANCE, QUALITY, AND CONDITION OF SURFACE TO MATCH ADJACENT WORK AND ELIMINATE EVIDENCE OF RESTORATION TO GREATEST EXTENT POSSIBLE.
- D. UNTIL FINAL ACCEPTANCE, MAINTAIN LAWN AND GRASS AREAS BY WATERING, MOWING, WEEDING, SPRAYING, CLEANING AND REPLACING AS NECESSARY TO KEEP THE TURF AND GRASS IN A VIGOROUS, HEALTHY CONDITION.
  1. WATERING: AS NECESSARY.
  2. MOWING:
     a) MOW NEWLY PLANTED GRASS AREAS WEEKLY AFTER INITIAL GROWTH REACHES 1.5 TO 2 INCHES.
  3. WEEDING: REMOVE WEEDS AND FOREIGN GRASS OVER LAWN AND GRASS AREAS AT LEAST ONCE A WEEK. HERBICIDES MAY BE USED ONLY WHEN APPROVED BY THE OWNER'S REPRESENTATIVE.

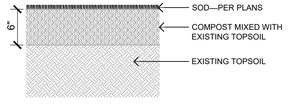
END OF SECTION 329210



B TYPICAL TRUNK PROTECTION
1/4" = 1'



A TYPICAL TREE PROTECTION FENCING
1/4" = 1'



NOTE:
1. STRIP AND STOCKPILE TOP 6" OF EXISTING TOPSOIL PER PLANS AND SPECIFICATIONS.
2. PLACE 6" OF TOPSOIL AND MIX IN COMPOST PER SPECIFICATIONS.

C SOD PROFILE
3/4" = 1'-0"

