

FINAL ENGINEERING PLANS

OLIVE GARDEN

420 SE ALICE'S ROAD
WAUKEE, IOWA 50263

ARCHITECTS PROJECT
Job # 4A0003

CONTRACTOR SHALL VERIFY ALL
CONDITIONS AND DIMENSIONS
AT THE JOB SITE AND NOTIFY
THE ARCHITECT OF ANY DIMEN-
SIONAL ERRORS, OMISSIONS OR
DISCREPANCIES BEFORE BEGIN-
NING OR FABRICATING ANY WORK.
DO NOT SCALE DRAWINGS.

IT IS A VIOLATION OF THE LAW
FOR ANY PERSON, UNLESS ACTING
UNDER THE DIRECTION OF A
LICENSED ARCHITECT, TO ALTER
AN ITEM IN ANY WAY.

Kimley-Horn
© 2024, KIMLEY-HORN AND ASSOCIATES, INC.
111 W. JACKSON BOULEVARD, STE 1320
CHICAGO, ILLINOIS 60604
WWW.KIMLEY-HORN.COM

Olive Garden
ITALIAN KITCHEN

Issue Date: 06-20-24

REVISION
1 07-08-24
AGENCY REVISIONS

Restaurant #: 6526

OLIVE GARDEN
P62DOM-BOX-L

HK Q3 2024 REV.

420 SE
ALICE'S RD.
WAUKEE,
IOWA

Drawing
COVER SHEET

C0.1

UTILITY AND GOVERNING AGENCY CONTACTS

COMMUNITY DEVELOPMENT DEPARTMENT
CITY OF WAUKEE
204 W. HICKMAN ROAD
WAUKEE, IOWA 50263
TEL: (515) 978-7897
CONTACT: ANDY KASS, AICP

PUBLIC WORK DEPARTMENT
CITY OF WAUKEE
805 UNIVERSITY AVENUE
WAUKEE, IOWA 50263
TEL: (515) 978-7920
CONTACT: RUDY KOESTER

FIRE DEPARTMENT
CITY OF WAUKEE
1300 SE L.A. GRANT PARKWAY
WAUKEE, IOWA 50263
TEL: (515) 978-7998
CONTACT: FIRE CHIEF CLINT ROBINSON

POWER COMPANY
MIDAMERICAN ENERGY
29817 R AVENUE
ADEL, IOWA 50003
TEL: (888) 427-5632

NATURAL GAS COMPANY
CITY OF WAUKEE
805 UNIVERSITY AVENUE
WAUKEE, IOWA 50263
TEL: (515) 978-7920
CONTACT: TIM L. ROYER

TELEPHONE
CELLULAR ADVANTAGE
100 E. HICKMAN ROAD
WAUKEE, IOWA 50263
TEL: (515) 219-0200

PROJECT TEAM

DEVELOPER
DARDEN RESTAURANTS, INC.
1000 DARDEN CENTER DRIVE
ORLAND, FL 32837
EMAIL: CZALAPI@DARDEN.COM
CONTACT: CHRIS ZALAPI, P.E.

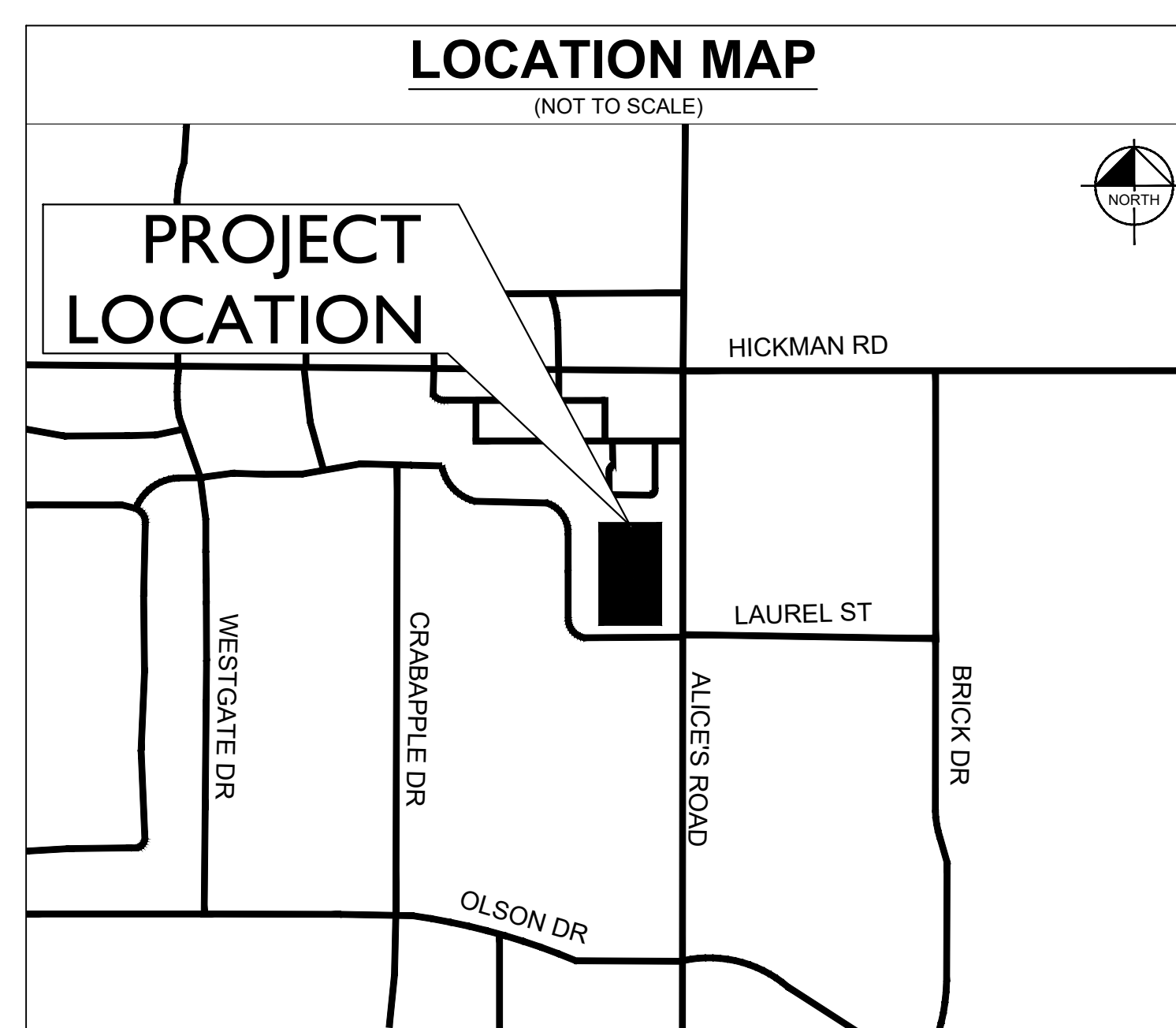
GEOTECH
ALLENDER BUTZKE ENGINEERS, INC.
3660 109TH STREET
URBANDALE, IA 50322
TEL: (515) 252-1855
CONTACT: STACIA L. ZINK, P.E.

ARCHITECT
ACS NEWPORT BEACH
101 SHIPYARD WAY, STE B
NEWPORT BEACH, CA 92663
TEL: (714) 436-9000
CONTACT: LARRY HIGA

CIVIL ENGINEER
KIMLEY-HORN AND ASSOCIATES, INC.
111 W. JACKSON BLVD, SUITE 1320
CHICAGO, IL 60604
TEL: (312) 726-9445
EMAIL: JOE.MAYER@KIMLEY-HORN.COM
CONTACT: JOE MAYER

LANDSCAPE ARCHITECT
KIMLEY-HORN AND ASSOCIATES, INC.
4201 WINFIELD ROAD, SUITE 600
WARRENVILLE, IL 60555
EMAIL: JOE.COGSWELL@KIMLEY-HORN.COM
CONTACT: JOE COGSWELL

SURVEYOR
CIVIL ENGINEERING CONSULTANTS, INC.
2400 86TH STREET, SUITE 12
URBANDALE, IA 50322
TEL: (515) 276-4884 EXT 214
CONTACT: PATRICK J SHEPARD, P.E., PLS



| PLAN REVISION LOG | | |
|-------------------|----------|------------------|
| NO. | DATE | DESCRIPTION |
| 1 | 07/08/24 | AGENCY REVISIONS |
| | | |
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LEGAL DESCRIPTION

LOT 1, WAUKEE TOWNE CENTER PLAT 5, AN OFFICAL
PLAT, NOW INCLUDED IN AND FORMING A PART OF THE
CITY OF WAUKEE, DALLAS COUNTY, IOWA

| Sheet List Table | | |
|---------------------------------|----------------------------------|----------|
| Sheet Number | Sheet Title | Revision |
| CIVIL ENGINEERING | | |
| C0.1 | COVER SHEET | |
| V0.0 | ALTA SURVEY (BY OTHERS) | |
| V0.1 | ALTA SURVEY (BY OTHERS) | |
| C1.1 | GENERAL NOTES | |
| C2.1 | EXISTING CONDITIONS PLAN | |
| C2.2 | EROSION & SEDIMENT CONTROL PLAN | |
| C2.3 | EROSION & SEDIMENT CONTROL NOTES | |
| C3.1 | SITE DIMENSIONAL CONTROL PLAN | |
| C4.1 | PAVING & STRIPING PLAN | |
| C4.2 | GRADING PLAN | |
| C4.3 | STORM SEWER PLAN | |
| C5.1 | UTILITY PLAN | |
| C6.1 | CONSTRUCTION DETAILS | |
| C7.1 | GEOTECHNICAL REPORT (BY OTHERS) | |
| C7.2 | GEOTECHNICAL REPORT (BY OTHERS) | |
| TECHNICAL SPECIFICATIONS | | |
| CS1 | CIVIL SPECIFICATIONS (1 OF 5) | |
| CS2 | CIVIL SPECIFICATIONS (2 OF 5) | |
| CS3 | CIVIL SPECIFICATIONS (3 OF 5) | |
| CS4 | CIVIL SPECIFICATIONS (4 OF 5) | |
| CS5 | CIVIL SPECIFICATIONS (5 OF 5) | |
| LANDSCAPE DESIGN | | |
| L1.0 | LANDSCAPE PLAN | |
| L2.0 | LANDSCAPE NOTES & DETAILS | |
| IR1.0 | IRRIGATION PLANS | |
| IR2.0 | IRRIGATION NOTES & DETAILS | |

PROFESSIONAL ENGINEER'S CERTIFICATION

I, ALAN CATCHPOOL, A LICENSED PROFESSIONAL ENGINEER OF IOWA, HEREBY CERTIFY THAT THIS SUBMISSION, PERTAINING ONLY TO THE "C" SERIES CIVIL SHEETS LISTED ABOVE BUT EXCLUDING DETAILS PREPARED BY OTHERS, WAS PREPARED ON BEHALF OF DARDEN BY KIMLEY-HORN AND ASSOCIATES, INC. UNDER MY PERSONAL DIRECTION. THIS TECHNICAL SUBMISSION IS INTENDED TO BE USED AS AN INTEGRAL PART OF AND IN CONJUNCTION WITH THE PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS.

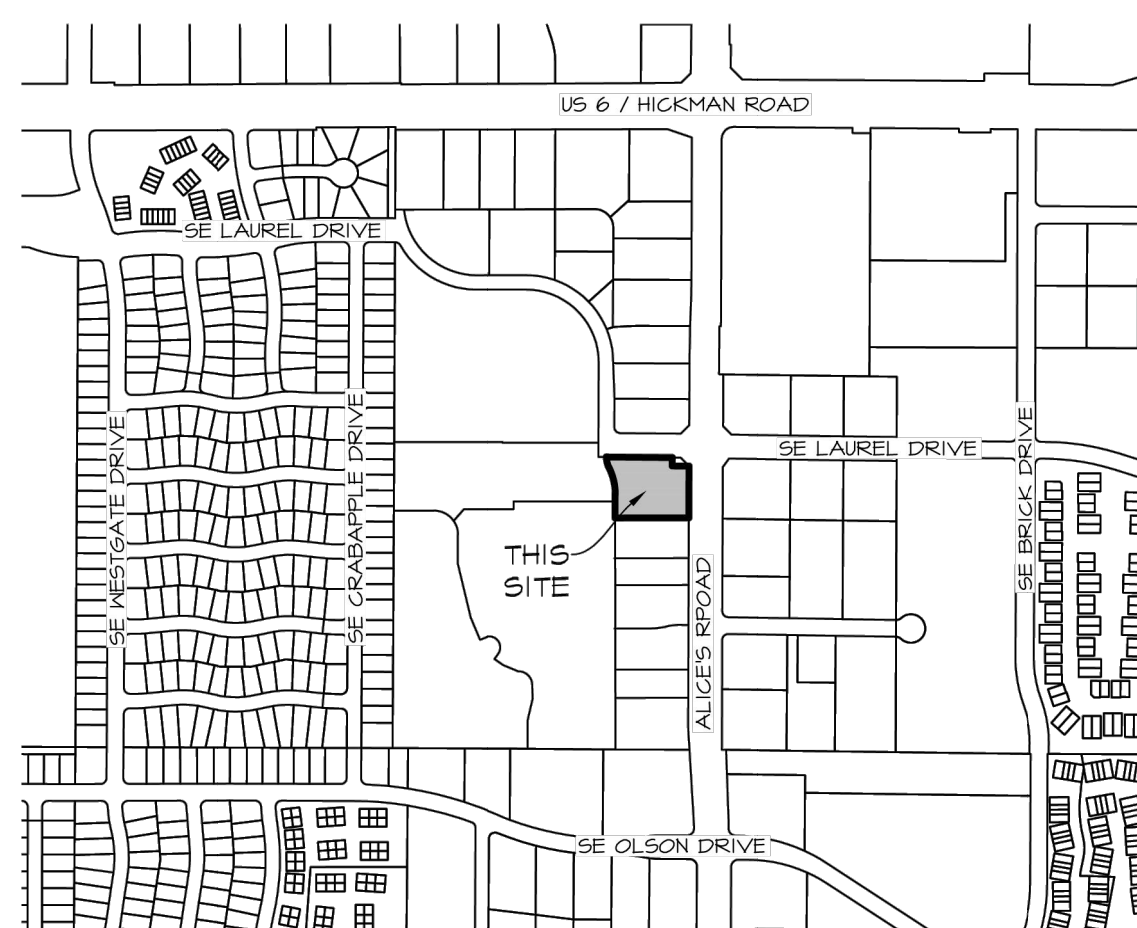
DATED THIS 8TH DAY OF JULY, A.D., 2024.

Alan Catchpool

IOWA LICENSED PROFESSIONAL ENGINEER 23542
DESIGN FIRM REGISTRATION NUMBER: 184002012-0006



ALTA/NSPS LAND TITLE SURVEY OF LOT 1 WAUKEE TOWNE CENTER PLAT 5 WAUKEE, IOWA



DRAWING INDEX

| PAGE# | SHEET TITLE |
|-------|-----------------------------|
| 1 | COVER |
| 2 | ALTA/NSPS LAND TITLE SURVEY |

LEGEND

| | |
|-----|--|
| ● | FOUND CORNERS (3/4" I.R. W/LEG CAP #1030) (UNLESS NOTED) |
| ○ | SET CORNERS (3/8" I.R. W/ORANGE CAP #12265) (UNLESS OTHERWISE NOTED) |
| --- | PROPERTY BOUNDARY |
| --- | LOT LINES |
| --- | ORIGINAL PLATTED LOT LINES |
| --- | BUILDING SETBACK LINE (B.S.L.) |
| --- | PARKING SETBACK LINE (P.S.L.) |
| --- | TREE LINE |
| --- | EXISTING PARKING STALL PAINT LINES |
| --- | BACK OF PORTLAND CEMENT CONCRETE (P.C.C.) |
| --- | CURB & EDGE OF PORTLAND CEMENT CONCRETE SLAB |
| --- | GUTTER |
| --- | CENTERLINE STREET |
| --- | SIDEWALK |
| --- | EXISTING CHAIN LINK FENCE |
| --- | EXISTING PIPE FENCE |
| --- | EXISTING WIRE FENCE |
| --- | OVERHEAD WIRES (X = NUMBER OF WIRES) |
| --- | UNDERGROUND FIBER OPTIC LINES |
| --- | STORM SEWER AND SIZE |
| --- | SANITARY SEWER AND SIZE |
| --- | WATER MAIN AND SIZE |
| --- | GAS MAIN AND SIZE |
| --- | UNDERGROUND ELECTRIC |
| --- | CATV - UNDERGROUND CABLE TELEVISION LINE |
| --- | UNDERGROUND TELEPHONE LINE |
| --- | RETAINING WALL |
| --- | EXISTING BUILDING |

| | |
|--|---|
| | SANITARY & STORM MANHOLE |
| | OPEN THROAT INTAKE OR M5 INTAKE |
| | SINGLE & DOUBLE BACK OF CURB (B/C) INTAKE |
| | STORM AREA INTAKE |
| | MEDIACOM COMMUNICATIONS RISER |
| | COMMUNICATIONS RISER |
| | ELECTRIC TRANSFORMER |
| | ELECTRIC METER |
| | ELECTRIC BOX |
| | WOOD POWER POLE WITH LIGHT |
| | POWER POLE |
| | STEEL STREET LIGHT POLE |
| | METAL LIGHT POLE |
| | GUYWIRE ANCHOR |
| | FIRE HYDRANT |
| | WATER MAIN GATE VALVE |
| | WATER MAIN STOP BOX VALVE |
| | SIGN |
| | DEEDED BEARING & DISTANCE |
| | PREVIOUSLY RECORDED BEARING & DISTANCE |
| | MEASURED BEARING & DISTANCE |
| | FINISHED FLOOR ELEVATION |
| | PORTLAND CEMENT CONCRETE |
| | ASPHALTIC CEMENT CONCRETE |
| | CONCRETE MASONRY UNIT |
| | FLAGPOLE |
| | IRON ROD |
| | IRON PIPE |
| | COUNTY RECORDER'S INDEXING BOOK AND PAGE |
| | EXISTING DECIDUOUS TREE & CALIPER SIZE (GRAPHIC TREE SIZE IS REPRESENTATIVE OF APPROXIMATE DRIP LINE) |
| | EXISTING EVERGREEN TREE & CALIPER SIZE (GRAPHIC TREE SIZE IS REPRESENTATIVE OF APPROXIMATE DRIP LINE) |
| | BUILDING HEIGHT MEASURED FROM THE EXISTING GROUND TO PEAK (HEIGHT ACCURACY = +/- 0.5 FEET) |
| | PROPERTY ADDRESS |

TITLE COMMITMENT NOTES:
THE FOLLOWING NOTES REFER TO SURVEY RELATED ITEMS IN TITLE COMMITMENT No. CPT13331 PREPARED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY DATED MARCH 1, 2024.

- 1a) EASEMENTS AND SETBACKS SHOWN ON WAUKEE TOWN CENTER PLAT 5 ARE SHOWN ON SURVEY
- 1b) EASEMENTS AND SETBACKS ON PLAT OF SURVEY DO NOT AFFECT SUBJECT PARCEL
- 1c) EASEMENTS AND SETBACKS ON WAUKEE MARKET PLACE PLAT 1 DO NOT AFFECT SUBJECT PARCEL
- 1d) EASEMENTS AND SETBACKS SHOWN ON WAUKEE TOWN CENTER PLAT 1 ARE SHOWN ON SURVEY
- 1e) EASEMENTS AND SETBACKS ON PLAT OF SURVEY DO NOT AFFECT SUBJECT PARCEL
- 1f) EASEMENTS AND SETBACKS SHOWN ON WAUKEE TOWN CENTER PLAT 2 ARE SHOWN ON SURVEY
- 1g) EASEMENTS AND SETBACKS SHOWN ON WAUKEE TOWN CENTER PLAT 3 ARE SHOWN ON SURVEY
- 12) EASEMENT FOR ROAD PURPOSES DOES NOT AFFECT SUBJECT PARCEL
- 13) EASEMENT FOR ELECTRIC LINES DOES NOT AFFECT SUBJECT PARCEL
- 14) EASEMENT FOR ELECTRIC TRANSMISSION LINES IS SHOWN ON SURVEY
- 15) TEMPORARY EASEMENT DOES NOT AFFECT SUBJECT PROPERTY SINCE IMPROVEMENTS ARE COMPLETE
- 16) PUBLIC SNOW STORAGE EASEMENT IS SHOWN ON SURVEY
- 17) PUBLIC UTILITY EASEMENT IS SHOWN ON SURVEY
- 18) PRIVATE WATER MAIN EASEMENT ON ADJACENT PROPERTY IS SHOWN ON SURVEY
- 19) PRIVATE SANITARY SEWER EASEMENT ON ADJACENT PROPERTY IS SHOWN ON SURVEY
- 20) PRIVATE STORM SEWER EASEMENT ON ADJACENT PROPERTY IS SHOWN ON SURVEY
- 21) SUBJECT PARCEL IS A BENEFITTED PROPERTY IN THE EASEMENT FOR STORM WATER DETENTION THAT IS NOT PLOTTABLE ON SURVEY
- 22) OPERATION AND EASEMENT AGREEMENT AFFECT SUBJECT PARCEL, NOT PLOTTABLE
- 23) PUBLIC UTILITY EASEMENT IS SHOWN ON SURVEY
- 24) AGREEMENT AND MEMORANDUM AFFECT SUBJECT PARCEL, NOT PLOTTABLE
- 25) AGREEMENT AND MEMORANDUM DO NOT AFFECT SUBJECT PARCEL

- NOTES**
- SUBJECT PARCEL HAS ACCESS TO SE LAUREL STREET, A PUBLIC STREET DEDICATED AS PUBLIC RIGHT-OF-WAY WITH THE RECORDING OF WAUKEE TOWNE CENTER PLAT 1.
 - SUBJECT PARCEL HAS EXISTING WATER AND SANITARY SEWER SERVICES.
 - THERE ARE NO ENCROACHMENTS.

PROPERTY OWNER:
WAUKEE TOWNE CENTER, LLC
611 MONTICELLO DR
BURLINGTON IA 52601

PROPERTY ADDRESS:
420 SE ALICE'S ROAD
WAUKEE IA 50265

PREPARED FOR:
DARDEN RESTAURANTS, INC.
1000 DARDEN CENTER DRIVE
ORLANDO, FL 32831

PROFESSIONAL LAND SURVEYOR:
PATRICK J. SHEPARD, P.E., PLS
2400 86TH STREET, SUITE 12
URBANDALE, IA 50322
(515) 276-4884 EXT 214
SHEPARD@CECLAC.COM

LEGAL DESCRIPTION:
LOT 1, WAUKEE TOWNE CENTER PLAT 5, AN OFFICIAL PLAT, NOW INCLUDED IN AND FORMING A PART OF THE CITY OF WAUKEE, DALLAS COUNTY, IOWA

ZONING / LAND USE:
PD C-1 COMMUNITY AND HIGHWAY SERVICE COMMERCIAL DISTRICT (BK. 2022, PG. 2020)

LAND AREA:
1.78 ACRES TOTAL

FLOOD ZONE:
ZONE 'X' ACCORDING TO FEMA FLOOD INSURANCE RATE MAPS, COMMUNITY-PANEL #10440395F MAP REVISED DECEMBER 7, 2018.

SETBACKS:
C-1
FRONT YARD = 30 FEET
SIDE YARD = 0 FEET
SIDE YARD = 30 FEET / IF ADJACENT TO 'R' DISTRICT
REAR YARD = 100 FEET (AS PER PD)
MAXIMUM HEIGHT = NO MINIMUM EXCEPT WHEN ADJACENT TO AN R-1, R-2 OR R-4 DISTRICT, THE MAXIMUM SHALL BE 2 STORIES OR 40 FEET AND 1 STORY OR 14 FEET FOR ACCESSORY BUILDING

CERTIFICATION
TO: DARDEN RESTAURANTS INC.
FIDELITY NATIONAL TITLE INSURANCE COMPANY

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2020 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, THE FIELD WORK WAS COMPLETED ON MARCH 20, 2024.

DATE OF PLAT OR MAP: May 1, 2024

PATRICK J. SHEPARD
LICENSE NO. 12265



Civil Engineering Consultants, Inc.

2400 86th Street, Unit 12 - Des Moines, Iowa 50322
515.276.4884 · mail@ceclac.com

CEC

DATE: May 1, 2024
DATE OF SURVEY: Mar. 20, 2024
DESIGNED BY: P.J.S.
DRAWN BY: J.P.S.

LOT 1 WAUKEE TOWN CENTER PLAT 5
420 SE ALICE'S ROAD, WAUKEE, IA
ALTA-NSPS LAND TITLE SURVEY

A2260



ARCHITECTS PROJECT Job # 4A0003

CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE JOB SITE AND NOTIFY THE ARCHITECTS OF ANY DIMENSIONAL ERRORS, OMISSIONS OR DISCREPANCIES BEFORE BEGINNING OR FABRICATING ANY WORK. DO NOT SCALE DRAWINGS.

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Issue Date: 06-20-24

| REVISION | |
|----------|----------|
| 1 | 07-08-24 |

AGENCY REVISIONS

Restaurant #: 6526

OLIVE GARDEN P62DOM-BOX-L

HK Q3 2024 REV.

420 SE ALICE'S RD.

WAUKEE, IOWA

Drawing

ALTA SURVEY

V0.0



GENERAL NOTES

- 1. EXISTING SITE TOPOGRAPHY, UTILITIES, RIGHT-OF-WAY AND HORIZONTAL CONTROL SHOWN ON THE DRAWINGS WERE OBTAINED FROM A SURVEY PREPARED BY: CIVIL ENGINEERING CONSULTANTS, INC. AND JOHN STREET, SUITE 112, URBANDALE, IA 50322. TEL: (515) 276-4884, EXT 214

- ADJUSTMENTS AS REQUIRED BY THE MUNICIPALITY UPON FINAL INSPECTION OF THE PROJECT. 20. HORIZONTALS SHALL NOT BE FLUSHED DIRECTLY onto the ROAD SURFGRADES. WHENEVER POSSIBLE, HOSES SHALL BE USED TO DIRECT THE WATER INTO LOT AREAS OR THE STORM SEWER SYSTEM, IF AVAILABLE.

PAVING NOTES

- 1. GENERAL 1.1. PAVING WORK INCLUDES FINAL SUBGRADE GRADING, PREPARATION, AND COMPACTION. PLACEMENT OF SUBBASE OR BASE COURSE MATERIALS, BITUMINOUS BINDER AND/OR SURFACE COURSES, FORMING, FINISHING, AND CURING CONCRETE PAVEMENT, CURBS, AND WALKS; AND FINAL CLEAN-UP AND ALL RELATED WORK.

SANITARY SEWER NOTES

- 1. SANITARY SEWER PIPE: ALL SANITARY SEWER PIPE MATERIAL, SIZE AND TYPE SHALL BE INSTALLED AS INDICATED ON THE UTILITY PLAN, UNLESS OTHERWISE NOTED ON THE PLANS. ALL SANITARY SEWER PIPE SHALL BE CONSTRUCTED OF BITUMINOUS-CEMENT MORTAR-LINED DUCTILE IRON PIPE, CLASS 50, CONFORMING TO ANSI A21.51 (AWWA C151), CEMENT MORTAR LINING SHALL CONFORM TO ANSI A21.4 (AWWA C104).

WATERMAIN NOTES

- 1. WATERMAIN PIPE: ALL WATERMAIN PIPE MATERIAL, SIZE AND TYPE SHALL BE INSTALLED AS INDICATED ON THE UTILITY PLAN, UNLESS OTHERWISE NOTED ON THE PLANS. ALL WATERMAIN PIPE SHALL BE CONSTRUCTED OF BITUMINOUS-CEMENT MORTAR-LINED DUCTILE IRON PIPE, CLASS 50, CONFORMING TO ANSI A21.51 (AWWA C151), CEMENT MORTAR LINING SHALL CONFORM TO ANSI A21.4 (AWWA C104).

EARTHWORK NOTES

- 1. GENERAL 1.1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE SOIL AND GROUNDWATER CONDITIONS AT THE SITE.

SIGNAGE AND PAVEMENT MARKING NOTES

- 1. ALL SIGNING AND PAVEMENT MARKING SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND THE CITY OF WAUKEE STANDARDS.

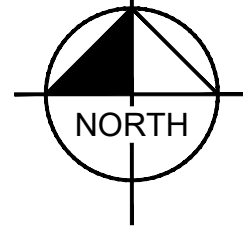
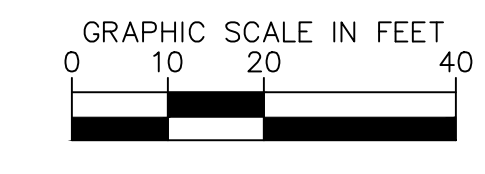
STORM SEWER NOTES

- 1. STORM SEWER PIPE: ALL STORM SEWER PIPE MATERIAL, SIZE AND TYPE SHALL BE INSTALLED AS INDICATED ON THE UTILITY PLAN, UNLESS OTHERWISE NOTED ON THE PLANS. ALL STORM SEWER PIPE SHALL BE CONSTRUCTED OF BITUMINOUS-CEMENT MORTAR-LINED DUCTILE IRON PIPE, CLASS 50, CONFORMING TO ANSI A21.51 (AWWA C151), CEMENT MORTAR LINING SHALL CONFORM TO ANSI A21.4 (AWWA C104).

ADJUSTMENTS AS REQUIRED BY THE MUNICIPALITY UPON FINAL INSPECTION OF THE PROJECT.

- 20. HORIZONTALS SHALL NOT BE FLUSHED DIRECTLY onto the ROAD SURFGRADES. WHENEVER POSSIBLE, HOSES SHALL BE USED TO DIRECT THE WATER INTO LOT AREAS OR THE STORM SEWER SYSTEM, IF AVAILABLE.

ACSA Architectural Construction Services Inc. 1010 Chesapeake Way, Suite B, Woodstock, IA 50090. Kimley-Horn & Associates, Inc. 2024 Kimley-Horn and Associates, Inc. Olive Garden Italian Kitchen. Issue Date: 06-20-24. Revision 1 07-08-24. Agency Revisions. Restaurant #: 6526. Olive Garden P62DOM-BOX-L. HK Q3 2024 REV. 420 SE ALICE'S RD. WAUKEE, IOWA. Drawing. GENERAL NOTES. IOWA ONE CALL 1-800-292-8989. C1.1



CONSULTING ARCHITECT
 ACS Architectural
 Construction
 Services
 Inc.
 181 Grayson Way
 Suite B
 Westport Beach, CA
 92683
 T 714 438-2003
 acs-arch.com
 NRP MKR ATL

ARCHITECTS PROJECT
 Job # 4A0003

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Kimley»Horn
 © 2024, KIMLEY-HORN AND ASSOCIATES, INC.
 10000 KIMLEY-HORN BOULEVARD, STE 1320
 CHARLOTTE, NORTH CAROLINA 28226
 PH: 704.366.7000



Issue Date: 06-20-24

| REVISION | |
|------------------|----------|
| 1 | 07-08-24 |
| AGENCY REVISIONS | |

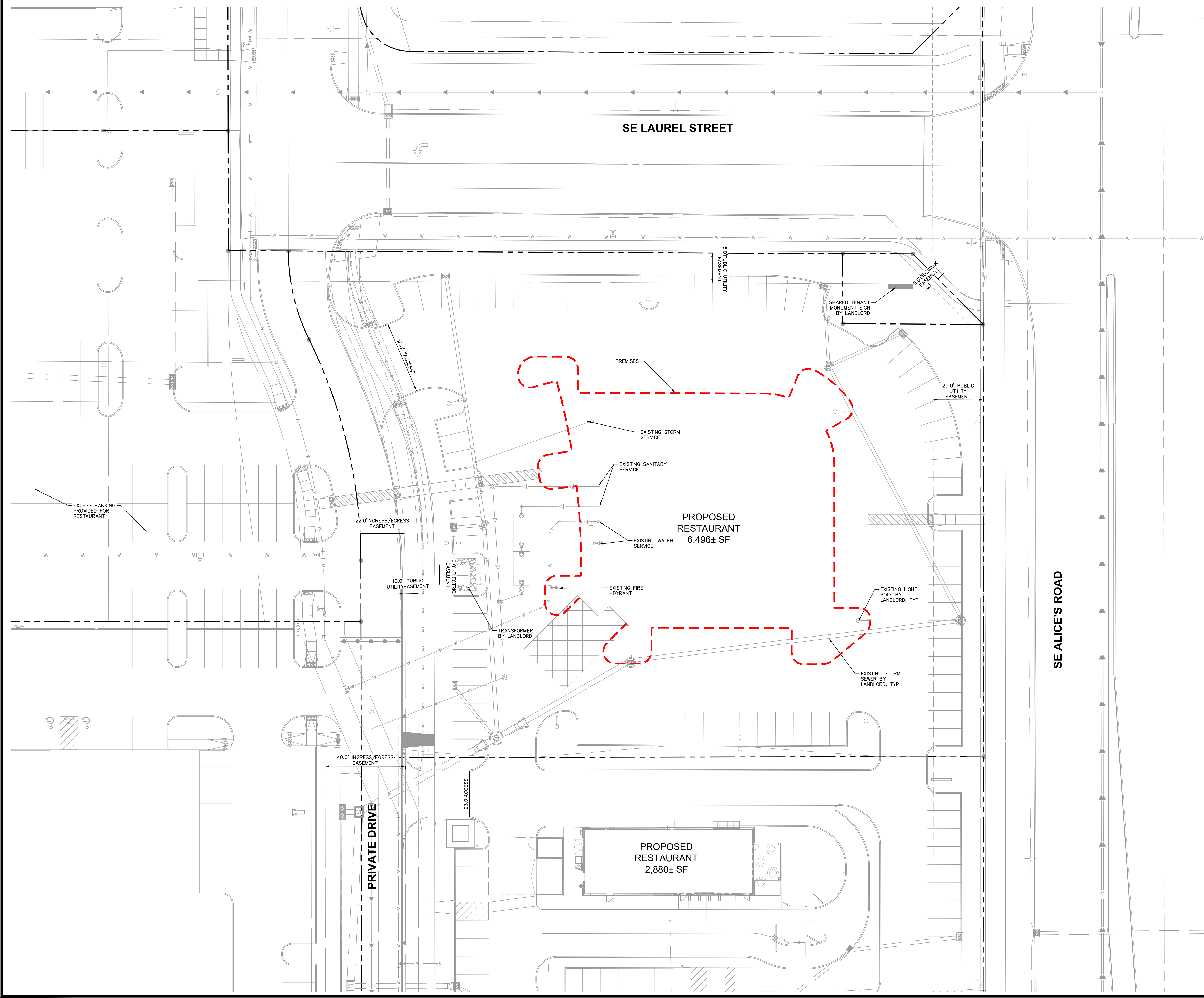
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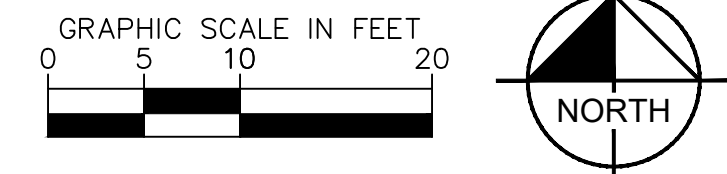
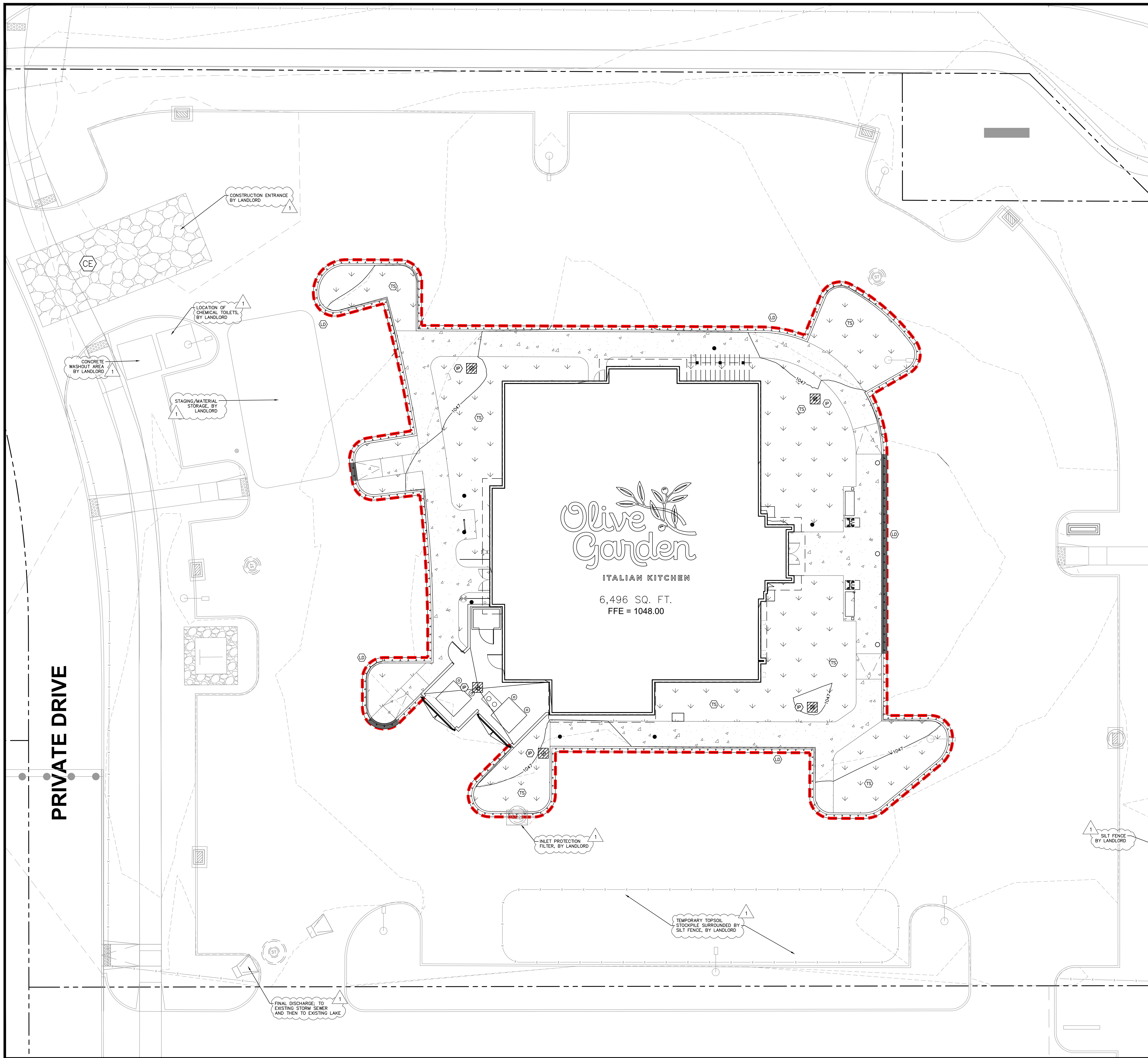
Drawing
 EXISTING
 CONDITIONS
 PLAN

C2.1



EXISTING CONDITIONS ON THIS PLAN SHOW PER LANDLORD
 DESIGN CIVIL ENGINEERING DRAWNS, PREPARED BY CEC,
 CIVIL ENGINEERING CONSULTANTS, DATED 05/05/2024.
 CONTRACTOR TO NOTIFY ENGINEER IF ANY DISCREPANCIES
 EXIST





EROSION CONTROL LEGEND

- TEMPORARY SEEDING (SEE EROSION CONTROL DETAILS)
- CONSTRUCTION ENTRANCE (BY LANDLORD)
- SILT FENCE (BY LANDLORD)
- INLET PROTECTION (SEE EROSION CONTROL DETAILS)
- INLET PROTECTION (BY LANDLORD)
- LIMITS OF DISTURBANCE
- EXISTING CONTOURS
- PROPOSED CONTOURS

SCHEDULING & SEQUENCING

- I. ROUGH GRADING** CONSTRUCTION ENTRANCE/EXIT, SILT FENCE PROTECTION, CONCRETE WASHOUT AREA AND TREE PROTECTION SHALL BE INSTALLED PRIOR TO THE INITIATION OF ROUGH GRADING. AS NEEDED, TEMPORARY EROSION CONTROL MEASURES TO BE INSTALLED UPON COMPLETION OF ROUGH GRADING AND AS NECESSARY THROUGHOUT CONSTRUCTION.
 - II. UTILITY INSTALLATION** ALL PRIOR EROSION CONTROL MEASURES INSTALLED ABOVE TO BE MAINTAINED AS NECESSARY DURING UTILITY INSTALLATION. STORM STRUCTURE, INLET PROTECTION SHALL BE INSTALLED AS STORM DRAINAGE SYSTEM IS CONSTRUCTED.
 - III. PAVING** ALL PRIOR EROSION CONTROL MEASURES INSTALLED ABOVE TO BE MAINTAINED AS NECESSARY DURING PAVING AND THROUGHOUT THE REMAINDER OF THE PROJECT.
 - IV. FINAL GRADING/SOIL STABILIZATION/LANDSCAPING** ALL TEMPORARY EROSION CONTROL MEASURES TO BE REMOVED AT THE CONCLUSION OF THE PROJECT AS DIRECTED BY THE LOCAL MUNICIPALITY.
- NOTE: THE SEQUENCE OF CONSTRUCTION SHOWN ABOVE IS A GENERAL OVERVIEW AND IS INTENDED TO CONVEY THE GENERAL CONCEPTS OF THE EROSION CONTROL DESIGN AND SHOULD NOT BE RELIED UPON FOR CONSTRUCTION PURPOSES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETAILED PHASING AND CONSTRUCTION SEQUENCING NECESSARY TO CONSTRUCT THE PROPOSED IMPROVEMENTS INCLUDED IN THESE PLANS. THE CONTRACTOR SHALL NOTIFY ENGINEER IN WRITING IMMEDIATELY, PRIOR TO AND/OR DURING CONSTRUCTION IF ANY ADDITIONAL INFORMATION ON THE CONSTRUCTION SEQUENCE IS NECESSARY. CONTRACTOR IS SOLELY RESPONSIBLE FOR COMPLYING WITH THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION AND ALL OTHER APPLICABLE LAWS.

QUANTITIES

| LANDLORD QUANTITIES | |
|--|---|
| SEE "WAUKEE OLIVE GARDEN" CIVIL ENGINEERING PLANS, BY CIVIL ENGINEERING CONSULTANTS, INC., FOR MORE DETAILS. | |
| 1,286 LF | SILT FENCE |
| 0.42 ACRES | 500 |
| 0.12 ACRES | SEEDING - TYPE 2 (PERMANENT) DISTURBED AREA OUTSIDE OF PROPERTY BOUNDARY. |
| 1.83 ACRES | SEEDING - TYPE 4 (TEMPORARY AS NEEDED) |
| 7 EA | INTAKE FILTER BASKETS |
| 1 EA | CONSTRUCTION ENTRANCE |
| 1.83 ACRES | DISTURBANCE AREA |
| TENANT QUANTITIES | |
| 0.13 ACRES | SEEDING - TYPE 4 (TEMPORARY AS NEEDED) |
| 5 EA | INTAKE FILTER BASKETS |

ITALIAN KITCHEN

 6,496 SQ. FT.

 FFE = 1048.00

PRIVATE DRIVE

CONSULTING ARCHITECT ACS Architectural Construction Services Inc. 101 Shaper Way Suite B Westport Beach, CA 92683 714 438-0303 acs-ar@csccs.com HIR MKS /ATL

ARCHITECTS PROJECT Job # 4A0003

CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE JOB SITE AND NOTIFY THE ARCHITECT OF ANY DIMENSIONAL ERRORS, OMISSIONS OR DISCREPANCIES BEFORE BEGINNING OR FABRICATING ANY WORK. DO NOT SCALE DRAWINGS.