No.	REVISIONS	DATE	BY

Kimley»Horn
805 PENNSYLVANIA AVENUE, SUITE 150
KANSAS CITY, MO 64105
PHONE: 816-652-03501
WWW.KIMLEY-HORN.COM

MO CERTIFICATE OF AUTHORITY #2005172, EXPIRES 12/31/22

STATE OF MISSOURI
SEAN ALBERT RAY
NUMBER LA-2012026597
LANDSCAPE ARCHITECT
03/20/2024

KHA PROJECT	268642000
DATE	03/20/2024
SCALE:	AS SHOWN
DESIGNED BY:	JDK
DRAWN BY:	DLL
CHECKED BY:	SAR

PLANTING DETAILS + SPECIFICATIONS

CP241991
FRANCIS QUADRANGLE
IRRIGATION, DRAINAGE, AND TURF REPLACEMENT

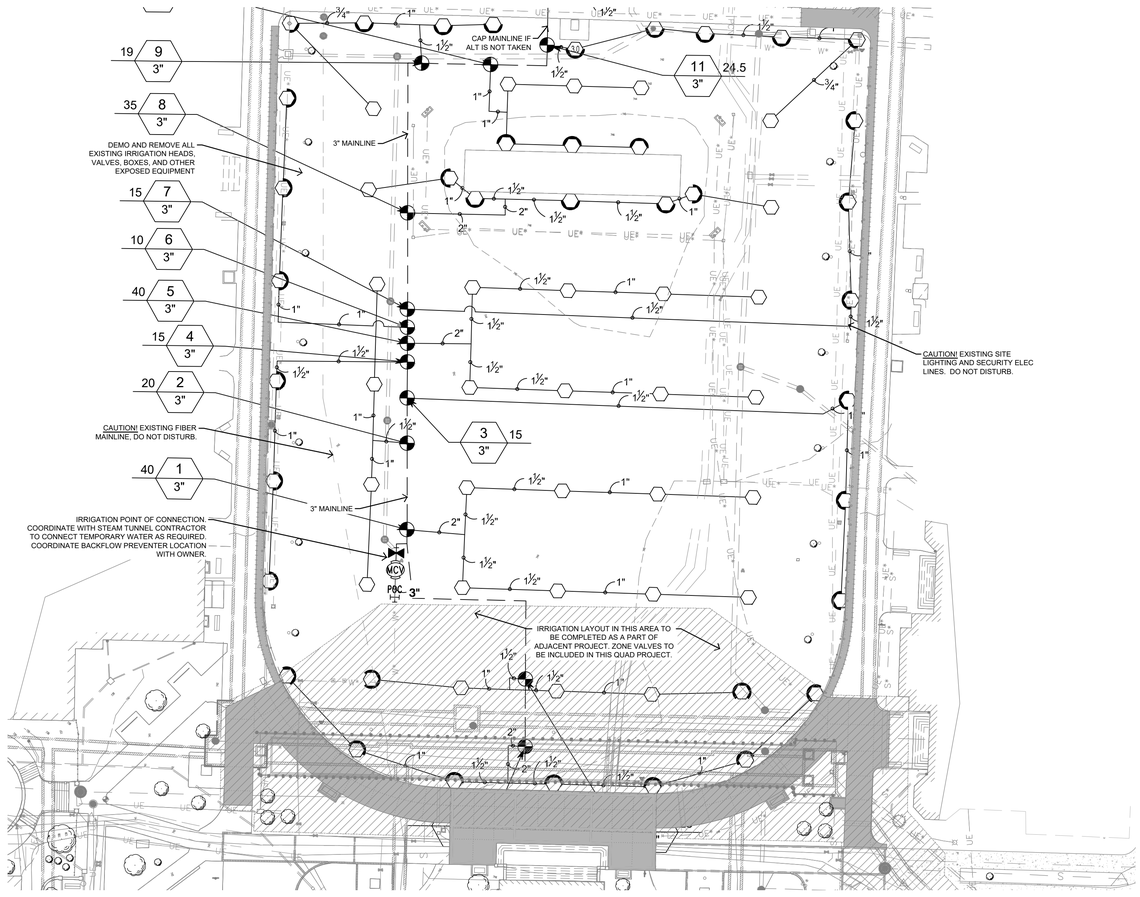
SHEET NUMBER
L-201

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
1.5	HUNTER I-20-04 1.5 TURF ROTOR, 4IN. POP-UP, ADJUSTABLE AND FULL CIRCLE. PLASTIC RISER. DRAIN CHECK VALVE. STANDARD NOZZLE.	8
2.5	HUNTER I-20-04 2.5 TURF ROTOR, 4IN. POP-UP, ADJUSTABLE AND FULL CIRCLE. PLASTIC RISER. DRAIN CHECK VALVE. STANDARD NOZZLE.	3
3.0	HUNTER I-20-04 3.0 TURF ROTOR, 4IN. POP-UP, ADJUSTABLE AND FULL CIRCLE. PLASTIC RISER. DRAIN CHECK VALVE. STANDARD NOZZLE.	54
5.0	HUNTER I-20-04 5.0 TURF ROTOR, 4IN. POP-UP, ADJUSTABLE AND FULL CIRCLE. PLASTIC RISER. DRAIN CHECK VALVE. STANDARD NOZZLE.	56

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	HUNTER IBV-FS 1IN., 1-1/2IN., 2IN., AND 3IN. BRASS ELECTRIC REMOTE CONTROL VALVE, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE. WITH FILTER SENTRY FACTORY INSTALLED OPTION.	22
	LANDSCAPE PRODUCTS INC. BBV 1/2IN., 3/4IN., 1IN., 1-1/4IN., 1-1/2IN., 2IN., 2-1/2IN., 3IN. FULL PORT BRASS BALL VALVE. SUITABLE FOR A FULL RANGE OF LIQUIDS AND GASES IN RESIDENTIAL AND COMMERCIAL APPLICATIONS.	1
MCV	HUNTER IBV 3" 1IN., 1-1/2IN., 2IN., AND 3IN. BRASS ELECTRIC MASTER VALVE, GLOBE CONFIGURATION, WITH NPT THREADED INLET/OUTLET, FOR COMMERCIAL/MUNICIPAL USE.	1
C	HUNTER A2C-75D-M 75-STATION DECODER CONTROLLER IN AN OUTDOOR GRAY METAL WALL MOUNT ENCLOSURE.	1
POC	POINT OF CONNECTION 3"	1
	IRRIGATION LATERAL LINE: PVC SCHEDULE 40	4,531 L.F.
	IRRIGATION MAINLINE: PVC SCHEDULE 40	758.5 L.F.

Valve Callout
Valve Number
Valve Flow
Valve Size



GRAPHIC SCALE IN FEET
0 15 30 60

NORTH

EXISTING IRRIGATION NOTES:

1. CONTRACTOR TO CONFIRM EXISTING SYSTEM SOURCE AND BACKFLOW ARE FULLY OPERATIONAL. COORDINATE TEMPORARY WATER CONNECTIONS WITH STEAM TUNNEL PROJECT AS REQUIRED.
2. CONTRACTOR TO CONFIRM EXISTING BACKFLOW IS TO SERVE IRRIGATION SYSTEM ONLY. EXISTING BACKFLOW MUST BE PLACED ON IRRIGATION SERVICE LINE TO PREVENT ANY POSSIBILITY OF BACKFLOW FROM BEING DIRECTED INTO THE BUILDING. IF THE EXISTING BACKFLOW IS NOT A DEDICATED IRRIGATION BACKFLOW, CONTRACTOR IS TO INSTALL A NEW BACKFLOW. SIZE ACCORDING TO METER SIZE.
3. CONFIRM EXISTING CONTROLLER ZONE AVAILABILITY. IF CONTROLLER CANNOT HANDLE PROPOSED ZONES, CONTACT IRRIGATION DESIGNER IMMEDIATELY.
4. CAP EXISTING LINES WHERE NECESSARY FOR CONSTRUCTION.
5. MAINLINE APPROXIMATE LOCATION AS SHOWN. CONTRACTOR TO LOCATE EXACT LOCATION AND UTILIZE. PROTECT MAINLINE IN PLACE DURING CONSTRUCTION. CAP EXISTING MAINLINE AND LEAVE IN PLACE WHERE NECESSARY.
6. DO NOT TRENCH UNDER EXISTING TREES. HAND TRENCH LATERALLY TO INSTALL HEADS, DRIP, ETC.
7. ALL PROPOSED IRRIGATION TO MATCH EXISTING PRECIPITATION RATES, IF ZONES ARE COMBINED WITH EXISTING ZONES, NO DRIP AND HEADS TO BE ON SAME ZONES.
8. ALL EXISTING IRRIGATION SHOWN TO REMAIN SHOULD BE PROTECTED DURING CONSTRUCTION. CONTRACTOR TO CONFIRM 100 PERCENT COVERAGE ON EXISTING AND MODIFY IF NEEDED.
9. DO NOT REMOVE EXISTING SLEEVED LINES UNDER PAVEMENT UNLESS SPECIFIED.
10. CONTRACTOR TO NUMBER EXISTING VALVES AND PROPOSED VALVES IN NUMERICAL ORDER STARTING FROM THE METER AND GOING IN A CLOCKWISE CIRCLE.

IRRIGATION NOTES:

1. IRRIGATION CONTRACTOR SHALL TEST EXISTING STATIC PRESSURE ON SITE PRIOR TO CONSTRUCTION. SHOULD EXISTING SITE PRESSURE BE BELOW 65 PSI, CONTRACTOR SHALL CONTACT THE IRRIGATION DESIGNER PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. COORDINATE IRRIGATION INSTALLATION WITH PLANTING PLAN AND SITE CONDITIONS TO PROVIDE COMPLETE 100% COVERAGE WITH MINIMUM OVERSPRAY. THE IRRIGATION CONTRACTOR SHALL MAKE MINOR ADJUSTMENTS TO ENSURE PROPER COVERAGE AT NO ADDITIONAL COST TO THE OWNER.
4. ALL CONSTRUCTION SHALL CONFORM TO CITY, COUNTY, STATE, AND FEDERAL REQUIREMENTS. IT SHALL BE THE RESPONSIBILITY OF THE IRRIGATION CONTRACTOR TO ENSURE THAT ALL IRRIGATION EQUIPMENT MEETS GOVERNMENT REGULATIONS. CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR OBTAINING ANY NECESSARY PERMITS OR APPROVALS PRIOR TO COMMENCEMENT OF OPERATIONS ON-SITE. COPIES OF THE PERMITS SHALL BE SENT TO THE OWNER/GENERAL CONTRACTOR.
5. LATERAL PIPE SHALL BE INSTALLED AT A MINIMUM DEPTH OF 12 INCHES. MAINLINE PIPE AND WIRES SHALL BE INSTALLED AT A MINIMUM DEPTH OF 18 INCHES.
6. ELECTRICAL POWER SHALL BE PROVIDED WITHIN 5 FEET OF CONTROLLER LOCATION BY GENERAL CONTRACTOR. LICENSED IRRIGATION CONTRACTOR TO PROVIDE FINAL HARD WIRE TO CONTROLLER.
7. 24 VOLT VALVE WIRE SHALL BE A MINIMUM OF 14 GAUGE, U.L. APPROVED FOR DIRECT BURIAL, SINGLE CONDUCTOR "IRRIGATION WIRE". CONTRACTOR TO CONFIRM WIRE SIZE PRIOR TO INSTALLATION. WIRE SPLICES SHALL BE ENCASED IN A WATERPROOF WIRE CONNECTOR UL APPROVED AND FILLED WITH SILICONE.
8. IRRIGATION VALVES AND VALVE BOXES SHALL BE LOCATED IN LANDSCAPE BEDS OR GROUNDCOVER AREAS WHENEVER POSSIBLE. ALL REMOTE VALVE BOXES SHALL BE SET FLUSH WITH FINISHED GRADE AND CONTAIN ONE CUBIC FOOT OF CLEAN GRAVEL BENEATH VALVE. LABEL REMOTE BOXES WITH ONE-INCH ALPHA NUMERIC NOTATION CORRESPONDING TO THE APPLICABLE ALPHA CONTROLLER AND NUMERIC STATION. USE 10" ROUND VALVE BOXES FOR ELECTRIC VALVES AND QUICK COUPLING VALVES. USE 15" X 9.5" RECTANGULAR BOX FOR DRIP VALVES UNLESS NOTED OTHERWISE. DOUBLE CHECK ASSEMBLY SHALL BE BOXED ACCORDING TO LOCAL CODES.
9. USE PVC SWING JOINT ASSEMBLIES TO CONNECT ALL SPRAY AND ROTOR HEADS.
10. CONTRACTOR IS TO CONTACT APPROPRIATE AUTHORITIES AND LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, EQUIPMENT QUANTITIES, AND UTILITY LOCATIONS PRIOR TO BEGINNING WORK.
11. SLEEVES SHALL BE INSTALLED BY GENERAL CONTRACTOR UNLESS OTHERWISE NOTED. SLEEVE MATERIAL SHALL BE PVC, SCHD. 40. CONTRACTOR SHALL EXTEND SLEEVES 24 INCHES BEYOND EDGE OF ALL PAVEMENT. ELECTRICAL WIRES FOR IRRIGATION VALVES AND IRRIGATION LINES ARE TO BE PLACED IN SEPARATE SLEEVES. SEE SLEEVING DETAIL. ALL PRESSURE MAINLINES UNDER ASPHALT PAVEMENT SHALL BE PLACED WITHIN SLEEVES AS NOTED.
12. DRIP LINE SHALL BE PLACED A MINIMUM OF 2" UNDER MULCH.
13. LICENSED IRRIGATION CONTRACTOR SHALL ADJUST SPRAY NOZZLES FOR "HEAD-TO-HEAD" COVERAGE AND ADJUST FOR MINIMUM OVERSPRAY ONTO PAVEMENT. NO OVERSPRAY IS PERMITTED ONTO STREETS OR SIDEWALKS.
14. IRRIGATION CONTRACTOR SHALL SUPPLY AND CONSTRUCT IRRIGATION SYSTEM WITH ALL MATERIALS AND PER MANUFACTURER SPECIFICATIONS SHOWN ON THIS PLAN. IF CONTRACTOR PREFERS MATERIALS THAT DIFFER FROM THE THIS PLAN, THEY SHALL BE APPROVED BY THE IRRIGATION DESIGNER PRIOR TO CONSTRUCTION.
15. VERIFY CONTROLLER AND RAIN SENSOR LOCATION AND MAINLINE POINT OF CONNECTION AT PROJECT SITE WITH OWNER.
16. EXISTING TREES TO REMAIN ARE TO BE PROTECTED FROM DAMAGE. DO NOT TRENCH OR EXCAVATE WITHIN THE CRITICAL ROOT ZONE OF ANY TREE.
17. IRRIGATION LATERAL LINES, MAIN LINES AND EQUIPMENT MAY BE SHOWN OUTSIDE PROPERTY LINES ON THIS PLAN, ALL IRRIGATION LINES AND EQUIPMENT ARE TO BE WITHIN AND INSTALLED WITHIN THE LIMITS OF THE PROPERTY LINE.
18. SUPPLY LINE AND METER TO BE PROVIDED BY GENERAL CONTRACTOR. BACKFLOW PREVENTER TO BE PROVIDED BY IRRIGATION CONTRACTOR. IRRIGATION CONTRACTOR'S POINT OF CONNECTION TO BEGIN AFTER THE IRRIGATION WATER METER.
19. IRRIGATION CONTRACTOR SHALL REVIEW WINTERIZATION PROCEDURES FOR IRRIGATION SYSTEM WITH OWNERS REPRESENTATIVE.
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22. INSTALLATION OF WORK SHALL BE COORDINATED WITH OTHER CONTRACTORS IN SUCH A MANNER AS TO ALLOW FOR A SPEEDY AND ORDERLY COMPLETION OF ALL WORK ON THE SITE.
23. CONTRACTOR SHALL PROVIDE "AS-BUILT" DRAWINGS OF THE FINAL INSTALLATION TO OWNER AT SUBSTANTIAL COMPLETION BEFORE RECEIVING FINAL PAYMENT. "AS-BUILT" DRAWINGS TO BE COLOR CODED BY ZONE ON 8.5" X 11", LAMINATED, AND PLACED IN CONTROLLER.
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25. INSTALL ALL IRRIGATION COMPONENTS AS PER MANUFACTURERS REQUIREMENTS.
26. IRRIGATION HEADS AND COMPONENTS SHALL BE LOCATED A MINIMUM OF 24" FROM ALL BUILDINGS TO AVOID ADVERSE PERFORMANCE OF FOUNDATIONS AND SLABS.
27. NO LATERALS LESS THAN 3/4" DIAMETER.