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Olive Garden
ITALIAN KITCHEN

Issue Date: 06-20-24

| REVISION | DATE |
|----------|----------|
| 1 | 07-08-24 |

AGENCY REVISIONS

Restaurant #: 6526

OLIVE GARDEN
P62DOM-BOX-L

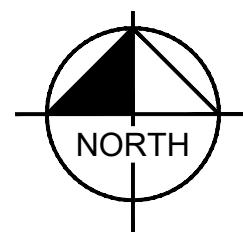
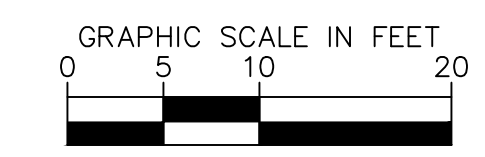
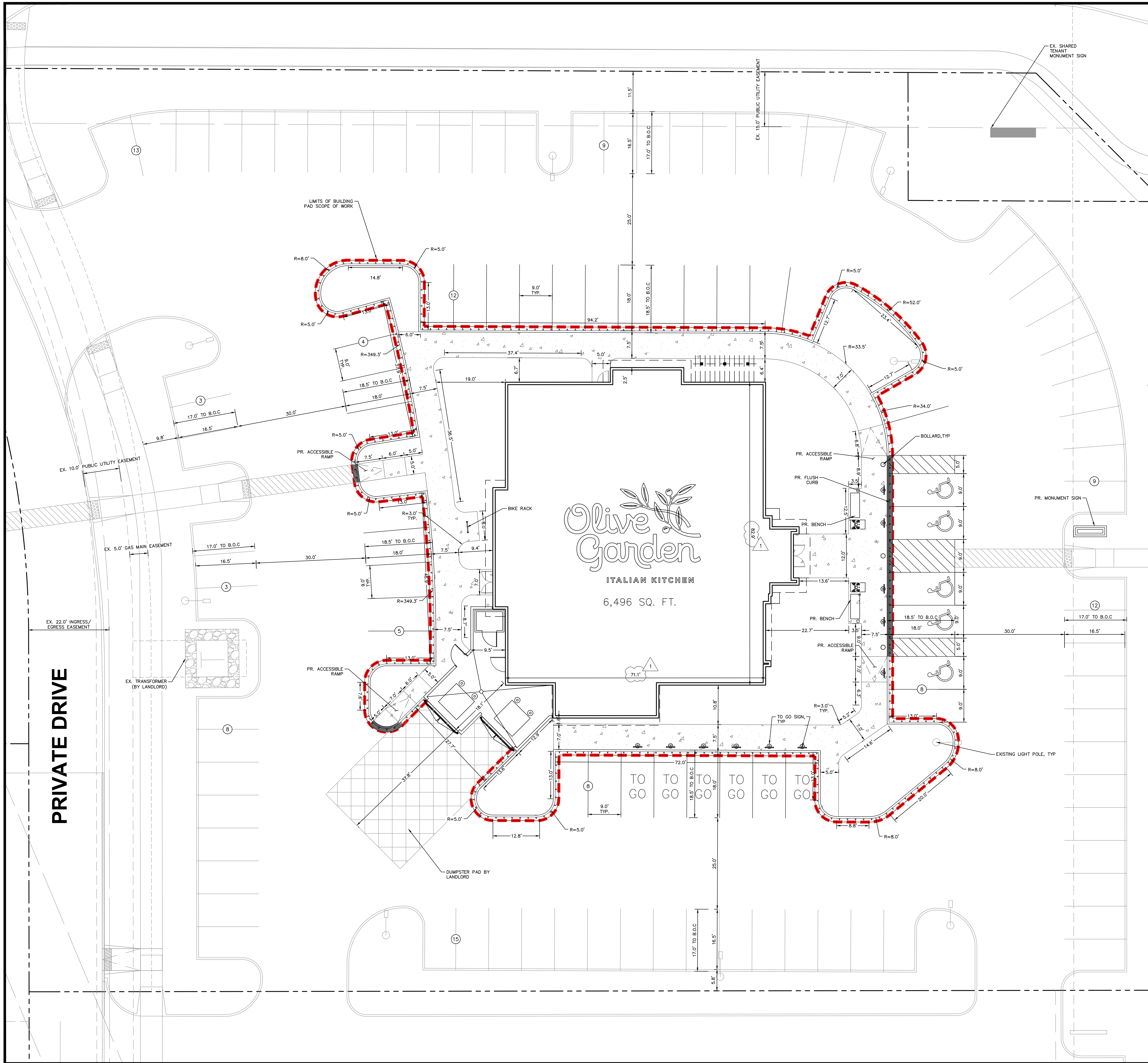
HK Q3 2024 REV.

420 SE ALICE'S RD.
WAUKEE, IOWA

Drawing
EROSION & SEDIMENT CONTROL PLAN

C2.2





SITE LEGEND

| | |
|--|-----------------------------|
| | TRANSFORMER |
| | ACCESSIBLE PAVEMENT MARKING |
| | ACCESSIBLE RAMP |
| | PARKING COUNT SIGN |
| | BENCH |

- ### GENERAL NOTES
- ALL DIMENSIONS REFER TO THE FACE OF CURB UNLESS OTHERWISE NOTED.
 - BUILDING DIMENSIONS ARE TO THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
 - REFER TO ARCHITECTURAL AND STRUCTURAL PLANS TO VERIFY ALL BUILDING DIMENSIONS.
 - RADIi ADJACENT TO PARKING STALL AND NOT DIMENSIONED ON THIS PLAN SHALL BE 3'-FEET, TYPICAL.
 - REFER TO ARCHITECTURAL PLANS FOR MONUMENT SIGN DETAILS. SEE MEP PLANS FOR SITE ELECTRICAL DRAWINGS.
 - ALL PROPOSED ON-SITE STRIPING SHALL BE PAINTED UNLESS OTHERWISE NOTED.

FEMA NOTE

PER FLOOD INSURANCE RATE MAP PANEL NO. 19049C0355F DATED 12/7/2016, THE SITE OR A PORTION OF THE SITE IS LOCATED IN ZONE X, AREAS OF MINIMAL FLOOD HAZARD.

SITE DATA TABLE

| SITE DATA | |
|--|------------------------------|
| PARCEL ID: | |
| PROPERTY AREA: | 1.79± ACRES |
| EXISTING ZONING: | PD C-1 |
| PROPOSED ZONING: | PD C-1 (PLANNED DEVELOPMENT) |
| EXISTING LAND USE: | UNDEVELOPED LAND |
| PROPOSED LAND USE: | RESTAURANT (OLIVE GARDEN) |
| BUILDING SETBACKS: | |
| - 30' FRONT YARD SETBACK (SE ALICE'S ROAD) | |
| - 100' REAR YARD SETBACK (PRIVATE DRIVE) | |
| PROPOSED BUILDING AREA: | 6,496± SF |
| PARKING DATA | |
| REQUIRED PARKING SPACES (1 SPACE FOR EACH 1,000 SQ. FT. OF GROSS FLOOR AREA) | 98 SPACES |
| TOTAL PARKING SPACES PROVIDED | 109 SPACES |
| REQUIRED ACCESSIBLE SPACES | 5 SPACES |
| PROVIDED ACCESSIBLE PARKING SPACES | 5 SPACES |

PRIVATE DRIVE

SE ALICE'S ROAD

CONSULTING ARCHITECT ACS Architectural Construction Services Inc.
 181 Grayson Way, Suite B, Westport Beach, CA 92683
 T 714 438-2003, F 714 438-2000, www.acsarchitect.com, HRP MKR / ATL

ARCHITECTS PROJECT Job # 4A0003

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Olive Garden
 ITALIAN KITCHEN

Issue Date: 06-20-24

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| 1 | 07-08-24 |

AGENCY REVISIONS

Restaurant #: 6526

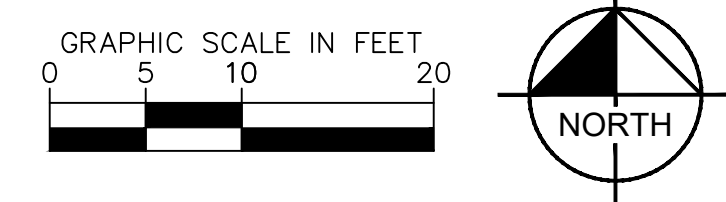
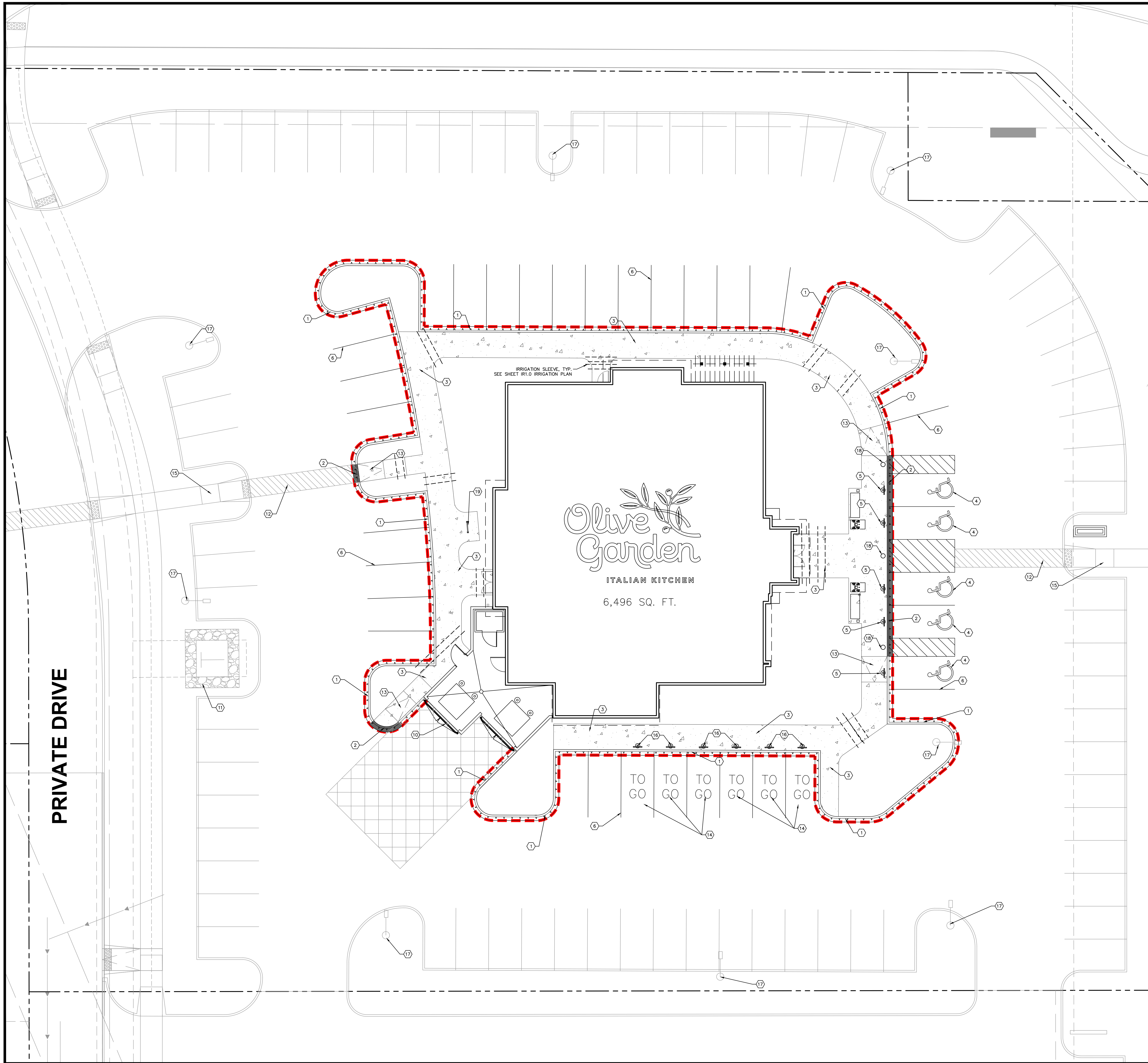
OLIVE GARDEN
 P62DOM-BOX-L
 HK Q3 2024 REV.

420 SE ALICE'S RD.
 WAUKEE, IOWA

Drawing
 SITE DIMENSIONAL CONTROL PLAN

C3.1





PAVING AND CURB LEGEND

| | |
|--|--|
| | CONCRETE SIDEWALK SEE CONSTRUCTION DETAILS FOR PAVEMENT SECTION |
| | HEAVY DUTY CONCRETE PAVEMENT (NOT USED) |
| | STANDARD PITCH CONCRETE CURB AND GUTTER |
| | CONCRETE DEPRESSED CURB AND GUTTER |
| | REVERSE PITCH CURB AND GUTTER |
| | ADA RAMP (SEE DETAILS) |
| | PIPE SLEEVE FOR IRRIGATION (SEE NOTE 4, THIS SHEET) |
| | EDGE OF PAVEMENT |

KEY NOTES

- 6-INCH CONCRETE CURB AND GUTTER, TYP. (SEE DETAILS, SHEET C6.1)
- DEPRESSED CURB AND GUTTER
- CONCRETE SIDEWALK, TYP. (SEE DETAILS, SHEET C6.1)
- ACCESSIBLE PAVEMENT MARKINGS, TYP. (BY LANDLORD)
- ACCESSIBLE PARKING SIGN, TYP. (MUTCD R7-8, SEE DETAILS)
- 4" WIDE PAINTED SOLID LINE, TYP. (BY LANDLORD)
- CONNECT TO EXISTING PAVEMENT, SIDEWALK, CURB, TYP.
- 24" WIDE STOP BAR, TYP. (BY LANDLORD, NOT USED)
- STOP SIGN, TYP. (BY LANDLORD)
- TRASH ENCLOSURE (SEE ARCHITECTURAL PLANS FOR DETAILS)
- TRANSFORMER PAD (BY LANDLORD)
- 5' PAINTED PEDESTRIAN CROSSWALK (BY LANDLORD)
- ACCESSIBLE RAMP (SEE DETAILS, SHEET C6.1)
- "TO GO" PAVEMENT MARKINGS
- EXISTING SIDEWALK
- TO-GO PARKING SIGN (SEE ARCHITECTURAL DETAILS)
- EXISTING LIGHT POLE (BY LANDLORD)
- 6-INCH BOLLARD (SEE DETAILS, SHEET C6.1)
- BIKE RACK

PAVING NOTES

- REFERENCE GEOTECH REPORT TO CONFIRM ALL PAVEMENT SPECIFICATIONS AND RECOMMENDATIONS.
- MAXIMUM JOINT SPACING SHALL NOT EXCEED 20'.
- EXPANSION JOINTS SHOULD BE USED WHEREVER THE PAVEMENT WILL ABUT A STRUCTURAL ELEMENT SUBJECT TO DIFFERENT MAGNITUDE OF MOVEMENT, E.G., LIGHT POLES, RETAINING WALLS, EXISTING PAVEMENT, STAIRWAYS, ENTRYWAY PIERS, BUILDING WALLS, MANHOLES.
- REFERENCE IRRIGATION AND MEP PLANS FOR CONDUIT SIZES AND LOCATIONS. ALSO, INSTALL SLEEVES AS NECESSARY FOR EXTERIOR LIGHTING.
- WHEN NATURAL FLOW OF DRAINAGE IS AWAY FROM CURB, CONTRACTOR TO INSTALL REVERSE/INVERTED GUTTER PITCH.
- IF DEMOLITION OR CONSTRUCTION ON SITE WILL INTERFERE WITH THE ADJACENT PROPERTY OWNER'S TRAFFIC FLOW, THE CONTRACTOR SHALL COORDINATE WITH ADJACENT PROPERTY OWNER, TO MINIMIZE THE IMPACT ON TRAFFIC FLOW. TEMPORARY RE-ROUTING OF TRAFFIC IS TO BE ACCOMPLISHED BY USING DOT APPROVED TRAFFIC BARRICADES, BARRELS, AND/OR CONES. TEMPORARY SIGNAGE AND FLAGMEN MAY BE ALSO NECESSARY.

ADAAG NOTES

- GROUND AND FLOOR SURFACES ALONG ACCESSIBLE ROUTES AND IN ACCESSIBLE ROOMS AND SPACES INCLUDING FLOORS, WALKS, RAMPS, STAIRS, AND CURB RAMPS, SHALL BE STABLE, FIRM, SLIP-RESISTANT, AND SHALL COMPLY WITH SECTION 4.5 OF THE ADAAG STANDARDS.

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781.438.0000, 848.491.0000, 848.491.0000
NRP MKR /ATL

ARCHITECTS PROJECT Job # 4A0003

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Olive Garden
ITALIAN KITCHEN

Issue Date: 06-20-24

| REVISION | DATE |
|----------|----------|
| 1 | 07-08-24 |

AGENCY REVISIONS

Restaurant #: 6526

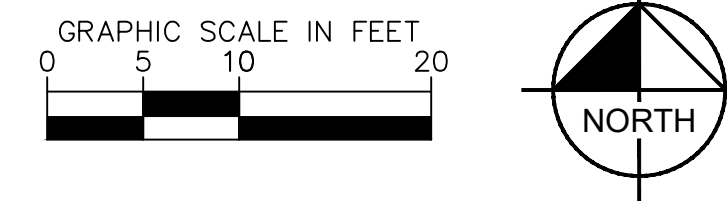
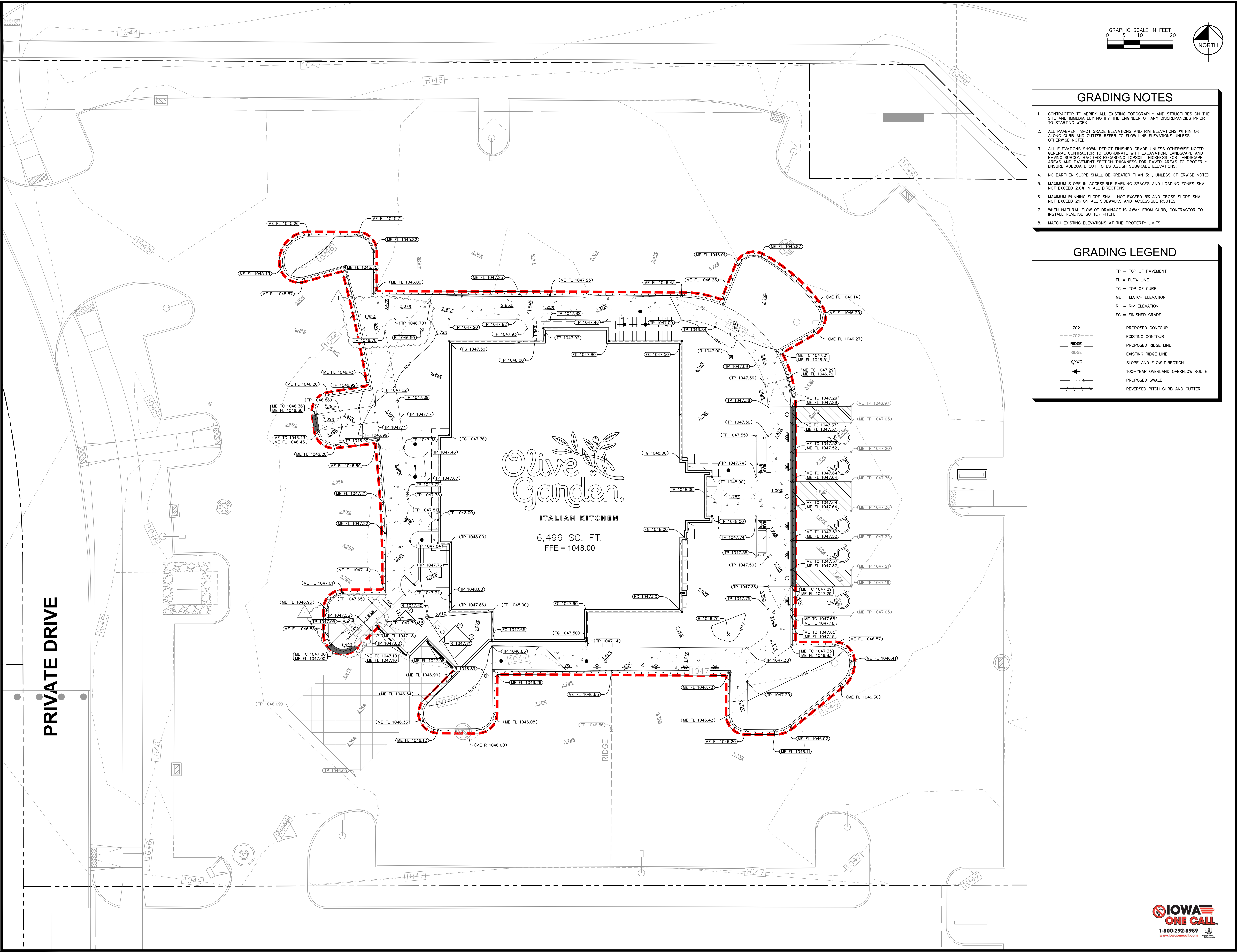
OLIVE GARDEN
P62DOM-BOX-L
HK Q3 2024 REV.

420 SE
ALICE'S RD.
WAUKEE,
IOWA

Drawing
PAVING & STRIPING PLAN

C4.1





GRADING NOTES

1. CONTRACTOR TO VERIFY ALL EXISTING TOPOGRAPHY AND STRUCTURES ON THE SITE AND IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO STARTING WORK.
2. ALL PAVEMENT SPOT GRADE ELEVATIONS AND RIM ELEVATIONS WITHIN OR ALONG CURB AND GUTTER REFER TO FLOW LINE ELEVATIONS UNLESS OTHERWISE NOTED.
3. ALL ELEVATIONS SHOWN DEPICT FINISHED GRADE UNLESS OTHERWISE NOTED. GENERAL CONTRACTOR TO COORDINATE WITH EXCAVATION, LANDSCAPE AND PAVING SUBCONTRACTORS REGARDING TOPSOIL THICKNESS FOR LANDSCAPE AREAS AND PAVEMENT SECTION THICKNESS FOR PAVED AREAS TO PROPERLY ENSURE ADEQUATE CUT TO ESTABLISH SUBGRADE ELEVATIONS.
4. NO EARTHEN SLOPE SHALL BE GREATER THAN 3:1, UNLESS OTHERWISE NOTED.
5. MAXIMUM SLOPE IN ACCESSIBLE PARKING SPACES AND LOADING ZONES SHALL NOT EXCEED 2.0% IN ALL DIRECTIONS.
6. MAXIMUM RUNNING SLOPE SHALL NOT EXCEED 5% AND CROSS SLOPE SHALL NOT EXCEED 2% ON ALL SIDEWALKS AND ACCESSIBLE ROUTES.
7. WHEN NATURAL FLOW OF DRAINAGE IS AWAY FROM CURB, CONTRACTOR TO INSTALL REVERSE GUTTER PITCH.
8. MATCH EXISTING ELEVATIONS AT THE PROPERTY LIMITS.

GRADING LEGEND

| | |
|----------------------|----------------------------------|
| TP = TOP OF PAVEMENT | PROPOSED CONTOUR |
| FL = FLOW LINE | EXISTING CONTOUR |
| TC = TOP OF CURB | PROPOSED RIDGE LINE |
| ME = MATCH ELEVATION | RIDGE |
| R = RIM ELEVATION | EXISTING RIDGE LINE |
| FG = FINISHED GRADE | SLOPE AND FLOW DIRECTION |
| | 100-YEAR OVERLAND OVERFLOW ROUTE |
| | PROPOSED SWALE |
| | REVERSED PITCH CURB AND GUTTER |

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ARCHITECTS PROJECT
 Job # 4A0003

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Kimley-Horn
 & Associates, Inc.
 2024 KIMLEY-HORN AND ASSOCIATES, INC.
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 WWW.KIMLEY-HORN.COM

Olive Garden
 ITALIAN KITCHEN

Issue Date: 06-20-24

| REVISION | |
|------------------|----------|
| 1 | 07-08-24 |
| AGENCY REVISIONS | |

Restaurant #: 6526

OLIVE GARDEN
 P62DOM-BOX-L
 HK Q3 2024 REV.

420 SE
 ALICE'S RD.
 WAUKEE,
 IOWA

Drawing
 GRADING PLAN

C4.2



PRIVATE DRIVE

Olive Garden
 ITALIAN KITCHEN
 6,496 SQ. FT.
 FFE = 1048.00

UTILITY LEGEND

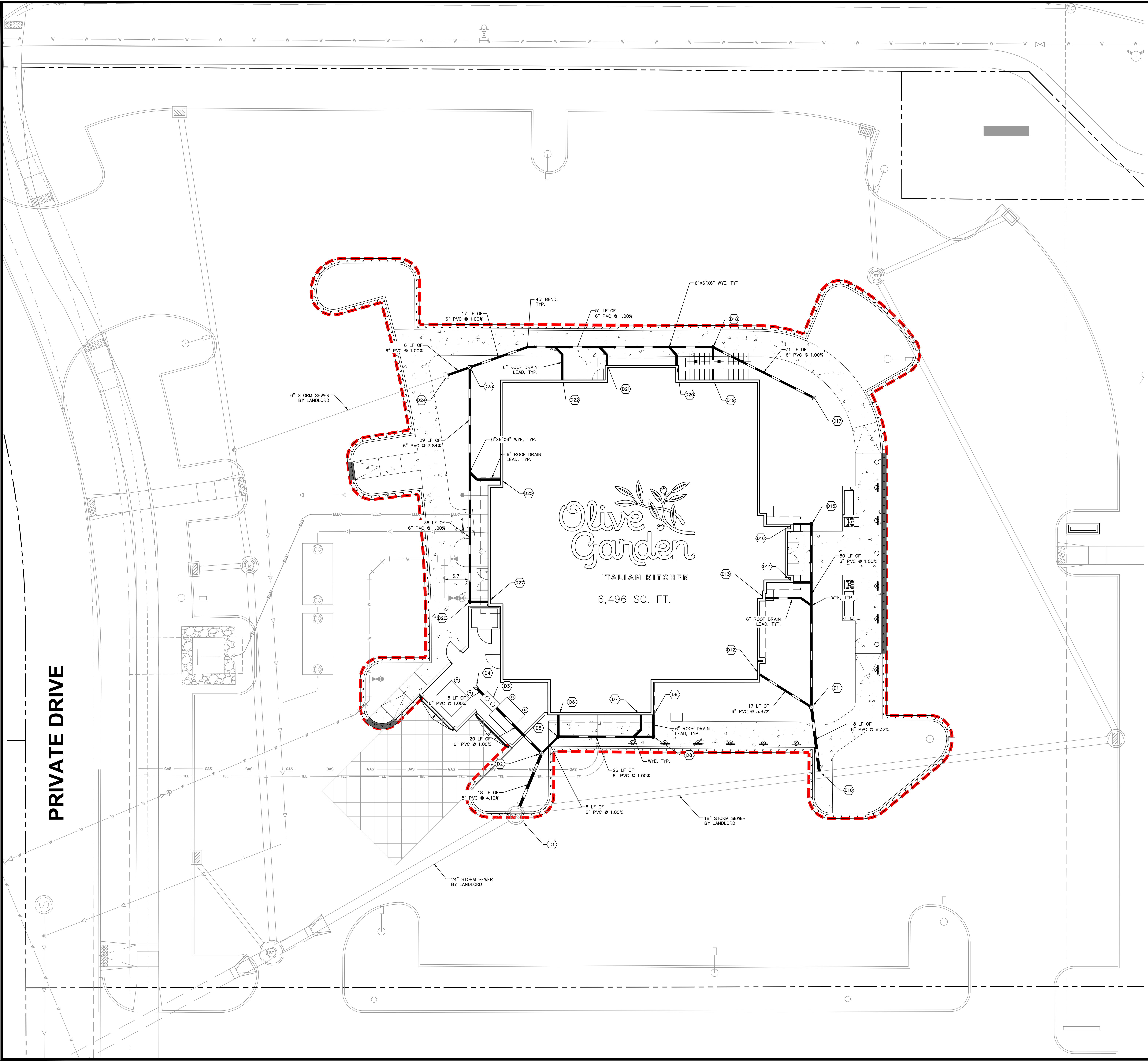
| | |
|-----------|---|
| — W — W — | EX. WATER LINE |
| ⊗ | EX. WATER VALVE |
| — W — W — | EX. SANITARY SEWER LINE |
| ⊗ | EX. SANITARY SEWER STRUCTURE |
| — W — W — | EX. STORM DRAIN LINE |
| ⊗ | EX. STORM STRUCTURE/INLET |
| — W — W — | EX. UNDERGROUND ELECTRIC LINE |
| ⊗ | EX. LIGHT POLE |
| — W — W — | PROPOSED UNDERGROUND ELECTRIC LINE |
| — W — W — | GAS LINE (BY GAS COMPANY) |
| — W — W — | PROPOSED PHONE LINE |
| — W — W — | PROPOSED STORM SEWER LINE |
| — W — W — | PROPOSED STORM STRUCTURES |
| — W — W — | PROPOSED SANITARY SEWER LINE |
| — W — W — | PROPOSED SANITARY MANHOLE |
| — W — W — | PROPOSED STORM/SANITARY CLEANOUT |
| — W — W — | PROPOSED WATER LINE |
| — W — W — | PROPOSED VALVE VAULT |
| — W — W — | PROPOSED VALVE BOX |
| — W — W — | PROPOSED FIRE HYDRANT |
| — W — W — | PROPOSED TRANSFORMER PAD (FOR REFERENCE ONLY) |

STORM STRUCTURE TABLE

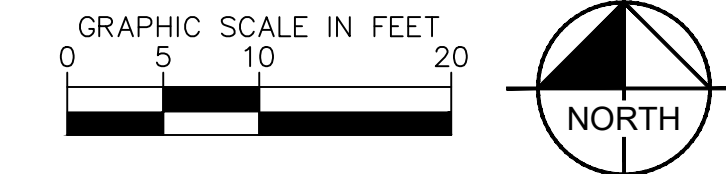
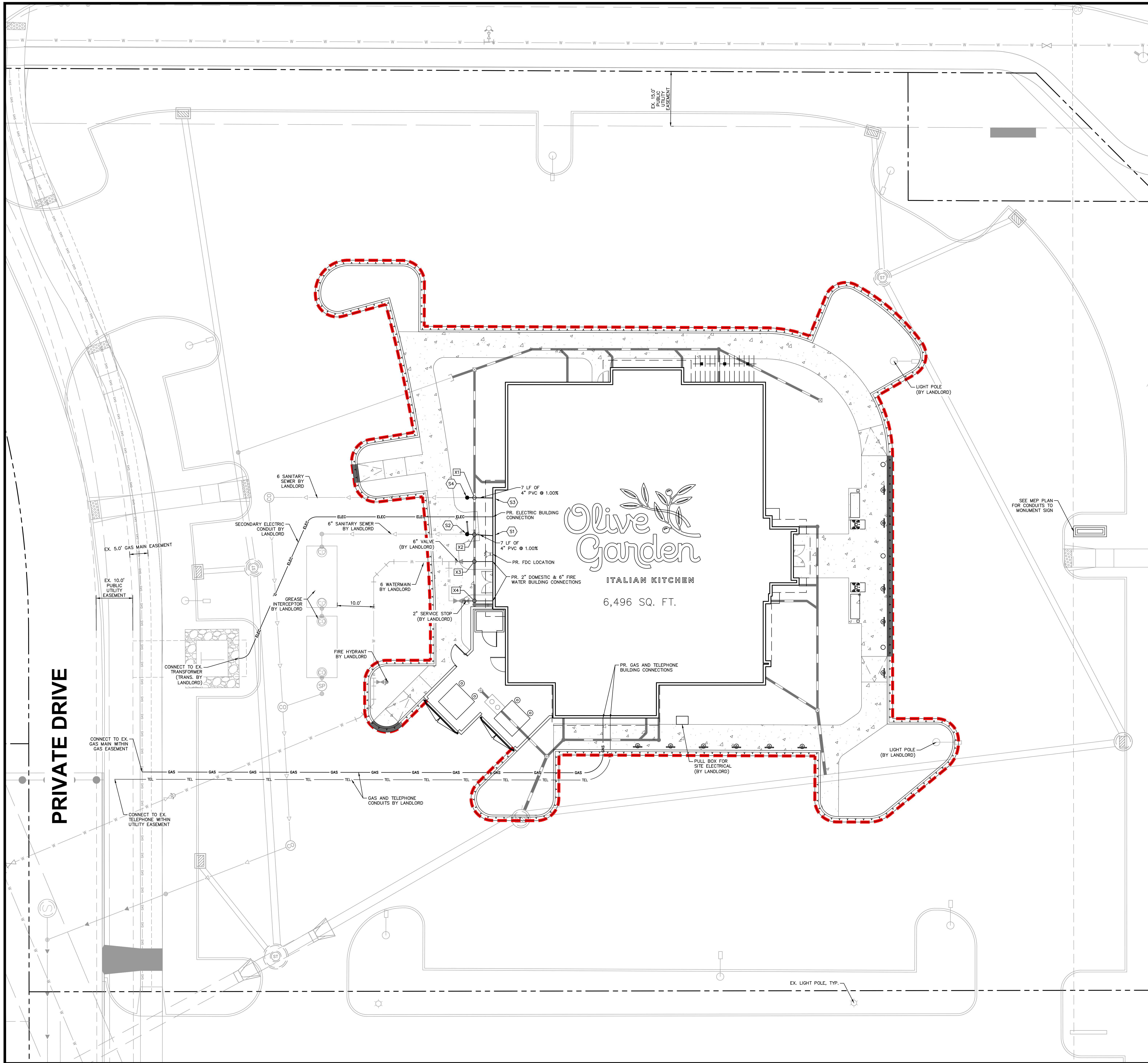
| STRUCTURE NAME: | DETAILS: |
|-----------------|---|
| D1 | CONNECT TO EXISTING 5" DIA. STORM MANHOLE RIM: 1046.00 INV IN: 1039.73 (E, 18") INV IN: 1043.43 (NE, 8") INV OUT: 1039.64 (SW, 24") |
| D2 | 12-INCH YARD DRAIN RIM: 1046.89 INV IN: 1044.18 (NE, 6") INV IN: 1044.37 (NW, 6") INV OUT: 1044.18 (SW, 8") |
| D3 | SAND/OIL INTERCEPTOR RIM: 1047.71 INV IN: 1044.18 (NE, 6") INV IN: 1044.57 (NW, 6") INV OUT: 1044.57 (SE, 6") |
| D4 | J.R. SMITH NO. 2010-H-B, ZURN 2610, OR APPROVED EQUAL WITH SEDIMENT BUCKET, SOLID HINGED COVER RIM: 1047.60 INV OUT: 1044.63 (SE, 6") |
| D5 | 6" STORM CLEANOUT RIM: 1046.82 INV IN: 1044.25 (E, 6") INV IN: 1044.25 (N, 6") INV OUT: 1044.25 (SW, 6") |
| D8 | 6" STORM CLEANOUT RIM: 1047.09 INV IN: 1044.51 (N, 6") INV OUT: 1044.51 (W, 6") |
| D10 | CORE INTO EXISTING 18-INCH STORM PIPE RIM: 1047.07 INV IN: 1042.68 (N, 8") INV IN: 1042.68 (E, 18") INV OUT: 1042.68 (W, 18") |
| D11 | 12-INCH YARD DRAIN RIM: 1046.70 INV IN: 1044.16 (N, 8") INV IN: 1044.16 (NW, 8") INV OUT: 1044.16 (S, 8") |
| D15 | 6" STORM CLEANOUT RIM: 1047.89 INV IN: 1044.66 (W, 6") INV OUT: 1044.66 (S, 6") |
| D17 | 12-INCH YARD DRAIN RIM: 1047.00 INV OUT: 1044.71 (NW, 6") |
| D18 | 6" STORM CLEANOUT RIM: 1047.23 INV IN: 1044.40 (SE, 6") INV IN: 1044.40 (S, 6") INV OUT: 1044.40 (W, 6") |
| D23 | 12-INCH YARD DRAIN RIM: 1046.50 INV IN: 1043.72 (E, 6") INV IN: 1043.72 (S, 6") INV OUT: 1043.72 (W, 6") |
| D24 | CONNECT TO STORM SEWER STUB BY LANDLORD RIM: 1046.65 INV IN: 1043.66 (E, 6") INV OUT: 1043.66 (W, 6") |
| D26 | 6" STORM CLEANOUT RIM: 1047.91 INV IN: 1045.18 (E, 6") INV OUT: 1045.18 (N, 6") |

MISCELLANEOUS STORM STRUCTURE TABLE

| STRUCTURE NAME: | DETAILS: |
|-----------------|---|
| D6 | ROOF DRAIN INV OUT: 1044.31 (S, 6") |
| D7 | ROOF DRAIN INV OUT: 1044.38 (S, 6") |
| D9 | ROOF DRAIN INV OUT: 1044.57 (S, 6") |
| D12 | ROOF DRAIN INV OUT: 1045.14 (SE, 6") |
| D13 | ROOF DRAIN INV OUT: 1045.48 (E, 6") |
| D14 | ROOF DRAIN INV OUT: 1045.48 (E, 6") |
| D16 | ROOF DRAIN INV OUT: 1045.48 (E, 6") |
| D19 | ROOF DRAIN INV OUT: 1045.28 (N, 6") |
| D20 | ROOF DRAIN INV OUT: 1045.24 (N, 6") |
| D21 | ROOF DRAIN INV OUT: 1045.40 (N, 6") |
| D22 | ROOF DRAIN INV OUT: 1045.34 (N, 6") |
| D25 | ROOF DRAIN INV OUT: 1045.23 (W, 6") |
| D27 | ROOF DRAIN INV OUT: 1045.23 (W, 6") |



Olive Garden
ITALIAN KITCHEN
6,496 SQ. FT.



UTILITY LEGEND

| | |
|------------------|---|
| — W — W — | EX. WATER LINE |
| ⊗ | EX. WATER VALVE |
| — S — S — | EX. SANITARY SEWER LINE |
| ⊗ | EX. SANITARY SEWER STRUCTURE |
| — SD — SD — | EX. STORM DRAIN LINE |
| ⊗ | EX. STORM STRUCTURE/INLET |
| - - - ELEC - - - | EX. UNDERGROUND ELECTRIC LINE |
| ⊗ | EX. LIGHT POLE |
| — GAS — | PROPOSED UNDERGROUND ELECTRIC LINE |
| — TEL — | GAS LINE (BY GAS COMPANY) |
| — S — S — | PROPOSED PHONE LINE |
| — SD — SD — | PROPOSED STORM SEWER LINE |
| ⊗ | PROPOSED STORM STRUCTURES |
| ⊗ | PROPOSED SANITARY SEWER LINE |
| ⊗ | PROPOSED SANITARY MANHOLE |
| ⊗ | PROPOSED STORM/SANITARY CLEANOUT |
| — W — W — | PROPOSED WATER LINE |
| ⊗ | PROPOSED VALVE VAULT |
| ⊗ | PROPOSED VALVE BOX |
| ⊗ | PROPOSED FIRE HYDRANT |
| ⊗ | PROPOSED TRANSFORMER PAD (FOR REFERENCE ONLY) |

- ### UTILITY NOTES
- ALL WATER LINES $\geq 3"$ SHALL BE DUCTILE IRON PIPE, CLASS 52.
 - ALL SANITARY SEWER LINES SHALL BE PVC MEETING ASTM D-3034 SDR 26 EXCEPT FOR SANITARY SEWER THAT CROSSES ABOVE WATER MAIN. THIS PIPE SHALL BE AWWA C900 UNLESS WATER MAIN CASING IS UTILIZED. PROVIDE 42" MINIMUM COVER.
 - CONTRACTOR SHALL COORDINATE ANY DISRUPTIONS TO EXISTING UTILITY SERVICES WITH ADJACENT PROPERTY OWNERS.
 - ALL ELECTRIC AND TELEPHONE EXTENSIONS INCLUDING SERVICE LINES SHALL BE CONSTRUCTED TO THE APPROPRIATE UTILITY COMPANY SPECIFICATIONS. ALL UTILITY DISCONNECTIONS SHALL BE COORDINATED WITH THE DESIGNATED UTILITY COMPANIES.
 - CONSTRUCTION SHALL NOT START ON ANY PUBLIC UTILITY SYSTEM UNTIL WRITTEN APPROVAL HAS BEEN RECEIVED BY THE ENGINEER FROM THE APPROPRIATE GOVERNING AUTHORITY AND CONTRACTOR HAS BEEN NOTIFIED BY THE ENGINEER.
 - CONTRACTOR TO CALL "811 IOWA ONE CALL" (1-800-292-8989) TO COORDINATE FIELD LOCATIONS OF EXISTING UNDERGROUND UTILITIES BEFORE ORDERING MATERIALS OR COMMENCING CONSTRUCTION. NOTIFY ENGINEER OF ANY DISCREPANCIES IMMEDIATELY.
 - PRIOR TO THE CONSTRUCTION OF OR CONNECTION TO ANY STORM DRAIN, SANITARY SEWER, WATER MAIN OR ANY OTHER UTILITIES, THE CONTRACTOR SHALL EXCAVATE, VERIFY AND CALCULATE ALL POINTS OF CONNECTION AND ALL UTILITY CROSSINGS AND INFORM THE ENGINEER AND THE OWNER/DEVELOPER OF ANY CONFLICT OR REQUIRED DEVIATIONS FROM THE PLAN. NOTIFICATION SHALL BE MADE A MINIMUM OF 72 HOURS PRIOR TO CONSTRUCTION. THE ENGINEER AND ITS CLIENTS SHALL BE HELD HARMLESS IN THE EVENT THAT THE CONTRACTOR FAILS TO MAKE SUCH NOTIFICATION. THE CITY OF WAUKEE SHALL BE NOTIFIED OF ANY AND ALL CHANGES TO THE DESIGN PLANS.
 - CONTRACTOR SHALL COMPLY COMPLETELY WITH THE LATEST STANDARDS OF OSHA DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL USE SUPPORT SYSTEMS, SLOPING, BENCHING AND OTHER MEANS OF PROTECTION. THIS IS TO INCLUDE, BUT NOT LIMITED TO, ACCESS AND EGRESS FROM ALL EXCAVATION AND TRENCHING. CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH PERFORMANCE CRITERIA AS REQUIRED BY OSHA.
 - CONTRACTOR TO AVOID DISRUPTION OF ANY ADJACENT TENANT'S TRAFFIC OPERATIONS DURING INSTALLATION OF UTILITIES.
 - ALL DIMENSIONS ARE TO CENTERLINE OF PIPE OR CENTER OF MANHOLE UNLESS NOTED OTHERWISE.
 - SEE ARCHITECTURAL AND MEP PLANS FOR EXACT UTILITY CONNECTION LOCATIONS AT BUILDING.
 - LIGHT POLES SHOWN FOR COORDINATION PURPOSES ONLY AND DO NOT REPRESENT ACTUAL SIZE. SEE SITE LIGHTING PLANS BY OTHERS FOR MORE INFORMATION.
 - SEE DETAILS FOR LOCATING STORM STRUCTURES WITHIN THE CURB LINE.
 - STORMWATER FACILITIES MUST BE FUNCTIONAL BEFORE BUILDING CONSTRUCTION BEGINS IF REQUIRED BY AUTHORITY HAVING JURISDICTION.

UTILITY CROSSING LEGEND

| | | |
|----|----------------------|--------------------------------|
| X1 | 6" STORM 4" SAN. | B/P = 1044.87 T/P = 1043.05 |
| X2 | 6" STORM 4" SAN. | B/P = 1044.97 T/P = 1043.39 |
| X3 | 6" STORM 6" WATER | B/P = 1045.06 T/P = 1042.35 |
| X4 | 6" STORM 2" WATER | B/P = 1045.15 T/P = 1042.41 |

NOTE: WHERE THERE IS LESS THAN 10 FT HORIZONTAL OR 18-IN VERTICAL SEPARATION BETWEEN A SEWER AND WATER MAIN, OR IF WATER MAIN CROSSES UNDER A SEWER, WATER MAIN QUALITY PIPE IS TO BE USED TO CONSTRUCT THE SEWER OR EITHER PIPE IS TO BE ENCASED. THE PROTECTION MUST EXTEND ON EACH SIDE OF THE CROSSING UNTIL THE DISTANCE BETWEEN THE WATER MAIN AND SEWER IS AT LEAST 10 FT. ACCEPTABLE WATER MAIN QUALITY PIPE INCLUDES PVC SDR/WWQ MEETING ASTM D2241 WITH JOINTS MEETING ASTM D3159 OR DUCTILE IRON PIPE RSP STORM SEWER WITH FLEXIBLE GASKET JOINTS MEETING ASTM C361 OR ASTM C443 IS ALSO ACCEPTABLE AT CROSSINGS.

SANITARY STRUCTURE TABLE

| STRUCTURE NAME: | DETAILS: |
|-----------------|---|
| S1 | SANITARY (GREASE) BUILDING CONNECTION FG: 1047.92 INV OUT: 1042.09 (W, 4") |
| S2 | 6" SANITARY CLEANOUT RIM: 1047.59 INV IN: 1042.02 (E, 4") INV OUT: 1042.02 (W, 4") |
| S3 | SANITARY (DOMESTIC) BUILDING CONNECTION FG: 1047.82 INV OUT: 1042.75 (W, 4") |
| S4 | 6" SANITARY CLEANOUT RIM: 1047.44 INV IN: 1042.68 (E, 4") INV OUT: 1042.68 (W, 4") |



CONSULTING ARCHITECT ACS Architectural Construction Services Inc.
1811 Dreyfus Way Suite B Westborough, MA 01581
Tel: 508-853-0000 Fax: 508-853-0001
www.acsarchitect.com

ARCHITECTS PROJECT Job # 4A0003

CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE JOB SITE AND NOTIFY THE ARCHITECTS OF ANY DIMENSIONAL ERRORS, OMISSIONS OR DISCREPANCIES BEFORE BEGINNING OR FABRICATING ANY WORK. DO NOT SCALE DRAWINGS.

IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, TO ALTER AN ITEM IN ANY WAY.

Kimley-Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
1000 WEST MAIN STREET, SUITE 100
WAUKEE, IOWA 52241
PH: 563-485-1100

Olive Garden
ITALIAN KITCHEN

Issue Date: 06-20-24

| REVISION | DATE |
|----------|----------|
| 1 | 07-08-24 |

AGENCY REVISIONS

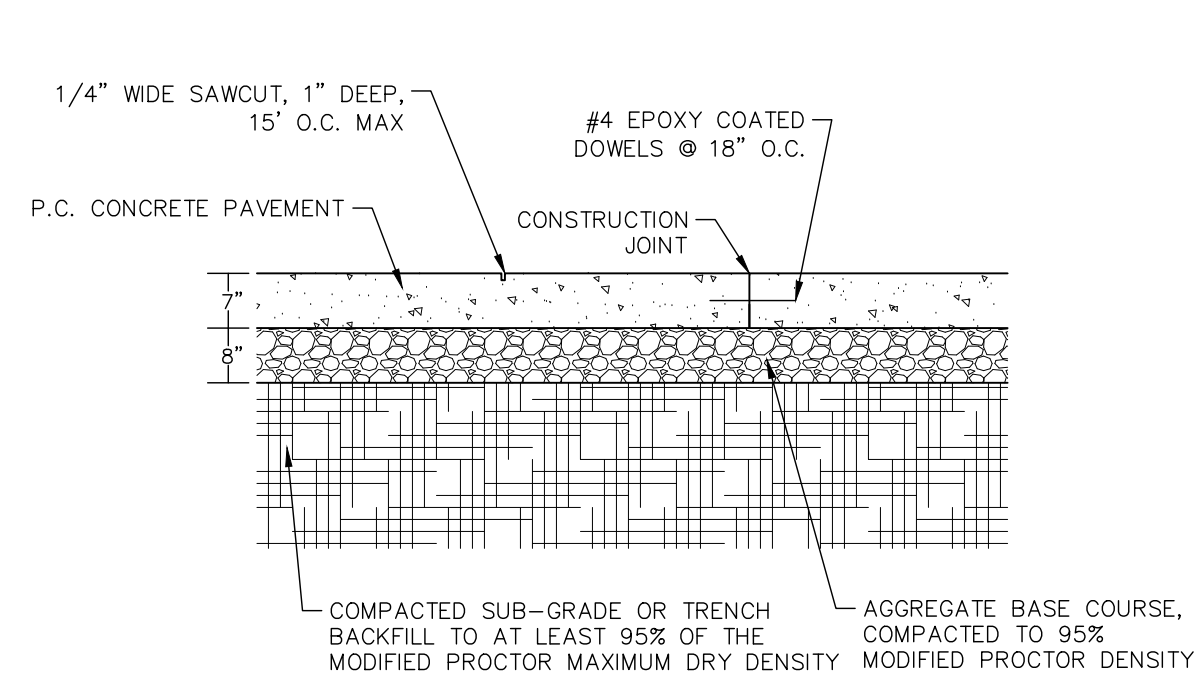
Restaurant #: 6526

OLIVE GARDEN P62DOM-BOX-L
HK Q3 2024 REV.

420 SE ALICE'S RD.
WAUKEE, IOWA

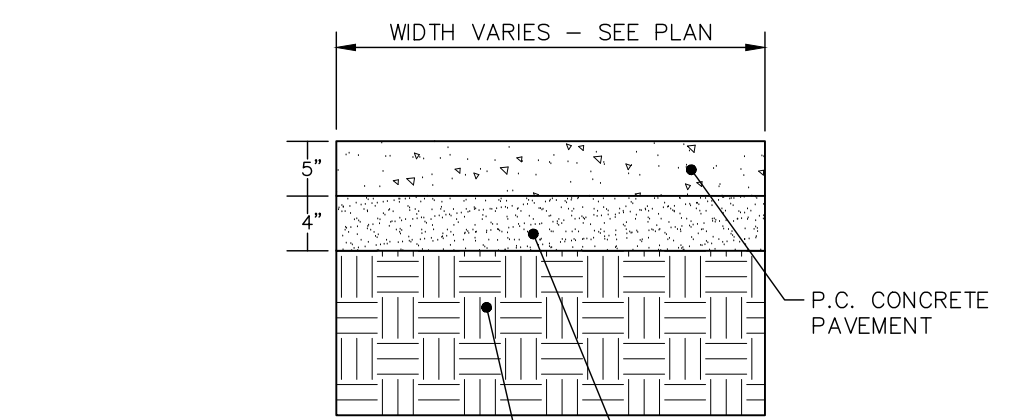
Drawing
UTILITY PLAN

C5.1



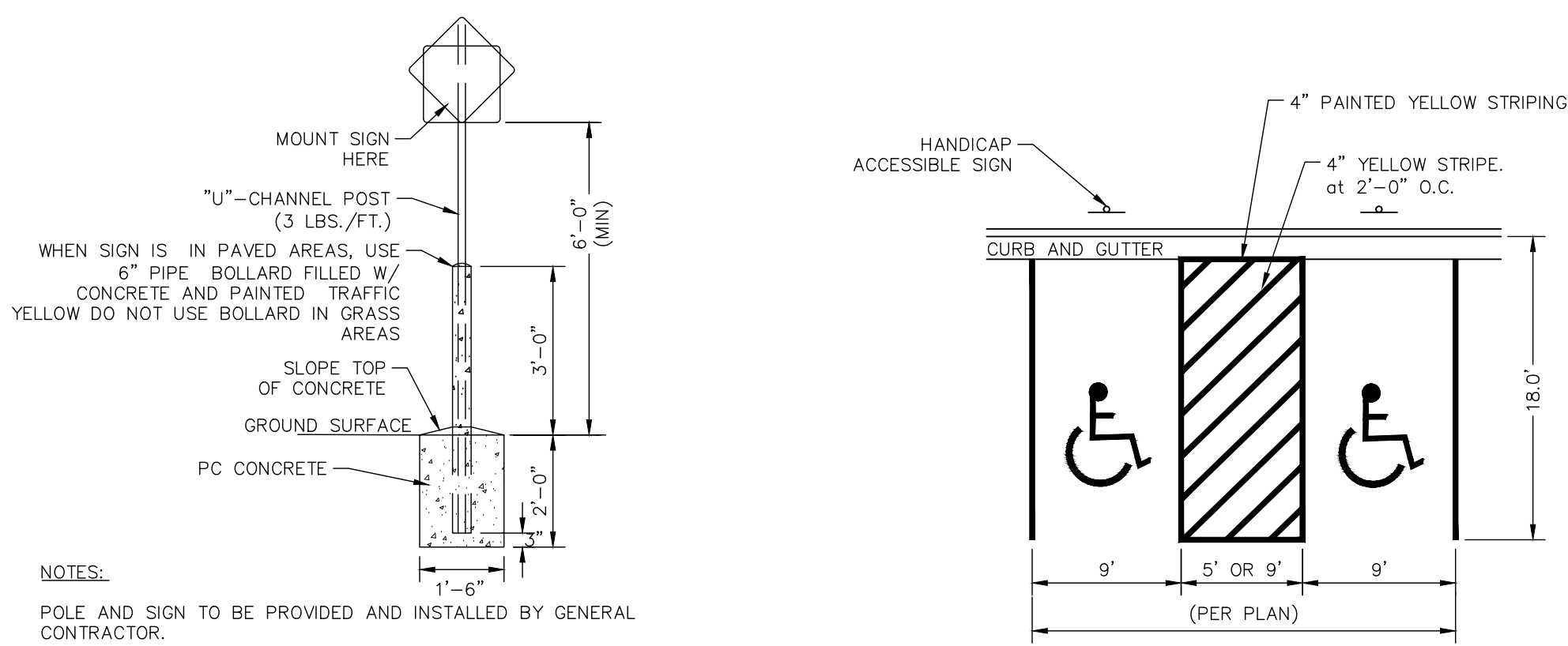
NOTES:
PAVEMENT THICKNESS, SUBGRADE PREP, ETC. DETERMINED FROM GEOTECHNICAL REPORT PERFORMED BY ALEXANDER BUTZKE ENGINEERS, INC. DATED 04/20/2024. REFER TO REPORT FOR ALL INFORMATION RELATED TO PAVING.
CONCRETE COMPRESSIVE STRENGTH SHALL COMPLY WITH ASTM DESIGNATION C39. MINIMUM 28-DAY STRENGTH = 4000 PSI

HEAVY DUTY CONCRETE PAVEMENT SECTION
N.T.S.



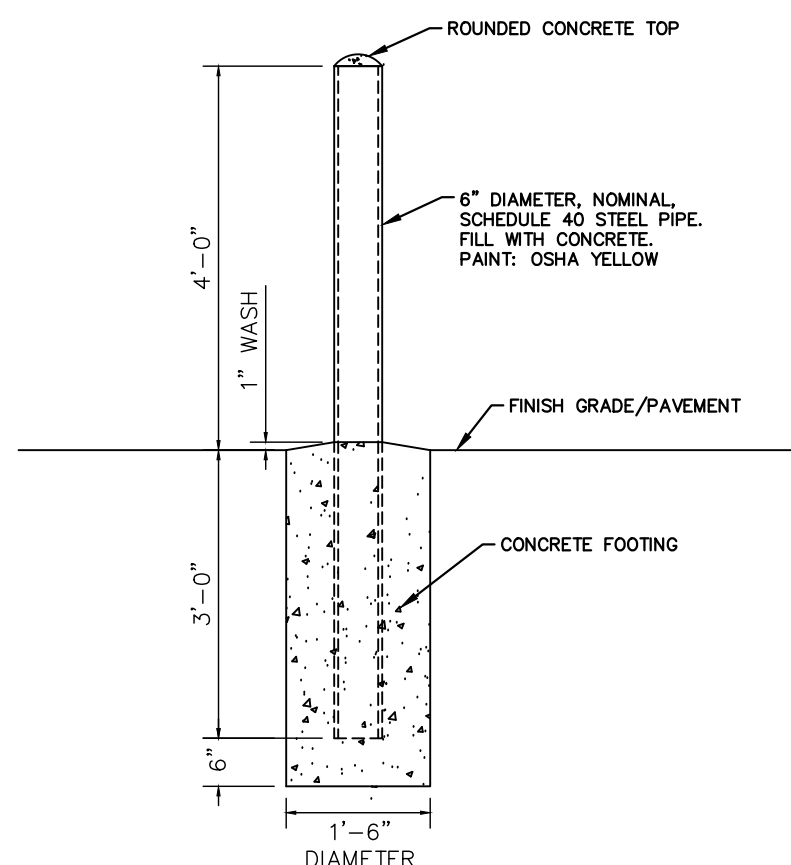
NOTES:
1. PROVIDE 1/2\"/>

CONCRETE SIDEWALK
N.T.S.

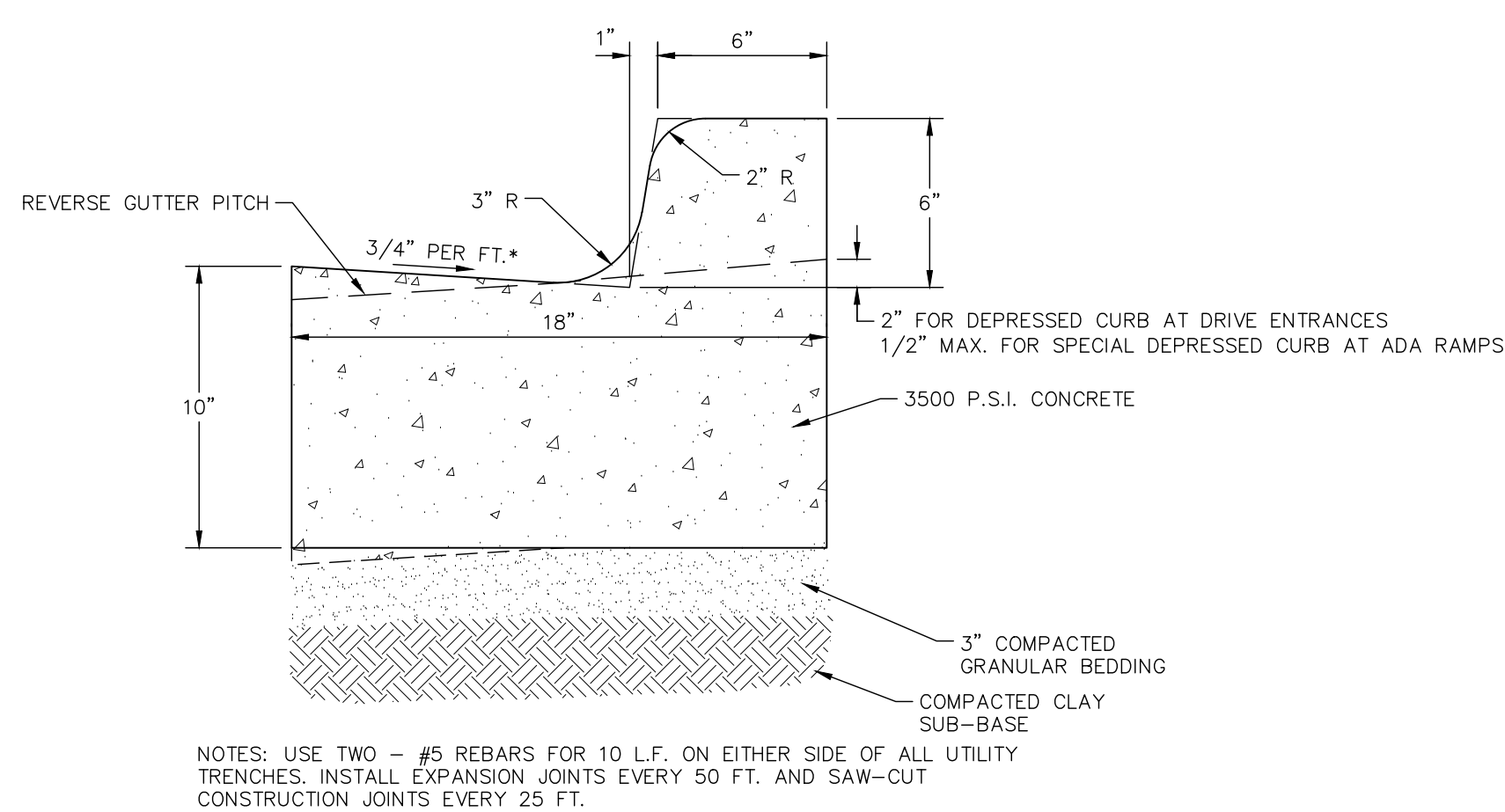


NOTES:
POLE AND SIGN TO BE PROVIDED AND INSTALLED BY GENERAL CONTRACTOR.
ALL SIGNS SHALL COMPLY WITH U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES", LOCAL CODES AND AS SPECIFIED. MOUNT SIGNS TO POST IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

TYPICAL HANDICAP STRIPING
N.T.S.

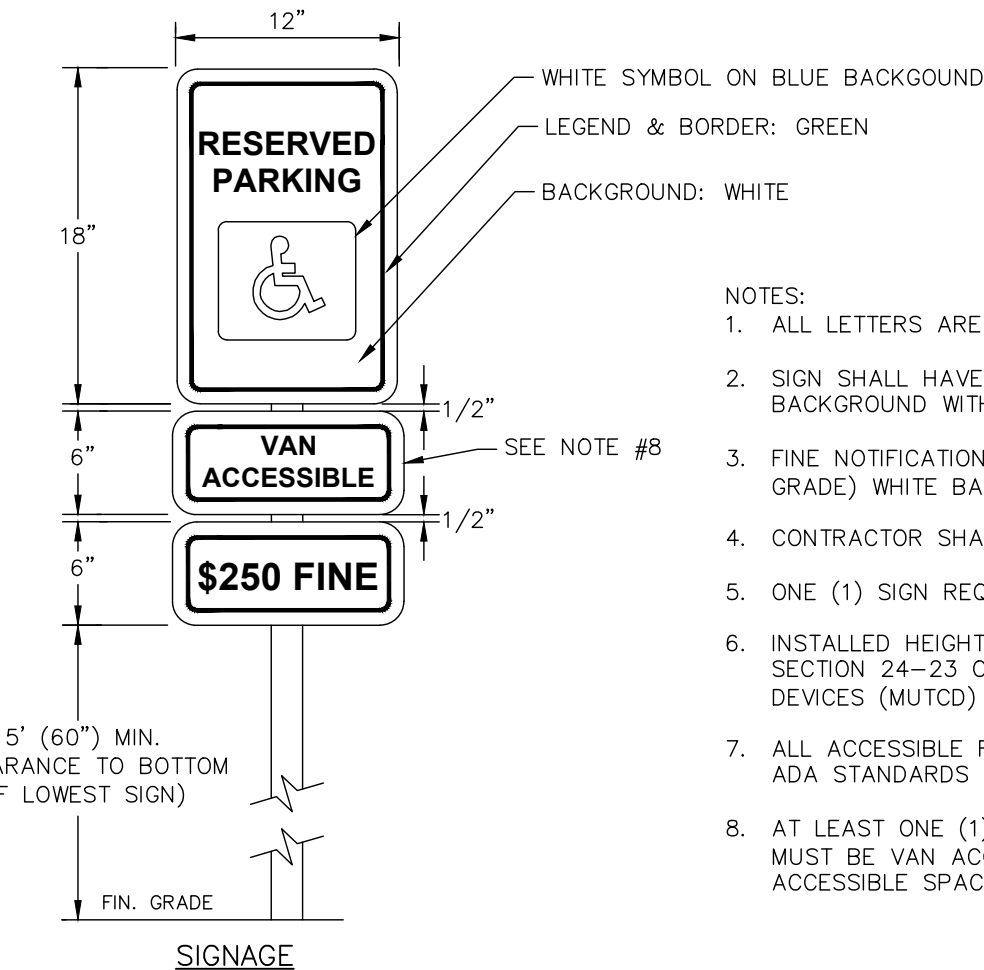


6\"/>



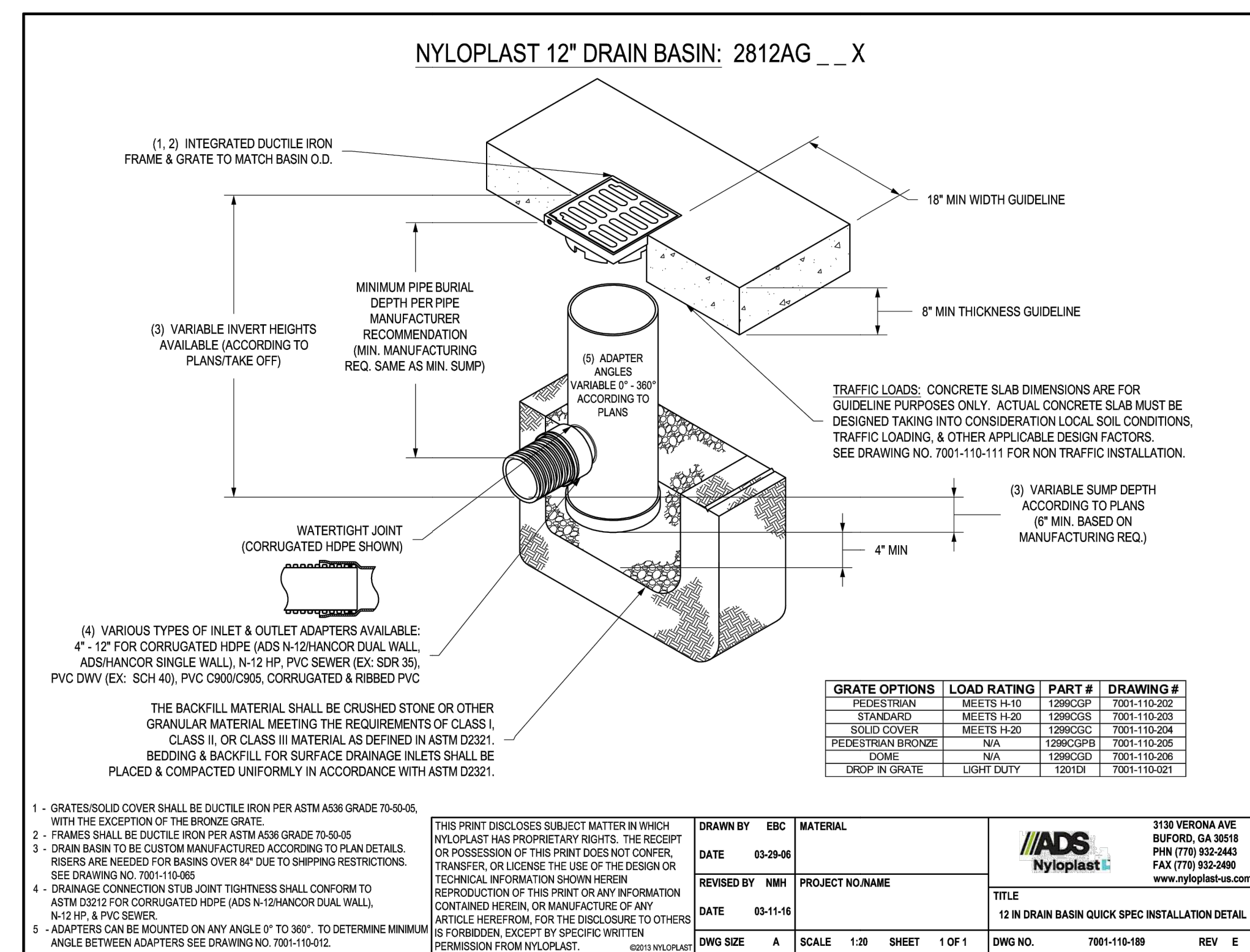
NOTES: USE TWO #5 REBARS FOR 10' L.F. ON EITHER SIDE OF ALL UTILITY TRENCHES. INSTALL EXPANSION JOINTS EVERY 50 FT. AND SAW-CUT CONSTRUCTION JOINTS EVERY 25 FT.
* MAXIMUM GUTTER SLOPE AT ADA RAMPS TO BE 5.0%

6-INCH CURB & GUTTER
N.T.S.



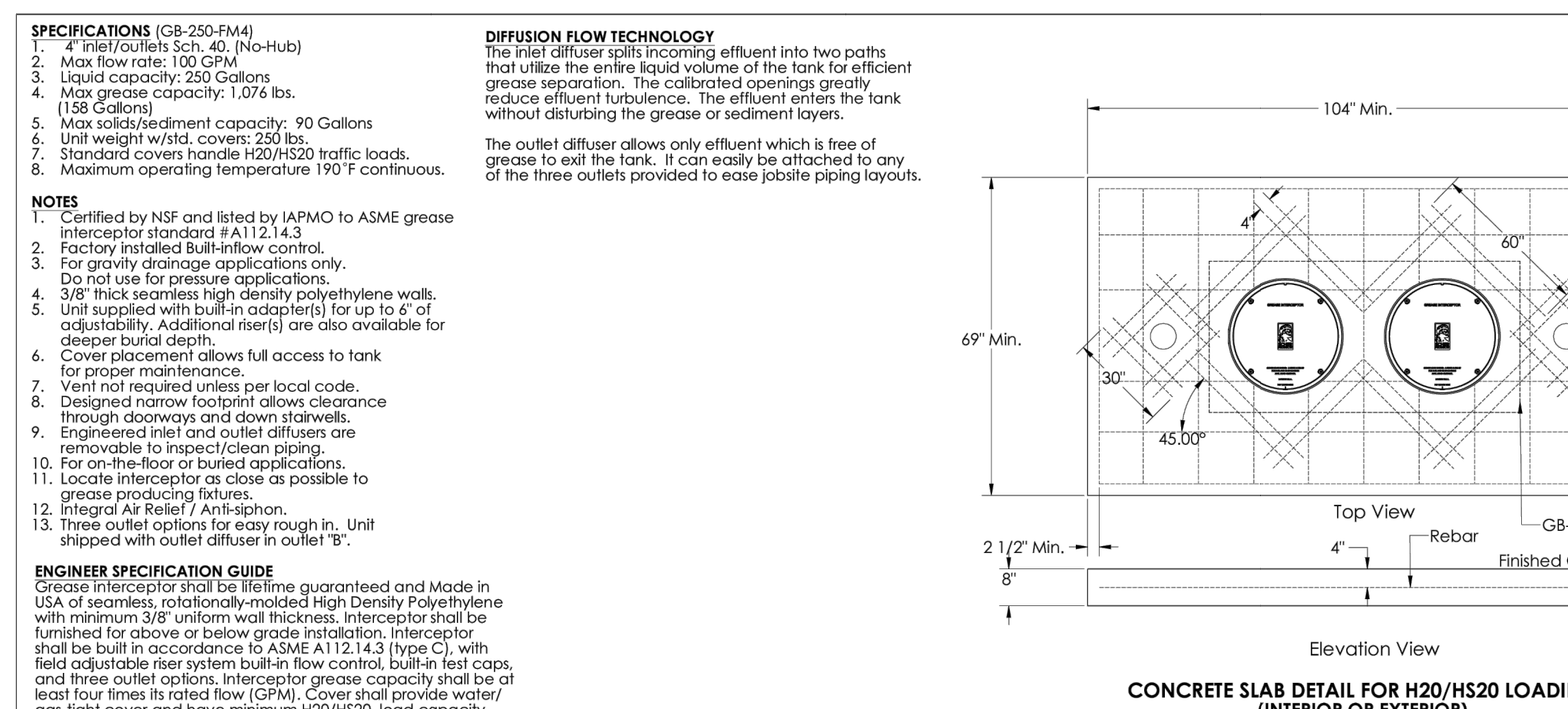
NOTES:
1. ALL LETTERS ARE 1\"/>

ACCESSIBLE PARKING SIGNAGE
N.T.S.

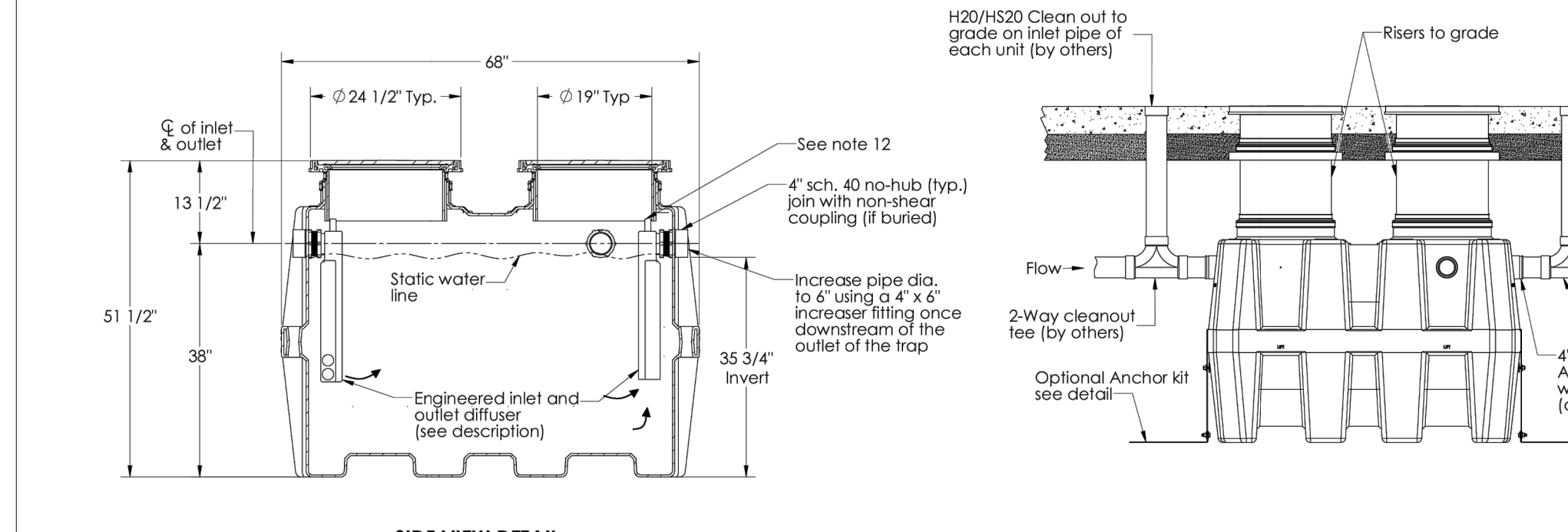


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12\"/>

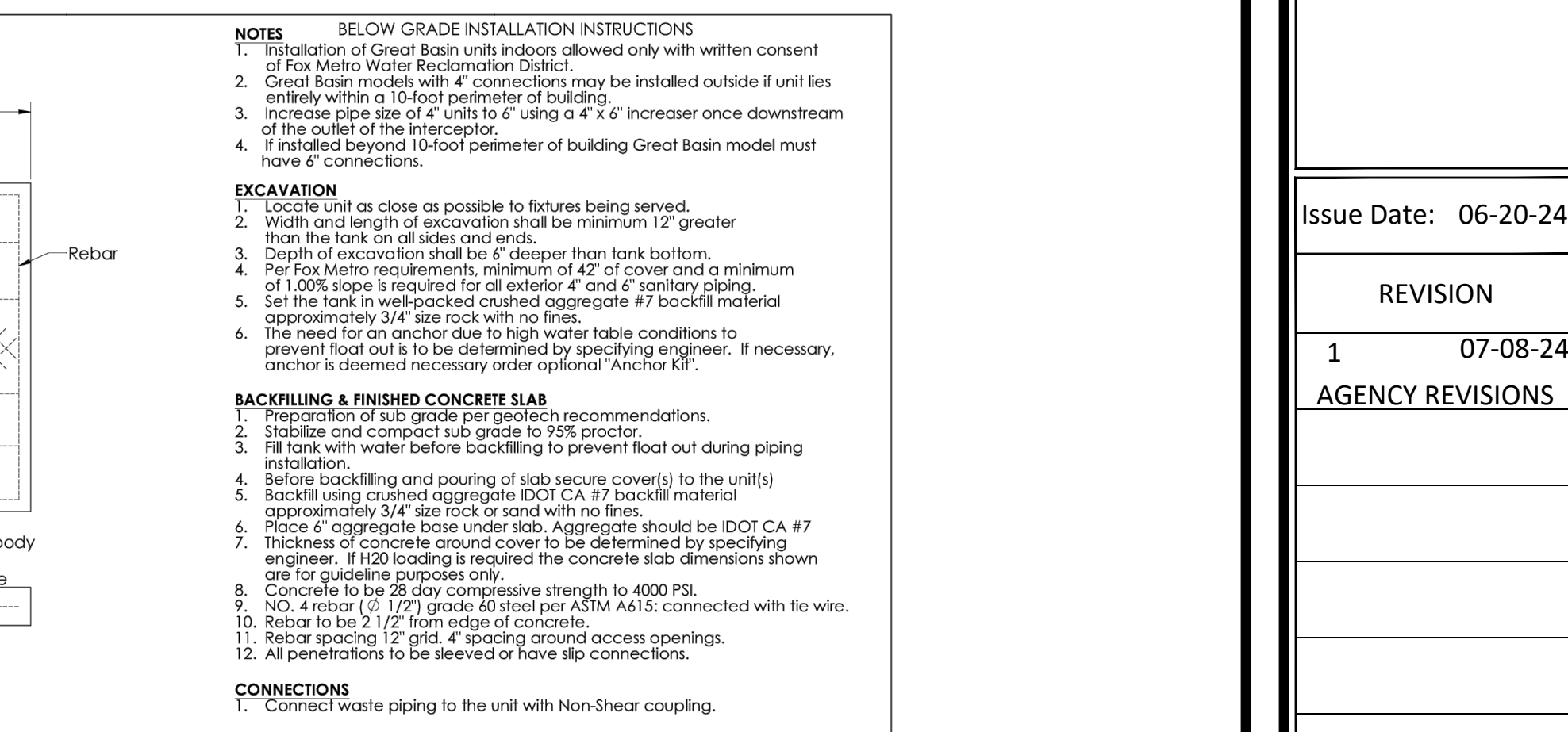


NOTES:
1. Preparation of sub grade per geotech recommendations.
2. Rebar and compact sub grade to 95% practice.
3. Fill tank with water before backfilling to prevent float during placing.
4. Backfill using crushed aggregate DOT CA #7 backfill material approximately 3/4\"/>

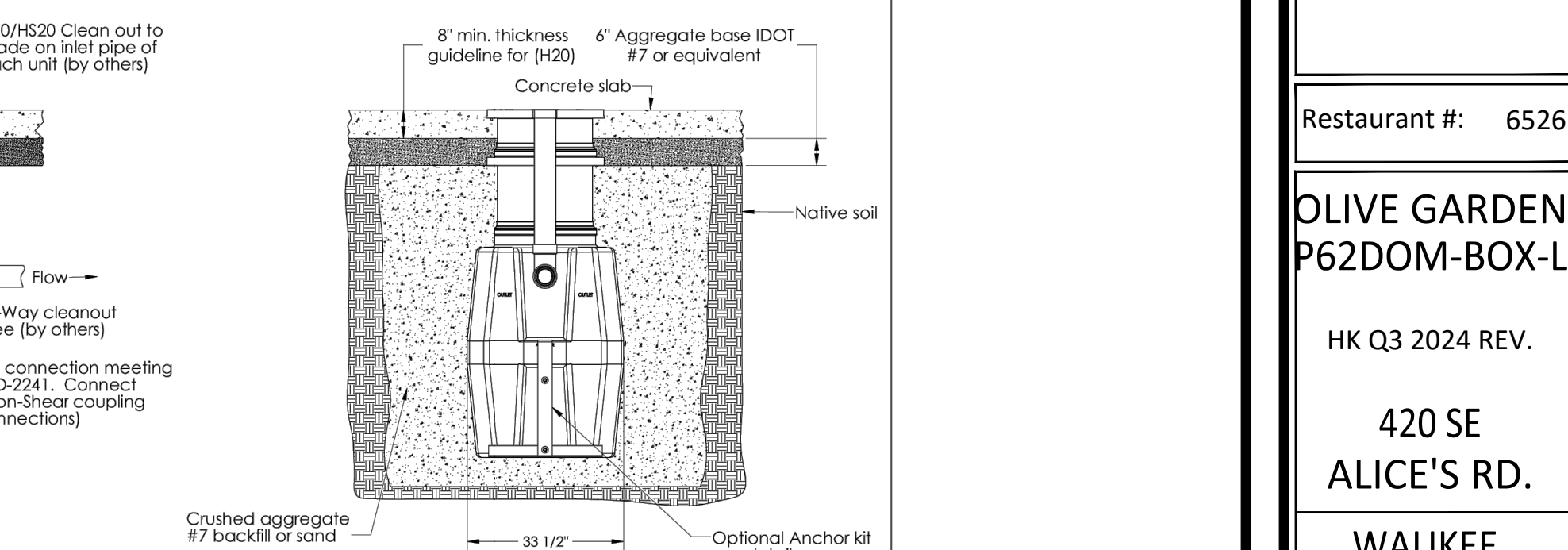


NOTES:
1. Installation of Great Basin units indoors allowed only with written consent of Fox Metro Water Reclamation District. Great Basin models with 4\"/>

SAND/OIL INTERCEPTOR
N.T.S.



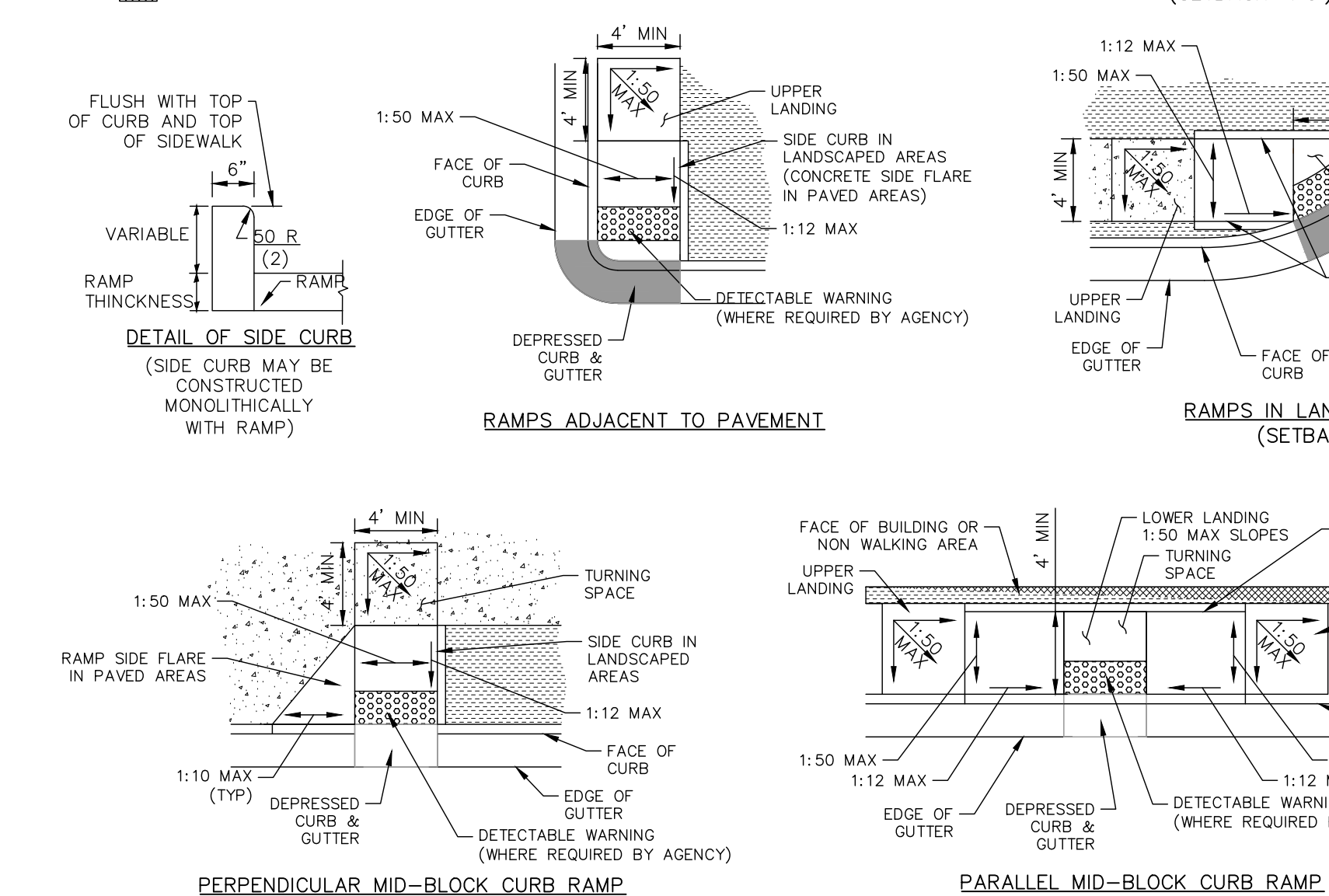
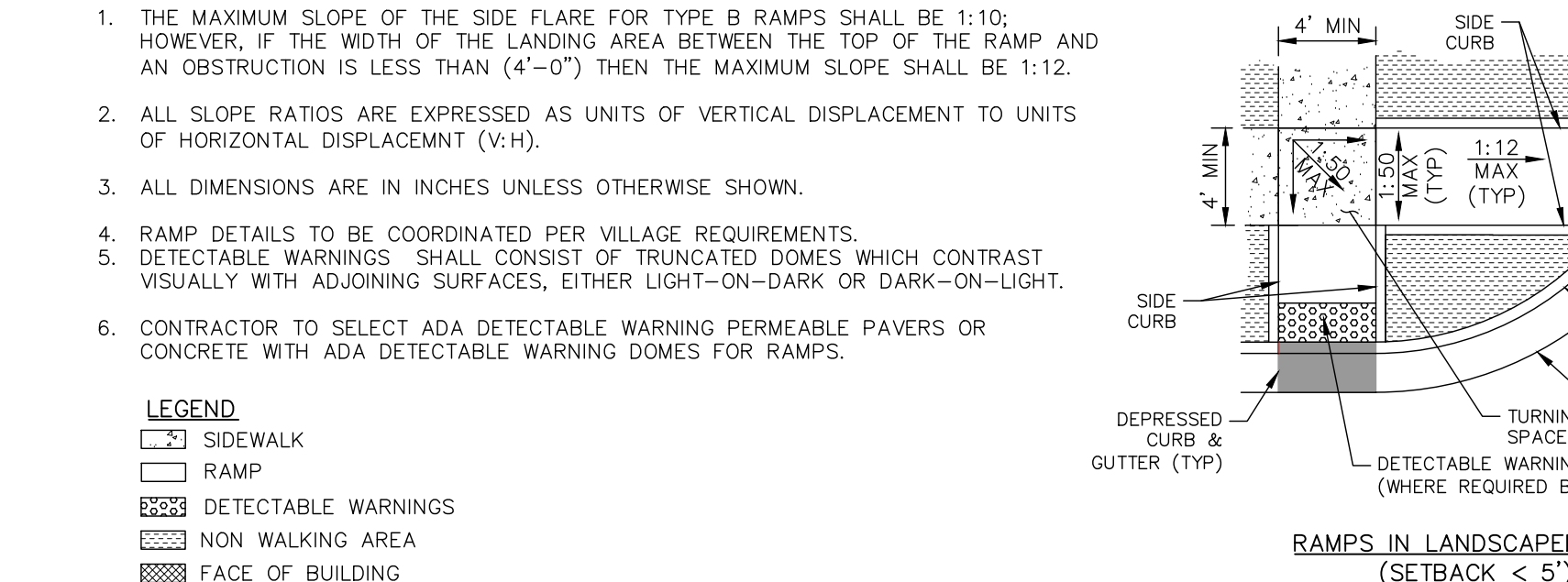
NOTES:
1. Installation of Great Basin units indoors allowed only with written consent of Fox Metro Water Reclamation District.
2. Great Basin models with 4\"/>



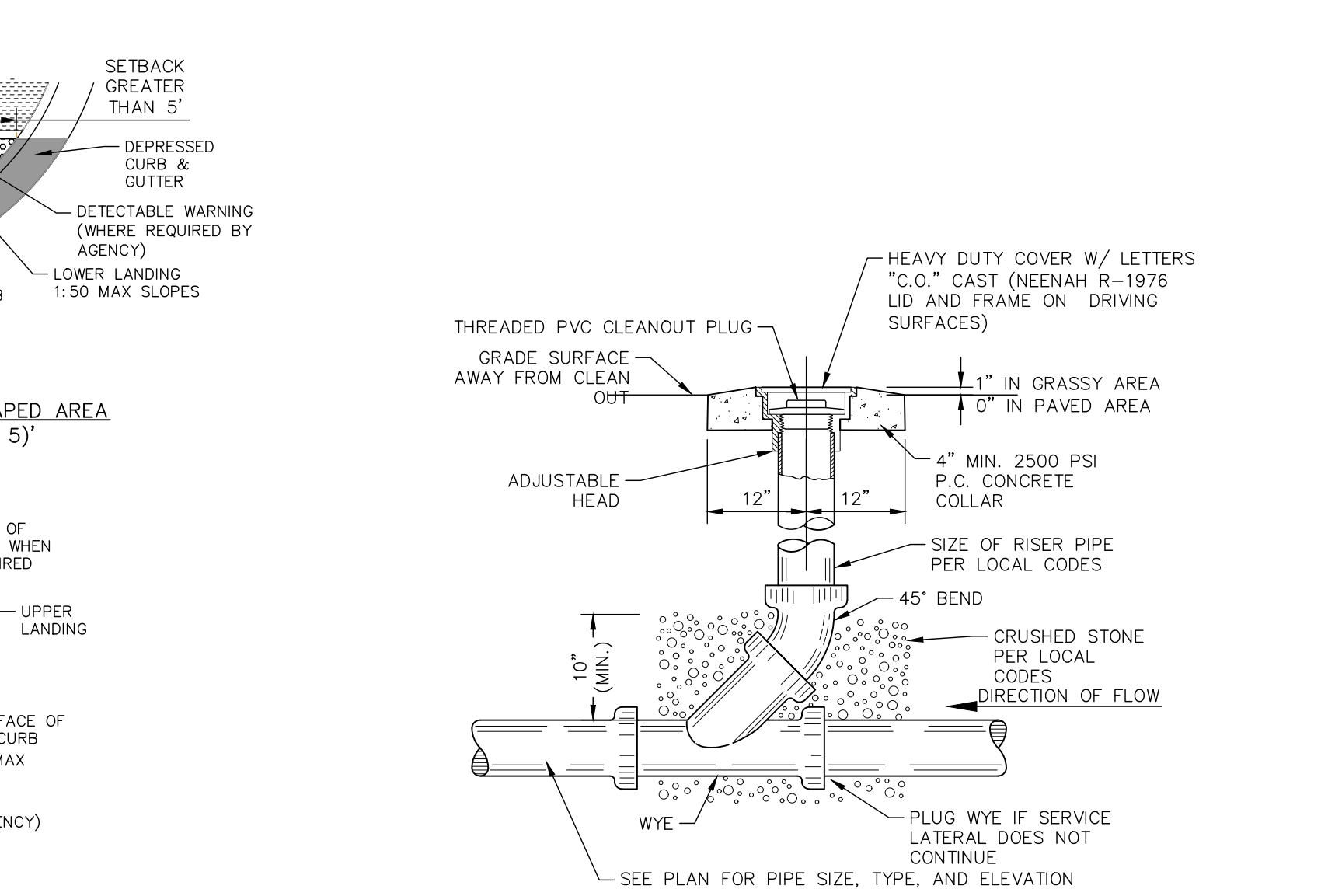
NOTE: SEE APPLICABLE DETAIL FOR BACKFILL AND BEDDING INSTRUCTIONS.