No.	REVISIONS	DATE	BY

Kimley»Horn
805 PENNSYLVANIA AVENUE, SUITE 150
KANSAS CITY, MO 64105
PHONE: 816-652-03501
WWW.KIMLEY-HORN.COM

MO CERTIFICATE OF AUTHORITY # 000172, EXPIRES 12/31/22

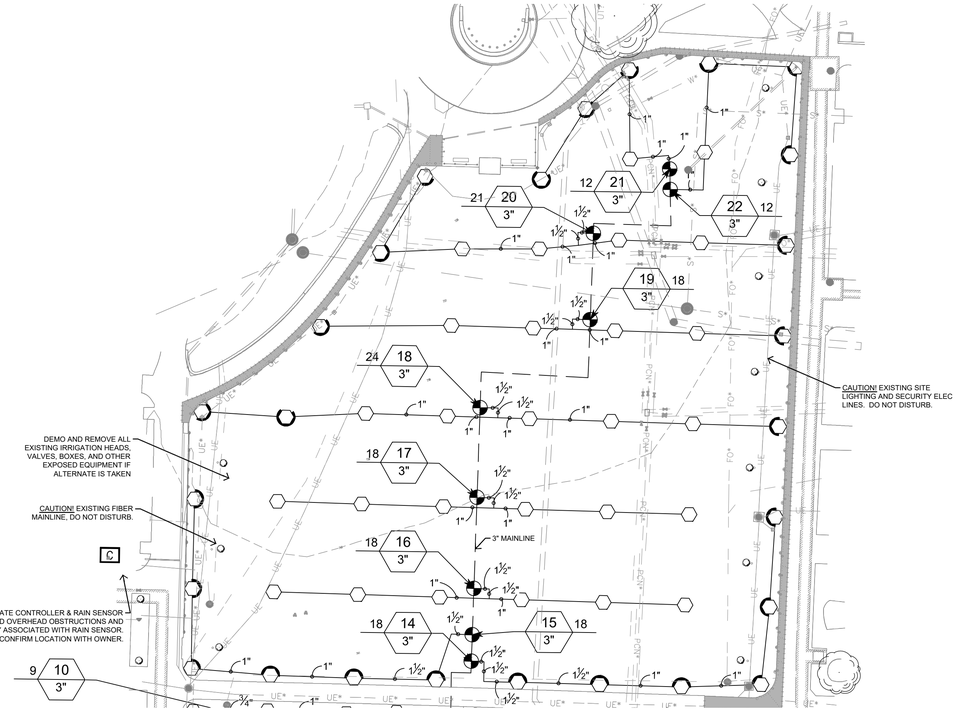
STATE OF MISSOURI
SEAN ALBERT RAY
NUMBER LA-2012026697
LANDSCAPE ARCHITECT
03/20/2024

KHA PROJECT	268642000
DATE	03/20/2024
SCALE:	AS SHOWN
DESIGNED BY:	JDK
DRAWN BY:	DLL
CHECKED BY:	SAR

CP241991
FRANCIS QUADRANGLE
IRRIGATION, DRAINAGE, AND TURF REPLACEMENT

IRRIGATION PLAN - BASE BID

SHEET NUMBER
L-300



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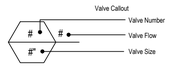

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GRAPHIC SCALE IN FEET
0 15 30 60

NORTH

No.	REVISIONS	DATE	BY

Kimley»Horn
805 PENNSYLVANIA AVENUE, SUITE 150
KANSAS CITY, MO 64105
PHONE: 816-652-03501
WWW.KIMLEY-HORN.COM

MO CERTIFICATE OF AUTHORITY # 000172, EXPIRES 12/31/22

STATE OF MISSOURI
SEAN ALBERT RAY
NUMBER LA-2012026597
LANDSCAPE ARCHITECT
03/20/2024

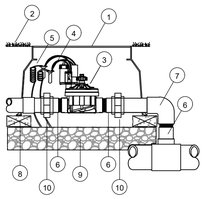
KHA PROJECT	268642000
DATE	03/20/2024
SCALE:	AS SHOWN
DESIGNED BY:	JDK
DRAWN BY:	DLL
CHECKED BY:	SAR

IRRIGATION PLAN - ADD ALT #1

CP241991
FRANCIS QUADRANGLE
IRRIGATION, DRAINAGE, AND TURF REPLACEMENT

SHEET NUMBER
L-301

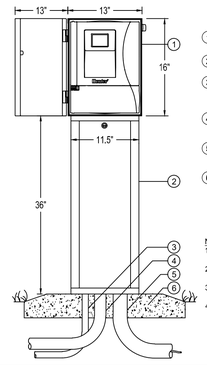
VALVE BOX TO BE INSTALLED 12-18" FROM BACK OF CURB



1. STANDARD VALVE BOX
2. FINISH GRADE
3. REMOTE CONTROL VALVE MODEL XXXXXXXX
4. WATERPROOF CONNECTORS (2)
5. 18-24" COILED WIRE
6. SCH 80 T.O.E. NIPPLE
7. MAIN LINE PIPE & FITTINGS
8. BRICK SUPPORTS (4)
9. 3/4" MINUS WASHED GRAVEL
10. PVC SLIP UNIONS

Electric Remote Control Valve — D

Scale: N.T.S.