SANITARY/STORM CLEAN-OUT
N.T.S.

GENERAL NOTES:
1. THE MAXIMUM SLOPE OF THE SIDE FLARE FOR TYPE B RAMPS SHALL BE 1:10. HOWEVER, IF THE WIDTH OF THE LANDING AREA BETWEEN THE TOP OF THE RAMP AND AN OBSTRUCTION IS LESS THAN (4'-0\"/>



SIDEWALK AND SIDEWALK RAMPS
N.T.S.



SIDEWALK AND SIDEWALK RAMPS
N.T.S.



NOTE: SEE APPLICABLE DETAIL FOR BACKFILL AND BEDDING INSTRUCTIONS.

SANITARY/STORM CLEAN-OUT
N.T.S.



NOTE: SEE APPLICABLE DETAIL FOR BACKFILL AND BEDDING INSTRUCTIONS.

SANITARY/STORM CLEAN-OUT
N.T.S.

APRIL 5, 2024 PN 241141

GEOTECHNICAL EXPLORATION

RESTAURANT BUILDING
 LOT 1, WAUKEE TOWNE CENTER PLAT 5
 SE LAUREL STREET
 WAUKEE, IOWA

PERFORMED FOR

WAUKEE TOWNE CENTER, LLC
 611 MONTICELLO DRIVE
 BURLINGTON, IA 52601

April 5, 2024

Waukee Towne Center, LLC
 611 Monticello Drive
 Burlington, IA 52601
 Attn: Mr. Mike Pearson

RE: Geotechnical Exploration
 Restaurant Building
 Lot 1, Waukee Towne Center Plat 5
 SE Laurel Street
 Waukee, Iowa
 PN 241141

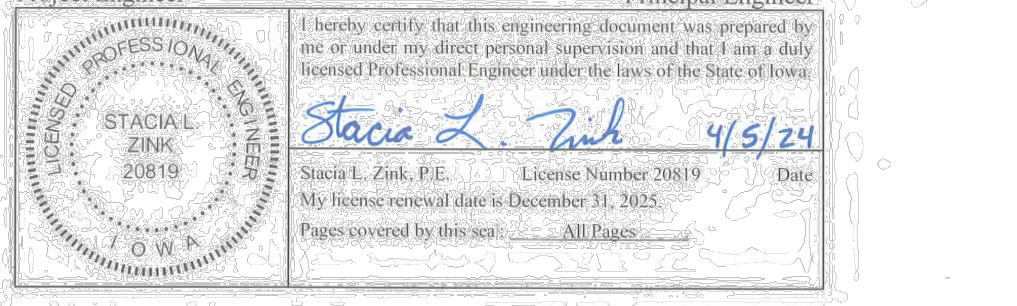
Dear Mr. Pearson:

Per your authorization, Allender Butzke Engineers Inc. (ABE) has completed the geotechnical exploration for the above referenced project. The geotechnical exploration was conducted to evaluate physical characteristics of subsurface conditions with respect to design and construction of this project. The enclosed report summarizes the project characteristics as we understand them, presents the findings of the borings and laboratory tests, discusses the observed subsurface conditions, and provides geotechnical engineering recommendations for the project.

We appreciate the opportunity to provide our geotechnical engineering services for this project. If you have any questions or need further assistance, please contact us at your convenience. We are also staffed and equipped to provide construction testing and inspection services on this project as well as environmental site assessments.

Respectfully submitted,
 ALLENDER BUTZKE ENGINEERS INC.

Stacie L. Zink, P.E. Mani Drummend, P.E.
 Project Engineer Principal Engineer



1 PC and Email Above
 2 Email Civil Engineering Consultants, Inc. Attn: Eli Ags, P.L.A., A.S.T.A.
 Attn: Cindy Weaver, P.E.

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GEOTECHNICAL EXPLORATION

RESTAURANT BUILDING
 LOT 1, WAUKEE TOWNE CENTER PLAT 5
 SE LAUREL STREET
 WAUKEE, IOWA

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ALLENDER BUTZKE ENGINEERS INC.

GEOTECHNICAL EXPLORATION

RESTAURANT BUILDING
 LOT 1, WAUKEE TOWNE CENTER PLAT 5
 SE LAUREL STREET
 WAUKEE, IOWA

PROJECT INFORMATION

Waukee Towne Center, LLC, with design assistance from Civil Engineering Consultants, Inc. (CEC) is planning a new restaurant building to be located on Lot 1 of Plat 5 at the Waukee Towne Center Development in Waukee, Iowa. We assume the proposed building will be a single-story, slab-on-grade, masonry/wood framed structure. Based on similar projects, we assume the building will be lightly to moderately loaded with wall loads of up to 4 kips per linear foot and column loads of 75 kips or less. As shown in the following Figure No. 1, parking areas will be located on all sides of the proposed building with a driveway connecting to the existing private drive on the west side of the property.

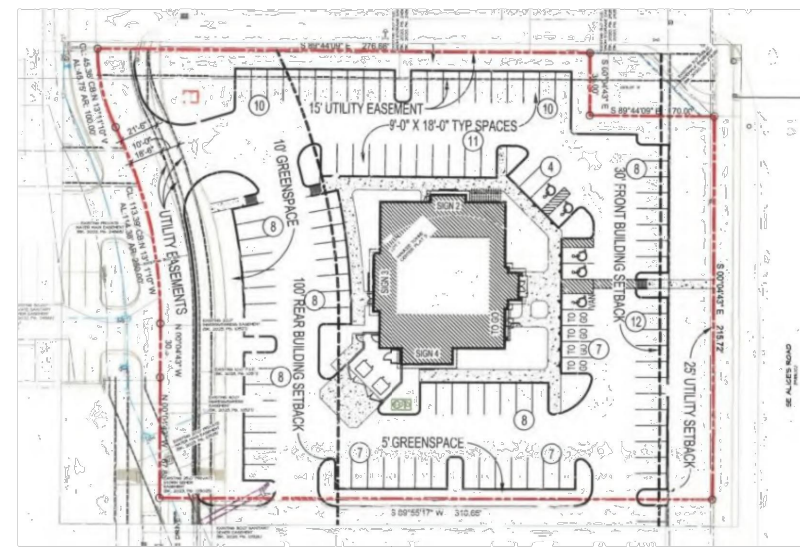


Figure No. 1 - Site Concept Plan (CEC)

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The project site has been previously rough graded. The existing ground surface slopes downhill from a local high point near elevation 1049.5 feet approximately in the center of the lot. A preliminary building finish floor elevation of 1048 feet was provided by CEC. Based on the preliminary floor elevation, we anticipate cut depths and fill thicknesses on the order of +/- 2 feet may be required to achieve the desired final building and pavement area grades.

FIELD EXPLORATION

Four soil borings were conducted at this site to depths of 10 to 20 feet below existing grades on March 21, 2024. The approximate locations of the borings are shown on the enclosed Site Plan and were located and staked at the site by CEC prior to field exploration. The boring surface elevations, indicated on the enclosed Boring Logs, were provided by CEC for the surveyed boring locations. Methods of drilling, sampling, standard laboratory testing, and classifying of subsurface materials are discussed in the Boring Log Description/Legend pages of the Appendix.

SUBSURFACE CONDITIONS

Site Geology

This project site is located within a geomorphic region known as the "Des Moines Glacial Lobe." The Wisconsin glacier was the last glacier to advance into north central Iowa. The brown to brown-gray Wisconsinan supraglacial till, deposited as the glacier retreated, present near the surface typically consists of sandy lean clay with random zones of high sand and silt content. Fine grained deposits of locally derived alluvium are commonly encountered at the surface in isolated upland depressions. The deeper dark gray Wisconsinan subglacial till, deposited as the glacier advanced, consists of a more homogeneous mixture of sand, silt and clay. Fill has been placed over the natural soils during past rough grading of the site.

Soil Profile

Detailed descriptions of soils encountered by this exploration are provided on the Boring Logs enclosed in the Appendix. The Profile of Borings (Plate A-1) presented in the Appendix depicts the relative deposit elevations in the borings. Following is a discussion of the subsurface materials encountered in the borings. Unless otherwise indicated, the depths of soil stratum and

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groundwater levels are referenced from below existing grade at the individual boring locations at the time of drilling.

Respread Topsoil - Respread topsoil consisting of dark brown to very dark gray lean to fat clay (CL-CH) with traces of organic matter was encountered at the ground surface of all four borings. The moist respread topsoil extended to depths between 0.8 to 1 foot.

Existing Fill - Fill consisting of dark brown, brown-gray, and dark gray sandy lean clay (CL) with traces of gravel was encountered beneath the respread topsoil. The moist and medium stiff to stiff fill extended to depths between 2.5 to 6 feet.

Local Alluvium - Brown-gray, dark brown, and very dark brown lean to fat clay (CL-CH) and sandy lean to fat clay (CL-CH) local alluvium was encountered underlying the existing fill. The moist and stiff local alluvium extended to depths from 4 to 7.5 feet.

Wisconsinan Glacial Till - Wisconsinan glacial till, generally consisting of sandy lean clay (CL) with traces of gravel was encountered underlying the local alluvium. The upper brown-gray portions of the Wisconsinan glacial till were generally moist and medium stiff to stiff transitioning to dark gray and stiff below depths of 15.5 to 18 feet in Boring Nos. 2 and 3. All borings terminated in the Wisconsinan glacial till near depths of 10 to 20 feet.

Groundwater Level Observations

The borings were monitored during and shortly after drilling operations to detect moisture seepage and groundwater accumulation. The results of our groundwater level observations are noted on the Boring Logs enclosed in the Appendix.

Moisture seepage was not observed during drilling operations and no groundwater accumulation was observed in the borings at completion of drilling operations. Approximately 24 hours after completion of drilling, groundwater accumulation was observed in Boring Nos. 2 and 3 near depths of 15 and 17 feet, respectively. These short-term groundwater levels are not necessarily a true indication of the groundwater table. Long-term observations would be necessary to accurately define the groundwater variations at this site.

Gray-brown coloring of the Wisconsinan glacial till is an indication of past fluctuations of the groundwater in this zone. Furthermore, local alluvium soils typically develop under high seasonal groundwater levels at or near the surface. Therefore, we interpret that past seasonal high groundwater tables have been near depths of 2.5 to 6 feet below the existing grades at this site.

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Fluctuation of groundwater levels can occur due to seasonal variations in the amount of rainfall, surface drainage, subsurface drainage, site topography, irrigation practices, and ground cover (pavement or vegetation).

ANALYSES AND RECOMMENDATIONS

Site Preparation and Existing Fill

Cut-and-fill construction will be performed at this site to achieve the desired final grades. Prior to the placing of concrete floors or pavements on this site, or before any fill is placed, the organic and loose materials in addition to all vegetation must be stripped. We expect that a minimum stripping depth of 6 to 12 inches will be required to completely remove the respread topsoil. The stripping depths may vary due to localized variations in vegetation cover and subsurface stability. The strippings could be used for landscaping purposes in non-critical areas where support for foundations, floor slabs, and pavements is not required. After site stripping, the substrate should be proof-rolled to delineate zones of soft soils present near the surface which may require additional removal or compaction.

Existing fill was encountered in the upper 2.5 to 6 feet of the soil borings. We assume that the majority of this fill was placed during rough grading of the property. Boring information indicates that fill sections were generally moist and exhibited medium stiff to stiff consistencies, which suggests that the fill may have been compacted at the time of placement. Allender Butzke Engineers has conducted limited compaction testing of site grading and utility backfill during overall site development. Although our records do not indicate specific testing during past fill placement on this lot, without a complete documented background of the fill placement at the site, there would be some risk associated with constructing settlement sensitive structures on existing fill. However, if all of the fill at this site possesses consistency and composition characteristics similar to or better than the fill encountered in the borings, the risk would be low, and it would be reasonable to consider building on the existing fill.

As a minimum, if the owner elects to build on the existing fill, extensive geotechnical probing, proof roll testing, and observations should be conducted by an ABE geotechnical engineer during over-excavation/construction to further note suitability and support capability of the existing soils beneath the proposed building. Deficient zones encountered within the fill are recommended to be over-excavated and backfilled with engineered compacted fill. It should be recognized that test probing is intended to reduce the frequency of inadvertently constructing over deficient soils, but because of the methods and practical extent (3 feet deep) of hand

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probing, not all deficient zones may be detected and corrected, especially in the lower portions of fill, which would still leave the owner accepting the risk of less desirable building and structure performance in favor of reduced initial construction costs to not remediate all undocumented existing fill.

If the owner prefers to take a more proactive approach to reduce uncertainty, all existing fill below the proposed structure could be over-excavated, moisture conditioned, and recompacted to support the new structures. Over-excavation and recompaction of the existing fill could be conducted during initial site grading.

There is a risk of movement and cracking associated with constructing new pavements over existing fill. The risk of pavement settlement and cracking may be acceptable to the owner, as pavements are more easily repaired than footings and floor slabs. If the owner chooses to accept the risk of possible future movements for pavements bearing on the existing fill, as a minimum, we recommend pavements be supported on 12 inches or more of prepared compacted subgrade. Deeper over-excavation and recompaction of existing fill would provide more reliable pavement support where deep existing fill is present below proposed parking lots or driveways.

Moderately Expansive Soils

Lean to fat clay (CL-CH) local alluvium soils were encountered between depths of 4.5 to 7.5 feet in Boring Nos. 2 and 3, approximately located within the footprint of the proposed building. These moderately plastic and moderately expansive soils are subject to volumetric change with changes in soil moisture content which can cause movement and distress to movement sensitive structures. The most severe problems occur where higher clay content soils (CL-CH and CH) are in a natural state of low moisture or are highly compacted at moisture contents near or below optimum moisture content on a relatively incompressible base. Subsequent moisture content increases below floor slabs or pavements after construction then cause the moderately expansive soils to swell appreciably. If the moisture content does not fluctuate much, then the soil swelling and heave will be minor.

In our experience, frost depth footings or formed foundations having a sustained bearing pressure of 600 pounds per square foot (psf) or more can generally resist the swell pressures associated with these moderately expansive lean to fat clay (CL-CH) local alluvium soils. The sustained bearing pressure may include the structure gravity dead load as well as the weight of the concrete foundation and soil backfill on top of the spread foundation projections. However, these soils can cause movement and distress to lightly loaded floor slabs and pavements constructed within or immediately above the moderately expansive soils.

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To reduce floor slab movement due to expansive soils, we recommend floor slabs bear on 2 feet or more of low-plasticity cohesive (Liquid Limit (LL) of 45 or less and Plasticity Index (PI) of 23 or less) or granular material. Existing sandy lean clay fill (LL-35 and PI-21) present above approximate elevation 1043.4 feet in Boring Nos. 2 and 3 would meet this requirement for the proposed finish floor near elevation 1048 feet. Moderately expansive lean to fat clay (CL-CH) respread topsoil should be completely stripped and removed during site preparation.

While providing a non-expansive soil buffer generally reduces future movements to acceptable levels, this method does not necessarily eliminate all movements. Other ways to reduce reflective cracking, where practical, is to design the slab-on-grade floors slabs to "float" free of edge-restraint at walls and columns and to provide vertical space for movement of non-load bearing walls setting on the slab.

Based on soil boring information and the preliminary grading plan, we do not anticipate that moderately expansive soils will be encountered within 12 inches of the proposed pavements. However, moderately expansive local alluvium soils are very common in this area and could be present within 12 inches of proposed pavements in unexplored areas of the site. Typical pavement movements due to moderately expansive soils (CL-CH) are similar to movements that pavements commonly experience from frost heave. Considering that proposed pavements will be subject to frost heave movements, the risk of movement due to moderately expansive soils is commonly accepted by owners and developers. If this approach is taken, we recommend pavements be supported on 12 inches or more of prepared compacted subgrade further discussed in the *Existent Subgrade Preparation* section of this report. Subgrade condition and moisture content should be maintained until the slabs or pavements are placed. If the soil is allowed to dry prior to slab or pavement placement, the risk of future slab movement would then increase. If moderately expansive soils are encountered within 12 inches of proposed pavements and a more proactive approach to reduce pavement movement due to expansive soils is preferred, pavements could bear on 12 inches or more of low plasticity cohesive (Liquid Limit of 45 or less and Plasticity Index of 23 or less), chemically stabilized on-site plastic soils, or cohesionless soils, such as drained crushed rock similar to Iowa DOT 4123 Modified Subbase.

Newly planted vegetation (trees and shrubs) growing close to the proposed buildings will remove moisture from the nearby soils. Foundations and floor slabs can potentially settle due to shrinkage of soils beneath the footings and floor slabs as the soils dry, especially during drought periods when mature trees withdraw moisture from nearby soils. As a general guideline, trees and shrubs should be kept a minimum horizontal distance away from the building equal to the ultimate height of the vegetation. Likewise, excessive irrigation next to the building can contribute to soil swelling and should be avoided.

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Site Grading

We recommend that low plasticity cohesive (Liquid Limit of 45 or less and Plasticity Index of 23 or less) or cohesionless soils, free of rubble and organics, be used as compacted fill. Inorganic existing soils such as the sandy lean clay (CL) existing fill, lean to fat clay (CL-CH) local alluvium, and the sandy lean clay (CL) Wisconsinan glacial fill would be suitable soil types for general fill applications. However, as previously discussed in the *Moderately Expansive Soils* section of this report, the lean to fat clay (CL-CH) local alluvium soils are moderately expansive and should not be used as fill within 2 feet of structures sensitive to movement unless properly treated as previously discussed.

The following Table A lists recommended minimum compaction requirements for cohesive and cohesionless fill materials in specific applications. For low plasticity cohesive soils (CL), moisture contents within a range of +/- 4 percent of the material's optimum moisture content are necessary to achieve the desired fill qualities. Soils compacted closer to optimum moisture content would exhibit greater stability under repeated construction traffic loading.

TABLE A
 RECOMMENDED DEGREE OF COMPACTION GUIDELINES

| Construction Application | Standard Proctor (ASTM D698) Cohesive Soil | Standard Proctor (ASTM D698) Cohesionless Soil | Relative Density (D4253 & D4254) Cohesionless Soil |
|--------------------------|--|--|--|
| Class 1 | 95% | 98% | 70% |
| Class 2 | 90% | 93% | 45% |
| Class 3 | 85% | 88% | 20% |

Class 1 - Subgrade for building foundations, slabs-on-grade, pavements and other critical backfill areas.
 Class 2 - Backfill adjacent to structures not supporting other structures - Minor subsidence possible.
 Class 3 - Backfill in non-critical areas - Moderate subsidence possible.

*Use Relative Density technique (ASTM D4253 & D4254) where Standard Proctor technique (ASTM D698) does not result in a definable maximum dry density and optimum moisture content.

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The on-site soils can be excavated utilizing conventional excavation equipment. Granular soils can generally be suitably compacted with vibratory compaction equipment whereas cohesive soils are more suitable for compaction with sheepsfoot or pneumatic type compactors. Care should be exercised in properly backfilling and compacting all trenches, especially utility trenches under or adjacent to the pavement. Loosely compacted or sand backfilled trenches can collect surface water and inadvertently direct it to the pavement subgrade and cause softening of the soil as well as increasing frost heave potential.

At the time of this geotechnical exploration, moisture content of the near surface existing fill, local alluvium, and Wisconsinan glacial till soils were generally near the recommended moisture content range for compaction. Depending upon precipitation levels prior to and during construction, adjustment of soil moisture content may be required in order to lower or raise the moisture to within the recommended moisture content range. Controlled wetting and dicing may be necessary to raise soil moisture content of dry soils. Dicing and aeration is generally the most economical method to lower soil moisture content, if climatic conditions allow. Chemical modification (drying) of very moist soils with Class C Dry ash, Portland cement, or quicklime can be accomplished if construction scheduling does not permit field drying. Common chemical modification methods may not be reactive when temperatures are near or below 40° Fahrenheit if grading or fill placement at the site will be conducted during colder weather.

Excavation, Stability and Dewatering

Boring information indicates excavations at the site will encounter predominantly cohesive soils with the possibility of wet sand seams or glacial outwash layers within the Wisconsinan glacial till. If excavations encounter only cohesive soils with no wet sand seams or layers, it is expected that the water seepage can be controlled by permitting it to drain into temporary construction sumps and be pumped outside the perimeter of the excavations. More extensive dewatering such as sand points and wells may be required for excavations which extend down into water bearing sand layers. We recommend that prior to excavating in saturated sand, water levels be lowered and maintained 2 feet or more below the bottom of excavations to prevent upward seepage forces which could reduce subsurface support.

The extent of bracing or sloping of open cut excavations will be dependent upon depth of cut, groundwater conditions, soils encountered, length of time the excavation will be open, area available for excavation and local governing regulations. Predominantly cohesive soils may appear to stand nearly vertical in shallow excavations for short periods of time. However, soil creep, surcharge loads, precipitation, subsurface moisture seepage, construction activity vibrations and other factors may cause these soils to cave within an unpredictable period of time.

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Excavations encountering sand may tend to cave rapidly, especially if water is flowing through the sand. Unstable granular excavation walls may also cause surrounding cohesive soils to become unstable. Temporary shoring, flattening of the excavation slopes or use of trench boxes may be required to maintain a safe condition. Determining the appropriate OSHA classifications of the soil types encountered and implementing the required provisions for sloping, shoring, and bracing of excavations throughout the project during construction are the responsibility of the contractor per OSHA.

Foundation Design

Based on our experience with similar past projects, we assume the single-story slab-on-grade masonry/wood framed restaurant building will be lightly to moderately-loaded with wall loads of up to 4 kips per linear foot and column loads of 75 kips or less. With a preliminary finish floor near elevation 1048 feet, we anticipate frost depth footings near an elevation of 1044 feet will bear on further tested and evaluated existing fill and natural local alluvium. We recommend continuous and isolated spread foundations be proportioned for maximum net allowable soil bearing pressures of 2,000 and 2,500 pounds per square foot, respectively. We estimate long-term total settlement due to structural loads will be less than 1 inch and differential settlement may be on the order of ½ of the total settlement when foundations bear on suitable natural soils.

Continuous foundations should be adequately reinforced to limit deflections caused by non-uniform soil support characteristics. All exterior foundations and foundations in unheated areas should be placed a minimum of 3.5 feet below final grade to provide protection against frost penetration and reduce movements associated with changes in soil moisture content. The on-site cohesive soils and newly placed cohesive fill would be suitable for trench foundations. Footing excavations should be kept free of water accumulation to prevent softening of subgrade soils.

Observations and test probing of the foundation subgrade soils should be conducted by an ABE geotechnical engineer to determine that the soils are compatible with the design criteria. If zones of soft or otherwise unsuitable soils are encountered at foundation level, we recommend that footings be extended to bear on firmer soils or an over-excavation and compacted backfill procedure be implemented. Over-excavations should extend 9 inches laterally in each direction beyond the foundation edges for each foot of over-excavation depth.

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Floor Slab Support

As discussed in the *Moderately Expansive Soils* section of this report, we anticipate the floor slab for the proposed building will have at least 2 feet of lean clay existing fill beneath the bottom of the floor slab, which will provide a buffer zone of low-plasticity material and reduce the potential for floor slab movements due to the moderately expansive local alluvium. Floor slabs can be designed for a modulus of subgrade reaction value of 100 pounds per cubic inch when bearing on the recommended prepared subgrade. Testing, observations and probing should be conducted during construction to delineate zones of soft soils which may require repair prior to concrete placement.

Pavement Subgrade Preparation

Uniform subgrade support is critical in pavement performance. As discussed in the *Existent Fill* section of this report, there is risk of settlement and cracking associated with constructing new pavements over the existing fill encountered at this site. If the owner chooses to accept the risk of future pavement movement by constructing new pavements over the existing fill, we recommend proof-rolling and technical observations be conducted by an ABE geotechnical engineer during subgrade preparation. As a minimum, we recommend that the prepared subgrade depth be at least 1 foot deep after fine grading or trimming and extend 2 feet beyond the edge of the pavements. The recommended 1 foot of compacted subgrade may necessitate undercutting and reworking soils in cut areas. Subgrade preparation to 1-foot depths for some soil types may not be suitable under repeated heavy construction vehicle loads and may require stabilization to greater depths. Depending upon moisture and subgrade conditions, it may be necessary to chemically stabilize the subgrade to facilitate paving operations.

Subgrade preparation should be completed shortly before paving operations commence and it to be maintained in suitable condition until paved. Damages caused by construction traffic or deterioration due to adverse weather are to be repaired prior to paving.

Depending upon conditions encountered at the time of construction, it may be necessary to moisture condition existing soils to achieve the recommended moisture content range of +/- 4 percent of optimum moisture content. Soils compacted closer to optimum moisture content will exhibit greater stability under construction traffic loading. Suitable cohesive soil compacted to a minimum of 95 percent of maximum dry density determined by ASTM D698 would provide a design support capability equivalent to a CBR value of 3 or a modulus of subgrade reaction value of 100 pounds per cubic inch. Subgrade compaction, moisture content and depth should be tested by an ABE representative.

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Pavement Thicknesses

Either rigid (Portland cement concrete, PCC) or flexible (hot mix asphalt, HMA) pavement types could be constructed on the prepared cohesive subgrade. Table B on the following page summarizes alternate pavement thicknesses for typical lightly-loaded, moderately-loaded and heavily-loaded paved areas. If a minimum 6-inch-thick crushed rock base (such as Iowa DOT 4123 Modified Subbase) with drains is constructed on the compacted subgrade to support the pavement, the recommended thicknesses of PCC or HMA pavement may be reduced by ½ and 1 inch, respectively. However, we recommend the lightly-loaded 5-inch-thick PCC pavement section not be reduced. A more specific pavement evaluation can be provided if traffic volume and loading information is available.

TABLE B
 TYPICAL PAVEMENT THICKNESSES

| Traffic Volume | Rigid: PCC ¹ | Flexible: HMA ² |
|-----------------------------|-------------------------|----------------------------|
| Lightly-Loaded ³ | 5" ⁴ | 6" |
| Moderately-Loaded | 6" | 7" |
| Heavily-Loaded ⁵ | 7" | 8" |

- PCC - Flexural strength of 550 psi
- Type A HMA - Structural coefficient of 0.44/inch
- Automobile and 1 to 2 trucks average daily traffic
- Thickness reduction due to crushed rock subbase does not apply
- Entrances, delivery areas, ramped areas or other areas of heavier truck traffic (25 trucks or less per day)

The above pavement thicknesses are considered to be typical and would require periodic maintenance. This maintenance would consist of sealing cracks/joints and replacement of isolated distressed areas. Thicker pavement sections would reduce maintenance and increase the pavement service life. Likewise, thinner sections would be expected to have a shorter service life that still may satisfy particular project needs but may require more maintenance. Other criteria which influence pavement service life include surface drainage, subsurface drainage, paving material quality, reinforcement, and joint design. Construction procedures involving placement, finishing, curing, jointing and weather protection can significantly impact pavement performance.

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Frost Heave

Key elements contributing to frost heave including freezing temperatures, available water, and fine-grained frost susceptible soils are generally present at sites in Iowa. As a result, frost heave problems are generally common (and most noticeable) in pavements or sidewalks adjacent to non-frost susceptible elements such as manholes, light poles, and exterior doors or frost protected stoops. Frost heave can cause pavement cracks to develop parallel to and several feet from curbs. This generally occurs where cleared paved areas exposed to freezing temperatures have more than adjoining paved areas insulated by piled snow. Areas cleared of snow not exposed to periodic sunshine during the winter, such as under canopies, on the north shaded side of buildings and other shaded areas may experience more frost heave than other sunshine exposed areas. Sometimes it is not readily apparent why frost heave problems occur at one location and not at another seemingly similar location.

While it is appropriate to implement measures to reduce frost heave such as insulation, replacing frost susceptible soils with less frost susceptible soils, void forms, sealing cracks/joints to reduce surface water infiltration, or drainage improvements (surface and subsurface), these measures may simply move the frost heave problem to a different location where preventative measures have not been implemented. Having a smooth transition between heaved and non-heaved areas is desirable but may be difficult and/or costly to accomplish. We are available to consult with you to discuss options for your consideration to reduce frost heave potential on this project.

GENERAL

The analyses and recommendations in this report are based in part upon the data obtained from the soil borings performed at the indicated locations and from any other information discussed in this report. This report does not reflect any variations which may occur between borings or service life. The nature and extent of such variations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

It is recommended that the geotechnical engineer be provided the opportunity to review the plans and specifications so that comments can be made regarding the interpretation and implementation of our geotechnical recommendations in the design and specifications. It is further recommended that the geotechnical engineer be retained for testing and observation

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ARCHITECTS PROJECT JOB # 4A0003

CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE JOB SITE AND NOTIFY THE ARCHITECTS OF ANY DIMENSIONAL ERRORS, OMISSIONS OR DISCREPANCIES BEFORE BEGINNING OR FABRICATING ANY WORK. DO NOT SCALE DRAWINGS.

IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, TO ALTER AN ITEM IN ANY WAY.

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Olive Garden
 ITALIAN KITCHEN

Issue Date: 06-20-24

REVISION
 1 07-08-24
 AGENCY REVISIONS

Restaurant #: 6526

OLIVE GARDEN
 P62DOM-BOX-L

CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE JOB SITE AND NOTIFY THE ARCHITECT OF ANY DIMENSIONAL ERRORS, OMISSIONS OR DISCREPANCIES BEFORE BEGINNING OR FABRICATING ANY WORK. DO NOT SCALE DRAWINGS.

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| REVISION | |
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| 1 | 07-08-24 |

AGENCY REVISIONS

Restaurant #: 6526

OLIVE GARDEN
 P62DOM-BOX-L

HK Q3 2024 REV.

420 SE
 ALICE'S RD.
 WAUKEE,
 IOWA

Drawing

CIVIL SPECIFICATIONS (1 OF 5)

CS1

SECTION 02210 – SITE EARTHWORK

Part 1.00 General

1.01 WORK INCLUDED

- A. The work specified in this Section consists of furnishing all labor, materials and equipment, and performing all operations required to complete the site preparation, earthwork and grading as shown on the Drawings and as specified herein. This work shall include, but not be limited to: site clearing and grubbing; root-raking; stripping; removal of muck and other unsuitable material; proof-rolling; earthwork for site grading, including dewatering, excavation, filling, or backfilling, and compaction; supplying approved fill material; final site grading; and other related requirements.
- B. The operations specified herein shall be performed within the limits indicated for site grading and other construction, as shown on the Drawings.
- C. The Contractor shall provide adequate protection against construction activity for all existing structures and utilities, above the surface or underground, including trees that are to remain, and other construction activities concurrently occurring on the site.
- D. Should damage occur to any structure, utility or other facility from these construction activities, repair or replacement to a condition equal to or better than the original shall be immediately made by the Contractor, at no cost to the Owner.
- E. The Contractor must determine for himself the total volume of all fill materials required for the project site.
- F. Definitions:
 1. Open Areas: Open areas shall be those areas that do not include building sites, paved areas, and street right-of-way and parking areas.
 2. Maximum Dry Density: Maximum dry soil unit weight in pounds per cubic foot at optimum moisture content of a specific material as determined by ASTM Test Designation D-1557 (Modified Proctor).
 3. Optimum Moisture Content: Percentage of water in a specific soil material at maximum dry density.

1.02 RELATED WORK

- A. Per local Transportation Standard Specifications for Highway and Bridge Construction, latest edition.

1.03 REFERENCE INFORMATION

- A. The following pertinent geotechnical investigation report has been prepared. The Contractor shall perform his own site observations/investigations as necessary and obtain and review the contents of the referenced report to become familiar with the site subsurface soil and groundwater conditions. The requirements of the geotechnical report shall prevail where discrepancies between the geotechnical report and the specifications exist.

1.04 QUALITY ASSURANCE

- A. Testing of materials to be used for fill, determination of unsuitable soil limits, density testing to adequately confirm the specified compaction, proof-rolling and strip subgrade observations shall be made by a Geotechnical Consultant approved by the Owner, at the expense of the Owner, with reports therefrom submitted to the Owner documenting that the testing and compaction procedures outlined in this specification have been satisfied. If initial density tests fail to meet the specifications, retesting shall be performed by the Owner's Geotechnical Consultant at the expense of the Contractor. Soil tests shall be performed for each lift of fill, if more than one is required for the depth of fill, and shall be taken where directed by the Engineer. Should test results be unsatisfactory, the Contractor shall recompact the fill lift and allow for supplemental tests by the Geotechnical Consultant for the area in question.
- B. A sufficient time shall be allotted for the Geotechnical Consultant to perform all control tests necessary to determine that proper fill material is being used and compaction is being obtained. The Contractor shall schedule filling operations so as to permit the making of the necessary control tests for each layer prior to the placing of subsequent layers. All fill lifts and all strip and cut subgrades (in pavement and building areas) shall be tested on a general schedule of one (1) test per 7,500 to 10,000 square feet. Building floor slab subgrade shall be tested on a general schedule of one (1) test per 2,500 square feet. More frequent testing may be required, particularly in areas with previous failing density tests.

Part 2.00 Products

2.01 MATERIALS

- A. Suitable materials for fills shall be classified as A-1, A-3, A-2-4, or A-2-6 in accordance with AASHTO Designation M-145 and shall be free from vegetation, organic material, debris, trash, roots and similar deleterious material. Suitable materials for imported fills shall be classified as A-1 or A-3 in accordance with AASHTO Designation M-145 and shall consist of clean, granular soils and be free from vegetation, organic material, debris, trash, roots and similar deleterious material. Not more than 15 percent by weight of fill material shall pass the U.S. No. 200 sieve. The use of fill materials from on-site excavations, which may contain more than 15 percent fines passing the No. 200 sieve, shall be approved in writing by the Owner provided Geotechnical Consultant before any reuse. If allowed, the location of placement and additional handling requirements for use of any material not meeting the above specified requirements for suitable materials, must be documented in writing by the testing laboratory and approved by the Engineer prior to placement of said material.
- B. Suitable Material To Be Placed in Water: Suitable material for fill to be placed in water shall be classified as A-1 or A-3 in accordance with AASHTO Designation M-145. Not more than 15 percent by weight of fill material shall pass the U.S. No. 100 sieve.
- C. Unsuitable materials are classified as A-2-5, A-2-7, A-4, A-5, A-6, A-7 and A-8 in accordance with AASHTO Designation M-145.

Part 3.00 Execution

3.01 PREPARATION

- A. Clearing, Grubbing, and Stripping
 1. Clearing, grubbing, and stripping shall be performed in the areas where required, including ditches, paved areas, areas to be excavated, areas where fill will be placed, and where structures will be erected. It shall include the complete removal and satisfactory disposal of all timbers, brush, stumps, weeds, rubbish, root-tadens, tops, and all other obstructions resting on or protruding through the surface of the existing ground. Where excavation is designated within the areas to be cleared and grubbed, all stumps, roots and deleterious material freely exposed, protruding through or appearing on the surface of the completed excavation, shall be removed to a depth of two feet minimum below the excavated surface and replaced with suitable compacted backfill. Within all areas where clearing and grubbing is to be done, all stumps, roots, and other debris projecting through or appearing on the surface of the ground shall be removed to a depth of one (1) foot below the surface. Cleared, grubbed and stripped areas shall be inspected and approved by the Owner's Geotechnical Consultant prior to any subsequent excavation or filling operations.
 2. Dicing shall be performed within the limits of construction. Designated dicing areas shall be mowed and raked to remove cuttings prior to dicing operations. The designated areas shall be diced two times such that the first pass is in a direction 90 degrees opposite the second pass and dicing operations shall be completed to a depth of 12-inches. Surficial soils to be removed from the diced areas shall be placed only in non-structural or embankment/berm areas approved by the Engineer soils in diced areas to be filled shall be tested for organic or filling by the Owner's Geotechnical Consultant prior to any, or filling. If the organic content exceeds 10 percent in areas to be paved, or 5 percent in building areas, the surficial diced soils shall be removed and placed in non-structural areas as indicated above.
 3. Selective clearing shall be performed in areas shown on the Drawings or as required by the Owner, in order to save selected trees. The trees areas designated to be saved shall be protected from construction equipment by the Contractor in a manner as shown on the Drawings or as approved by the Engineer.
 4. Areas to be excavated or filled upon shall be stripped of grass, roots, and any unsuitable material, if present, shall be completely removed. Stripped materials suitable for topsoil shall be raked to remove materials larger than 2 inches in diameter and stockpiled on-site, as directed by the Owner.

3.02 PERFORMANCE

A. Excavation

1. Excavation shall conform to the limits indicated on the Drawings or specified herein. This work shall include shaping and sloping and other necessary in bringing the earthwork to the required grade, alignment and cross-section.
2. All suitable materials removed from excavation areas shall be used for as practicable in future pavement or building areas, or in the formation of embankments, subgrades, shoulders, building sites and other places as shown on the Drawings, or as directed by the Engineer. All suitable excavated material shall be considered property of the Owner and shall not be removed from the property without permission of the Owner. Excess excavated suitable material shall be stockpiled on-site at a location approved by the Owner and Engineer.
3. Suitable on-site excavated materials containing silt, and slightly clayey to clayey fine sands shall be sufficiently dried by surface spreading and dicing if necessary, or by mixing with cleaner fine sands prior to reuse/placement in fill areas, as directed by the Owner's Geotechnical Consultant.
4. Existing or remaining silt and slightly clayey to clayey fine sand materials, as determined by the Owner's Geotechnical Consultant, at or below the area of the building slab or foundations shall be removed and replaced (if necessary) to a depth of 24-inches (minimum), as directed by the Owner's Geotechnical Consultant, with suitable compacted structural materials.
5. Muck, organic, silt and clayey sediments, or other unsuitable materials encountered under fill areas, structures, pavement areas, underground utilities and/or as shown on the drawings, shall be excavated and removed as directed by the Owner's Geotechnical Consultant. Removal of unsuitable material in areas where buildings are to be constructed shall include the area under the building and extend to a minimum of ten (10) feet beyond the building limits, or as directed by the Engineer. Removal of unsuitable material in areas where pavement is to be placed shall include the area under the surface and extend to a minimum of five (5) feet beyond the outside edges, or as directed by the Owner's Geotechnical Consultant. At locations where utility or foundations shall be installed, etc. are to be installed with a top (crown) elevation above the bottom surface of any unsuitable material, removal shall be completed to a minimum width of three (3) feet outside the utility alignment.
6. Muck, organic, silt and clayey sediments, and other unsuitable material excavated under the requirements of this Section shall be disposed of off-site, unless otherwise indicated on the Drawings or as directed by the Owner, at the Contractor's expense.