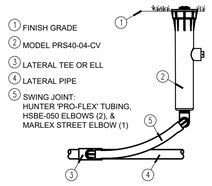


1. IRRIGATION CONTROLLER (HCC-800-M) PER PLAN
2. METAL PEDESTAL, GRAY POWDER-COATED (ICC-PED)
3. ELECTRICAL SUPPLY CONDUIT - CONNECT TO POWER SOURCE, J-BOX INSIDE CONTROLLER
4. GROUND WIRE CONDUIT - GROUND PER ASIC GUIDELINES
5. IRRIGATION CONTROL WIRE IN CONDUIT - SIZE AND TYPE PER LOCAL CODES
6. CONCRETE PEDESTAL BASE PER PLAN - INSURE POSITIVE DRAINAGE AWAY FROM PEDESTAL.

NOTES:
1. CONTROLLER ACCEPTS 120 VOLTS A.C. OR 230 VOLTS A.C. (INTERNATIONAL MODEL).
2. CONTROLLER SHALL BE HARD-WIRED TO GROUNDED 110 VAC POWER SOURCE.
3. CONTROLLER AND PEDESTAL ARE 5' [13 cm] DEEP.
4. REFER TO THE HUNTER HCC INSTALLATION GUIDE FOR FURTHER INSTRUCTIONS.

Hunter HCC Controller — C

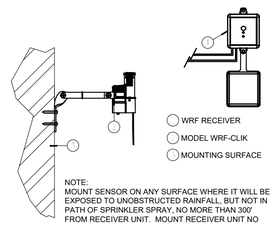
Scale: N.T.S.



1. FINISH GRADE
2. MODEL PRS40-04-CV
3. LATERAL TEE OR ELL
4. LATERAL PIPE
5. SWING JOINT: HUNTER 'PRO-FLEX' TUBING, HSBE-050 ELBOWS (2), & MARLEX STREET ELBOW (1)

MP Rotator Sprinkler — B

Scale: N.T.S.



- WRF RECEIVER
- MODEL WRF-CLIK
- MOUNTING SURFACE

NOTE:
MOUNT SENSOR ON ANY SURFACE WHERE IT WILL BE EXPOSED TO UNOBSTRUCTED RAINFALL, BUT NOT IN PATH OF SPRINKLER SPRAY, NO MORE THAN 300' FROM RECEIVER UNIT. MOUNT RECEIVER UNIT NO FURTHER THAN 6' FROM CONTROLLER.

Wireless Rain/Freeze Sensor — A

Scale: N.T.S.

No.	REVISIONS	DATE	BY

Kimley»Horn
805 PENNSYLVANIA AVENUE, SUITE 150
KANSAS CITY, MO 64105
PHONE: 816-652-03501
WWW.KIMLEY-HORN.COM

MO CERTIFICATE OF AUTHORITY #:001572, EXPIRES 12/31/22

STATE OF MISSOURI
SEAN ALBERT RAY
NUMBER LA-2012026597
LANDSCAPE ARCHITECT
03/20/2024

KHA PROJECT	268642000
DATE	03/20/2024
SCALE:	AS SHOWN
DESIGNED BY:	JDK
DRAWN BY:	DLL
CHECKED BY:	SAR

IRRIGATION DETAILS

CP241991
FRANCIS QUADRANGLE
IRRIGATION, DRAINAGE, AND TURF REPLACEMENT

SHEET NUMBER
L-302

SECTION 32 84 00: IRRIGATION

A. EXTENT:

INCLUDES FURNISHING ALL LABOR, MATERIALS AND EQUIPMENT FOR THE PROPER INSTALLATION OF THE IRRIGATION SYSTEM. THE WORK INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING: (1) TRENCHING AND BACKFILL, (2) AUTOMATICALLY CONTROLLED LOW VOLUME IRRIGATION SYSTEM, (3) TEST ALL SYSTEMS AND MAKE OPERATIVE, (4) "AS-BUILT" DRAWINGS.