SECTION 02210 – SITE EARTHWORK – CONTINUED

D. Fills and Compaction

1. Suitable backfill or fill material shall be provided, placed and compacted where unsuitable material has been removed, and as required to perform construction and elevate the site to the finish grades, as shown on the Drawings. Materials to be used for fill shall be approved by the Owner's Geotechnical Consultant prior to their placement. If a suitable fill material source is available within the limits of the project, the Owner may allow the use thereof and shall designate the borrow site whereby the Contractor may acquire the fill. If a suitable fill material source is not available on the project site, the Contractor shall furnish the necessary additional suitable fill material to complete the work to the lines and grades indicated on the Drawings. Off-site fill sources shall be tested and approved by the Owner's Geotechnical Consultant prior to moving any material on-site.
2. Areas excavated to building and pavement subgrade elevations, and excavated areas required to be filled shall be leveled, compacted, and tested prior to placement of fill material. Compaction shall be by means of a vibrating drum roller or by other suitable methods capable of completing the work in an efficient manner. The vibratory drum roller shall have a minimum static drum weight of 20,000 pounds and be capable of exerting a minimum impact energy of 36,000 pounds. Soft pumping, disturbed, unsuitable or yielding soils encountered during compaction shall be brought to the attention of the Owner's Geotechnical Consultant to determine whether over-excavation and replacement, of any of these types of materials is required. A minimum of 10 overlapping passes in a criss-cross pattern shall be made with the vibratory drum roller to initially compact the subject area. Compaction shall continue until a minimum density equivalent to 95 percent of the Maximum Modified Proctor Density is achieved in accordance with ASTM D-1557. Compaction shall be tested for a minimum depth of three (3) foot below the excavated or stripped surface in pavement areas, and a minimum of three (3) feet below building areas.
3. The backfill and fill materials shall be placed and compacted as specified hereinafter. Fills shall be constructed of approved suitable material placed at a moisture content near optimum in successive uniform lifts of not more than twelve (12) inches in depth loose measure, and compacted by the use of a vibrating steel wheel roller as described above, or other suitable methods. Thickness of layers may be increased (to no greater than 18 inches loose) provided the equipment and methods used are proven by field density testing to be capable of compacting thicker layers to specified densities. Layer thickness shall be decreased if equipment and methods used are proven to be incapable of compacting layers to specified densities. Where applicable, the first lift may be up to eighteen (18) inches above the groundwater table, if approved by the Engineer. The Owner's Geotechnical Consultant to serve as a working platform for the compaction equipment. The use of this procedure does not relieve the Contractor of the requirement to achieve the specified density for a minimum depth of 1 or 2 feet below the natural grade depending on the area.
4. Fills shall be compacted to a density of not less than 95 percent of its maximum Modified Proctor Density as determined by ASTM D-1557. The subgrade materials immediately below the building floor slab, footings, pavement base, subbase, and base shall be re-compacted to a minimum of 98 percent of ASTM D-1557 just prior to the Garden Concept building slab, footing or pavement subbase construction. Should tests indicate unsatisfactory results, compaction procedures shall continue until subsequent tests indicate the stipulated results have been achieved.
5. Backfills soils placed adjacent to footings or walls below grade shall be carefully compacted with a light rubber-tired roller or vibratory plate compactor to avoid damaging the footings or walls and shall be compacted to 98 percent of ASTM D-1557 (ground footings and slabs), and to 95 percent of ASTM D-1557 against below grade walls. Suitable sand fills placed in footing excavations above the bearing level and in other areas which are expected to provide support or embedment constraint (including all pipeline or utility excavations within the structure and pavement areas) shall be placed in loose lifts not more than 12 inches thick and compacted to a minimum of 98 percent of the maximum modified Proctor dry density (ASTM-1557).
6. Suitable fill materials containing silt, slightly clayey to clayey fine sand materials which exhibit characteristics of high plasticity or heavy, spongy or otherwise unstable conditions, shall be sufficiently air-dried or adequately mixed with cleaner fine sands prior to use for fill. Placement of these materials in fill areas shall be directed by the Owner's Geotechnical Consultant, and such fill materials shall be positioned within lower lift levels of high fill areas, with a top elevation a minimum of four (4) feet below any proposed pavement surface or structure foundation or slab, unless otherwise approved by the Owner's Geotechnical Consultant.
7. Fine sands to slightly silted fine sands classified as suitable fill materials, as determined by the Owner's Geotechnical Consultant, excavated from on-site areas shall be placed in the upper levels in all fill areas.

3.02 PERFORMANCE

A. Excavation

1. The Contractor shall perform all excavation of every description and of whatever substances encountered, to the dimensions required for construction and as specified herein. All excavations shall be made by open cut.
2. Slopes of excavated areas below 4 feet deep shall be sloped at 1.5 horizontal (H) to 1 vertical (V) or flatter and be protected from seepage and erosion. Temporary excavations greater than 10 feet deep should have side slopes of 2H:1V or flatter or be properly sheeted and braced.
3. Excavation areas shall be properly sheeted and braced if required to protect the safety of workmen, the general public, this or other work or structures, or excavation walls. Excavation for the structures shall be sufficient to provide a clearance between their outer surfaces and the face of the excavation, sheeting, or bracing, of not less than 2 feet. Materials encountered in the excavation which have a tendency to slough or fall into the excavations, if not removed, will weaken the overlying strata, or are otherwise rendered unstable by the excavation operation shall be retained by sheeting, stabilization, grouting or other approved methods.
4. Excavation for the structures shall be carried to an elevation one (1) foot lower than the proposed outside bottom of the structure to provide space for the select backfill material. Any unsuitable material encountered below proposed structures shall be removed and replaced with select material. Prior to placing the select backfill, the excavation shall be leveled so that it is reasonably level over the full area beneath the surface to be extended and the structure.
5. Excavation for structures shall be carried down to the bottom of the structure where dewatering methods are such that a dry excavation bottom is exposed and the naturally occurring material at the bottom of the excavation is not disturbed, and the material has not more than 12 inches of water above it. Any water which accumulates in the excavations for structures shall be removed promptly by well pumps in a manner as to not cause injury to the public health, or to private property, to work completed or in progress, to the surface of the streets, or cause any interference with the use of the same by the public. Pumps and engines for dewatering systems shall be operated with mufflers and at a minimum noise level suitable to a residential area. The Contractor shall be responsible for any nuisance created due to the disposal of water from his drainage system.
6. All excess suitable material shall be stockpiled on-site at a location approved by the Owner and Engineer. Muck, organic, silt and clayey sediments, and other unsuitable material excavated under the requirements of this Section shall be disposed of off-site, unless otherwise indicated on the Drawings or as directed by the Owner, at the Contractor's expense.
7. The space between the proposed outside bottom of the structure and the bottom of the excavation shall be backfilled with graded limerock and leveled to receive the proposed structure.
8. Suitable backfill material shall be provided, placed and compacted around the structures as required to fill the excavated area up to finish grades, as shown on the Drawings. Materials to be used for fill shall be approved by the Owner's Geotechnical Consultant prior to their placement. If a suitable fill material source is available within the limits of the project, the Owner may allow the use thereof and shall designate the borrow site whereby the Contractor may acquire the fill. If a suitable fill material source is not available on the project site, the Contractor shall furnish the necessary additional fill material to complete the work to the lines and grades indicated on the Drawings.
9. The Contractor shall provide adequate protection against construction activity for all existing structures and utilities, above the surface or underground, including trees that are to remain, and other construction activities concurrently occurring on the site.
10. Should damage occur to any structure, utility or other facility from these construction activities, repair or replacement to a condition equal or better than the original shall be immediately made by the Contractor, at no cost to the Owner.
11. Definitions:
 1. Maximum Density: Maximum weight in pounds per cubic foot of a specific material as determined by ASTM Test Designation D-1557.
 2. Optimum Moisture: Percentage of water in a specific material at maximum density.

END OF SECTION

SECTION 02220 – STRUCTURE EXCAVATION AND BACKFILL

Part 1.00 General

1.01 WORK INCLUDED

- A. The work specified in this Section consists of furnishing all labor, materials and equipment, and performing all operations required to complete the site preparation, earthwork and grading as shown on the Drawings and as specified herein, for construction of the storm drainage, sanitary sewer, and storm distribution systems. This work shall include, but not be limited to: site clearing and grubbing; stripping; dewatering; trenching; removal of muck and other unsuitable material; earthwork for grading and other related requirements; backfilling; compaction; supplying approved fill material; final grading; and other related requirements.
- B. The operations specified herein shall be performed within the limits indicated for site grading and other construction, as shown on the Drawings.
- C. The Contractor shall provide adequate protection against construction activity for all existing structures and utilities, above the surface or underground, including trees that are to remain, and other construction activities concurrently occurring on the site.
- D. Should damage occur to any structure, utility or other facility from these construction activities, repair or replacement to a condition equal or better than the original shall be immediately made by the Contractor, at no cost to the Owner.
- E. Definitions:
 1. Maximum Density: Maximum weight in pounds per cubic foot of a specific material as determined by ASTM Test Designation D-1557.
 2. Optimum Moisture: Percentage of water in a specific material at maximum density.

1.02 RELATED WORK

- A. Section 02210 – Site Earthwork
- B. Section 02220 – Structure Excavation and Backfill
- C. Section 2530 – Dewatering System

1.03 REFERENCE INFORMATION

- A. If a geotechnical report pertaining to the site has been prepared, it may be obtained from the Engineer upon request.
- B. Contractor may obtain copies of standard specifications from the City, at his own expense, for requirements of related standards.

SECTION 02220 – STRUCTURE EXCAVATION AND BACKFILL – CONTINUED

1.04 QUALITY ASSURANCE

- A. Density tests to adequately confirm the specified compaction shall be made by a testing laboratory approved by the Owner, at the expense of the Owner, with reports therefrom submitted to the Owner documenting that the compaction requirements as outlined in this specification have been satisfied. If initial density tests fail to meet the specifications, retesting shall be done at the expense of the Contractor. Said tests shall be performed for each lift of fill, if more than one is required for the depth of fill, and shall be taken where directed by the Engineer. Should test results be unsatisfactory, the Contractor shall recompact the fill and provide supplemental tests for the area in question.
- B. A sufficient time shall be allotted for the testing laboratory to perform all control tests necessary to determine that proper fill material is being used and compaction is being obtained. The Contractor shall schedule backfilling operations so as to permit the making of the necessary control tests for each layer prior to the placing of subsequent layers.

Part 2.00 Products

2.01 MATERIALS

- A. Suitable materials for fills shall be classified as A-1, A-3, A-2-4, or A-2-6 in accordance with AASHTO Designation M-145 and shall be free from vegetation, organic material, debris, trash, roots and similar deleterious material. Suitable materials for imported fills shall be classified as A-1 or A-3 in accordance with AASHTO Designation M-145 and shall consist of clean, granular soils and be free from vegetation, organic material, debris, trash, roots and similar deleterious material. Not more than 15 percent by weight of fill material shall pass the U.S. No. 200 sieve.
- B. Suitable Material To Be Placed in Water: Suitable material for fill to be placed in water shall be classified as A-1 or A-3 in accordance with AASHTO Designation M-145. Not more than 15 percent by weight of fill material shall pass the U.S. No. 100 sieve.
- C. Unsuitable materials are classified as A-2-5, A-2-7, A-4, A-5, A-6, A-7 and A-8 in accordance with AASHTO Designation M-145.
- D. Graded Limerock: Material for backfill below precast structures shall be graded limerock equal to state DOT specifications.
- E. Select Material: Select material shall be suitable material that does not contain any rock larger than that which will pass through a 3-inch diameter ring.

Part 3.00 Execution

3.01 PREPARATION

- A. Clearing, Grubbing, and Stripping
- B. Clearing, grubbing, and stripping shall be performed in the areas where required for the proper installation of structures at locations shown on the Drawings. It shall include the complete removal and satisfactory disposal of all timbers, brush, stumps, weeds, rubbish, tops, and all other obstructions resting on or protruding through the surface of the existing ground.
- C. Selective clearing shall be performed in areas shown on the Drawings or as required by the Owner, in order to save plantings, shrubbery, trees, utility poles, or structures. The above items, where designated by the Owner or Engineer, shall be transplanted, relocated, braced, shored, or otherwise protected as directed by the Owner.

3.02 PERFORMANCE

A. Excavation

1. The Contractor shall perform all excavation of every description and of whatever substances encountered, to the dimensions required for construction and as specified herein. All excavations shall be made by open cut.
2. Slopes of excavated areas below 4 feet deep shall be sloped at 1.5 horizontal (H) to 1 vertical (V) or flatter and be protected from seepage and erosion. Temporary excavations greater than 10 feet deep should have side slopes of 2H:1V or flatter or be properly sheeted and braced.
3. Excavation areas shall be properly sheeted and braced if required to protect the safety of workmen, the general public, this or other work or structures, or excavation walls. Excavation for the structures shall be sufficient to provide a clearance between their outer surfaces and the face of the excavation, sheeting, or bracing, of not less than 2 feet. Materials encountered in the excavation which have a tendency to slough or fall into the excavations, if not removed, will weaken the overlying strata, or are otherwise rendered unstable by the excavation operation shall be retained by sheeting, stabilization, grouting or other approved methods.
4. Excavation for the structures shall be carried to an elevation one (1) foot lower than the proposed outside bottom of the structure to provide space for the select backfill material. Any unsuitable material encountered below proposed structures shall be removed and replaced with select material. Prior to placing the select backfill, the excavation shall be leveled so that it is reasonably level over the full area beneath the surface to be extended and the structure.
5. Excavation for structures shall be carried down to the bottom of the structure where dewatering methods are such that a dry excavation bottom is exposed and the naturally occurring material at the bottom of the excavation is not disturbed, and the material has not more than 12 inches of water above it. Any water which accumulates in the excavations for structures shall be removed promptly by well pumps in a manner as to not cause injury to the public health, or to private property, to work completed or in progress, to the surface of the streets, or cause any interference with the use of the same by the public. Pumps and engines for dewatering systems shall be operated with mufflers and at a minimum noise level suitable to a residential area. The Contractor shall be responsible for any nuisance created due to the disposal of water from his drainage system.
6. All excess suitable material shall be stockpiled on-site at a location approved by the Owner and Engineer. Muck, organic, silt and clayey sediments, and other unsuitable material excavated under the requirements of this Section shall be disposed of off-site, unless otherwise indicated on the Drawings or as directed by the Owner, at the Contractor's expense.
7. The space between the proposed outside bottom of the structure and the bottom of the excavation shall be backfilled with graded limerock and leveled to receive the proposed structure.
8. Suitable backfill material shall be provided, placed and compacted around the structures as required to fill the excavated area up to finish grades, as shown on the Drawings. Materials to be used for fill shall be approved by the Owner's Geotechnical Consultant prior to their placement. If a suitable fill material source is available within the limits of the project, the Owner may allow the use thereof and shall designate the borrow site whereby the Contractor may acquire the fill. If a suitable fill material source is not available on the project site, the Contractor shall furnish the necessary additional fill material to complete the work to the lines and grades indicated on the Drawings.
9. The Contractor shall provide adequate protection against construction activity for all existing structures and utilities, above the surface or underground, including trees that are to remain, and other construction activities concurrently occurring at the site.
10. Should damage occur to any structure, utility or other facility from these construction activities, repair or replacement to a condition equal or better than the original shall be immediately made by the Contractor, at no cost to the Owner.
11. Definitions:
 1. Maximum Density: Maximum weight in pounds per cubic foot of a specific material as determined by ASTM Test Designation D-1557.
 2. Optimum Moisture: Percentage of water in a specific material at maximum density.

END OF SECTION

SECTION 02221 – TRENCHING, BACKFILLING AND COMPACTION FOR UTILITY AND DRAINAGE SYSTEMS

Part 1.00 General

1.01 WORK INCLUDED

- A. The work specified in this Section consists of furnishing all labor, materials and equipment, and performing all operations required to complete the site preparation, earthwork and grading as shown on the Drawings and as specified herein, for construction of the utility and drainage systems consisting of trenching, backfilling, and compaction. This work shall include, but not be limited to: site clearing and grubbing; stripping; dewatering; trenching; removal of muck and other unsuitable material; earthwork for grading and other related requirements; backfilling; compaction; supplying approved fill material; final site grading; and other related requirements.
- B. The operations specified herein shall be performed within the limits indicated for site grading and other construction, as shown on the Drawings.
- C. The Contractor shall provide adequate protection against construction activity for all existing structures and utilities, above the surface or underground, including trees that are to remain, and other construction activities concurrently occurring at the site.
- D. Should damage occur to any structure, utility or other facility from these construction activities, repair or replacement to a condition equal or better than the original shall be immediately made by the Contractor, at no cost to the Owner.
- E. Definitions:
 1. Maximum Density: Maximum weight in pounds per cubic foot of a specific material as determined by ASTM Test Designation D-1557.
 2. Optimum Moisture: Percentage of water in a specific material at maximum density.

1.02 RELATED WORK

- A. Section 02210 – Site Earthwork
- B. Section 02220 – Structure Excavation and Backfill
- C. Section 2530 – Dewatering System

1.03 REFERENCE INFORMATION

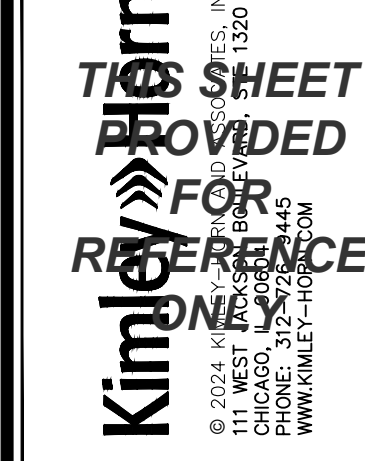
- A. Contractor may obtain the geotechnical report(s) pertaining to the site from the Engineer, for requirements of related standards.
- B. Contractor may obtain a copy of standard specifications from the City, at his own expense, for requirements of related standards.



1-800-292-8989

CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE JOB SITE AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES, OMISSIONS OR ERRORS BEFORE BEGINNING OR FABRICATING ANY WORK. DO NOT SCALE DRAWINGS.

IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS AUTHORIZED UNDER THE DIRECTION OF A LICENSED ARCHITECT, TO ALTER OR ALTER IN ANY WAY.



Issue Date: 06-20-24

| REVISION | |
|----------|----------|
| 1 | 07-08-24 |

AGENCY REVISIONS

Restaurant #: 6526

OLIVE GARDEN
 P62/DOM-BOX-L

HK Q3 2024 REV.

420 SE
 ALICE'S RD.

WAUKEE,
 IOWA

Drawing
 CIVIL
 SPECIFICATIONS
 (2 OF 5)

SECTION 02507 – PRIME AND TACK COATS

Part 1.00 General

- 1.01 WORK INCLUDED
- A. The work specified in this Section consists of an application of bituminous material on previously prepared bases and on existing pavement surfaces in accordance with these specifications and in conformity with the lines, grades, dimensions and notes shown on the Drawings.

Part 2.00 Products

- 2.01 MATERIALS
- A. Prime Coat: Unless otherwise indicated, the material used for the prime coat shall be cutback Asphalt Grade RC-70 or RC-250 and shall conform to the requirements specified in AASHTO Designation M-81. Unless otherwise indicated, the use of either RC-70 or RC-250 shall be at the Contractor's option.
 - B. Tack Coat: The material used for the tack coat shall be emulsified asphalt, Grade RS-2 and shall conform to the requirements specified in AASHTO Designation M-140.

2.02 EQUIPMENT

- A. The pressure distributor used for placing the tack or prime coat shall be equipped with pneumatic tires having sufficient width of rubber in contact with the road surface to avoid breaking the bond or forming a rut in the surface. The distance between the centers of openings of the nozzle or nozzles of the spray bar shall be equal to the width of the application required, within an allowable variation of not less than 25 percent, nor more than 75 percent in excess of the other nozzles which shall have uniform openings. When the application covers less than the full width, the normal opening of the end nozzle at the junction line may remain the same as those of the interior nozzles.

Part 3.00 Execution

- 3.01 PREPARATION
- A. Before applying any bituminous material, all loose material, dust, dirt, and foreign material, which might prevent proper bond with the existing surface, shall be removed. Particular care shall be taken to clean the outer edges of the strip to be treated in order to ensure that the prime or tack coat will adhere.

- B. When the prime or tack coat is applied adjacent to curb and gutter, or any other concrete surface (except where they are to be covered with a bituminous wearing course), such concrete surfaces shall be protected by heavy paper or other protective material while the prime or tack coat is being applied. Any bituminous material deposited on such concrete surfaces shall be removed immediately.

3.02 WEATHER LIMITATIONS

- A. No bituminous material shall be applied when the air temperature is less than 50°F in the shade, or when the weather conditions or the condition of the existing surface is unsuitable. In no case shall bituminous material be applied while rain is falling or when there is water on the surface to be treated.

3.03 APPLICATION OF PRIME COAT

- A. After the base has been finished, the full width of surface shall be swept with a power broom supplemented with hand brooms and mechanical blowers prior to the application of the prime coat. Care shall be taken to remove all loose dust, dirt and objectionable matter. If deemed necessary, the base shall be lightly sprinkled with water immediately in advance of the prime coat. The prime coat shall be applied to the full width of the surface to be treated. The temperature of the prime material shall be such as to ensure uniform distribution. The material shall be applied with a pressure distributor as specified above. The amount to be applied shall be sufficient to coat the surface thoroughly and uniformly without any excess to form pools or to flow off the base. For limerock base, the rate of application shall not be less than 0.10 gallons per square yard. For other bases, the rate of application shall not be less than 0.15 gallons per square yard. For soil cement base, the rate of application shall not be less than 0.15 gallons per square yard.
- C. The prime material shall be applied in a uniform layer. The material shall be applied in a light uniform application of clean sand shall be applied and rolled. The sand shall be nonplastic, shall be free from silt and rock particles and shall not contain any sticks, vegetation, grass, roots or organic matter. After the sand covering has been applied, the surface may be opened to traffic.

3.04 APPLICATION OF TACK COAT

- A. In general, a tack coat will not be used on primed bases except in areas which have become excessively dirty and cannot be cleaned or where the prime has cured and lost all of its bonding effect.
- B. No tack coat shall be applied until the primed base or leveling course has been cleaned and is free from sand, dust and other loose material.
- C. The tack coat shall be applied with a pressure distributor as specified above. It shall be heated to a suitable consistency and applied in a thin uniform layer at the rate between 0.02 gallons and 0.08 gallons per square yard.
- D. The tack coat shall be applied sufficiently in advance of the laying of the wearing surface to permit drying, but shall not be applied for in advance or over such an area as to cause its adhesiveness as a result of being covered with dust or other foreign material. Suitable precautions shall be taken by the Contractor to protect the surface while the tack coat is drying and until the wearing surface is applied.

END OF SECTION

SECTION 02512 – ASPHALTIC CONCRETE PAVING

Part 1.00 General

- 1.01 SCOPE OF WORK
- A. The work specified in this Section consists of the construction of asphaltic concrete surface courses composed of a mixture of aggregates, mineral filler and asphalt cement properly laid upon a prepared subgrade, in accordance with these specifications and in conformity with the lines, grades, thickness and typical cross section shown on the Drawings.

- B. The Contractor shall furnish and apply all asphaltic concrete as specified by the Drawings. Asphaltic concrete pavement around drain inlets and catch basins shall conform to the following provisions, except placing material may be by hand methods.

1.02 RELATED WORK

- A. Section 02210 – Site Earthwork
- B. Section 02234 – Soil Cement Base
- C. Section 02240 – Concrete

1.04 REGULATORY AGENCY REQUIREMENTS

- A. Conform to governing authority requirements for application licensing and authority to use toxicant chemicals.
- B. Provide certification that toxicants conform to requirements.

1.05 SUBMITTALS

- A. Product Data: Submit per SUBMITTALS Section. Indicate toxicants to be used, composition by percentage, dilution schedule, and intended application rate. Owner's acceptance is required prior to shipment.
- B. Manufacturer's Installation Instructions: Submit per SUBMITTALS Section.

1.06 GUARANTEE

- A. Bonded Guarantee which covers against invasion or propagation of subterranean termites, damage to building or building contents caused by termites; repairs to building or building contents so caused, for a period of five years after substantial completion; subject to annual renewal thereafter.

Part 2.00 Products

2.01 MATERIALS

- A. Bituminous Material: Asphalt cement, Viscosity Grade AC-20, shall conform to the requirements of State Department of Transportation (latest edition).
- B. Course Aggregate: 1. The coarse aggregate shall be composed of clean, durable limestone. When subjected to the Los Angeles Abrasion Test (ASTM T-96), the loss shall not exceed 40 percent. 2. Extraneous Substances: All coarse aggregate shall be washed and free from disintegrated pieces, soft, silty, vegetable matter and adherent coatings as specified by the Drawings. a. The weight of the extraneous substances shall not exceed the following percentages:

| | |
|-------------------|-------|
| Coal and Lignite | 0.25% |
| Clay Lumps | 0.05 |
| Clay and Clinkers | 0.05 |
| Soft Fragments | 10.00 |
| Flint | 0.05 |
| Sticks (Weeds) | 0.03 |

 Material Passing No. 200 Sieve .175

- 3. In addition, the sum of the percentages of all materials listed above shall not exceed 10 percent. Course aggregate containing any appreciable amount of phosphate shall not be used.

| |
|---|
| 3. Stone: Pre-Ternozoic limestone and dolomites shall not be used as crushed-stone aggregates, either coarse or fine, for wearing courses of asphaltic concrete surface courses. This specifically includes materials from the Ketona Dolomite (Cambrian), Newala Limestone (Lower Ordovician), Bangor Limestone (Mississippian), and other formations of similar composition and origin occurring in central and northern Alabama and Georgia. |
|---|

 4. Bangor Limestone (Mississippian) and other formations of similar composition and origin occurring in central and northern Alabama and Georgia. It may be either air-cooled blast-furnace slag or phosphate slag. It shall be reasonably uniform in density and quality, and free from deleterious substances other than as permitted above. The total content of sulfur shall not be more than 1.5 percent of sulfur. The dry rodded weight shall be not less than 70 pounds per cubic foot. The loss, when the slag is subjected to the Los Angeles Abrasion Test, shall not exceed 45 percent.
- C. Fine Aggregate: 1. Fine aggregate concrete shall consist of natural sand, stone screenings, slag screenings or a coarse aggregate composed of clean, tough, angular grains, free from clay, loam or other foreign matter. Stone or slag screenings shall be produced from materials complying with the abrasion requirements for coarse aggregate specified above. 2. Any screenings used in the combination of aggregate shall contain not more than 15 percent of material passing the No.200 sieve and shall be washed if necessary to meet this requirement. 3. The natural sand portion of the fine aggregate other than screenings shall be siliceous containing not more than 10 percent of material passing the No. 200 sieve.

END OF SECTION

SECTION 02276 – TEMPORARY EROSION AND SEDIMENTATION CONTROL

Part 1.00 General

1.01 WORK INCLUDED

- A. The work specified in this Section consists of designing, providing, maintaining and removing temporary erosion and sedimentation controls as necessary.
- B. Temporary erosion controls include, but are not limited to, grading, mulching, seeding, watering and reseeded on-site surfaces and spoil and borrow area surfaces, and providing interceptor ditches of ends of berms, installing staked silt barriers or floating silt barriers at those locations which will ensure that erosion and pollution during construction will be prevented in accordance with state DOT Standard Specifications for Road and Bridge Construction.
- C. Contractor is responsible for providing effective temporary erosion and sedimentation control measures during construction or until final controls become effective, so as to ensure that sedimentation and/or turbidity problems are not created in the receiving water bodies. The Contractor shall be responsible for the correction of any erosion, shading, or water quality problems that result from the construction or operation of the surface water management system.
- D. Temporary sedimentation controls include, but are not limited to, silt dams, traps, barriers, and other appliances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the Owner.
- F. Temporary erosion and sediment control measures shall include effective means to maintain water quality prior to discharge from project site.

1.02 RELATED WORK

- A. Section 02210 – Site Earthwork
- B. Section 02332 – Seeding and Mulching
- C. Section 02934 – Sodding

1.03 SUBMITTALS

- A. The Contractor shall be required to submit to state and local agencies (with copy to the Owner and Engineer) for review and approval the program for temporary erosion and sediment control to be implemented by the Contractor prior to commencing construction. All additional permits required by the agencies shall be obtained and paid for by the Contractor.
- B. The approval by the state and local agency of the Contractor's program in no way relieves the Contractor from the responsibility to meet all applicable rules, regulations, and permitting conditions.

Part 2.00 Products

2.01 EROSION CONTROL

- A. Materials to control erosion and sedimentation shall comply with Iowa DNR GP#2 and City of Waukee CODES#20 requirements.

2.02 SEDIMENTATION CONTROL

- A. Install and maintain silt dams, traps, barriers, and other appliances as necessary. Hay bales, which deteriorate, and filter stone which dislodges, shall be replaced.

Part 3.00 Execution

3.01 PREPARATION

- A. Minimum procedures for grassing are: 1. Scarify slopes to a depth of not less than six inches and remove large clods, rock, stumps, roots larger than 1/2-inch in diameter, and debris. 2. Sow seed within twenty-four (24) hours after the ground is scarified with either mechanical seed drills or rotary band seeders. 3. Apply mulch loosely and to a thickness of between 1/2-inch and 1-1/2 inches. 4. Apply netting over mulched areas on sloped surfaces. 5. Roll and water seeded areas in a manner that will encourage sprouting of seeds and growing of grass. Reseed areas which exhibit unsatisfactory growth. Backfill and seed eroded areas.
- B. Floating Silt Barriers: 1. The work shall consist of installing, maintaining and removal of floating silt barriers to contain turbidity that may occur as the result of dredging, filling, dewatering, or other construction activities in Waters of the State or any of the existing on-site lakes, ponds, or storm-water management systems. 2. The type of barrier used, the deployment and maintenance of the barrier shall be such as to minimize dispersion of turbid waters and will not cause an increase in the existing permitted turbidity from the construction site into the receiving waters.

3.02 PERFORMANCE

- A. Should any of the temporary erosion and sedimentation control measures employed by the Contractor fail to produce results which comply with the requirements of this specification, the Contractor shall immediately take whatever steps necessary to correct the deficiency.

END OF SECTION

SECTION 02285 – TERMITE CONTROL

Part 1.00 General

- 1.01 SECTION INCLUDES
- A. Soil poisoning treatment.
 - B. Warranty

1.02 INENT

- A. To guard against termites and other common ground insects detrimental to wood construction. Materials mentioned in Part 2.00 of this Specification are suggested for use but shall not be used if disallowed by governing laws and/or ordinances.

1.03 QUALITY ASSURANCE

- A. Applicator: Company specializing in soil treatment for termite control with five years documented experience.
- B. Materials: Provide certification that toxicants conform to requirements.

1.04 REGULATORY AGENCY REQUIREMENTS

- A. Conform to governing authority requirements for application licensing and authority to use toxicant chemicals.

1.05 SUBMITTALS

- A. Product Data: Submit per SUBMITTALS Section. Indicate toxicants to be used, composition by percentage, dilution schedule, and intended application rate. Owner's acceptance is required prior to shipment.
- B. Manufacturer's Installation Instructions: Submit per SUBMITTALS Section.

1.06 GUARANTEE

- A. Bonded Guarantee which covers against invasion or propagation of subterranean termites, damage to building or building contents caused by termites; repairs to building or building contents so caused, for a period of five years after substantial completion; subject to annual renewal thereafter.

Part 2.00 Products

2.01 TOXICANT CHEMICAL(S)

- A. Terimid, BASF – apply per manufacturer's recommendations.

2.02 MIXES

- A. Dilute toxicant chemical to a percent solution specified by manufacturer.

Part 3.00 Execution

3.01 DELIVERY

- A. Deliver materials in original unopened manufacturer's packaging with labels and seals identifying content.

3.02 INSPECTION

- A. Verify exposed soil surfaces are unfrozen, sufficiently dry to absorb toxicant, ready to receive treatment. Beginning of application means acceptance means acceptance of soil conditions.

3.03 APPLICATION

- A. Apply materials in accord with recommended safety precautions for materials used.
- B. Toxicant Chemicals: 1. Apply toxicant immediately prior to installation of vapor barrier under slab-on-grade or finish grading outside foundation walls. Apply extra treatment to structure penetrations, pipe ducts, and other soil penetrations. Apply as a coarse spray to ensure uniform distribution. Coordinate soil treatment at foundation perimeter with finish grading and landscaping work to avoid disturbance of treated soil.

3.04 CLEAN-UP

- A. Upon completion of work of this Section, remove related debris from premises.

END OF SECTION

SECTION 02240 – STABILIZED SUBGRADE

Part 1.00 General

1.01 WORK INCLUDED

- A. The work specified in this Section consists of the construction of a stabilized subgrade where indicated on the Drawings. Construction shall be to the uniformly, density and bearing ratio specified hereinafter. Roadways, streets, and parking areas shall be stabilized to the depths and dimensions indicated on the Drawings. B. Definitions: The stabilizing shall be stone per state DOT or as described hereinafter. The required bearing ratio value shall be obtained either by constructing the subgrade of selected materials from the roadway and borrow areas, or by stabilizing the subgrade material by the addition and mixing in of suitable stabilizing material. Such work shall be done in accordance with these specifications, lines, grades, thicknesses and notes as shown on the Drawings.

1.02 RELATED WORK

- A. Section 02210 – Site Earthwork

Part 2.00 Products

2.01 MATERIALS

- A. General: The particular type of stabilizing material to be used shall be in accordance with Paragraph 2.01.E hereinafter and shall meet the following requirements: 1. Under this method, it shall be the Contractor's responsibility that the spreading of any additional commercial or local materials. Removal of any section of existing base will not be required until the need for it in maintaining traffic is fulfilled. 2. The utilization of materials from an existing base may be called for in combination with the designated type of stabilizing. C. Commercial Materials: 1. General: Materials that are designated as Commercial Materials that are to be used for stabilizing may be either commercial limerock, limerock overburden or crushed shell, or state DOT specified. 2. Limerock: For limerock and limerock overburden, the percentage of carbonates of calcium and magnesium shall be at least 70, and the plasticity index shall not exceed 10. The gradation of both commercial limerock and limerock overburden shall be such that 97 percent of these materials will pass a 1 1/2-inch sieve. 3. Crushed Shell: Crushed shell for this use shall be mollusk shell (i.e., oysters, mussels, clams, cemented coquina, etc.). Steamed shell will not be permitted. This shell shall meet the following requirements: a. At least 97 percent by weight of the total material shall pass a 3/4-inch screen and at least 50 percent by weight of the total material shall be retained on the No. 4 sieve. b. Not more than 20 percent by weight of the total material shall pass the No. 200 sieve. The determination of the percentage passing the No. 200 sieve shall be made by washing the material over the sieve. c. In the event that the shell meets the above requirements without crushing, crushing will not be required. D. Local Materials: 1. General: Local materials used for stabilizing may be high-bearing-value soils of sand-silt-clay material, or materials passing the 40-mesh sieve shall have a liquid limit not greater than 30 and a plasticity index not greater than 10. 2. Blending: No blending of materials to meet these requirements will be permitted unless authorized by the Engineer. When blending is permitted, the blended material shall be tested and approved before being spread on the roadway or parking area. E. Type B Stabilization: 1. The types of materials, Commercial or Local, shall be at the Contractor's option. 2. No separate payment for stabilizing materials will be made. 3. Prior to the beginning of stabilizing operations, the area to be stabilized shall have been constructed to an elevation such that upon completion of stabilizing operations the completed stabilized subgrade will conform to the lines, grades and cross-section shown in the plans. Prior to the spreading of any additional stabilizing material, the surface of the subgrade shall be brought to a plane approximately parallel to the plane of the proposed finished surface. 4. The subgrade to be stabilized may be processed in one or more sections, units, or methods being used do not provide the required uniformity, particle size limitation, compaction and other desired results, in which case, the Engineer will direct that the processing be done in more than one course.

Part 3.00 Execution

3.01 PREPARATION

- A. General: 1. Prior to the beginning of stabilizing operations, the area to be stabilized shall have been constructed to an elevation such that upon completion of stabilizing operations the completed stabilized subgrade will conform to the lines, grades and cross-section shown in the plans. Prior to the spreading of any additional stabilizing material, the surface of the subgrade shall be brought to a plane approximately parallel to the plane of the proposed finished surface. 2. The subgrade to be stabilized may be processed in one or more sections, units, or methods being used do not provide the required uniformity, particle size limitation, compaction and other desired results, in which case, the Engineer will direct that the processing be done in more than one course.

3.02 APPLICATION

- A. Stabilizing Material: 1. When additive stabilizing materials are required, the designated quantity shall be spread uniformly over the area to be stabilized. 2. When materials from an existing base are to be utilized in the stabilizing at a particular location, all of such materials shall be placed and spread prior to the addition of stabilizing additives. 3. Commercial stabilizing material shall be spread by the use of mechanical spreaders except that where use of such equipment is not practicable other means of spreading may be used, but only as authorized in writing by approval of the Engineer of the proposed alternate method. B. Mixing: 1. The mixing shall be done with rotary tillers, or other suitable equipment. The area to be stabilized shall be thoroughly mixed throughout the entire depth and width of the stabilizing limits. 2. The mixing operations, as specified, will be required regardless of whether the existing soil, or select soils placed within the limits of the stabilized sections, have the required bearing value without the addition of stabilizing materials. C. Maximum Particle Size of Mixed Material: At the completion of mixing, all particles of material within the limits of the area to be stabilized shall pass a 3/4-inch ring. Any particles not meeting this requirement shall be removed from the stabilized area or shall be broken down so as to meet this requirement. D. Compaction: After the mixing operations have been completed and requirements for bearing value, uniformity and particle size have been satisfied, the stabilized area shall be compacted, in accordance with Paragraph 3.02.B hereinafter. The materials shall be compacted at a moisture content permitting the specified compaction. If the moisture content of the material is improper for attaining the specified density, either water shall be added or the material shall be permitted to dry until the proper moisture content for the specified compaction is reached. E. Finish Grading: The completed stabilized subgrade shall be shaped to conform with the finished lines, grades and cross-section indicated in the Drawings. The subgrade shall be checked by the use of elevation stakes, or other means approved by the Engineer. F. Requirements for Condition of Completed Subgrade: 1. After the stabilizing and compacting operations have been completed, the subgrade shall be firm and substantially unyielding, to the extent that it will support construction equipment and will have the bearing value required by the Drawings. 2. All soft and yielding material, and any other portions of the subgrade that will not compact readily, shall be removed and replaced with suitable material and the whole subgrade brought to line and grade, with proper allowance for subsequent compaction. G. Maintenance Of Completed Subgrade: After the subgrade has been completed as specified above, the Contractor shall maintain it free from ruts, depressions and any damage resulting from the hauling or handling of materials, equipment, tools, etc. It shall be the Contractor's responsibility to maintain the required density until the subsequent base or pavement is in place. Such responsibility shall include repairs, replacement, etc., of curbs and gutters, sidewalks, etc., which might become necessary in order to reconstruct the subgrade in the event of underwash or other damage occurring to the prepared and stabilized subgrade. Any such work required for reconstruction shall be the Contractor's expense. Ditches and drains shall be constructed and maintained along the completed subgrade section to provide adequate drainage.

3.03 FIELD QUALITY CONTROL

A. Bearing Value Requirements:

- 1. General: Bearing value samples will be obtained and tested by the Engineer at completion of satisfactory mixing of the stabilized area. For any area where the bearing value obtained is deficient from the value indicated in the Drawings, excess of the tolerance established herein, additional stabilizing material shall be spread and mixed in accordance with 3.02.B.1 & 2. This reprocessing shall be done for the full length of the roadway being stabilized and longitudinally for a distance of 50 feet beyond the limits of the area in which the bearing value is deficient. The Contractor shall make his own determination of the quantity of additional stabilizing material to be used in reprocessing.

B. Density Requirements:

- 1. General: Within the entire limits of the width and depth of the areas to be stabilized, the minimum density acceptable at any location will be 98 percent of the maximum density as determined by ASTM T-180, Test Method A. C. Testing: Tests for the subgrade bearing capacity and compaction shall be located no more than 300 feet apart and shall be staggered to the left, right, and on the centerline of roadways, and at a frequency of one test per 1,000 square yards of stabilized area in parking areas, at locations to be determined by the Engineer.

END OF SECTION

SECTION 02221 – TRENCHING, BACKFILLING AND COMPACTION FOR UTILITY AND DRAINAGE SYSTEMS – CONTO.

- 5. After the backfill has been placed to a level 12 inches over the waterline or force main pipe, the remainder of the backfill shall be placed in layers, not to exceed 12 inches, and compacted with mechanical vibrators or other suitable equipment, to obtain a density of the backfilled material of not less than 98 percent of its maximum density as hereinafter defined.
- 6. After selected backfill has been placed to a depth of 12 inches over the storm drainage and sanitary sewer pipe, backfilling shall proceed to a depth of 30 inches over the pipe by placing the backfill material in 9-inch layers and thoroughly compacting it with mechanical vibrators. Backfill in this portion of the work shall be compacted to 95 percent of maximum density of the material as hereinafter defined.
- 7. After the backfill has been placed to a level 30 inches over the storm drainage and sanitary sewer pipe, the remainder of the backfill shall be placed in layers, not to exceed 12 inches, and compacted with mechanical vibrators or other suitable equipment to obtain a density of the backfilled material of not less than 95 percent of its maximum density as hereinafter defined.
- 8. For storm drainage and sanitary sewer pipe in unproved areas outside the right-of-way, the backfill shall be placed to a level 36 inches above the crown of the pipe by placing the backfill material in 9 inch layers and compacted to a minimum density of 95 percent of its maximum density, as hereinafter defined. The remaining backfill shall be placed in layers of not more than 12 inches and compacted to a minimum density of 95 percent of its maximum density.
- 9. Within paved areas of trench excavation, the base and surfacing shall be reconstructed as specified under Section 02574 – Pavement Removal and Replacement (granular material all the way up). 10. No more than 800 feet of trench with pipe in place shall be partially backfilled at any time.

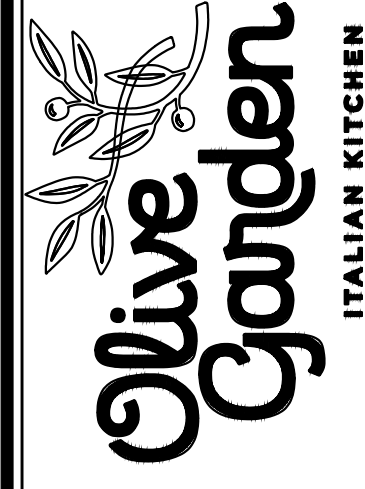
E. Additional Excavation and Backfill:

- 1. Where unsuitable material, such as organic soils, roots, mulch, other vegetable matter, or other material which, in the opinion of the Geotechnical Engineer, will result in unsatisfactory foundation conditions, is encountered below the level of the proposed pipe bedding material, it shall be wholly or partially removed as directed by the Geotechnical Engineer and disposed of off-site at the Contractor's expense. Sheeting shall be installed, if necessary, to maintain pipe trenches within the specified limits. The resulting excavation shall be backfilled with suitable backfill material, placed in 6 inch layers, tamped and compacted up to the level of the bottom of the proposed pipe bedding material. Sufficient compaction of this material shall be performed to protect the proposed pipe against settlement. Construction shall then proceed in accordance with the provisions as specified above.
- 2. Additional excavation shall be performed only when ordered by the Engineer. Where organic or other unsuitable material is encountered in the excavation, the Contractor shall bring the condition to the attention of the Engineer and obtain his determination as to whether or not the material will require removal, prior to preparing the pipe bedding.
- F. Restoration of Existing Surfaces: Paved and graded areas disturbed by the operations required under this Section shall be restored to a condition equal to or better than the existing condition, or as indicated on the Drawings and/or specified herein.

CONTRACTOR SHALL VERIFY ALL
CONDITIONS AND DIMENSIONS
AT THE JOB SITE AND NOTIFY
THE ARCHITECT OF ANY DIMEN-
SIONAL ERRORS, OMISSIONS OR
DISCREPANCIES BEFORE BEGIN-
NING OR FABRICATING ANY WORK
DO NOT SCALE DRAWINGS

IT IS A VIOLATION OF THE LAW
FOR ANY PERSON, UNLESS ACTING
UNDER THE DIRECTION OF A
LICENSED ARCHITECT, TO ALTER
ANY ITEM IN ANY WAY.

**THE SHEET
PROVIDED
FOR
REFERENCE
KINDLY
DO NOT SCALE DRAWINGS**



Issue Date: 06-20-24

| REVISION | |
|----------|----------|
| 1 | 07-08-24 |

AGENCY REVISIONS

Restaurant #: 6526

OLIVE GARDEN
P62DOM-BOX-L

HK Q3 2024 REV.