B. GENERAL

1. APPROVAL: WHEREVER THE TERMS "APPROVE" OR "APPROVED" ARE USED IN THE SPECIFICATIONS, THEY SHALL MEAN THE APPROVAL OF THE OWNER'S CONSTRUCTION REPRESENTATIVE IN WRITING.
2. BEFORE ANY WORK IS STARTED, A CONFERENCE SHALL BE HELD BETWEEN THE CONTRACTOR AND THE OWNER'S CONSTRUCTION REPRESENTATIVE CONCERNING THE WORK UNDER THIS CONTRACT.
3. COORDINATION: COORDINATE AND COOPERATE WITH OTHER CONTRACTORS TO ENABLE THE WORK TO PROCEED AS RAPIDLY AND EFFICIENTLY AS POSSIBLE.
4. INSPECTION OF SITE:
   i. CONTRACTOR SHALL ACQUAINT HIMSELF WITH ALL SITE CONDITIONS. SUBMISSION OF HIS PROPOSAL SHALL BE CONSIDERED EVIDENCE THAT THE EXAMINATION HAS BEEN CONDUCTED. SHOULD UTILITIES NOT SHOWN ON THE PLANS BE FOUND DURING EXCAVATIONS, CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER'S CONSTRUCTION REPRESENTATIVE FOR INSTRUCTIONS AS TO FURTHER ACTION. FAILURE TO DO SO WILL MAKE CONTRACTOR LIABLE FOR ANY AND ALL DAMAGE THERETO ARISING FROM HIS OPERATIONS SUBSEQUENT TO DISCOVERY OF SUCH UTILITIES NOT SHOWN IN PLANS.
   ii. CONTRACTOR SHALL MAKE NECESSARY ADJUSTMENTS IN THE LAYOUT AS MAY BE REQUIRED TO CONNECT TO EXISTING STUBOUTS, SHOULD SUCH STUBS NOT BE LOCATED EXACTLY AS SHOWN, AND AS MAY BE REQUIRED TO WORK AROUND EXISTING WORK AT NO INCREASE IN COST TO THE OWNER'S CONSTRUCTION REPRESENTATIVE.
5. PROTECTION OF EXISTING PLANTS AND SITE CONDITIONS: CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT SITE CONDITIONS TO REMAIN. SHOULD DAMAGE BE INCURRED, THE CONTRACTOR SHALL REPAIR THE DAMAGE TO ITS ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE. USE CAUTION AT UTILITY CROSSING LOCATIONS.
6. THE OWNER RESERVES THE RIGHT TO SUBSTITUTE, ADD, OR DELETE ANY MATERIAL OR WORK AS THE WORK PROGRESSES. ADJUSTMENTS TO THE CONTRACT PRICE SHALL BE NEGOTIATED IF DEEMED NECESSARY BY THE OWNER ON A PER DIEM BASIS.
7. THE OWNER RESERVES THE RIGHT TO REJECT MATERIAL OR WORK WHICH DOES NOT CONFORM TO THE CONTRACT DOCUMENTS. REJECTED WORK SHALL BE REMOVED OR CORRECTED AT THE EARLIEST TIME POSSIBLE.
8. "AS-BUILT" IRRIGATION DRAWINGS: PREPARE AN "AS-BUILT" DRAWING ON A BLUEPRINT WHICH SHALL SHOW DEVIATIONS FROM THE BID DOCUMENTS MADE DURING CONSTRUCTION AFFECTING THE MAIN LINE PIPE, CONTROLLER LOCATIONS, REMOTE CONTROL VALVES AND QUICK COUPLING VALVES. THE DRAWINGS SHALL ALSO INDICATE AND SHOW APPROVED SUBSTITUTIONS OF SIZE, MATERIAL AND MANUFACTURERS NAME AND CATALOG NAME AND CATALOG NUMBER. THE DRAWINGS SHALL BE DELIVERED TO THE TENANT'S CONSTRUCTION REPRESENTATIVE BEFORE FINAL ACCEPTANCE OF WORK.
10. FINAL ACCEPTANCE: FINAL ACCEPTANCE OF THE WORK MAY BE OBTAINED FROM OWNER'S CONSTRUCTION REPRESENTATIVE UPON SATISFACTORY COMPLETION OF ALL WORK.
11. GUARANTEE: ALL WORK SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF ACCEPTANCE AGAINST ALL DEFECTS IN MATERIAL, EQUIPMENT AND WORKMANSHIP. GUARANTEE SHALL ALSO COVER REPAIR OF DAMAGE TO ANY PART OF THE PREMISES RESULTING FROM LEAKS OR OTHER DEFECTS IN MATERIAL, EQUIPMENT AND WORKMANSHIP TO THE SATISFACTION OF THE TENANT'S CONSTRUCTION REPRESENTATIVE. REPAIRS, IF REQUIRED, SHALL BE DONE PROMPTLY AT NO COST TO THE OWNER.
12. A LAMINATED PLAN (8 1/2 X 11) SHOWING THE DIFFERENT IRRIGATION ZONES IN COLOR, PREPARED BY THE IRRIGATION CONTRACTOR, SHALL BE POSTED IN THE MECHANICAL ROOM.

C. MATERIALS

1. GENERAL: ALL MATERIALS THROUGHOUT THE SYSTEM SHALL BE NEW AND IN PERFECT CONDITION.
2. PLASTIC PIPING: ALL MAIN LINES SHALL BE SCHEDULE 40 AND LATERAL LINES SHALL BE CLASS 200 POLYVINYL CHLORIDE (PVC) PIPE AND SHALL COMPLY WITH ONE OF THE FOLLOWING STANDARDS: ASTM D 1785, ASTM D-2241, AWWA C-900, OR AWWA C-905. SDR-PR PIPE SHALL HAVE A MINIMUM WALL THICKNESS AS REQUIRED BY SDR-26. PVC GASKETS FITTINGS SHALL CONFORMING TO ASTM D 3139. GASKETS SHALL CONFORM TO ASTM F 477. SOLVENT-WELD PVC FITTINGS SHALL MEET THE REQUIREMENTS OF SCHEDULE 40 AS SET FORTH IN ASTM D 2466. THREADED PVC PIPE FITTINGS SHALL MEET THE REQUIREMENTS OF SCHEDULE 40 AS SET FORTH IN ASTM D 2464. CONFORMING TO ASTM D-1784 AND D-2241
3. PLASTIC FITTINGS: ALL SOLVENT-WELD PVC FITTINGS SHALL MEET THE REQUIREMENTS OF SCHEDULE 40 AS SET FORTH IN ASTM D 2466. SCHEDULE 40 SOLVENT-WELD, POLYVINYL CHLORIDE (PVC) STANDARD WEIGHT AS MANUFACTURED BY SLOANE, LASCO, OR APPROVED EQUAL.
4. SOLVENT CEMENT: PVC CEMENT SHALL MEET ASTM D 2564 AND PVC CLEANER-TYPE SHALL MEET ASTM F 656.
5. SPRINKLER HEAD RISERS: SCHEDULE 40 PVC FOR RISERS. PIPE SHALL BE CUT WITH A STANDARD PIPE CUTTING TOOL WITH SHARP CUTTERS. REAM ONLY TO FULL DIAMETER OF PIPE AND CLEAN ALL ROUGH EDGES OR BURRS. CUT ALL THREADS ACCURATELY WITH SHARP DIES. NOT MORE THAN THREE(3) FULL THREADS SHALL SHOW BEYOND FITTINGS WHEN PIPE IS MADE UP. ASSEMBLIES SHALL BE AS DETAILED.
6. AUTOMATIC CONTROLLER: SEE LEGEND
7. REMOTE CONTROL VALVES: SEE LEGEND
8. CONTROL WIRING: 24 VOLT SOLID UL APPROVED FOR DIRECT BURIAL IN GROUND. MINIMUM WIRE SIZE: 14 GAUGE. ALL SPLICES SHALL BE MADE WITHIN VALVE BOX.
9. SLEEVES FOR CONTROL WIRING: UNDER ALL WALKS AND PAVED AREAS AND WHERE INDICATED ON DRAWINGS. MINIMUM PVC SCHEDULE 40 PLASTIC PIPE.
10. SPRINKLER HEADS/ DRIP LINE: SEE LEGEND
11. QUICK COUPLING VALVES: SHALL BE NOTED ON DRAWINGS IF REQUIRED.