420 SE
ALICE'S RD.
WAUKEE,
IOWA

Drawing
CIVIL
SPECIFICATIONS
(3 OF 5)

SECTION 02512 - ASPHALTIC CONCRETE PAVING - CONTINUED

4. The asphalt concrete, when tested by means of laboratory sieves, shall meet the following requirements:

| Passing Sieve | Retained on Sieve | Percent by Weight |
|---------------|-------------------|-------------------|
| No. 4 | No. 10 | 90-100 |
| No. 10 | No. 40 | 15-50 |
| No. 40 | No. 80 | 25-60 |
| No. 80 | No. 200 | 8-10 |

5. Fine aggregate containing more than 1.00 percent of phosphate shall not be used.
D. Mineral Filler:
1. Mineral filler shall consist of ironrock dust, Portland cement, slag dust, hydrated lime or other inert mineral matter approved by the Engineer and conforming to the following gradation requirements:
Total Passing No. 30 Sieve 100 Percent
Total Passing No. 80 Sieve 95 Percent (Min.)

2. The mineral filler shall be thoroughly dry and free from lumps consisting of aggregations of fine particles. Ground phosphate will not be allowed as a mineral filler.

2.02 GENERAL COMPOS-ON OF MIXTURE

A. The bituminous mixture shall be composed of a combination of aggregate (coarse, fine, or mixtures thereof), mineral filler, if required, and bituminous material. The several aggregate fractions shall be sized, uniformly graded and combined in such proportions that the resulting mixture will meet the grading and physical properties of the approved job mix formula.

B. In all cases, the job mix formula shall be within the design ranges specified in the following table:

| GRADATION DESIGN RANGE | | |
|------------------------|----------|----------|
| Sieve Size | Type 2-1 | Type 3-1 |
| 3/4" inch | 100 | 100 |
| 1/2" inch | 85-100 | 100 |
| 3/8" inch | 75-93 | 88-100 |
| No. 10 | 31-53 | 40-70 |
| No. 40 | 19-35 | 20-45 |
| No. 80 | 10-20 | 16-41 |
| No. 200 | 2-7 | 4-8 |

C. Asphalt cement (Bitumen) shall consist of 4-1/2 to 9 percent by weight of the total mix as determined by job mix formula. For highly absorptive aggregates, the upper limit may be raised.
D. Where hand placing and finishing is permitted for small and irregular areas, such as turnouts, crossovers, acceleration and deceleration lanes, etc., the portion of the Grade No. 16 coarse aggregate retained on a No. 4 sieve may be omitted from the mixture and the percent by weight of the coarse aggregate passing the No. 4 sieve and retained on the No. 10 sieve shall be within the range specified for the total coarse aggregate in the mix.
E. Proportions of Silica Sand and Local Materials: Not more than 25 percent of the total aggregate used shall be silica sand or local materials. The silica sand shall conform to all requirements of specifications and the local materials shall meet the requirements of state DOT Standard Specifications for Road and Bridge Construction (latest edition).

2.03 FORMULA FOR JOB MIX
A. The general composition limits prescribed above are master ranges of tolerances to govern mixtures made from any materials meeting the specifications, and they are maximum and minimum for all cases. A closer control appropriate to the job materials will be required for the specific project in accordance with the mix formula.
B. No work shall be started until the Engineer has approved the job mix formula.
C. Materials that will be used to make up the approved job mix shall be stockpiled in sufficient quantity to meet the demands for the entire project progress. If this is not practicable, care must be taken to ensure adequate quality control of the materials used in each job mix. Should the source of supply for the materials used in the job mix change, or should the materials from the source vary appreciably from the materials used in the job mix formula, the job mix formula must be altered accordingly.
C. Combined dry aggregate gradation of the hot bins shall be within the following limits of the job mix formula:

| Sieve Size | Tolerance Percent | |
|------------|-------------------|-----------|
| | One Test | Two Tests |
| 3/4" inch | 5.0 | 3.5 |
| 1/2" inch | 5.0 | 3.5 |
| 3/8" inch | 5.0 | 3.5 |
| No. 4 | 5.0 | 3.5 |
| No. 10 | 4.0 | 2.8 |
| No. 40 | 4.0 | 2.8 |
| No. 80 | 2.1 | 1.7 |
| No. 200 | 2.0 | 1.4 |

D. After the job mix formula is established, each mix for the project shall meet the approved formula within the following tolerances:
Characteristics Tolerance
Asphalt Content (Extraction) ± 0.70%
Asphalt Content (Printout) ± 0.30%
Passing No. 10 Sieve ± 0.20%
Passing No. 200 Sieve ± 0.00%
E. In no case shall a job mix that is outside the tolerances stated above be such that it falls out of the master range.
G. Samples of the mixture in use will be taken as many times daily as is necessary in the opinion of the Engineer. The mixtures shall be maintained uniformly throughout the project within the above tolerances.
H. Job materials found to have characteristics requiring a content of bituminous material less than is indicated in the formula prescribed above, will be rejected or adjusted to form blend, which will produce a balanced mixture under the approved conditions. When two or more aggregates are blended, the use of two or more bins shall be employed for the blending of such material.
I. The aggregates shall be heated and dried at the paving plant before entering the mixer. The temperature of the aggregates shall be so controlled that the temperature of the completed mixture at the plant will fall within the permissible range allowed by these Specifications. Any dried aggregated contaminated with fuel oil shall be wasted.

3.03 PREPARATION OF MIXTURE

A. Batch Mixing

| Mix Type | Minimum Marshall Stability (lbs.) | Flow (0.01 in.) | Minimum Air (MA) (%) | Void (V) (%) |
|----------|-----------------------------------|-----------------|----------------------|--------------|
| S-1 | 1500 | 8-14 | 14 | 3-5 |
| S-11 | 1000 | 8-16 | 14 | 3-7 |
| S-1 | 1000 | 8-14 | 14 | 3-5 |

3.01 PREPARATION OF ASPHALTIC CEMENT
A. The asphalt cement shall be delivered to the asphalt plant at a temperature not to exceed 350°F and shall be maintained within a range of 320°F to 350°F in advance of mixing operations. Heating within these limits shall be constant and wide fluctuations of temperature during a day's production will not be permitted.

3.02 PREPARATION OF AGGREGATES
A. Stockpiling coarse aggregate shall be done in such a manner so the aggregate will not segregate.
B. All aggregates to be blended or proportioned shall be placed in separate bins at the cold hopper and proportioned by means of calibrated gates or other approved devices. When two or more aggregates are blended, the use of two or more bins shall be employed for the blending of such material.
C. The aggregates shall be heated and dried at the paving plant before entering the mixer. The temperature of the aggregates shall be so controlled that the temperature of the completed mixture at the plant will fall within the permissible range allowed by these Specifications. Any dried aggregated contaminated with fuel oil shall be wasted.

3.03 PREPARATION OF MIXTURE
A. Batch Mixing
1. The dried aggregate, prepared as described herein before and combined in batches to meet the job mix formula by weighing each separate bin size, shall be conveyed to the empty mixer.
2. The hot asphalt cement, accurately measured, shall then be introduced, and the mixing continued until the mixture is thoroughly uniform and homogeneous. The total mixing time in no case shall be less than 35 seconds. Each batch must be kept separate throughout the weighing and mixing operations.
B. Continuous Mixing: The dried aggregate, prepared as described herein before and proportioned to meet the job mix formula by volumetric measurement, shall be introduced into the mixer. The hot asphalt cement shall be introduced into the mixer in synchronization with the feeding of aggregate. The quantity shall be measured by volume. Mixing shall be sufficient to produce a thoroughly uniform and homogeneous mixture.
C. General: The ingredients of the mix shall be heated and combined in such a manner as to produce a mixture which shall meet a temperature, when discharged from the pugmill or surge bin, between the limits of 230°F and 310°F.

3.04 TRANSPORTATION OF MIXTURE
A. The mixture shall be transported in light vehicles previously cleaned of all foreign material and, if necessary, each load shall be covered with a waterproof canvas cover of sufficient dimensions to protect it from weather conditions. The inside surface of the truck bodies may be thinly coated with soapy water, or a mixture of water with not more than five percent of lubricating oil, but no excess of either shall be used. After the truck bodies are coated before any mixture is placed therein, they shall be raised so that all excess water will drain out. Kerosene, gasoline or similar products shall not be used to prevent adhesion.

SECTION 02512 - ASPHALTIC CONCRETE PAVING - CONTINUED

3.04 TRANSPORTATION OF MIXTURE
A. The mixture shall be transported in light vehicles previously cleaned of all foreign material and, if necessary, each load shall be covered with a waterproof canvas cover of sufficient dimensions to protect it from weather conditions. The inside surface of the truck bodies may be thinly coated with soapy water, or a mixture of water with not more than five percent of lubricating oil, but no excess of either shall be used. After the truck bodies are coated before any mixture is placed therein, they shall be raised so that all excess water will drain out. Kerosene, gasoline or similar products shall not be used to prevent adhesion.

3.05 LIMITATIONS FOR SPREADING
A. The mixture shall be spread only when the surface is properly prepared and is intact, firm, cured and dry. No mixture shall be spread when the air temperature is less than 40°F, or when the spreading cannot be finished and compacted during daylight hours. The temperature of the mix at the time of spreading shall not be less than 230°F.

3.06 PLACING MIXTURE
A. Upon arrival, the mixture shall be dumped into an approved mechanical spreader and immediately spread and struck off to the full width required and to such appropriate loose depth for each successive course that when the work is completed the required thickness or weight of mixture per square yard will be secured. An excess amount of mixture shall be carried ahead of the screed at all times. Hand raking shall be done behind the machine as required.
B. In limited areas, where, on account of irregularities or unavoidable obstacles, the use of mechanical spreading and finishing equipment is impracticable, the mixture may be spread by hand, when so authorized by the Engineer.
C. The mixture shall be laid only when the surface to be covered is dry and only when weather conditions are suitable. All defective areas in the foundation shall be replaced in advance of laying the mixture.
D. All structures which will be in actual contact with the asphaltic mixture, including the vertical faces of existing pavements, shall be pointed with a uniform coating of asphalt material to provide a closely bonded, water-tight joint.
E. When necessary, due to traffic requirements, the mixture shall be laid in strips in such manner as to provide for a passage of traffic. When the road is closed to traffic, the mixture may be laid the full width of pavement, by machines traveling in echelon.
F. Before any rolling is started, the surface shall be checked, any inequalities adjusted, and the drippings, fat sandy accumulations from the screed, and fat spots from any source, shall be removed and replaced with satisfactory material.

3.07 COMPACTING MIXTURE
A. After the spreading, the mixture shall be rolled when it has set sufficiently or come to the proper condition to be rolled, and when the rolling does not cause undue displacement.
B. Rolling shall begin at the center and progress toward the outside, parallel to the centerline of the roadway, uniformly lapping at least one-half of the width of the roller.
C. The motion of the roller shall be such that it will be slow enough to avoid displacement of the mixture, and displacement of the roller shall be corrected by the use of rakes and fresh mixture where required. The rolling shall include transverse, longitudinal, diagonal and, where practicable, crescent rolling, as well as any other method which will obtain the specified density.
D. The self-rolling with steel-wheeled rollers shall follow from 5 tons to 12 tons shall follow as close behind the spreader as is possible without picking up, displacing, or blistering the material. Rolling with self-propelled pneumatic-tired rollers shall begin as soon as possible and as close behind the self-rolling as the heat of the mixture will permit. This rolling shall be done such that the self-propelled rollers shall cover every one of the surface with at least one roller wheel. The rolling shall be done before the pavement temperature is lower than 140°F, and shall be continued until all roller marks or tire marks are eliminated. Self-propelled, pneumatic-tired rollers shall be used for the rolling of patching and leveling courses. At the option of the Contractor, a steel-wheeled roller may be used to supplement the self-propelled pneumatic-tired rollers, but not more than one steel-wheeled roller may be used in conjunction with the necessary number of self-propelled pneumatic-tired rollers. After final compaction, the finished pavement shall at no point have a density less than 95 percent of the laboratory compacted density.
E. The self-propelled pneumatic-tired rollers shall proceed at a speed from 6 to 10 miles per hour and the rate of rolling shall not exceed 3,000 square yards per hour per roller. A sufficient number of self-propelled pneumatic-tired rollers shall be used so that the rolling of the surface for the required number of passes within this maximum rolling rate shall not delay any other phase of the placing operation, nor result in excessive cooling of the mixture before the rolling is complete. In the event that the rolling is not properly maintained to schedule as outlined above, the laying operation shall be discontinued until the surface has cooled to a temperature suitable for the rolling.
F. In all places inaccessible to a roller, such as adjacent to curbs, headers, gutters, bridges, manholes, etc., the required compaction shall be secured with tamps. Depressions which may develop before the completion of the rolling shall be remedied by loosening the mixture and adding new material to bring such depressions to a true surface.
G. Should any depressions remain after final compaction has been obtained the mixture shall be removed sufficiently and new material added to form a true and even surface.
H. The mixture, after compaction, shall be to the thickness shown on the Drawings. The surface, after compaction, of no place shall show excess of asphalt, and any excess of asphalt, or other defect, shall be cut out and replaced with fresh mixture and immediately compacted to conform with the surrounding area. Any mixture which becomes loose or broken, or which is otherwise defective prior to laying the wearing course shall be removed and replaced with fresh mixture. No. 10 shall be immediately compacted to conform with the surrounding area.
I. Gasoline or oil from rollers shall not be allowed to deposit on the pavement and any pavement damaged by such deposits shall be removed and replaced.
J. Any mixture remaining unrolled after rolling shall be removed and replaced.

3.08 JOINTS
A. Transverse Joints: At the end of each day's work, or whenever the laying is to be discontinued for such length of time as to allow the mixture to become chilled, transverse joints shall be formed either by laying a board, equal in thickness to the compacted thickness of the pavement, across the width of strip being spread and rolling the mixture against the board, or by using paper or sand.
B. Longitudinal Joints: Where only a portion of the width of pavement is to be laid and opened to traffic, the longitudinal joints shall be formed by rolling the exposed strip first laid. When the adjacent strip is constructed, the edge of the mixture in place shall be trimmed back so as to expose an even surface.
C. Overlays: If correcting, the overlay shall cover the length of the defective area and taper uniformly to a featheredge thickness at a minimum distance of 50 feet on either side of the defective area. The overlay shall extend full width of the roadway. Care shall be taken to maintain the specified cross slope. The mix used for the overlay may be adjusted as necessary for this purpose by the Engineer. Overlaying will not be permitted, when the finished pavement surface is to be constructed of a different concrete grade than the existing pavement.
D. Other Methods: For courses which will not be the final pavement surface, correction of minor deficiencies may be made by methods other than specified above and approved by the Engineer.
E. Thickness Requirements: The thickness of the compacted asphaltic concrete surface shall be determined by paving and shall be no less than that shown on the Drawings. Any surface course found to be less than the thickness shown on the Drawings by greater than 4-inches shall be removed and replaced.
F. Protection of Pavement: After the completion of the pavement, no vehicular traffic of any kind shall be permitted on the pavement until it has set sufficiently to prevent rutting or other distortion.

3.09 FIELD QUALITY CONTROL
A. Surface Requirements:
1. For the purpose of testing the finished surface, a 15-foot straightedge and a standard template cut to the true cross section of the road shall at all times be available on the work site.
2. The Contractor shall provide or designate some employee whose duty is to handle the straightedge and template in checking all rolled surfaces, under the direction of the Engineer.
3. The finished surface shall be such that it will not vary more than 1/4 inch from the template cut to the cross section of the road, not more than 3/16 inch from the 15-foot straightedge applied parallel to the center line of the pavement. Any irregularity of the surface exceeding the above limits shall be corrected. Depressions that may develop after the initial rolling shall be remedied by loosening or removing the mixture and adding new material to bring the areas to a true surface. No skin patching shall be done. Such portions of the completed pavement that are defective in surface composition or in composition, or that do not comply with all other requirements of these Specifications, shall be taken up and replaced with suitable mixture, properly laid in accordance with these specifications and at the expense of the Contractor.
4. Removing and Replacing: If correction is made by removing and replacing the pavement, the removal shall be for the full depth of the course and extend at least 50 feet on either side of the defective area, for the full width of the paving lane.
5. Overlaying: If correcting, the overlay shall cover the length of the defective area and taper uniformly to a featheredge thickness at a minimum distance of 50 feet on either side of the defective area. The overlay shall extend full width of the roadway. Care shall be taken to maintain the specified cross slope. The mix used for the overlay may be adjusted as necessary for this purpose by the Engineer. Overlaying will not be permitted, when the finished pavement surface is to be constructed of a different concrete grade than the existing pavement.
6. Other Methods: For courses which will not be the final pavement surface, correction of minor deficiencies may be made by methods other than specified above and approved by the Engineer.
7. Thickness Requirements: The thickness of the compacted asphaltic concrete surface shall be determined by paving and shall be no less than that shown on the Drawings. Any surface course found to be less than the thickness shown on the Drawings by greater than 4-inches shall be removed and replaced.
8. Protection of Pavement: After the completion of the pavement, no vehicular traffic of any kind shall be permitted on the pavement until it has set sufficiently to prevent rutting or other distortion.

3.10 TESTING AND REPORTS
A. Testing for performance in accordance with these Specifications will be paid for by the Owner. The frequency of testing shall be a minimum of that specified below and at the locations as directed by the Engineer. However, any retesting necessary in areas not initially meeting these Specifications shall be paid for by the Contractor.
B. Prior to the start of the placing of the asphaltic concrete, the job mix formula prepared by a certified material-testing laboratory shall be submitted to and be approved by the Engineer. All job mix design formula design shall be current within the last 12 months.
C. During construction of the asphaltic concrete wearing surface, the following tests must be completed and reports submitted to the Engineer before acceptance can be given:
1. Extraction stability and gradation of combined aggregate - 1 test per day, Bitumen content, stability and gradation of aggregates to conform to intent of job mix formula.
2. Density and depth checks - 1 test per 250 linear feet of road (minimum 2 tests per street) and one test per 2,700 square yards of parking lot area. Minimum acceptable density for each course of asphaltic concrete material shall be 95 percent of the design unit weight in the job mix formula.

END OF SECTION

SECTION 02526 - CONCRETE SIDEWALK, CURB AND GUTTER, AND TRAFFIC SEPARATOR

1.01 WORK INCLUDED
A. The work included in this Section consists of furnishing all labor, material, equipment and transportation for the construction of the concrete sidewalks, curb and gutter, and traffic separator to the lines and grades as shown on the Drawings.
1.02 RELATED WORK
A. Section 02110 - Site Earthwork
B. Section 03000 - Concrete (Site Work)
1.03 SUBMITTALS
A. All materials specified shall be certified by the producer or manufacturer that the furnished material meets the specific requirements of the specifications.
1.04 MATERIALS
A. Concrete: Concrete shall be Class B that conforms to the requirements of Section 03000 - Concrete (Site Work).
B. All other necessary materials shall comply with those described in Article 2.01 of Section 03000 - Concrete (Site Work).

3.01 PREPARATION
A. Subgrade Condition:
1. The finished subgrade shall be maintained in a smooth, compact condition and any areas that are disturbed prior to placing of the concrete shall be restored at the Contractor's expense. The subgrade shall be moist at the time the concrete is placed. Water shall be uniformly applied ahead of the paving operations. Large rocks and other obstructions shall be removed to a minimum depth of 6 inches below the finished subgrade elevation, and the space shall be backfilled with sand, loose coarse material or other suitable material, which shall be thoroughly compacted by rolling or tamping.
2. The subgrade shall be accurately trimmed to the required elevation with a 1/4-inch tolerance. High areas shall be trimmed to proper elevation. Low areas may be filled with suitable material and compacted to the specified density or filled with concrete integrally with the placing of the concrete.
B. Setting Forms: The forms shall be accurately set to line and grade and such that they rest firmly, uniformly, and true to the center and progress toward the outside, parallel to the centerline of the roadway, uniformly lapping at least one-half of the width of the roller.
C. Blinding: The blinding method will be allowed, provided that an acceptable finished product, true to the grade and cross-section, can be obtained.
D. Mixing Concrete: Concrete shall be mixed in accordance with the requirements of Section 03000 - Concrete (Site Work).

3.02 INSTALLATION
A. Placing Concrete:
1. The concrete shall be distributed on the subgrade to such depth that, when it is consolidated and finished, the thickness required by the specifications will be obtained at all points and the surface will at no point be below the grade specified for the finished surface. The concrete shall be deposited on the subgrade in a manner that will require as little rehandling as possible. Placing of the concrete shall be continuous between transverse joints, without the use of intermediate bulkheads.
2. Reinforcement shall be placed as shown on the Drawings and shall be maintained at this location during the placing and finishing operations.
3. Concrete shall be thoroughly consolidated against and along the faces of all forms by means of vibrators. Vibrators shall not be permitted to come in contact with the subgrade or a side form. Vibration at any one location shall not continue so long as to produce puddling or the accumulation of air.
B. Striking-off, Consolidating and Finishing Concrete: Immediately after the placing, the concrete shall be struck off, consolidated and finished, to produce a finished product conforming to the cross-section, width and surface finish required by the Drawings and Specifications.
C. Straightening and Surface Corrections:
1. After finishing has been completed and the excess water removed, but while the concrete is still in a plastic state, the surface of the concrete shall be tested for trueness with an accurate 10-foot straightedge. The straightedge shall be furnished by the Contractor. The straightedge shall be held in successive positions parallel to the work centerline, in contact with the surface, and the whole area tested from one side of the slab to the other as necessary. The advance along the walk shall be in successive stages of not more than one-half the length of the straightedge. Any depressions shall be immediately filled with freshly mixed concrete and struck-off, consolidated and refinished. High areas shall be cut down and refinished. Straightedge testing and surface correction shall continue until the entire surface appears to conform to the required grade and cross-section. All surface irregularities exceeding 1/4 inch in 10 feet shall be corrected.
2. Final Finish: For sidewalks, as soon as the water sheen has disappeared and just before the concrete becomes nonplastic, all edges, including expansion joint edges, shall be finished with an edging tool having a radius of 1/4 inch and a light broom finish shall be given to the surface perpendicular to the forms. For curbs, as soon as the water sheen has disappeared and just before the concrete becomes nonplastic, a light broom finish shall be given to the surface in the longitudinal direction of the curb.
E. Joints-Sidewalks:
1. Transverse Construction Joints: Transverse construction joints shall be conducted at the end of all pours and at other locations where the pouring operation is stopped for as long as 30 minutes. Construction joints, however, shall not be placed within ten feet of any other transverse joint or at either end of a section of work. If sufficient concrete has not been placed to form a slab at least ten feet long, the excess concrete, back to the last preceding joint, shall be removed. The joints shall be formed by placing a wood or metal bulkhead accurately and securely in place, in a plane perpendicular to the profile and centerline of the pavement. Construction joints shall have tooled edges with a 1/4-inch radius.
2. Transverse Construction Joints: Transverse construction joints shall be formed at five-foot intervals. The forms of weakness created by sawing the surface of the pavement, and shall consist of a groove, 1/4 inch wide, cut in the fresh concrete shall be perpendicular to the surface of the walk, shall extend to a depth of 1-1/2 inches below the top surface and shall have 1/4-inch radius top edges.
3. Transverse Expansion Joints: One-half inch expansion joints shall be formed by placing preformed joint filler around all structures and at intervals not exceeding 100 feet, or as shown on the Drawings.

3.03 CURB, CURB AND GUTTER, AND TRAFFIC SEPARATOR
A. Transverse Construction Joints: Transverse construction joints shall be constructed at the end of all pours and at other locations where the pouring operation is stopped for as long as 30 minutes. Construction joints, however, shall not be placed within ten feet of any other transverse joint or at either end of a section of curb. If sufficient concrete has not been placed to form a slab at least ten feet long, the excess concrete, back to the last preceding joint, shall be removed. The joints shall be formed by placing a wood or metal bulkhead accurately and securely in place, in a plane perpendicular to the profile and centerline of the pavement. Construction joints shall be sawed, in a manner similar to construction joints, so that a groove will be formed for holding the joint sealing compound.
2. Transverse Construction Joints: Transverse construction joints shall be constructed at ten-foot intervals and shall consist of planes of weakness created by sawing the surface of the hardened concrete. The cut shall be perpendicular to the surface of the pavement, and shall extend to a depth of six inches below the top of the curb and one and one-half inches below the gutter.
3. Curing compound shall be uniformly applied to the surfaces to be cured, in a single coat, immediately after the curb and gutter has sufficiently set. A minimum of 12 hours, the Contractor shall have hardened to the degree that tearing and raveling are not excessive and before uncontrolled shrinkage cracking begins. If, at any time, uncontrolled cracking occurs, the Contractor will be required to modify his methods for curing.
4. Sealing and Sealing Joints: Joints in gutters which are to be sealed, shall be filled with joint sealing material before the roadway is opened to traffic and as soon after completion of the curing period as is feasible, just prior to sealing, each joint shall be thoroughly cleaned of all foreign material (including any membrane curing compound) and the joint faces shall be clean and surface-dry when the sealer is applied.
a. The sealing material shall be applied to each joint to conform to the details shown on the Drawings and in accordance with the manufacturer's recommendation. The pouring shall be done in such manner that the material will not be spilled on the exposed surfaces of the concrete. Any excess material on the surface of the concrete gutter shall be removed immediately and the gutter surface cleaned.
b. All cracks occurring in the gutter prior to its acceptance shall be cleaned out and sealed as specified above, except that the cracks and fractures shall be completely filled with joint sealer and any excess filler material cut down level with the gutter surface.

3.04 CURING
1. After the finishing operations have been completed and as soon as the concrete has hardened sufficiently that marking of the surface will not occur, the entire surface and the edges of the newly placed concrete shall be covered and cured with membrane curing compound.
2. Curing compound shall be uniformly applied to the surfaces to be cured, in a single coat, continuous film, at the rate of one gallon to not more than 200 square feet, by a mechanical applicator.
3. During compound shall not be applied during periods of rainfall. Curing compound shall not be applied to the inside faces of joints to be sealed. Should the film become damaged from any cause (Form Removal), the concrete has sufficiently set a minimum of 12 hours, the Contractor shall remove the forms and shall backfill the space on each side. The earth shall be compacted and graded in a satisfactory manner without damage to the concrete work. Honeycombs shall be filled with sand cement mortar. Plastering will not be allowed on the face of the walk or curb. Rejected work shall be removed and replaced at the expense of the Contractor.

END OF SECTION

SECTION 02530 - DEWATERING SYSTEM

1.01 SCOPE OF WORK
A. In general, the work specified in this Section consists of supplying labor, materials and performing all work necessary to lower and control the groundwater levels and hydrostatic pressures to permit all excavations and construction specified under this Contract to be performed in the dry.
1.02 EXAMINATION OF THE SITE AND REFERENCE DOCUMENTS
A. The Contractor shall take all the steps that he considers necessary to familiarize himself with the site conditions, the ground conditions and the groundwater conditions.
B. The Contractor shall obtain permits as required by local, state, or other agencies having jurisdiction over dewatering activities.
C. The Contractor shall obtain the geotechnical report(s) pertaining to the site from the Owner.

2.00 PRODUCTS
Not used
Part 3.00 Execution
3.01 METHOD
A. The Contractor may use any dewatering method he deems feasible so long as it results in working in the dry and stable soil conditions.
B. The Contractor shall install the permanent site underdrain system during the early stages of construction to aid in controlling the groundwater during construction.
C. The Contractor shall conform and meet all conditions, obtain necessary permits and requirements of the regulatory agencies that have jurisdiction.
D. The exhaust system of gasoline and diesel engines for dewatering pumps shall be equipped with mufflers, subject to the approval of the Engineer, said mufflers so designed as to provide maximum noise suppression. In the event the Engineer considers the muffling of gasoline or diesel driven pumps unsatisfactory, the Contractor shall be required to use electrically driven dewatering pumps. If a portable generator is used, the exhaust gas system of said generator shall also be properly baffled and subject to the approval of the Engineer.

3.02 DEWATERING REQUIREMENTS
A. It is the intent of these specifications that an adequate dewatering system be installed to lower and control the groundwater in order to permit excavation, construction, grading and the placement of fill materials, all to be performed under dry conditions. The dewatering system shall be adequate to prevent the water-bearing strata above and below the bottom of the excavation.
B. The contractor shall be solely responsible for the arrangement, location and depths of the dewatering system necessary to accomplish the work described under this section of the specifications. The dewatering shall be accomplished in a manner that will reduce the hydrostatic head below any excavation to the extent that the water level in the construction area is a minimum of two (2) feet below the prevailing excavation surface and any surface to be compacted, will prevent the loss of fines, seepage, boils, quick conditions, or softening of the foundation strata; will maintain stability of the sides and bottom of the excavation; and will result in all construction operations being performed in the dry.
C. The Contractor shall promptly dispose of all water removed from the excavations in such a manner as will not endanger public health, damage public or private property, or affect adversely any portion of the work under construction or completed by him or any other Contractor. Contractor shall obtain written permission from the Owner for any property, involved before digging ditches or constructing watercourses for the removal of water.
D. The disposal of water from the dewatering system shall be coordinated with applicable portions of Section 02276 entitled Temporary Erosion and Sedimentation Control and the requirements of the State of Iowa.
E. If the dewatering system may not be installed due to inadequacy or failure of the dewatering system, then loosening of the foundation strata, or instability of the slopes, or damage to the structure or structures may occur. The supply of all labor and materials, and the performance of all work necessary to carry out additional work for reinstatement of the structures of foundation soil resulting from such inadequacy or failure shall be undertaken by the Contractor subject to the approval of the Engineer, and at no additional expense to the Owner.

END OF SECTION

SECTION 02577 - PAVEMENT MARKING

1.01 WORK INCLUDED
A. The work included in this Section consists of furnishing all labor, materials, transportation, equipment and incidentals required to provide painted reflectorized traffic stripes, including edge stripes and traffic guides as shown on the Drawings and specified herein.
1.02 SUBMITTALS
A. Certification of testing laboratory as to compliance with State DOT Standard Specifications for Highway and Bridge Construction (latest edition).

2.01 MATERIALS
A. Traffic paint shall conform to the State DOT Standard Specifications for Highway and Bridge Construction (latest edition).
B. Thermoplastic traffic stripes and markings shall conform with the State DOT Standard Specifications for Highway and Bridge Construction (latest edition).
C. Glass spheres for reflective paint shall conform with the State DOT Standard Specifications for Highway and Bridge Construction (latest edition).

3.01 APPLICATION
A. Equipment used, alignment, application and protection shall be in accordance with the State DOT Standard Specifications for Highway and Bridge Construction (latest edition).

END OF SECTION

SECTION 02640 - VALVES AND APPURTENANCES

1.01 SCOPE OF WORK
A. Furnish and install all valves and appurtenances as shown on the Drawings and as specified herein.
B. The equipment shall include, but not be limited to, the following:
1. Gate valves
2. Ball valves for PVC pipe
3. Check valves
4. Plug valves
5. Air and vacuum valves
6. Fire hydrants
7. Corporation stops
8. All materials and manufacturers of solid materials shall meet the requirements of the utility agency that will maintain this system. Contractor shall obtain a copy of the requirements from the agency.
12. Hydraulic cushioned check valves
13. Pressure gauges

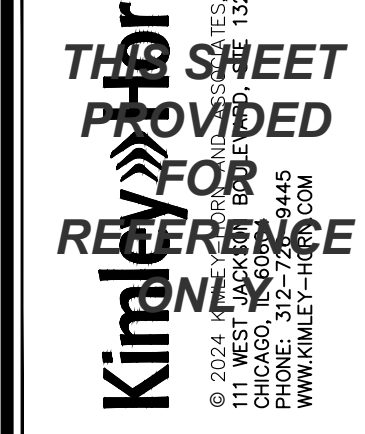
1.02 DESCRIPTION OF SYSTEMS
A. All of the equipment and materials specified herein are intended to be standard for use in controlling the flow of water, sewage, sludge, chemicals, etc., depending on the applications.
B. All materials and manufacturers of solid materials shall meet the requirements of the utility agency that will maintain this system. Contractor shall obtain a copy of the requirements from the agency.
1.03 QUALIFICATIONS
A. All of the types of valves and appurtenances shall be a product of well-established reputable firms who are fully experienced and qualified in the manufacture of the particular equipment to be furnished. The equipment shall be designed, constructed and installed in accordance with the best practices and methods and shall comply with these specifications as applicable.
B. All valves and appurtenances shall have the name of the maker and the requirements of the utility agency that will maintain this system. Contractor shall obtain a copy of the requirements from the agency.
1.04 SUBMITTALS
A. Submit to the Engineer within 30 days after execution of the contract a list of materials to be furnished, the names of the suppliers and the date of delivery of materials to the site.
B. Complete shop drawings of all valves and appurtenances shall be submitted to the Engineer for approval.
1.05 TOOLS
A. Special tools required for normal operation and maintenance shall be supplied with the equipment.
2.01 MATERIALS AND EQUIPMENT
A. General:
1. All valves and appurtenances shall be of the size shown on the Drawings, and wherever possible, all equipment of the same type shall be from one manufacturer.
2. All valves and appurtenances shall be sufficiently set a minimum of 12 hours, the Contractor shall remove the forms and shall backfill the space on each side. The earth shall be compacted and graded in a satisfactory manner without damage to the concrete work. Honeycombs shall be filled with sand cement mortar. Plastering will not be allowed on the face of the walk or curb. Rejected work shall be removed and replaced at the expense of the Contractor.

END OF SECTION

ARCHITECTS PROJECT
Job # 4A0003

CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE JOB SITE AND NOTIFY THE ARCHITECT OF ANY DISCREPANCIES BEFORE BEGINNING OR FABRICATING ANY WORK. DO NOT SCALE DRAWINGS.

IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, TO ALTER ANY ITEM IN ANY WAY.



Issue Date: 06-20-24

| REVISION | |
|----------|----------|
| 1 | 07-08-24 |

AGENCY REVISIONS

Restaurant #: 6526

OLIVE GARDEN
P62DOM-BOX-L

HK Q3 2024 REV.

420 SE
ALICE'S RD.

WAUKEE, IOWA

Drawing
CIVIL SPECIFICATIONS (4 OF 5)

CS4

SECTION 02600 – WATER DISTRIBUTION SYSTEM – CONTINUED

- 4.2. Water for testing and flushing shall be potable water provided by the Contractor from a source approved by the Engineer.
- D. Allowable Limits For Leakage:
- The hydrostatic pressure tests shall be performed as herein above specified and no installation, or section thereof, will be acceptable until the leakage is less than the number of gallons per hour as determined by the formulas:
- For PVC:
 $L = \frac{ND \times (P) \times W}{1400}$
 L = allowable leakage in gallons per hour
 N = number of joints in the section tested
 D = nominal diameter of the pipe in inches
 W = average test pressure maintained during the leakage test in pounds per square inch gauge
 For Ductile Iron:
 $L = \frac{SD \times (P) \times W}{133,200}$
 L = allowable leakage in gallons per hour
 S = length of tested pipe in feet
 D = nominal diameter of the pipe in inches
- Water shall be supplied to the main during the test period as required to maintain the test pressure as specified. The quantity used shall be measured by pumping from a calibrated container.
- E. Correction of Work: Where leakage exceeds the allowable limit, as specified herein before, the defective pipe or joints shall be located and repaired. If the defective portions cannot be located, the Contractor shall remove and reconstruct as much of the work as is necessary in order to conform to the specified limits. Any visible leaks or any defective pipe or joint shall be repaired or replaced as directed by the Engineer even though the total leakage is within the specified allowable limits. No additional payment will be made for the correction of defective work or for damage to other parts of the work resulting from such corrective work.
- F. Disinfection:
- Before any portion of water distribution system is to be placed in service it shall be disinfected in accordance with the requirements of AWWA Standard C651, "Disinfecting Water Mains".
 - The disinfection shall be by free chlorine in aqueous solution at a minimum concentration for 24 hours or more of not less than 50 parts per million, except for the Slug Method with 100 ppm chlorine.
 - Core shall be taken to provide disinfection to the total system. Following contact with chlorine disinfectant, the system shall be thoroughly flushed out. Samples shall then be taken using sterile containers obtained from the authority having jurisdiction. Samples shall be taken by the Contractor and delivered by him to the authority having jurisdiction or approved laboratory for analysis.
 - If samples do not conform to the requirements of the specification, the disinfection procedure shall be repeated until two series of satisfactory samples are obtained; the period between such series of samples shall be a minimum of 24 hours.

END OF SECTION

SECTION 02720 – STORM DRAINAGE STRUCTURES, PIPES AND FITTINGS

- Part 1.00 General
- 1.01 WORK INCLUDED
- The work included in this Section consists of furnishing all necessary labor, materials, equipment and existing Drainage System. Should the work indicated on the Drawings Reinforced concrete horizontal storm sewer system to original or better condition.
- 1.02 RELATED WORK
- Section 02210 – Site Earthwork
 - Section 02221 – Trenching, Backfilling and Compaction for Utility and Drainage Systems.
 - Section 03000 – Dewatering System
 - Section 03000 – Concrete (Site Work).
- 1.03 SUBMITTALS
- Shop Drawings: Shop drawings for the following items shall be submitted for approval.
 - Precast structures.
 - Pipe and fittings.
 - Manufacturer's certification of conformance to ASTM requirements for grate castings, precast structures, and drainage pipe.
- 1.04 JOB CONDITIONS
- Existing Drainage System: Should the work indicated on the Drawings require connection to an operational order, the Contractor shall repair or replace any damaged portions of the existing storm sewer system to original or better condition.
- Part 2.00 Products
- 2.01 MATERIALS
- Reinforced Concrete Pipe:
 - Concrete pipe shall be reinforced concrete culvert pipe conforming to ASTM Designation C-76, Class III, except when otherwise indicated on the Drawings. Reinforced concrete horizontal elliptical pipe shall conform to the requirements of ASTM Designation C-507, Class III. All concrete pipe shall be furnished without lifting holes.
 - Concrete pipe joints shall have a continuous O-ring rubber gasket which fits snugly in the annular space between the beveled surfaces of the tongue and groove ends of the pipe to form a watertight seal. The water-tightness of the joints shall be tested in accordance with the requirements of ASTM D445.
 - Zinc Coated Corrugated Iron or Steel Culvert Pipe: Zinc coated (galvanized) corrugated iron or steel culvert pipe, pipe arch and underdrain perforated pipe shall conform to the requirements of AASHTO Designation M-190, Type D (fully coated and fully paved).
 - Smooth Lined Polymer Coated Corrugated Metal Pipe: Smooth lined corrugated pipe shall be composed of a smooth liner and helically corrugated shell integrally attached at helical lock seams spaced not more than 30 inches apart and extending from end to end of each length of pipe and shall conform to the requirements of AASHTO Designation M-245. Metal sheets shall be precast on both surfaces and conform to the requirements of AASHTO Designation M-246, except the color need not be black. The total metal thickness of the nonprecast sheets for the shell and liner shall be less than the gauge shown in the Drawings.
 - Smooth lined Corrugated Aluminum Pipe: Smooth lined corrugated aluminum pipe shall be composed of a smooth liner and helically corrugated shell integrally attached at helical lock seams spaced not more than 30 inches apart and extending from end to end of each length of pipe and shall conform to the requirements of AASHTO Designation M-196. The total metal thickness of the sheets for the shell and liner shall be less than the gauges indicated in the Drawings for the respective steel.
 - Corrugated Aluminum Alloy Culvert Pipe: Corrugated aluminum alloy culvert pipe, arch pipe and underdrain shall conform to the requirements of AASHTO Designation M-196.
 - Aluminum Coated Corrugated Steel Pipe and Pipe Arch: Aluminum coated corrugated steel pipe and pipe arch shall conform to the requirements of AASHTO Designation M-36 and shall be fabricated from sheet that conforms to AASHTO Designation M-274. Corrugations and pipe gauge shall be as indicated in the Drawings. On each end of pipe shall be two rolled annular corrugations to facilitate field connection. Connecting bands shall be field joined in the following manner:
 - Concrete pipe shall be attached to the pipe with a minimum of 20 percent of its original circumference when set on the pipe prior to placing the band.
 - Other corrugated pipe field joints shall be coupled with bands that conform to the requirements of AASHTO Designation M-36 for steel pipe and M-36 for aluminum pipe.
 - Brick: Brick, for drainage structures shall be dense, hard burned, shale or clay brick conforming to the requirements of ASTM Designation C-90 and shall be laid in a running bond with mortar between five and twenty-five grams of water absorbed in one minute by dried brick, set flat face down, in a 1/8 inch of water.
 - Concrete: Mortar: Cement mortar for manhole construction shall be one part cement and two parts clean sharp sand to which may be added lime in the amount of not over twenty-five percent by weight. Concrete shall conform to the requirements of Section 03000 – Concrete and unless otherwise specified, all concrete shall be Class B.
 - Precast Concrete Units: Precast concrete drainage structures shall be constructed in accordance with ASTM Designation C-478. The design and fabrication of precast units shall be as shown on the Drawings and specified herein.
 - Cast-in-place Units: Cast-in-place concrete drainage inlets and other structures shall be constructed according to the Drawings and in conformance with the applicable requirements of Section 03000 – Concrete. Concrete for cast-in-place units shall be Class A.
 - Coatings: Coatings for inlets and other items shall conform to the ASTM Designation A, Class 25. Coatings shall be true to pattern in form and dimensions and free of pouring faults and other defects in patterns which may impair the strength or otherwise make them unfit for the service intended. No plugging or filling will be allowed. Coating patterns shall conform to those shown on the Drawings.
 - Corrugated Polyethylene pipe with smooth interior shall be that manufactured by ADVANCE DRAINAGE SYSTEMS (N-12) or equal. Pipe and joints shall be watertight and meet ASTM D3212, AASHTO M252, Type "S", and AASHTO M284, Type "S".

SECTION 02660 – WATER DISTRIBUTION SYSTEM – CONTINUED

- 2.02 JOINTS:
- All joints for PVC pipe 2 inches and larger shall be push-on type—joints, joints shall conform to the requirements of ASTM Designation D 3139 and provide for the pressure rating of the pipe.
 - Joints in PVC pipe smaller than 2 inches shall be solvent welded in accordance with the recommendations of the pipe manufacturer.
- A. Prestressed Concrete Pipe (PCP): Pipe, fittings and specials shall conform to AWWA Standard C301, "Prestressed Concrete Pressure Pipe, Steel Cylinder Type, for Water and Other Liquids." Fittings and specials shall be "Type B". The pipe interior shall receive a bituminous seal coat as specified in AWWA C104, unless other special protective linings are specified. Gaskets shall be of a material composition suitable for the specific service application. Pipe design shall be in accordance with AWWA C301, for the maximum operational internal pressure and external loading. The Contractor shall submit said design calculations from the manufacturer to the Engineer.
- B. Copper Pipe: Copper pipe or tubing for underground installation shall be Type K and conform to the requirements of ASTM Designation B 221. Fittings shall be brass with approved compression or flare type connections.
- C. Galvanized Steel Pipe:
- Pipe Material: Galvanized steel pipe shall be Schedule 40 and conform to the requirements of ASTM Designation A 120.
 - Fittings: Fittings for galvanized steel pipe shall be galvanized malleable iron pipe, 150 pound, Type U, conforming to Federal Specification WW-P-221.
 - Joints: Joints shall be standard screw thread type.
- F. Polyethylene Tubing: Polyethylene tubing for service lines shall be municipal service copper tube sized and approved for potable water use by the National Sanitation Foundation. Tubing shall bear the NSF seal and conform to the requirements of AWWA C901/ASTM D 2737, and shall have a minimum pressure class of 160 with DR 9. Polyethylene materials shall be PE 3406 and shall conform to, ASTM D 3350.
- E. Polyethylene Pressure Pipe: Polyethylene pressure pipe for service lines shall be iron pipe sized and approved for potable water use by the National Sanitation Foundation. Tubing shall bear the NSF seal and conform to the requirements of AWWA C901/ASTM D 2239, and shall have a minimum pressure class of 160 with IDR 7. Polyethylene materials shall be PE 3406 and shall conform to ASTM D 3350.

Part 3.00 Execution

- 3.01 INSTALLATION
- All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported.
 - Fire hydrants shall be set at the locations designated by the Engineer and bedded on a firm foundation. Each hydrant shall be set in true vertical alignment and properly braced. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the Drawings. Felt roofing paper shall be placed around the hydrant above before placing concrete. If directed, the hydrant shall be tied to the pipe with suitable rods or clamps, either galvanized pointed, or otherwise rustproof treated. Concrete used for backing shall not be less than 1 part cement, 2-1/2 parts sand, and 5-1/2 parts stone.
 - Prior to installation of cast couplings, the pipe ends shall be cleaned thoroughly for a distance of 8 inches. The pipe manufacturer (pipe subcontract) shall provide instructions for cleaning. The non-toxic, water soluble, imparts neither taste or odor to the conveyed water and is ANS/NSF 61 approved as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 1/2 inches from the end and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers shall then be pressed evenly and firmly in the middle ring ends. After the bolts have been inserted and all nuts have been made up finger-tight, diametrically opposite nuts shall be alternately and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.
- 3.02 SHOP PAINTING
- Ferrous surfaces of valves and appurtenances shall receive a coating of rust-inhibitive primer. All pipe connection openings shall be capped to prevent the entry of foreign matter prior to installation.
- 3.03 FIELD PAINTING
- All metal valves and appurtenances specified herein and exposed to view will be painted as part of the work.
- 3.04 FIELD TESTING
- All installations, all valves and appurtenances shall be tested at least 1 hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint item tested is defective, it shall be repaired or replaced to the satisfaction of the Engineer.

END OF SECTION

SECTION 02640 – VALVES AND APPURTENANCES – CONTINUED

- 2.13 HYDRAULIC CUSHIONED CHECK VALVES
- Hydraulic cushioned check valves shall meet AWWA-508 and shall be constructed with a heavy cast iron body with a welded steel disc having a rubber seating face, or non-corrosive shaft for attachment of counterweight arm and lever, and a completely non-corrosive hydraulic cushioning chamber. It shall be designed for installation on the pump discharge to absolutely prevent the return of flow back through the pump, and shall close at a controlled rate to minimize the normal closing surge. The hydraulic cushioning chamber shall be attached to the face of the valve body externally and be constructed with a piston operating in a chamber that will permit the valve to be operated without any metering action. The cushioning shall be by oil stored in an oil reservoir attached by piping and fittings to the cushion chamber. The chamber shall be vented to provide an adjustable closing speed to meet the service requirements.
- 2.14 PRESSURE GAUGES
- Pressure gauges shall be direct mounted, cast aluminum case, with a 4-1/2 inch diameter dial and furnished with a clear glass crystal window, 1/4-inch shut-off valve, and a bronze pressure snubber. Provide diaphragm seals between shut-off valve and pressure gauge on all lines. All gauges shall be waterproofed. The face dial shall be white finished aluminum with jet-black graduations and figures. The face dial shall indicate the units of pressure being measured (e.g., feet, inches, etc.) or be dual scale.

Part 3.00 Execution

- 3.01 INSTALLATION
- All valves and appurtenances shall be installed in the locations shown, true to alignment and rigidly supported.
 - Fire hydrants shall be set at the locations designated by the Engineer and bedded on a firm foundation. Each hydrant shall be set in true vertical alignment and properly braced. Concrete thrust blocks shall be placed between the back of the hydrant inlet and undisturbed soil at the end of the trench. Minimum bearing area shall be as shown on the Drawings. Felt roofing paper shall be placed around the hydrant above before placing concrete. If directed, the hydrant shall be tied to the pipe with suitable rods or clamps, either galvanized pointed, or otherwise rustproof treated. Concrete used for backing shall not be less than 1 part cement, 2-1/2 parts sand, and 5-1/2 parts stone.
 - Prior to installation of cast couplings, the pipe ends shall be cleaned thoroughly for a distance of 8 inches. The pipe manufacturer (pipe subcontract) shall provide instructions for cleaning. The non-toxic, water soluble, imparts neither taste or odor to the conveyed water and is ANS/NSF 61 approved as a gasket lubricant. A follower and gasket, in that order, shall be slipped over each pipe to a distance of about 1/2 inches from the end and the middle ring shall be placed on the already laid pipe end until it is properly centered over the joint. The other pipe end shall be inserted into the middle ring and brought to proper position in relation to the pipe already laid. The gaskets and followers shall then be pressed evenly and firmly in the middle ring ends. After the bolts have been inserted and all nuts have been made up finger-tight, diametrically opposite nuts shall be alternately and uniformly tightened all around the joint, preferably by use of a torque wrench of the appropriate size and torque for the bolts.
- 3.02 SHOP PAINTING
- Ferrous surfaces of valves and appurtenances shall receive a coating of rust-inhibitive primer. All pipe connection openings shall be capped to prevent the entry of foreign matter prior to installation.
- 3.03 FIELD PAINTING
- All metal valves and appurtenances specified herein and exposed to view will be painted as part of the work.
- 3.04 FIELD TESTING
- All installations, all valves and appurtenances shall be tested at least 1 hour at the working pressure corresponding to the class of pipe, unless a different test pressure is specified. If any joint item tested is defective, it shall be repaired or replaced to the satisfaction of the Engineer.

END OF SECTION

SECTION 02660 – WATER DISTRIBUTION SYSTEM

- Part 1.00 General
- 1.01 WORK INCLUDED
- The work included under this Section consists of furnishing all material, equipment, transportation, tools and labor to install water mains, valves, fittings, specials, and replaced with concrete shown on the Drawings or specified herein, including flushing, testing and sterilizing for a complete job ready to operate.
- 1.02 RELATED WORK
- Section 02210 – Site Earthwork
 - Section 02221 – Trenching, Backfilling and Compaction for Utility Systems
 - Section 02300 – Dewatering System
 - Section 02840 – Valves and Appurtenances
 - Section 03000 – Concrete
 - Section ANS/61
- 1.03 QUALITY ASSURANCE
- Design Requirements:
 - PVC pipe mains 4 inches and larger in diameter shall be constructed with cast or ductile iron fittings.
 - PVC pipe shall not be used for water mains larger than 12 inches in diameter.
 - Water mains 4 inches to 12 inches in diameter shall be PVC or ductile iron as shown on the Drawings.
 - Water mains larger than 12 inches in diameter shall be ductile iron, unless otherwise noted on the Drawings.
 - Shop Drawings:
 - Shop drawings shall be submitted to the Engineer for approval prior to construction.
 - Shop drawings shall include:
 - Material and manufacturer's data sheets for all pipe and fittings.
 - Details of restrained and flexible joints.
 - Hydrants.
 - Meter vaults and boxes.
 - Valves and valve boxes.
 - Joint lubricant.
 - Restraint joints.
- Part 2.00 Products
- 2.01 MATERIALS
- Ductile Iron Pipe and Fittings:
 - Ductile iron pipe, Ductile iron pipe shall conform to the requirements of ANSI Standard A21.21/C151. A minimum of Class 52 pipe shall be supplied.
 - Fittings:
 - All ductile iron fittings shall be mechanical joint or single gasket push-on type fittings with a minimum pressure rating of 350 psi and shall conform to the requirements of ANSI/AWWA A21.53/C153.
 - Mechanical joint and/or single gasket push-on type fittings shall be cement lined, seal coated and outside coated as specified above for ductile iron pipe.
 - Restraint Joints: Restraint joints shall be of the types fabricated by the various manufacturers, upon approval by the Engineer of details submitted by the Contractor. Restraint joints that require field welding will not be acceptable. Restraint joints shall be of the type that require no field welding or restraint shall not be less than that required for the design wall thickness. Joints using set screws will not be acceptable. Restrainted joints shall be furnished for 24 inches and larger pipe at intervals of 100 feet.
 - Gaskets: Gaskets shall be of vulcanized crude rubber or polyvinyl chloride/plastic. Gaskets shall be of the type specified in the drawings. Gaskets shall meet ANSI/AWWA C111/A21.11.
 - Galvanized Chloride Pipe (PVC):
 - PVC Pipe (4 inches to 12 inches in diameter) shall be manufactured from polyvinyl chloride resin conforming to ASTM Designation D1784. Pipe of this material shall conform to AWWA C900. The pipe shall bear the National Sanitation Foundation (NSF) seal for potable water pipe. Pipe shall have a minimum dimension ratio number of 18 and shall be supplied in standard lengths of 20 feet.
 - PVC Pipe (4 inches to 36 inches in diameter) shall be manufactured from polyvinyl chloride resin conforming to ASTM Designation D1784. Pipe of this material shall conform to AWWA C905. The pipe shall bear the National Sanitation Foundation (NSF) seal for potable water pipe. Pipe shall have a dimension ratio number of 25 and a pressure class rating of 165. Pressure class 235 shall meet DR18 and shall be supplied in standard lengths of 20 feet.

SECTION 02640 – VALVES AND APPURTENANCES – CONTINUED

- 2.02 GATE VALVES
- Gate valves for water shall meet the requirements of AWWA C509. Valves shall be rated for 150 psi working pressure and a minimum 300-psi test pressure. Valve shall be iron body, bronze-mounted, resilient seat double disc, parallel seat, and non-rising stem type fitted with O-Ring seats. The operating nuts shall be 2 inches square. All valves shall open counter clockwise. Stuffing boxes shall be the O-Rings type. Gate valves shall be mechanical joint, ANSI/AWWA C111/A21.11, or flange joint, ANSI B16.1, Class 125, as shown on the Drawings or specified.
 - All buried valves shall be fitted with cast iron three-piece adjustable valve boxes. The barrel shall be two-piece, screw type, having a 5-1/4 inch shaft. The upper section shall be complete with cast iron cover. Covers shall have "WATER" for water valves and "RECLAIM" for reclaim valves with cast iron top. Valve boxes shall be provided with a concrete base as shown on the Drawings. Four tee-banded wedge wrenches of suitable length shall be furnished to operate all valves within valve boxes.
 - Exposed valves shall be equipped with handwheels or chainwheels as shown on the Drawings. Handwheels shall be of ample size and shall have an ARROW and the word "OPEN" cast thereon to indicate the direction of opening.
 - Valves 12 inches or larger shall be provided with level or spur gears depending on the position of the valve as indicated on the Drawings. The gears shall be housed in a grease case of the extended yoke type to permit repacking the stuffing box of the valve without disassembly. Valves 16 inches or larger designed to lie horizontally shall be equipped with rollers to carry the weight of the wedge throughout its travel.
 - Gate wrenches and extension stems shall be provided by the manufacturer.
- 2.03 BALL VALVES FOR PVC PIPE
- All ball valves for PVC pipe shall be of PVC Type 1 with union, socket, threaded or flanged ends as required. Ball valves shall be full port, full flow, all plastic construction, 150 psi rated with Teflon seat seats and T-handles.
 - All valves shall be mounted in such a position that valve position indicators are plainly visible when standing the floor.
- 2.04 CHECK VALVES
- Check valves for cast iron and ductile iron pipe shall be swing type and shall meet the material requirements of AWWA Specification C500. The valves shall be iron body, bronze mounted, single disc, 150 psi working pressure, nonnoak, and hydraulically tested at 300 psi. Ends shall be 125 pound ANSI B16.1 flanges or 125 pound ANSI B21 threaded fittings depending upon location.
 - When there is no flow through the line, the disc shall hang lightly against its seat in a practically vertical position. When open the disc shall be parallel to the flow of waterway.
 - Check valves shall have bronze seat and body rings, stainless steel hinge pins and bronze nuts on the bolts of bolted covers.
 - Valves shall be so constructed that disc and body rings may easily be removed and replaced without removing the valve from the line. Valves shall be fitted with an extended hinge arm with outside lever and spring or weight on the end.
 - Check valves for small diameter PVC pipe shall be of PVC Type 1, Series BC with union, socket, threaded or flanged ends as required.

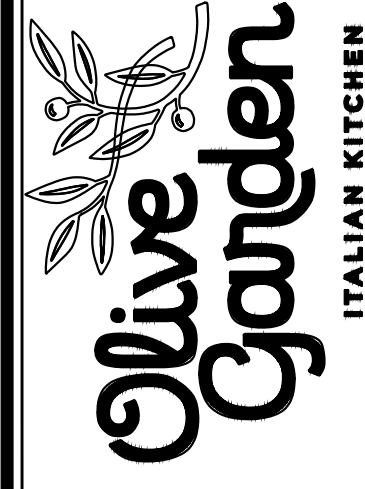
- 2.05 PLUG VALVES
- Plug valves for sewer piping shall be non-lubricated eccentric plug type with semi-steel bodies, resilient faced plugs, and welded necked seats. Port areas shall be at least 80 percent of full pipe area. Valves shall be capable of one-tight shut-off at pressure differentials up to the full rating of the valve with pressure in either direction. All exposed nuts, bolts, springs, and washers shall be zinc plated, except exposed hardware for submerged valves shall be stainless steel. Valve bodies shall be furnished with 125/150-pound ANSI standard flanged ends, or mechanical joints, as shown on the Drawings.
 - All valves 20 inches or larger shall be equipped with gear actuators. All gearing shall be enclosed, suitable for running in oil, with seals provided on all shafts to prevent entry of dirt and water into the actuator. All shaft bearings shall be furnished with permanently lubricated bronze bearing bushings. Actuator shall clearly indicate valve position and an adjustable stop shall be provided. Construction of actuator housing shall be semi-steel. Plug valves installed such that actuators are 6 feet or more above the floor, shall be provided with chainwheels and chain.
 - Shown on the drawings, plug valves shall be installed with extended shafts and actuators. Actuators for extended shafts shall be mounted on floor stands where indicated on the Drawings or shall have removable handwheels where floor stands are not called for. Six-inch sleeves be provided for extended shafts in all floors, and covers shall be provided where necessary. Shafts shall be of adequate strength to handle the valve, and shall be 304 stainless steel where submerged and carbon steel elsewhere. Floor stands shall be equipped with valve position indicators and a lock for maintenance.
 - All buried valves shall be furnished with three-piece cast iron adjustable valve boxes. The barrel shall be two-piece, screw type, having a 5-1/4 inch shaft. The upper section shall be complete with cast iron cover. Covers shall have "SEWER" cast into the top. Valve boxes shall be provided with concrete base as shown on the Drawings.
 - All plug valves shall be installed so that the direction of flow through the valve is in accordance with the manufacturer's recommendations.
- 2.06 AIR RELEASE VALVES – AIR AND VACUUM VALVES AND COMBINATION
- The air release valves of air and vacuum release valves shall be suitable for sewage or water, rated for a minimum 150 psi working pressure, and shall have a cast iron body and cover, stainless steel float and trim, and Buna-N seat. The fittings shall be threaded. Valves shall be furnished with backwash accessories. Valves shall meet AWWA C-507. Valves used in potable water service shall be certified to NSF/ANSI 61 Drinking Water System Components. Valve body and cover shall be constructed of ASTM A126 Class B cast iron for working water pressure up to 300 psi.
 - Check assembly air and vacuum release valves shall be able to allow air or gas to escape during the liquid filling process and to permit air to enter when the system is drained, partially drained or flow is stopped, causing the system pressure to drop below atmospheric pressure. The valves shall be of the large orifice, floating ball type. The body shall be of flanged gray cast iron construction with integral cone seat and ball retaining rails. The ball shall be a hollow steel sphere with a smooth coating of nitril rubber. The valve shall be suitable for 150 psi working pressure and a temperature of 185 degrees F. Flanged ends shall be integral with body casting, flat faced and drilled to ANSI B16.1, Class 150 cast iron standard.
- 2.07 FIRE HYDRANTS
- Fire hydrants shall be 5-1/4 inch minimum valve opening and shall comply with the current AWWA Standard Specification C502-05 with fire hydrants for water works service. Each hydrant shall have 8-inch mechanical joint ends with strapping loops and shall open by turning counter-clockwise. Fire hydrants shall be of ample length for 3-1/2 foot depth of bury, and be furnished with a safety handle and compression nut. The body shall be 2-1/2 inch thick heavy cast iron with a minimum of one 4-1/2 inch pumpner nozzle, all having National Standard hose threads. Bronze nozzles shall have caps attached by chains. Operating nuts shall be AWWA Standard (pentagonal, measuring 1-1/2 inch point to face). Fire hydrants shall be equipped with self-lubricating and O-Ring packing. Fire hydrants shall be painted in accordance with the specifications in a color to correspond to the present standard of the city having jurisdiction.
 - Hydrants shall be installed plumb and in true alignment with the connection pipes to the water main. They shall be securely braced against the end of the trench (undisturbed soil) with concrete thrust blocks. The gravel or crushed stone for the drain sump, followed by backfilling, shall be carefully placed and compacted. Installed hydrants shall be painted line-yellow (DuPont 77440 or equivalent) for the final color. Hydrant placement shall not be at a distance greater than 18 feet from a paved stabilized area, which can withstand the weight of a Class A pumper. The center of the steamer post shall be 18 inches above final grade. Steamer post shall be correctly positioned for proper connections as defined by the authority having jurisdiction. Hydrant valve shall be permanently connected to the water main tee with "All Thread" rod locking retainer glands.

SECTION 02660 – WATER DISTRIBUTION SYSTEM

- Part 1.00 General
- 1.01 WORK INCLUDED
- The work included under this Section consists of furnishing all material, equipment, transportation, tools and labor to install water mains, valves, fittings, specials, and replaced with concrete shown on the Drawings or specified herein, including flushing, testing and sterilizing for a complete job ready to operate.
- 1.02 RELATED WORK
- Section 02210 – Site Earthwork
 - Section 02221 – Trenching, Backfilling and Compaction for Utility Systems
 - Section 02300 – Dewatering System
 - Section 02840 – Valves and Appurtenances
 - Section 03000 – Concrete
 - Section ANS/61
- 1.03 QUALITY ASSURANCE
- Design Requirements:
 - PVC pipe mains 4 inches and larger in diameter shall be constructed with cast or ductile iron fittings.
 - PVC pipe shall not be used for water mains larger than 12 inches in diameter.
 - Water mains 4 inches to 12 inches in diameter shall be PVC or ductile iron as shown on the Drawings.
 - Water mains larger than 12 inches in diameter shall be ductile iron, unless otherwise noted on the Drawings.
 - Shop Drawings:
 - Shop drawings shall be submitted to the Engineer for approval prior to construction.
 - Shop drawings shall include:
 - Material and manufacturer's data sheets for all pipe and fittings.
 - Details of restrained and flexible joints.
 - Hydrants.
 - Meter vaults and boxes.
 - Valves and valve boxes.
 - Joint lubricant.
 - Restraint joints.
- Part 2.00 Products
- 2.01 MATERIALS
- Ductile Iron Pipe and Fittings:
 - Ductile iron pipe, Ductile iron pipe shall conform to the requirements of ANSI Standard A21.21/C151. A minimum of Class 52 pipe shall be supplied.
 - Fittings:
 - All ductile iron fittings shall be mechanical joint or single gasket push-on type fittings with a minimum pressure rating of 350 psi and shall conform to the requirements of ANSI/AWWA A21.53/C153.
 - Mechanical joint and/or single gasket push-on type fittings shall be cement lined, seal coated and outside coated as specified above for ductile iron pipe.
 - Restraint Joints: Restraint joints shall be of the types fabricated by the various manufacturers, upon approval by the Engineer of details submitted by the Contractor. Restraint joints that require field welding will not be acceptable. Restraint joints shall be of the type that require no field welding or restraint shall not be less than that required for the design wall thickness. Joints using set screws will not be acceptable. Restrainted joints shall be furnished for 24 inches and larger pipe at intervals of 100 feet.
 - Gaskets: Gaskets shall be of vulcanized crude rubber or polyvinyl chloride/plastic. Gaskets shall be of the type specified in the drawings. Gaskets shall meet ANSI/AWWA C111/A21.11.
 - Galvanized Chloride Pipe (PVC):
 - PVC Pipe (4 inches to 12 inches in diameter) shall be manufactured from polyvinyl chloride resin conforming to ASTM Designation D1784. Pipe of this material shall conform to AWWA C900. The pipe shall bear the National Sanitation Foundation (NSF) seal for potable water pipe. Pipe shall have a minimum dimension ratio number of 18 and shall be supplied in standard lengths of 20 feet.
 - PVC Pipe (4 inches to 36 inches in diameter) shall be manufactured from polyvinyl chloride resin conforming to ASTM Designation D1784. Pipe of this material shall conform to AWWA C905. The pipe shall bear the National Sanitation Foundation (NSF) seal for potable water pipe. Pipe shall have a dimension ratio number of 25 and a pressure class rating of 165. Pressure class 235 shall meet DR18 and shall be supplied in standard lengths of 20 feet.

CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE JOB SITE AND NOTIFY THE ARCHITECTS OF ANY DIMENSIONAL ERRORS, OMISSIONS OR DISCREPANCIES BEFORE BEGINNING OR FABRICATING ANY WORK. DO NOT SCALE DRAWINGS.

IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, TO ALTER OR ALTER IN ANY WAY.



Issue Date: 06-20-24

REVISION
 1 07-08-24
 AGENCY REVISIONS

Restaurant #: 6526

OLIVE GARDEN
 P62DOM-BOX-L

HK Q3 2024 REV.

420 SE
 ALICE'S RD.
 WAUKEE,
 IOWA

Drawing
 CIVIL
 SPECIFICATIONS
 (5 OF 5)



CS5

SECTION 02730 - SANITARY SEWAGE SYSTEM - CONTINUED

5. Tests shall be conducted on portions of the system not exceeding three manhole runs or more than 1,000 feet of main sewer, or as otherwise directed by the Engineer. Tests shall be run continuously for three hours. Where infiltration or exfiltration exceeds the allowable limits specified herein, the defective pipe, joints, or other faulty construction shall be located and repaired by the Contractor. If the defective portions cannot be located, the Contractor shall reconstruct as much of the work as is necessary in order to conform to the specified allowable limits. Testing shall be performed as the job progresses and shall be started after 2,000 feet of pipe are laid.
6. The Contractor shall provide all labor, equipment and materials and shall conduct all testing required, under the direction of the Engineer. No separate payment will be made for this work and the cost for this work shall be included in the unit price quoted in the proposal for the applicable item of work.
7. Specifications for Sanitary Sewer Main Low Pressure Air Test Revised March 2006
- a. Scope: This specification governs the testing of sanitary sewer mains by the low pressure air test (line pressure drop method).
- b. General Requirement
- b.1. The low-pressure air test may be used on pipe less than 18 inch diameter shall be low-pressure air tested for leaks upon the completion of the backfill and compaction operation. Sanitary sewer mains less than 8 inch and greater than 18 inch diameter will be tested for leaks per test method determined/specified by RWI.
- b.1.a. The sanitary sewer manholes must pass the manhole vacuum testing process and all sanitary sewer services must be complete with ends capped that be connected to solid mains prior to the low-pressure air test.
- b.1.b. The low-pressure air test method shall be in accordance with ASTM F1417-92 (Reapproved 2005), except as specified otherwise herein.
- b.1.c. The Contractor shall remove all debris, soil and rocks from the sanitary sewer mains and manholes prior to the low-pressure air test by a cleaning ball, high velocity jet, cleaning mandrel or other means.
- b.1.d. The Contractor shall furnish all equipment and labor required, including necessary piping/hoses, pneumatic pumps, compression pump, pressure-regulator valve, 9 psi pressure-relief valve, control valves, pressure gauges and second timer or stop watch. The test pressure gauge shall have a maximum range of 0-10 pounds per square inch (psi) and the pressure gauge figure intervals shall be a maximum of 0.25 psi increments.
- b.1.e. The required low-pressure air test time shall be based upon the total length and diameter of sanitary sewer main from manhole to manhole (sewer service lines are not included). The minimum low-pressure air test period is 7 minutes and 34 seconds.
- b.2. The low-pressure air test shall be performed by the Contractor and witnessed by the Engineer and the RWI personnel. The Engineer shall furnish low-pressure air test reports of sanitary sewer mains to the Contractor and RWI.
- b.2.a. The low-pressure air test shall be performed as follows: If no pressure drop/loss has occurred during the first 50 percent of the test period as calculated from the 1.0 psi pressure drop table (not less than the minimum low-pressure air test period of 7 minutes and 34 seconds).
- c. Safety Precautions
- c.1. This low-pressure air test may be dangerous to personnel if, through lack of understanding or carelessness, a line is over pressurized or plugs/caps are installed or restrained improperly. The axial force on an 8 inch plug at the start of a properly conducted test is over 200 pounds. Restraint systems must be designed to handle these forces with adequate safety factors.
- c.2. No one shall be allowed in the manholes or near a capped pipe during testing. All gauges, piping manifolds and control valves shall be located above ground.
- c.3. When sanitary sewer mains are tested, it is mandatory that all caps and plugs be braced as an added safety factor.
- c.4. Do not over pressurize the sanitary sewer main. Do not exceed 9.0 psi.
- d. Test Procedures
- d.1. After cleaning the interior surface of the sanitary sewer main, the Contractor shall place and inflate pneumatic plugs in the sanitary sewer main pipe at both connecting manholes. One of the plugs must have an inlet tap, or other provision for connecting a hose to a portable air control source.
- d.2. Connect the air hose to the inlet tap and the portable air control source. The air equipment shall consist of necessary valves and pressure gauges to control an oil-free air source and the rate of which airflow into the test section.
- d.3. Add air slowly to the test section until the pressure inside the sewer pipe reaches 4.0 psi. After the pressure of 4.0 psi is obtained, regulate the air supply so that the pressure is maintained between 3.5 psi to 4.0 psi for at least two minutes to stabilize air/ANSI temperature conditions.
- d.4. Close the air supply valve; release the pressure in the pipe test section to 3.5 psi and the test period is started. Observe the time required for the pressure to drop from 3.5 psi to 2.5 psi. The minimum test time/period is determined from the following 1.0 psi pressure drop table.
- d.5. All pneumatic plugs shall be removed from both connecting manholes after the test.
- e. Failure of Low-Pressure Air Test
 Any sanitary sewer main/services that fails the low-pressure air test must be repaired. Upon completion of the repairs and the backfill/compaction operation, the sanitary sewer main shall be retested as described in the above test procedures. The Engineer must witness the sewer main repair and backfill operation. The cost of the repair and backfill is incidental to the cost of the project.
- f. Acceptance
 The sanitary sewer main shall have passed the low-pressure air test if the pipe test section does not drop below 2.5 psi during the specified test period.

| Pipe Dia. (in.) | Minimum Length (ft.) | Minimum Specified Time Required for a 1.0 PSI Pressure Drop For Sizes and Length of Pipe Indicated for Q=0.015 | | | | | | | | | |
|-----------------|----------------------|--|--------|--------|--------|--------|--------|--------|--------|------|------|
| | | 100 FL | 150 FL | 200 FL | 250 FL | 300 FL | 350 FL | 400 FL | 450 FL | | |
| 8 | 7:34 | 2:08 | 1:50 | 1:34 | 1:18 | 1:02 | 0:46 | 0:30 | 0:14 | 0:08 | 0:02 |
| 10 | 9:26 | 2:39 | 2:34 | 2:18 | 1:52 | 1:36 | 1:20 | 1:04 | 0:88 | 0:72 | 0:56 |
| 12 | 11:20 | 3:19 | 3:14 | 2:58 | 2:32 | 2:16 | 1:50 | 1:34 | 1:18 | 1:02 | 0:86 |
| 15 | 14:10 | 3:59 | 3:54 | 3:38 | 3:12 | 2:56 | 2:40 | 2:24 | 2:08 | 1:52 | 1:36 |
| 16 | 15:10 | 4:19 | 4:14 | 3:58 | 3:32 | 3:16 | 2:50 | 2:34 | 2:18 | 2:02 | 1:46 |
| 18 | 17:00 | 4:59 | 4:54 | 4:38 | 4:12 | 3:56 | 3:40 | 3:24 | 3:08 | 2:52 | 2:36 |

SECTION 02730 - SANITARY SEWAGE SYSTEM - CONTINUED

2. If, through failure to provide suitable trench sheeting, or other causes, the maximum width for trench excavations, as specified elsewhere in these specifications, is exceeded, the Contractor shall construct concrete encasement around the pipe for the length of the excessive excavation. No payment will be made for the concrete encasement required due to excessive trench widths.
3. The joints of beginning and end of sewer or service pipe encasement shall not be more than 6 inches from a pipe joint to protect the pipe from cracking due to uneven settlement of its foundation or the effects of superimposed live loads.
- A. Manholes/Concrete Structures
1. Structures shall be leak-tight and constructed of precast units conforming to the requirements of ASTM Designation C-478 with reinforcement of Grade 40 bars and the following modifications thereto:
- a. The minimum shell thickness shall be 8 inches.
- b. Concrete to be used in precast manholes shall be Type II.
- c. Lift rings shall be provided for handling precast structure sections. Only non-penetrating lift holes shall be permitted. Such holes shall be filled with non-expanded shrink proof after installation of the structure sections.
- d. The design of the structure shall include a precast base of not less than 8 inches in thickness poured monolithically with the bottom section of the structure walls.
- e. All openings and joints shall be sealed watertight with rubber gaskets meeting ASTM C-443.
- f. The structure barrel, top and base sections shall have tongue and groove joints.
- g. Precast structure tops, if used, shall terminate at such elevations as will permit concrete grade rings set in bituminous sealer under the structure frame to make allowance for future street grade adjustments.
- h. Drop connections, where required on precast structures, shall be manufactured with the structure elements at the casting yard. The manufacturer shall submit for approval the method of drop construction.
2. The interior and exterior walls shall be coated with two applications of cool tar epoxy applied as recommended by the coating manufacturer. Interior surfaces shall be coated with a minimum dry mix thickness of 16 mils, and exterior surfaces shall be coated with a minimum dry mix thickness of 9 mils.
3. Show structures may substitute on eight-inch precast reinforced slab on the top in lieu of the concrete cover frames. Slabs shall be formed in a full bed of mortar and pointed to form a dense joint.
4. Structure top slabs or cone sections shall be set between 3 inches and 12 inches below bottom of structure cover frames. Where shown on the Drawings the Contractor shall provide a minimum of 3 inches to accommodate future grade changes without disturbing structure. Where distance between bottom of structure cover frame and top of cone is greater than 18 inches, riser units shall be manufactured by Fencjo Joint Sealer Company, Inc. Precast leveling rings setting cast iron frames over structures shall be a minimum of 2 inches thick and have one No. 2 continuous reinforcing steel bar. Leveling rings shall not be used for more than 12 inches of vertical adjustment.
5. Structure castings shall be fully bedded in mortar with adjustment brick courses placed between the frame and structure. The top of structure castings located in pavement, shoulder areas, and sidewalks shall be set flush with grade. The top of structure castings located in these areas shall be set 2 inches above grade unless otherwise shown on the Drawings.
6. Precast structures that are installed in conjunction with PVC pipe shall utilize approved coupling devices set at the same elevations as specified herein below and indicated on the Drawings.
7. The invert channels shall be smooth and accurately shaped to a semicircular bottom conforming to the inside of the adjacent sewer section. Sleep sills outside the invert channels shall be avoided. Changes in size and grade shall be made gradually and evenly. Changes between manholes or sewer or entering branch shall be a smooth curve with radius as long as practicable. Invert channels shall also be formed for pipe stub-outs to be installed as specified herein.
8. All annular spaces between structure or wetwell walls and pipe coupling adapters shall be thoroughly plugged with Embraco No. 167 Mortar or approved equal, nonshrink mortar, applied and cured in strict conformance with the manufacturer's recommendations so there will be no leakage around the pipe. The mortar shall be finished smooth and flush with the adjoining interior and exterior structure or wetwell wall surfaces.
- E. Connections to Existing Structures and Sewers
1. Various sewer lines shall be connected to existing manholes and structures. Provisions have been made in some of the existing structures for future connections and may require only the removal of a plug and the connection of the proposed line, while other connections will require cutting into the existing structure. The Contractor shall exercise care in cutting into the existing structure and any damage done to the structure shall be repaired as required by the Engineer and at the Contractor's expense. Drop connections to existing manholes shall be installed as shown on the Drawings for new construction.
2. The drop connection existing manhole shall be constructed of SDR 35 polyvinyl chloride (PVC) per ASTM Designation C-212, Grade SM, Size 3/2 inch (W) x 8 inches (L) x 2 1/4 inch (H).
3. Cement Mortar. Cement mortar for manhole construction shall comply with ASTM Designation C-270, Type M, except that the cement shall be Portland Type I or II only. No mortars that have stood for more than one hour shall be used.
- K. Cast Tar Epoxy. Cast tar epoxy shall be Koppers Bitumatic No. 300M, Tremac Trem-Tar No. 46-413 or approved equal.
- L. Joint Sealer. Joint sealer material for precast manhole structures shall be cold adhesive preformulated plastic gaskets conforming with FOOI Standard Specifications for Road and Bridge Construction (latest edition), Section 942-2. The joint sealer material shall be "Ram-Nok," as manufactured by K.T. Snyder or approved equal.
- M. Non-Shrink Mortar. Non-shrink mortar for filling annular spaces between precast manhole walls and pipe coupling adapters shall be Embraco No. 167 Mortar or approved equal.

SECTION 02730 - SANITARY SEWAGE SYSTEM - CONTINUED

- C. Ductile Iron Pipe:
1. Ductile iron pipe shall conform to the requirements of ANSI/AWWA A21.51/C151, with a class thickness in conformance with the requirements of ANSI/AWWA A21.50/C150. The pipe shall be furnished in minimum standard lengths of 18 feet.
2. Joints shall conform to ANSI Standard A21.10/150 psi minimum pressure rating. Fittings shall have the same lining as adjacent piping.
3. Joints shall be mechanical type of "push-on" type conforming to ANSI Standard A21.11.
4. Coatings and Linings: Interior and exterior of ductile iron pipe shall be polyethylene lined. The lining shall extend from the plain end of the pipe to the gasket set of the bell socket. Not less than five (5) percent of the pipe shall be checked from dry mill thickness, with compliance certification submitted to the Engineer.
- a. Bituminous exterior coating, when polyethylene lining is not required, shall have a dry thickness covering a minimum of 20 mils (0.02 inches) and shall be Koppers Bitumatic 300-M, or approved equal.
- b. Polyethylene interior lining shall comply with AWWA C116 and shall be compounded with enough carbon black during show ground structure. The polyethylene lining shall be fused to the interior of the pipe by heat, forming a tightly bonded lining, with minimum 40 mils dry thickness. The polyethylene lining system shall be "Polybond," as manufactured by the American Cast Iron Pipe Co., or approved equal.
- D. Casing Pipe. Casing pipe shall be steel pipe that conforms to the requirements of ASTM Designation A-139 Grade B and have a yield strength of 35,000 psi. Joints for steel casing shall be single-weld and shall conform to AWWA Standard C-206. Casing pipe wall thickness for roadway crossings shall not be less than that listed in the following schedule:
- | Nominal Outside Diameter (inches) | Nominal Thickness (inches) |
|-----------------------------------|----------------------------|
| 18 or less | 0.250 |
| 20 | 0.281 |
| 24 | 0.344 |
| 28 | 0.375 |
| 28 or 30 | 0.406 |
- E. Pipe Adapters
1. Donut pipe adapters shall be manufactured from virgin polyvinyl chloride (PVC) or polyurethane adaptable to similar or dissimilar pipes of the same or different sizes. Donuts shall be as manufactured by Fencjo Joint Sealer Company, Inc. or approved equal.
2. Flexible couplings shall be manufactured from virgin polyvinyl chloride (PVC) or polyurethane adaptable to similar or dissimilar pipes of the same or different sizes. The flexible coupling shall be as manufactured by Fencjo Joint Sealer Company, Inc. or approved equal and supplied with No. 304 stainless steel bands.
3. Connection of gravity sewer lines to precast manholes and wetwells shall be made by using a watertight resilient connector conforming to the requirements of ASTM Designation C-923.
- F. Pipe Fittings. Unless otherwise specified, no branches shall be provided in the gravity sewer main for service lateral connections. Wyes shall be 8 inches inside diameter, unless otherwise indicated on the Drawings. All fittings shall be of the same material as the pipe. Pipes for stub-outs shall be of the same material as the pipe and gasketed with the same gasket material as the pipe joint. The plug shall be secured to withstand system test pressures.
- G. Concrete Inlets and Other Structures shall conform to the requirements of Section 03000 - Concrete (Site Work). Concrete classes for the various purposes shall be as follows:
1. Manhole bottoms, Class A
2. Precast manholes, Class B (minimum)
3. Pipe and riser encasement, Class C
4. Protective slabs, Class C
- H. Castings. Gray iron castings for manhole frames, covers and other items shall conform to the ASTM Designation A-48, Class 30. Castings shall be set to pattern in form and dimensions and bedded in concrete. Castings shall be kept clean during laying operations by means of plugs, or otherwise make them unfit for the service intended. The seating surfaces between frames and covers shall be machined to fit true. No plugging or filling will be allowed. Lifting or "pick" holes shall be provided, but shall not penetrate the cover. Casting patterns shall conform to those shown or indicated on the Drawings. The words SANITARY SEWER shall be cast in all manhole covers. All manhole frames and covers shall be traffic bearing. All manhole frames and covers shall be suitable for the future addition of a cast iron ring for upward adjustment of the top elevation.
- I. Brick. Bricks for manhole construction shall be dense, hard burned, shale or heavy brick conforming to ASTM Designation C-216, Grade SW, Size 3/2 inch (W) x 8 inches (L) x 2 1/4 inch (H).
- J. Cement Mortar. Cement mortar for manhole construction shall comply with ASTM Designation C-270, Type M, except that the cement shall be Portland Type I or II only. No mortars that have stood for more than one hour shall be used.
- K. Cast Tar Epoxy. Cast tar epoxy shall be Koppers Bitumatic No. 300M, Tremac Trem-Tar No. 46-413 or approved equal.
- L. Joint Sealer. Joint sealer material for precast manhole structures shall be cold adhesive preformulated plastic gaskets conforming with FOOI Standard Specifications for Road and Bridge Construction (latest edition), Section 942-2. The joint sealer material shall be "Ram-Nok," as manufactured by K.T. Snyder or approved equal.
- M. Non-Shrink Mortar. Non-shrink mortar for filling annular spaces between precast manhole walls and pipe coupling adapters shall be Embraco No. 167 Mortar or approved equal.

Part 3.00 Execution

- 3.01 PREPARATION
- A. Pipe Grading. Upon satisfactory installation of the pipe bedding, as specified in Section 02221- Trenching, Backfilling and Compaction for Utility and Drainage Systems, a continuous trench for the pipe barrel shall be formed. Rebar or the pipe bells or couplings shall be excavated by hand digging. When the pipe is laid in the prepared trench, true to line and grade, the pipe barrel shall provide continuous uniform support and no pressure shall be exerted on the pipe joints from the trench bottom.
- C. Cleanliness. The interior of all pipe shall be thoroughly cleaned of all foreign material before being lowered in the trench and shall be kept clean during laying operations by means of plugs, or other approved methods. During suspension of work for any reason at any time, a suitable stopper shall be placed in the end of the pipe laid to prevent mud or other foreign material from entering the pipe.
- 3.02 INSTALLATION
- A. Pipe Laying shall proceed upgrade with spigot ends pointing in the direction of flow. Before pipe is joined, gaskets shall be cleaned of all dirt and stones and other foreign material. The spigot ends of the pipe and/or pipe gaskets shall be lubricated lightly with a lubricant as specified by the pipe manufacturer and approved by the Engineer. Sufficient pressure shall be applied to the pipe so as to properly seat the socket into the bell of the pipe. All pipe shall be laid straight, true to the lines and grades shown on the Drawings. Variance from established line and grade, at any point along the length of the pipe, shall not be greater than 1/32 of an inch per inch of pipe diameter and not to exceed 1/2 inch, provided that any such variance does not result in a level or reverse sloping invert.
2. Any pipe which is disturbed or found to be defective after laying shall be taken up and re-laid or replaced at the Contractor's expense.
3. Polyvinyl Chloride Pipe
- a. Transportation. Care shall be taken during transportation of the pipe that it is not cut, kinked or otherwise damaged.
- b. Handling Pipe Lengths. Ropes, fabric or rubber protected slings and straps shall be used when handling pipes. Chains, cables or hooks inserted into the pipe ends shall not be used. Two slings spread apart shall be used for lifting each length of pipe. Pipe or fittings shall not be dropped onto rock or unrepaired ground.
- c. Handling Pipeline. The handling of the joined pipeline shall be in such a manner that the pipe is not damaged by dragging it over sharp and cutting objects. Sections of the pipes with deep cuts and gouges shall be removed.
- d. Lowering Pipe into Trench. Care shall be exercised when lowering pipe into the trench to prevent damage to or twisting of the pipe.
- e. Special Precautions. Polyvinyl chloride pipe connected to heavy fittings, manholes and rigid structures shall be supported in such a manner that no subsequent relative movement between the pipe and the joint with the rigid structures is possible.
- B. Service Connections:
1. Service connections of the size and type called for on the Drawings, shall be provided in accordance with the details therefore as shown or indicated on the Drawings.
2. Sewer pipe shall be extended to the street right-of-way line and plugged with an approved removable plastic plug (unless otherwise indicated on the Drawings). All connections and changes of pipe shall be made using standard fittings designed for the purpose.
3. In order to provide an insured economic service connections where septic tanks are to be abandoned and the house or building sewer connected to the new collection system, the Contractor shall, with the Engineer or his representative, locate and determine the elevation of the septic tank influent line or house sewer before locating or installing the new or other fitting in the street sewer. The Engineer or his representative shall approve all such eye or other fitting locations after giving due consideration to lengths, obstructions and such other conditions affecting the location.
4. On curved streets, the exact location for each service connection shall be marked by etching or cutting an 'S' in the concrete curb. Where no curb exists or is planned, locations shall be marked by a method approved by the Engineer.
- C. Concrete Encasement
1. Class C concrete encasement shall be constructed so as to provide a minimum of 6 inches of concrete on all sides of the sewer pipe. Encasement shall be constructed where:
- a. The sewer or service pipe crosses over or under a road, driveway or other paved surface.
- b. The sewer or service pipe crosses over or under a road, driveway or other paved surface.
- c. The sewer or service pipe crosses over, or at a depth which provides less than 18 inches clear distance between pipes when crossing under water mains. Encasement shall extend a minimum of 10 feet on each side of the point of crossing.
- d. The lateral separation of the PVC sewer pipe and potable water pipe is less than 10 feet.
- *The installation of pressure-tight joint ductile iron pipe for the same dimensions will be substituted for the concrete encasement.