D. WORKMANSHIP:

1. LAY OUT WORK AS ACCURATELY AS POSSIBLE TO THE DRAWINGS. THE DRAWINGS, THOUGH CAREFULLY DRAWN, ARE GENERALLY DIAGRAMMATIC TO THE EXTENT THAT SWING JOINTS, OFFSETS, AND ALL FITTINGS ARE NOT SHOWN.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR FULL AND COMPLETE COVERAGE OF ALL IRRIGATED AREAS AND SHALL MAKE ANY NECESSARY MINOR ADJUSTMENTS AT NO ADDITIONAL COST TO THE OWNER'S CONSTRUCTION REPRESENTATIVE.
3. ANY MAJOR REVISIONS TO THE IRRIGATION SYSTEM MUST BE SUBMITTED AND ANSWERED IN WRITTEN FORM, ALONG WITH ANY CHANGE IN CONTRACT PRICE.

E. INSTALLATION

1. EXCAVATION AND TRENCHING
   i. PERFORM ALL EXCAVATIONS AS REQUIRED FOR THE INSTALLATION OF THE WORK INCLUDING UNDER THIS SECTION, INCLUDING SHORING OF EARTH BANKS TO PREVENT CAVE-INS. RESTORE ALL SURFACES, EXISTING UNDERGROUND UTILITIES, ETC., DAMAGED OR CUT AS A RESULT OF THE EXCAVATIONS TO AND IN A MANNER APPROVED BY THE OWNER.
   ii. TRENCHES SHALL BE MADE WIDE ENOUGH TO ALLOW A MINIMUM OF 6 INCHES BETWEEN PARALLEL PIPE LINES. TRENCHES FOR PIPE LINES SHALL BE MADE OF SUFFICIENT DEPTHS TO PROVIDE THE MINIMUM COVER FROM FINISH GRADE AS FOLLOWS:
      a) 24" MINIMUM BELOW BOTTOM PAVEMENT PER SLEEVING INSTALLATION DETAIL THIS SHEET
      b) MINIMUM COVER OVER IRRIGATION LINES TO HEADS/ DRIPLINE EXCEPT VEHICLE TRAFFIC
      c) AREAS ARE AS FOLLOWS:
         12" COVER OVER LATERALS
         18" COVER OVER MAINLINE
   iii. MAINTAIN ALL WARNING SIGNS, SHORING, BARRICADES, FLARES AND RED LANTERNS AS REQUIRED BY THE SAFETY ORDERS OF THE DIVISION OF INDUSTRIAL SAFETY AND LOCAL ORDINANCES.
2. PIPE LINE ASSEMBLY:
   i. INSTALL REMOTE CONTROL VALVES WHERE SHOWN AND GROUP TOGETHER WHERE PRACTICAL, PLACE NO CLOSER THAN 6 INCHES TO WALK EDGES, BUILDINGS AND WALLS.
   ii. PLASTIC PIPE AND FITTINGS SHALL BE SOLVENT WELDED USING SOLVENTS AND METHODS RECOMMENDED BY MANUFACTURER OF THE PIPE, EXCEPT WHERE SCREWED CONNECTIONS ARE REQUIRED. PIPE AND FITTINGS SHALL BE THOROUGHLY CLEANED OF DIRT, DUST AND MOISTURE BEFORE APPLYING SOLVENT WITH A NON-SYNTHETIC BRISTLE BRUSH.
   iii. PIPE MAY BE ASSEMBLED AND WELDED ON THE SURFACE. SNAKE PIPE FROM SIDE TO SIDE OF TRENCH BOTTOM TO ALLOW FOR EXPANSION AND CONTRACTION.
   iv. MAKE ALL CONNECTIONS BETWEEN PLASTIC PIPE AND METAL VALVES OR STEEL PIPE WITH THREADED FITTINGS USING PLASTIC MALE ADAPTERS.
3. SPRINKLER HEADS/DRIPLINE:
   i. INSTALL ALL SPRINKLERS/ DRIPLINE AS DETAILED ON DRAWINGS.
   ii. DO NOT SCALE PLANTS FOR EXACT HEAD LOCATION.
   iii. PROVIDE A MINIMUM OF 4" BETWEEN SPRINKLERS/DRIPLINE AND PAYMENT/BUILDINGS.
4. CLOSING OF PIPE AND FLUSHING LINES:
   i. A. CAP OR PLUG ALL OPENINGS AS SOON AS LINES HAVE BEEN INSTALLED TO PREVENT THE ENTRANCE OF MATERIALS THAT WOULD OBSTRUCT THE PIPE. LEAVE IN PLACE UNTIL REMOVAL IS NECESSARY FOR COMPLETION OF INSTALLATION.
   ii. THOROUGHLY FLUSH OUT ALL WATER LINES BEFORE INSTALLING HEADS, DRIPLINE, VALVES AND OTHER HYDRANTS.
   iii. TEST IN ACCORDANCE WITH PARAGRAPH ON HYDROSTATIC TESTS.
   iv. UPON COMPLETION OF THE TESTING, THE CONTRACTOR SHALL COMPLETE ASSEMBLY AND ADJUST SPRINKLER HEADS FOR PROPER DISTRIBUTION.
5. INSPECTIONS:
   SPRINKLER/ DRIPLINE LAYOUT AND SPACING INSPECTION: VERIFICATION THAT THE IRRIGATION DESIGN IS ACCURATELY INSTALLED IN THE FIELD. IT WILL ALSO PROVIDE FOR ALTERATION OR MODIFICATION OF THE SYSTEM TO MEET FIELD CONDITIONS. SPACING SHOULD BE WITHIN 5% OF THE DESIGN SPACING.
   i. PIPE INSTALLATION DEPTH INSPECTION: ALL PIPES IN THE SYSTEM SHALL BE INSTALLED TO DEPTHS AS PREVIOUSLY DESCRIBED IN SECTION 'E' OF THESE SPECIFICATIONS.
   ii. OPEN TRENCH INSPECTION: THE TRENCH AND ALL JOINTS AND EVERY TRANSITION IN PIPE SIZE, WILL BE OPEN WHERE OPEN TRENCH INSPECTION IS REQUIRED.
   iii. INSPECTIONS WILL BE PERFORMED THROUGHOUT THE DURATION OF INSTALLATION. INSPECTION MAY BE MADE BY THE OWNER TO ENSURE COMPLIANCE WITH DESIGN INTENT, SPECIFICATIONS, AND THE IRRIGATION CODES.
6. HYDROSTATIC TESTS:
   i. REQUEST THE PRESENCE OF THE OWNER IN WRITING AT LEAST 48 HOURS IN ADVANCE OF TESTING.
   ii. TESTING TO BE ACCOMPLISHED AT THE EXPENSE OF THE CONTRACTOR AND IN THE PRESENCE OF THE OWNER.
   iii. CENTER LOAD PIPING WITH SMALL AMOUNT OF BACKFILL TO PREVENT ARCHING OR SLIPPING UNDER PRESSURE.
   iv. APPLYING A CONTINUOUS AND STATIC WATER PRESSURE OF 125 PSI WHEN WELDED PLASTIC JOINTS HAVE CURED AT LEAST 3 HOURS AND WITH THE RISERS CAPPED AS FOLLOWS:
      a) MAIN LINES AND SUBMAINS TO BE TESTED FOR 2 HOURS.
      b) NO PRESSURE LOSS IS ALLOWED FOR SOLVENT WELD MAINLINE/ PIPE.
   v. FOR PVC AND O-RING GASKET PIPE THE ALLOWABLE LEAKAGE SHALL NOT EXCEED THE NUMBER OF GALLONS PER HOUR AS DETERMINED BY THE FOLLOWING FORMULA:

      L=NPD / 1,850

      IN WHICH: L=ALLOWABLE LEAKAGE, IN GALLONS PER HOUR
      N=NUMBER OF JOINTS
      D=PIPE DIAMETER IN INCHES
      P=AVERAGE TEST PRESSURE IN PSI GAUGE
   vi. REPAIR LEAKS RESULTING FORM TESTS.
7. AUTOMATIC CONTROLLERS:
   i. CONNECT REMOTE CONTROL VALVES TO CONTROLLER IN A CLOCKWISE SEQUENCE TO CORRESPOND WITH STATION SETTING BEGINNING WITH STATIONS 1, 2, 3, ETC.
8. AUTOMATIC CONTROL WIRING:
   j. INSTALL CONTROL WIRING, SPRINKLER MAINS AND LATERALS IN COMMON TRENCHES WHEREVER POSSIBLE.
   ii. INSTALL CONTROL WIRES AT LEAST 18" BELOW FINISHED GRADE AND SNAKE WIRE SIDE TO SIDE IN TRENCH BELOW MAIN LINE. EXPANSION CURLS SHALL BE PROVIDED WITHIN THREE (3') FEET OF EACH WIRE CONNECTION TO SOLENOID AND AT LEAST EVERY THREE HUNDRED (300') FEET IN LENGTH. (EXPANSION CURLS ARE FORMED BY WRAPPING AT LEAST FIVE (5) TURNS OF WIRE AROUND A ROD OR PIPE 1" OR MORE IN DIAMETER, THEN WITHDRAWING THE ROD).
   iii. CONTROL WIRE SPLICES WILL BE ALLOWED ONLY RUNS OVER 1000 FT. CONNECTIONS SHALL BE IN VALVE BOX AND LOCATION TO BE SHOWN ON AS-BUILT PLANS.
   iv. ALL WIRING PASSING UNDER EXISTING OR FUTURE PAVING, CONSTRUCTION, ETC., SHALL BE ENCASED IN PLASTIC OR GALVANIZED STEEL CONDUIT EXTENDING AT LEAST 24" BEYOND EDGES OF PAVING OR CONSTRUCTION.
9. BACKFILL AND COMPACTING:
   i. AFTER SYSTEM IS OPERATING AND REQUIRED TESTS AND INSPECTIONS HAVE BEEN MADE, BACKFILL EXCAVATIONS AND TRENCHES WITH CLEAN SOIL, FREE OF RUBBISH. INITIAL BACKFILL MATERIAL TO 6 INCHES ABOVE THE TOP OF PIPE SHALL BE FREE OF ROCKS OR STONES LARGER THAN ONE INCH IN DIAMETER FINAL BACKFILL MATERIAL SHALL BE FREE OF ROCKS OR STONES LARGER THAN 3 INCHES IN DIAMETER.
   ii. COMPACT TRENCHES IN AREAS TO BE PLANTED BY THOROUGHLY FLOODING THE BACKFILL. JETTING PROCESS MAY BE USED IN THOSE AREAS.
   iii. DRESS OFF ALL AREAS TO FINISH GRADES.
10. PROTECTIVE RADIUS OF EXISTING TREES:
   i. AN AUGER IS TO BE USED TO TUNNEL UNDER EXISTING TREES IF IRRIGATION IS INSTALLED WITHIN THE PROTECTIVE RADIUS OF EXISTING TREES AND ONLY IF THERE IS NO OTHER OPTION OR TO DO SO CREATES AN UNREASONABLE HARDSHIP.

F. CLEAN-UP

1. REMOVE FROM THE STATE ALL DEBRIS RESULTING FORM WORK FOR THIS SECTION.

END SECTION 32 84 00.

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IRRIGATION SPECIFICATIONS

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