SECTION 02720 - STORM DRAINAGE STRUCTURES, PIPES AND FITTINGS - CONTINUED

- Part 3.00 Execution
- 3.01 PREPARATION
- A. Clearing. The Contractor shall perform all necessary clearing operations for the installation of the storm drainage structures, pipe and fittings as specified in Section 02210 - Site Earthwork, Section 02220 - Structure Excavation and Backfill, and Section 02221- Trenching, Backfilling and Compaction for Utility and Drainage Systems.
- 3.02 PERFORMANCE
- A. The Contractor shall perform all necessary operations, such as excavation, dewatering, foundation preparation for structures, pipe bedding, backfilling, backfill compaction, etc., for the proper installation of the storm drainage structures, pipe and fittings as specified in Section 02220-Structure Excavation and Backfill, and Section 02221-Trenching, Backfilling, and Compaction for Utility and Drainage Systems.
- B. Laying Concrete Pipe
1. All pipe shall be carefully laid true to the line and grade shown on the Drawings. Any deviation from true alignment or grade which would result in a displacement from the normal position of the gasket of as much as 1/4 inch, or which would produce a gap exceeding 1/2 inch between sections of pipe for more than 1/3 of the circumference of the inside of the pipe, will not be acceptable and where such occurs, the pipe shall be re-laid without additional compensation. No mortar, joint compound, or other filler which would tend to restrict the flexibility of the gasket joint shall be applied to the gap. Pipes having defects that have not caused their rejection are to be so laid that these defects will be in the upper half of the pipe.
- b. Before installation of the pipe gasket, the gasket and the surface of the pipe joint, including the gasket recess shall be clean and free from grit, dirt, or other foreign matter at the time the joints are made. In order to facilitate closure of the joint, application of an approved vegetable soap lubricant immediately prior to closing of the joint will be permitted.
- c. All pipes shall be laid with bells or grooves up. As the pipes are laid throughout the work, they must be thoroughly cleaned and protected from dirt and water. No length of pipe shall be laid until the two preceding lengths have been thoroughly embedded in place so as to prevent any movement or disturbance of the finished joint. No walking on or working over the pipes after they are laid, except as may be necessary in tamping earth and refilling, will be permitted until they are covered to a depth of one foot. Fill placed around the pipe shall be deposited on both sides simultaneously to approximately the same elevation and uniformly compacted. Whenever the pipe laying is discontinued, or at night, the unfinished end is to be securely protected from displacement due to caving of the banks or from other injury and a suitable stopper is to be inserted therein.
2. Laying Coupled Pipe
- a. All coupled pipe shall be carefully laid, true to the line and grade shown on the Drawings. The pipe gasket and coupling bond shall be centered over the joint with the coupling ball bolts securely tightened without cutting the gasket.
- b. Fill placed around the pipe shall be deposited on both sides simultaneously to, approximately the same elevation and uniformly compacted. Whenever the pipe laying is discontinued, as at night, the unfinished end is to be securely protected from displacement due to caving of the banks or from other injury and a suitable stopper is to be inserted therein.
3. Drainage Structures:
- a. Concrete inlets or other structures shall be constructed in conformity with the Drawings. Forms shall be designed and constructed so that they may be removed without injury to the concrete and shall be kept in place for at least 24 hours after concrete is poured. Concrete shall be thoroughly tamped and shall be cured for at least 5 days after removal of forms. Precast pieces shall be thoroughly cleaned, saturated with water and pointed up with mortar.
- d. Hecost inlets or other structures may be used in lieu of cast-in-place structures. Gates are to be set in place in mortar to the proper line and grade.
- 3.03 TESTING STRUCTURES
- A. Leakage. The watertightness of manholes and inlets (except for bottomless types) may be tested, at the Engineer's option, at the time the structure is completed and backfilled. The test procedure shall be as follows:
1. Fill the structures with water to an elevation 1 foot below the start of the cone section with a minimum depth of 4 feet and a maximum depth of 20 feet.
2. Plug all inlets and outlets with approved stoppers or plugs.
3. Record the water surface drop during a 15-minute period. The maximum allowable drop in water surface is 1/2 inch for each 15-minute period. If the leakage exceeds this rate, the Contractor shall repair or replace the structure so as to provide a structure which will meet the required watertightness standards.
- END OF SECTION
- SECTION 02730 - SANITARY SEWAGE SYSTEM
- Part 1.00 General
- 1.01 WORK INCLUDED
- A. The work included in this Section consists of furnishing all labor, equipment and materials necessary for the construction of gravity sanitary sewer lines, manholes, laterals, sewer connections and appurtenances as shown on the Drawings and specified therein.
- 1.02 RELATED WORK
- A. Section 02210 - Site Earthwork.
- B. Section 02220 - Structure Excavation and Backfill.
- C. Section 02221 - Trenching, Backfilling and Compaction.
- D. Section 02530 - Dewatering System.
- E. Section 03000 - Concrete (Site Work).
- 1.03 QUALITY ASSURANCE
- A. Shop drawings of the manholes, proposed to be furnished for this work, are submitted to and approved by the Engineer prior to the manufacture of the units. Manholes which are not manufactured in strict conformance with the approved shop drawings and these specifications will be rejected.
- B. The Contractor shall furnish shop drawings on all pipe, fittings and other appurtenances to show conformity with plans and specifications.
- C. Tests: Certified records of the tests made by the manufacturer, or by a reliable commercial laboratory, or both, shall be submitted with each shipment of pipe. All pipe will be inspected upon delivery and that which does not conform to the requirements of these specifications shall be rejected and must be immediately removed by the Contractor. The Contractor shall furnish and provide samples of pipe for the performance of such additional tests, as the Owner may deem necessary.
- D. Each length of pipe shall bear the name or trademark of the manufacturer, the location of the manufacturing plant, and the class or strength classification of the pipe. The markings shall be plainly visible on the pipe barrel. Pipe, which is not marked, clearly is subject to rejection. All rejected pipe shall be promptly removed from the project site by the Contractor.
- E. For precast manhole structures, the date of manufacture and the name or trademark of the manufacturer shall be clearly marked on each precast section.
- F. All materials and manufacturers of sold materials shall meet the requirements of the utility agency that will maintain this system. Contractor obtain a copy of the requirements from the agency.
- 1.04 SUBMITTALS
- A. Shop Drawings:
1. Shop drawings shall be submitted to the Engineer for approval prior to construction. Where applicable, the following information shall be submitted:
- a. Precast manholes.
- b. Manufacturer's certification of conformance to ASTM requirements for precast structures.
- c. Manhole frames, covers and other castings.
- d. Manufacturer's certification of conformance to ASTM requirements for castings.
- e. Pipe joint and fittings.
- f. Mill Test Certificates on ductile iron pipe.
- g. Certified test records for polyvinyl chloride pipe.
- h. Pipe adapters.
- B. Record Information. The Contractor shall submit to the Engineer the stations and left or right offsets of all services (terminal ends) as measured from the nearest downstream manhole along the centerline of the sewer, along with the elevations of the manhole covers and inverts of all pipes in the manholes.
- Part 2.00 Products
- 2.01 MATERIALS
- A. Pipe used in gravity sewer construction shall be polyvinyl chloride pipe (PVC) or ductile iron pipe (DIP).
- B. Polyvinyl Chloride Pipe (PVC):
1. PVC pipe and fittings for gravity sewer lines shall be manufactured from polyvinyl chloride resin conforming to ASTM Designation D-1784.
2. PVC pipe and fittings, 4-inches to 18-inches in diameter, shall conform to the requirements of ASTM Designation D-3034, and shall have a Standard Dimension Ratio (SDR) of not more than thirty-five (35). PVC pipe and fittings, 18-inches to 27 inches in diameter, shall conform to the requirements of ASTM Designation F-679, and shall have a Standard Dimension Ratio (SDR) of not more than thirty-five (35).
3. All PVC pipe shall bear the NSF-DW seal. The minimum standard length of pipe shall be 13 feet.
4. PVC pipe joints shall be integral bell elastomeric gasket joints manufactured in accordance with ASTM Designation F-477. Rubber sealing rings shall be factory installed.
5. Minimum pipe stiffness (F/AY) at 5 percent deflection shall be 46 psi for all sizes tested in accordance with ASTM Method D-2412.
6. Polyvinyl chloride pipe shall be stored on level ground, preferably turf or sand, free of sharp objects which could damage the pipe. Stacking of the polyvinyl chloride pipe shall be limited to a height that will not cause excessive deformation of the bottom layers of pipes. Where necessary due to ground conditions, the pipe shall be stored on wooden sleepers, spaced suitably and of such width as not to allow deformation of the pipe at the point of contact with the sleeper or between supports.
7. All PVC pipe, fittings, and specials shall be manufactured by J-M Manufacturing Company. Certainflex or approved equal.

CONTRACTOR SHALL VERIFY ALL
 CONDITIONS AND DIMENSIONS
 AT THE JOB SITE AND NOTIFY
 THE ARCHITECT OF ANY DIMEN-
 SIONAL ERRORS, OMISSIONS OR
 DISCREPANCIES BEFORE BEGIN-
 NING OR FABRICATING ANY WORK
 DO NOT SCALE DRAWINGS

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 CHICAGO, IL 60606
 WWW.KIMLEY-HORN.COM

Olive Garden
 ITALIAN KITCHEN

Issue Date: 06-20-24

| REVISION | |
|------------------|----------|
| 1 | 07-08-24 |
| AGENCY REVISIONS | |

Restaurant #: 6526

OLIVE GARDEN
 P62DOM-BOX-L

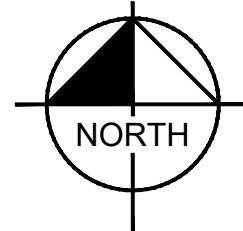
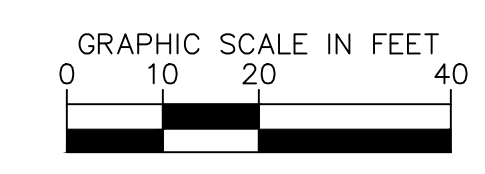
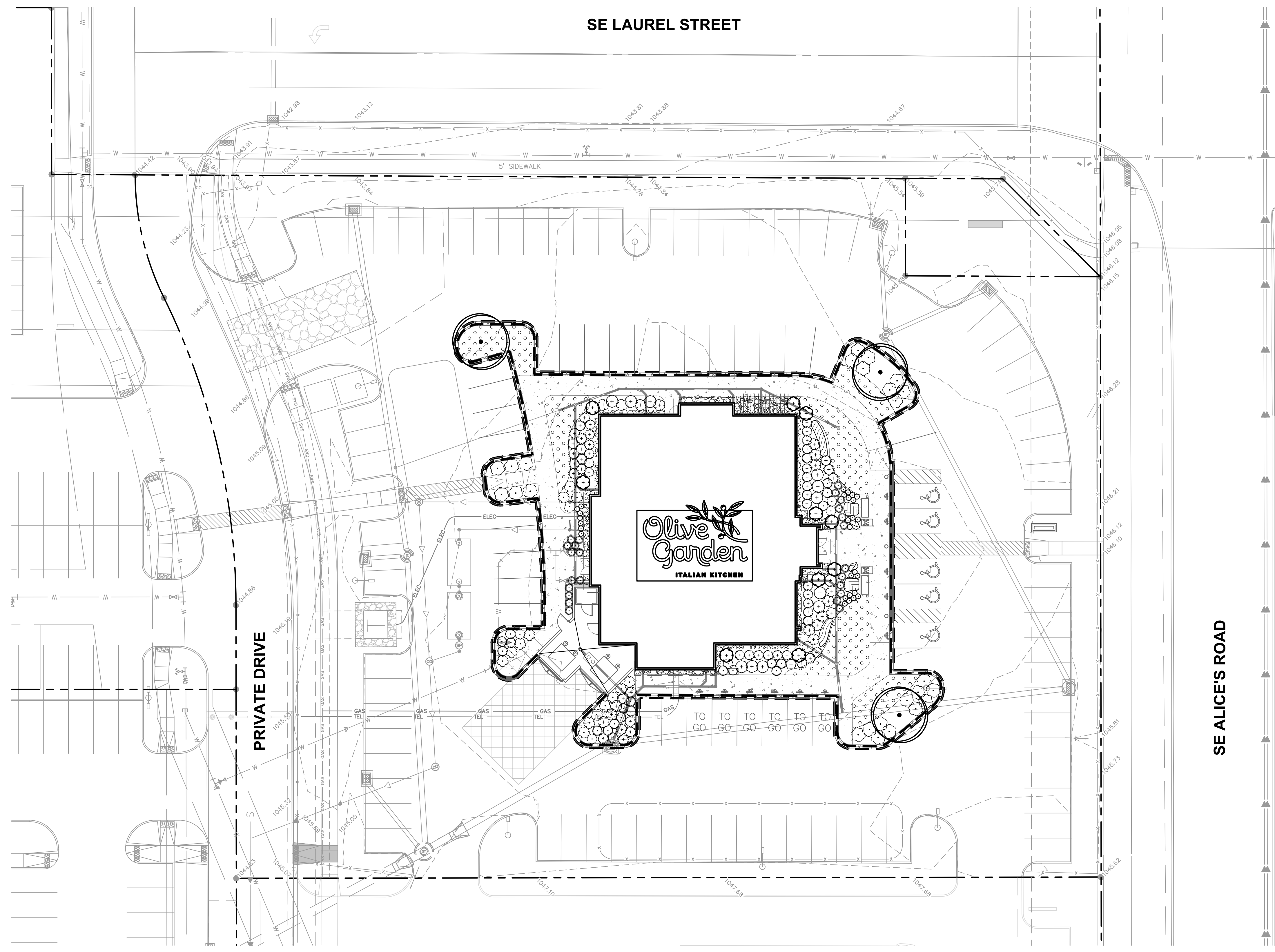
HK Q3 2024 REV.

420 SE
 ALICE'S RD.

WAUKEE,
 IOWA

Drawing
 LANDSCAPE
 PLAN

L1.0



LANDSCAPE NOTES

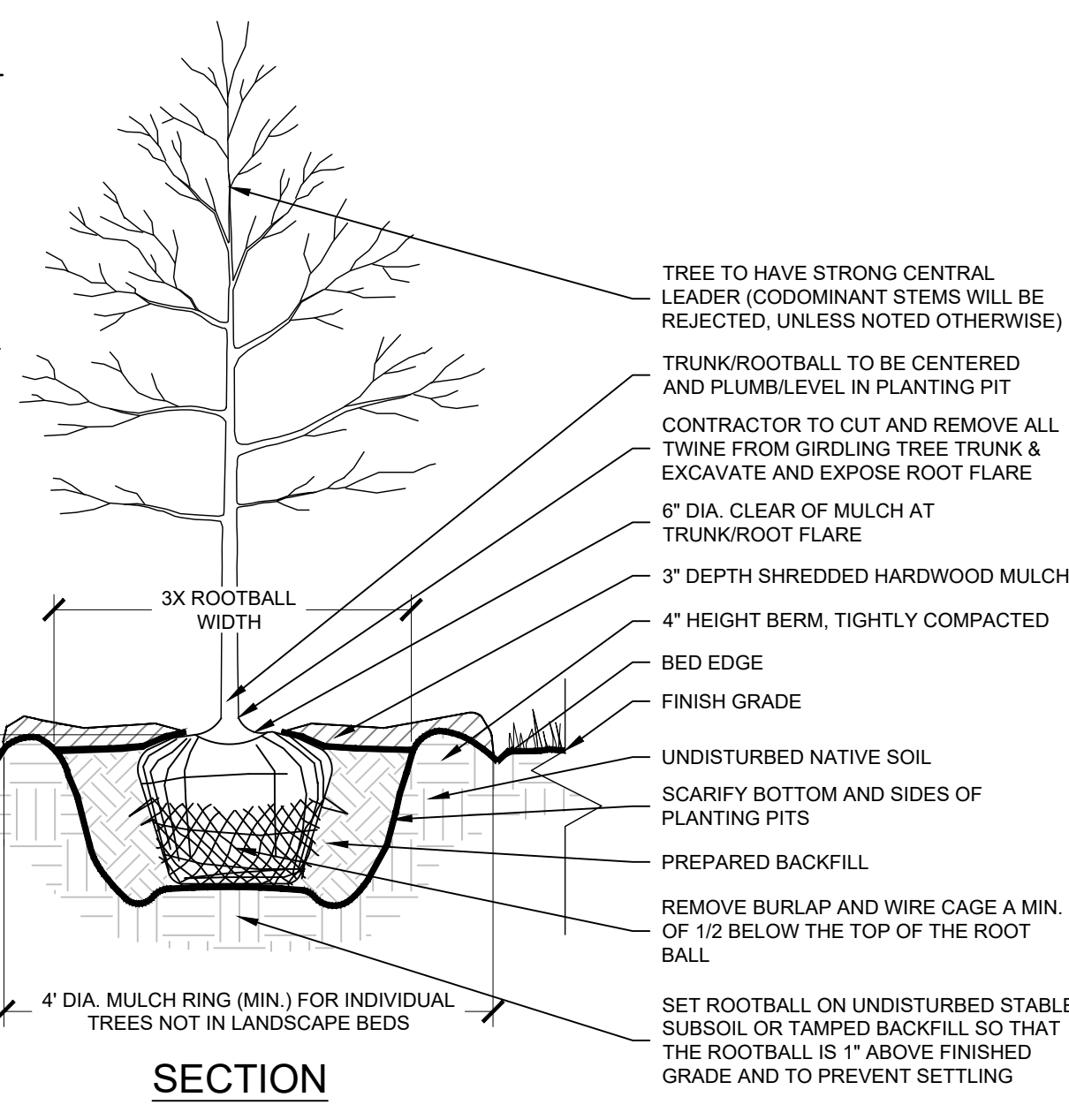
1. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING MATERIALS AND PLANTS SHOWN ON THE LANDSCAPE PLAN. THE CONTRACTOR IS RESPONSIBLE FOR THE COST TO REPAIR UTILITIES, ADJACENT LANDSCAPE, PUBLIC AND PRIVATE PROPERTY THAT IS DAMAGED BY THE CONTRACTOR OR THEIR SUBCONTRACTOR'S OPERATIONS DURING INSTALLATION OR DURING THE SPECIFIED MAINTENANCE PERIOD. CALL FOR UTILITY LOCATIONS PRIOR TO ANY EXCAVATION.
2. THE CONTRACTOR SHALL REPORT ANY DISCREPANCY IN PLAN VS. FIELD CONDITIONS IMMEDIATELY TO THE LANDSCAPE ARCHITECT, PRIOR TO CONTINUING WITH THAT PORTION OF WORK.
3. NO PLANTING WILL BE INSTALLED UNTIL ALL GRADING AND CONSTRUCTION HAS BEEN COMPLETED IN THE IMMEDIATE AREA.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY OF THEIR TRENCHES OR EXCAVATIONS THAT SETTLE.
5. ALL PLANTS TO BE SPECIMEN GRADE, WELL BRANCHED, HEALTHY, FULL, PRE-INOCULATED AND FERTILIZED. PLANTS SHALL BE FREE FROM DISEASE, PESTS, WOUNDS, AND SCARS. PLANTS SHALL BE FREE FROM NOTICEABLE GAPS, HOLES, OR DEFORMITIES. PLANTS SHALL BE FREE FROM BROKEN OR DEAD BRANCHES. TRUNKS WILL BE WRAPPED IF NECESSARY TO PREVENT SUN SCALD AND INSECT DAMAGE. THE LANDSCAPE CONTRACTOR SHALL REMOVE THE WRAP AT THE PROPER TIME AS PART OF THIS CONTRACT.
6. THE OWNER'S REPRESENTATIVE MAY REJECT ANY PLANT MATERIALS THAT ARE DISEASED, DEFORMED, OR OTHERWISE NOT EXHIBITING SUPERIOR QUALITY.
7. ALL NURSERY STOCK SHALL BE GUARANTEED, BY THE CONTRACTOR, FOR ONE YEAR FROM DATE OF FINAL INSPECTION. THE GUARANTEE BEGINS ON THE DATE OF THE LANDSCAPE ARCHITECT'S OR OWNERS WRITTEN ACCEPTANCE OF THE INITIAL PLANTING. REPLACEMENT PLANT MATERIAL SHALL HAVE A ONE YEAR GUARANTEE COMMENCING UPON PLANTING.
8. PLANTS TO MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-2014 OR MOST CURRENT VERSION) REQUIREMENTS FOR SIZE AND TYPE SPECIFIED.
9. PRUNE PLANTS AS NECESSARY- PER STANDARD NURSERY PRACTICE AND TO CORRECT POOR BRANCHING OF EXISTING AND PROPOSED TREES.
10. TOPSOIL SHALL BE PROVIDED AND GRADED BY THE GENERAL CONTRACTOR UP TO 6 INCHES BELOW FINISHED GRADE IN TURF AREAS AND 18 INCHES IN PLANTING AREAS.
11. PLANTING AREA TOPSOIL SHALL BE TESTED AND AMENDED PER THE RECOMMENDATIONS OF THE AGRONOMICAL SOIL REPORT. CONTRACTOR SHALL OBTAIN AGRONOMICAL SOIL REPORT.
12. SEED/SOD LIMIT LINES ARE APPROXIMATE. CONTRACTOR SHALL SEED/SOD ALL AREAS WHICH ARE DISTURBED BY GRADING WITH THE SPECIFIED SEED/SOD MIXES.
13. EDGING TO BE A SPADED EDGE UNLESS INDICATED OTHERWISE ON THE PLANS. SPADED EDGE TO PROVIDE V-SHAPED DEPTH AND WIDTH TO CREATE SEPARATION BETWEEN MULCH AND GRASS. A SPADED BED EDGE SHALL SEPARATE MULCH BEDS FROM TURF OR SEEDED AREAS. A SPADED EDGE IS NOT REQUIRED ALONG CURBED EDGES.
14. CONTRACTOR SHALL INSTALL SHREDDED HARDWOOD MULCH AT A 3" DEPTH TO ALL TREES, SHRUB, PERENNIAL, AND GROUND COVER AREAS. TREES PLACED IN AREA COVERED BY TURF SHALL RECEIVE A 4 FT WIDE MAXIMUM TREE RING WITH 3" DEPTH SHREDDED HARDWOOD MULCH.
15. INSTALLATION OF TREES WITHIN PARKWAYS SHALL BE COORDINATED IN THE FIELD WITH LOCATIONS OF UNDERGROUND UTILITIES. TREES SHALL NOT BE LOCATED CLOSER THAN 5' FROM UNDERGROUND UTILITY LINES AND NO CLOSER THAN 10' FROM UTILITY STRUCTURES.
16. DO NOT DISTURB THE EXISTING PAVING, LIGHTING, OR LANDSCAPING THAT EXISTS ADJACENT TO THE SITE UNLESS OTHERWISE NOTED ON PLAN.
17. ALL DISTURBED AREAS TO BE SODDED OR SEEDED, UNLESS OTHERWISE NOTED. SOD/SEED SHALL BE LOCAL HARDY TURF GRASS MIX UNLESS OTHERWISE NOTED.
18. PLANT QUANTITIES SHOWN ARE FOR THE CONVENIENCE OF THE OWNER AND JURISDICTIONAL REVIEW AGENCIES. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL PLANT QUANTITIES AS DRAWN.
19. THE CONTINUED MAINTENANCE OF ALL REQUIRED LANDSCAPING SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY ON WHICH SAID MATERIALS ARE REQUIRED. ALL PLANT MATERIALS REQUIRED BY THIS SECTION SHALL BE MAINTAINED AS LIVING VEGETATION AND SHALL BE PROMPTLY REPLACED IF THE PLANT MATERIAL HAS DIED PRIOR TO FINAL ACCEPTANCE. PLANTING AREAS SHALL BE KEPT FREE OF TRASH, LITTER, AND WEEDS AT ALL TIMES.

PLANT SCHEDULE

| SYMBOL | CODE | QTY | BOTANICAL / COMMON NAME | CONT | CAL | SIZE |
|----------------------|------|-----|---|-------|----------|--------------|
| TREES | | | | | | |
| | GS | 3 | GLEDITSIA TRIACANTHOS 'INERMIS' / SKYLINE HONEY LOCUST | B & B | | |
| | JS | 10 | JUNIPERUS SCOPULORUM 'SKYROCKET' / SKYROCKET JUNIPER | | | 6' HT. MIN. |
| SHRUBS | | | | | | |
| | CK | 24 | CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS | | SEE PLAN | 24" HT. MIN. |
| | CS | 23 | CORNUS ALBA 'STALTOUCH' / TOUCH OF ELEGANCE™ TATARIAN DOGWOOD | | SEE PLAN | 24" HT. MIN. |
| | RG | 25 | RHUS AROMATICA 'GRO-LOW' / GRO-LOW FRAGRANT SUMAC | | SEE PLAN | 18" HT. MIN. |
| | ST | 28 | SPOROBOLUS HETEROLEPIS 'TARA' / TARA PRAIRIE DROPS EED | | SEE PLAN | 12" HT. MIN. |
| | VM | 15 | VIBURNUM DENTATUM 'BLUE MUFFIN' / BLUE MUFFIN ARROWWOOD VIBURNUM | | SEE PLAN | 36" HT. MIN. |
| SHRUB AREAS | | | | | | |
| | EA | 18 | ECHINACEA PURPUREA 'ALBA' / WHITE CONEFLOWER | | 24" O.C. | 18" HT. MIN. |
| | HB | 12 | HEMEROCALLIS X 'BELA LUGOSI' / BELA LUGOSI DAYLILY | | 24" O.C. | 18" HT. MIN. |
| GROUND COVERS | | | | | | |
| | RI | | RIVER ROCK MULCH / 1"-2" DIA. LOCALLY SOURCED, WASHED | | | |
| | TS2 | | TURF SOD / DROUGHT TOLERANT FESCUE BLEND | | | |

NOTES:

- INSPECT TREE FOR DAMAGED BRANCHES, APPLY CORRECTIVE PRUNING.
- SET ROOT BALL ON UNEXCAVATED OR TAMPED SOIL. TOP OF ROOTBALL SHALL BE TWO INCHES ABOVE SURROUNDING GRADE WITH BURLAP AND WIRE BASKET INTACT.
- REMOVE WIRE BASKET AND BURLAP DOWN 1/2 OF ROOT BALL. REMOVE ANY TWINE, SYNTHETIC MATERIAL, WIRES, STRAPS, BURLAP, ETC. THAT COULD GIRDLING THE TREE OR RESTRICT TREE GROWTH. REMOVE OR CORRECT GIRDLING ROOTS.
- TAMP EXCAVATED SOIL AROUND BASE OF ROOTBALL.
- BACKFILL REMAINDER EXCAVATED SOIL TAMPED LIGHTLY.
- WATER THOROUGHLY WITHIN TWO HOURS USING 10 TO 15 GALLONS OF WATER.
- APPLY MULCH IN EVEN LAYER, KEEPING 6" AWAY FROM ROOT FLARE.
- FINAL LOCATION OF TREE TO BE APPROVED BY OWNER.
- PERFORM PERCOLATION TEST PER PLANTING SPECIFICATIONS. IF SUBSURFACE DRAINAGE PROBLEMS ARE ENCOUNTERED, NOTIFY PROJECT LANDSCAPE ARCHITECT.

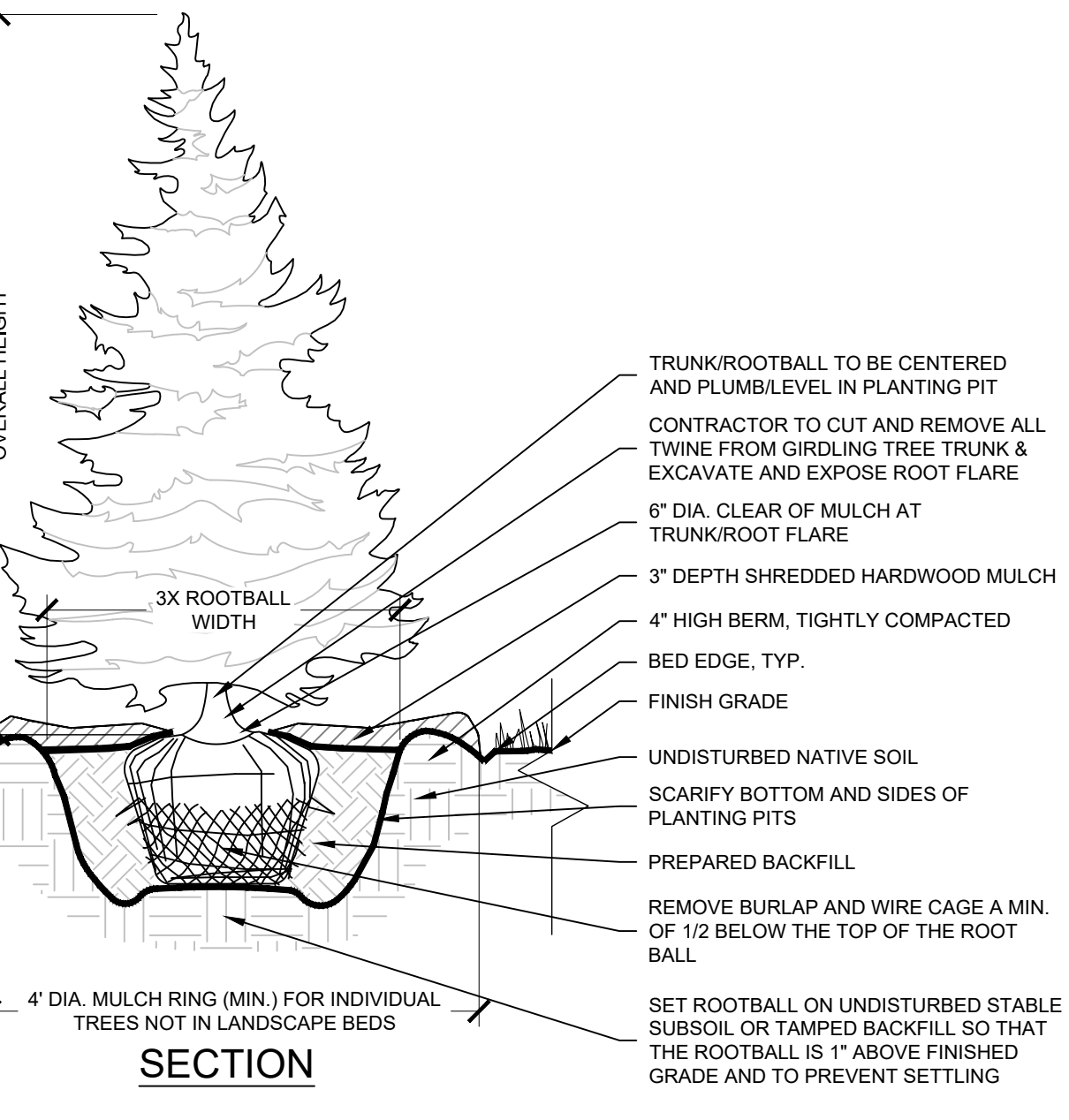


1 TYPICAL TREE PLANTING

N.T.S.

NOTES:

- INSPECT TREE FOR DAMAGED BRANCHES, APPLY CORRECTIVE PRUNING.
- SET ROOT BALL ON UNEXCAVATED OR TAMPED SOIL. TOP OF ROOTBALL SHALL BE TWO INCHES ABOVE SURROUNDING GRADE WITH BURLAP AND WIRE BASKET INTACT.
- REMOVE WIRE BASKET AND BURLAP DOWN 1/2 OF ROOTBALL. REMOVE ANY TWINE AND (IF USED), SYNTHETIC MATERIAL. REMOVE OR CORRECT GIRDLING ROOTS.
- TAMP EXCAVATED SOIL AROUND BASE OF ROOTBALL.
- BACKFILL REMAINDER EXCAVATED SOIL TAMPED LIGHTLY. HIGH CLAY OR POOR SOIL SHALL RECEIVE SOIL AMENDMENT PER LANDSCAPE NOTES.
- WATER THOROUGHLY WITHIN TWO HOURS USING 10 TO 15 GALLONS OF WATER.
- APPLY MULCH IN EVEN LAYER, KEEPING AWAY FROM ROOT FLARE.
- FINAL LOCATION OF TREE TO BE APPROVED BY OWNER.
- PERFORM PERCOLATION TEST PER PLANTING SPECIFICATIONS. IF SUBSURFACE DRAINAGE PROBLEMS ARE ENCOUNTERED, NOTIFY PROJECT LANDSCAPE ARCHITECT.



2 EVERGREEN TREE PLANTING

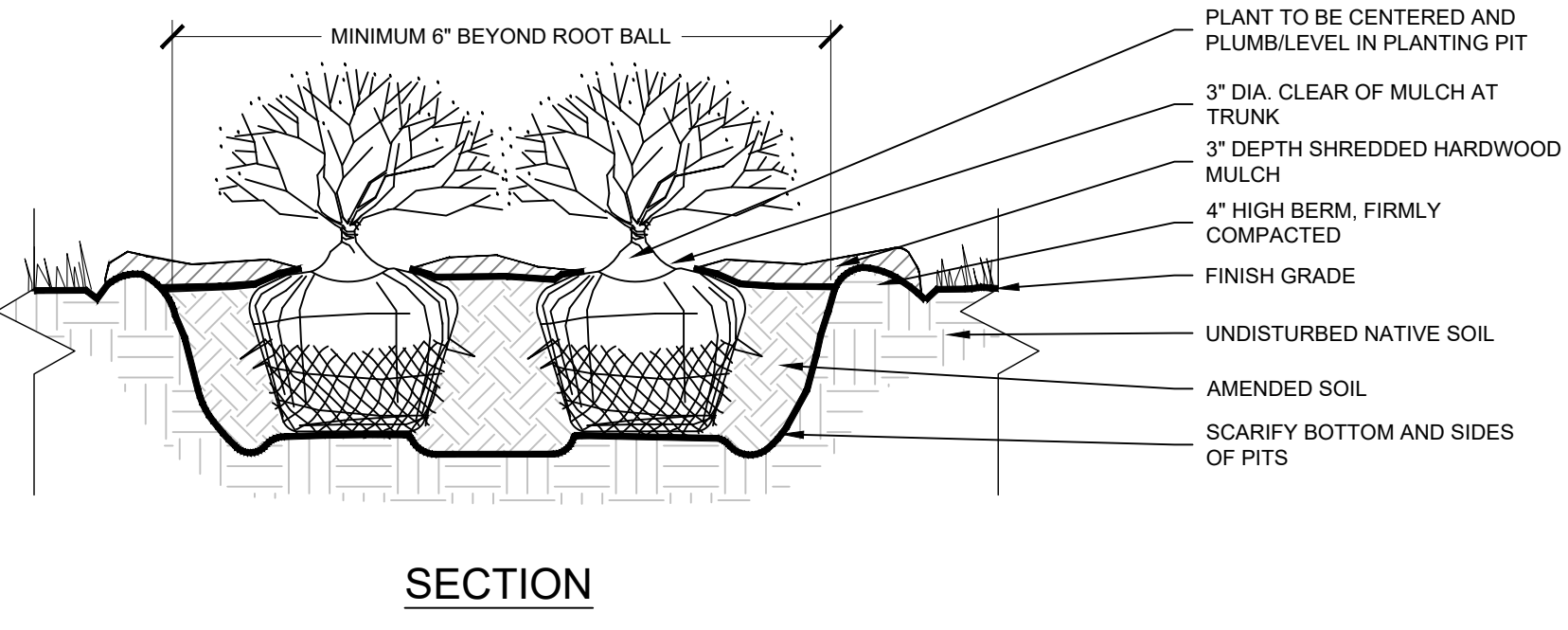
N.T.S.

3 SHRUB PLANTING AT SIDEWALK

N.T.S.

NOTES:

- APPLY CORRECTIVE PRUNING.
- SET ROOT BALL OR CONTAINER ON UNEXCAVATED OR TAMPED SOIL. TOP OF ROOTBALL (CONTAINER) SHALL BE ONE INCH ABOVE SURROUNDING GRADE. FOR LARGER SHRUBS WITHIN PLANTING BED DIG A DEEPER PIT ONLY FOR THOSE SHRUBS.
- REMOVE BURLAP FROM TOP HALF THE LENGTH OF ROOTBALL TWINE AND (IF USED) SYNTHETIC MATERIAL SHALL BE REMOVED FROM PLANTING BED. FOR CONTAINER GROWN SHRUBS, REMOVE CONTAINER AND LOOSEN ROOTS PRIOR TO INSTALLATION. REMOVE OR CORRECT GIRDLING ROOTS.
- PLUMB AND BACKFILL WITH AMENDED SOIL PER LANDSCAPE NOTES. WATER THOROUGHLY WITHIN TWO HOURS.
- APPLY MULCH IN EVEN LAYER, KEEPING AWAY FROM ROOT FLARE. MULCH LIMITS FOR SHRUBS EXTEND TO ALL LIMITS OF PLANTING BED. SEE PLANS FOR BED LAYOUTS.

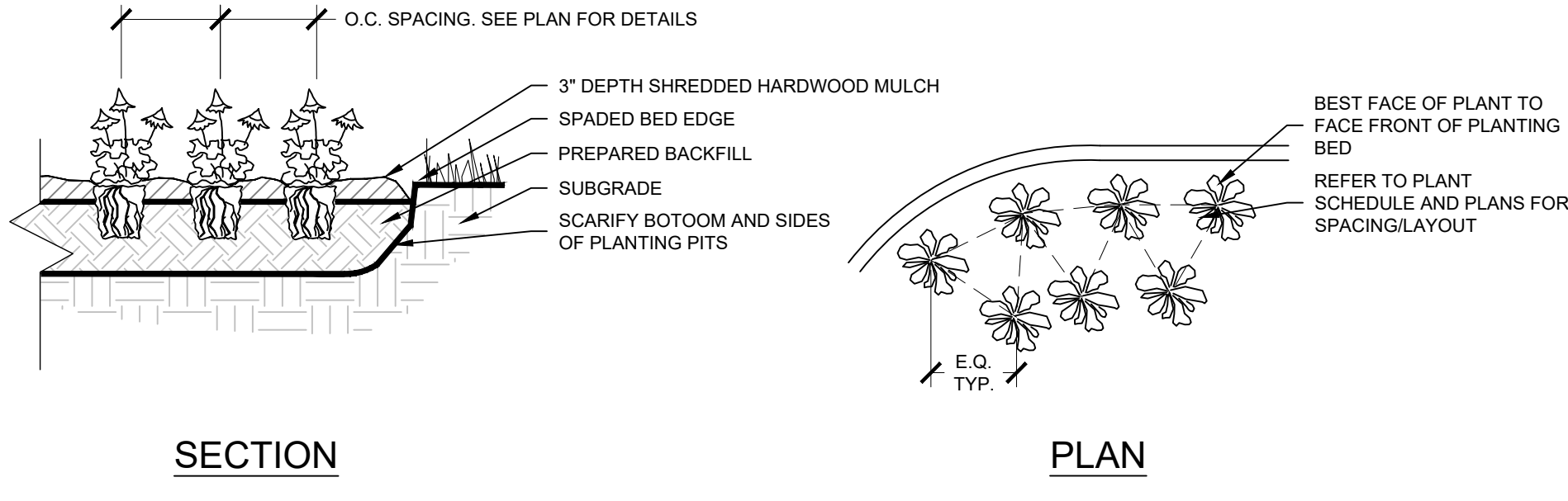


4 SHRUB PLANTING

N.T.S.

NOTES:

- EXCAVATE PLANTING BED.
- BED HEIGHT IS TO BE 2" ABOVE FINISH GRADE AND WELL DRAINED.
- REMOVE CONTAINER, SCORE SOIL MASS TO REDIRECT AND PREVENT CIRCLING ROOTS. CORRECT GIRDLING ROOTS.
- PLANT MATERIAL SHALL BE LAID OUT BY FOLLOWING THE BED EDGE, WORKING TOWARDS THE CENTER OF THE BED USING TRIANGULAR (STAGGERED) SPACING AS PLAUSIBLE.
- PLUMB AND BACKFILL WITH PLANTING MIX AS SPECIFIED IN LANDSCAPE NOTES.
- APPLY MULCH IN EVEN LAYER, KEEPING AWAY FROM ROOT FLARE. MULCH LIMITS FOR PERENNIALS/GRASS/COVER EXTEND TO ALL LIMITS OF PLANTING BED. SEE PLANS FOR BED LAYOUTS.
- SPACING TO BE AS SPECIFIED IN THE PLANT LIST OR AS SHOWN ON DRAWINGS. PERENNIALS SHALL BE PLACED WITH THEIR CENTER 24" FROM EDGE OF BED.

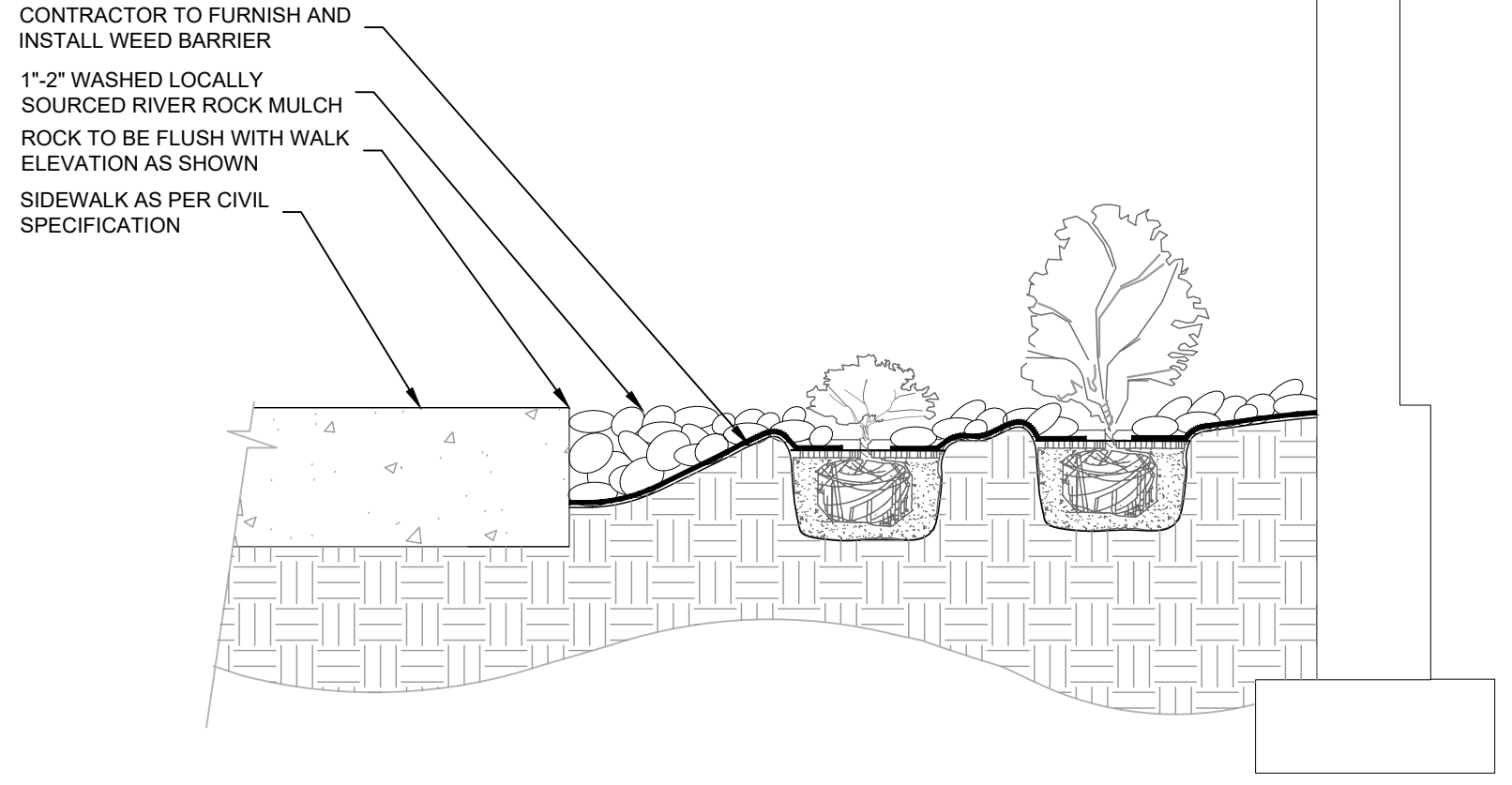


5 PERENNIAL PLANTING

N.T.S.

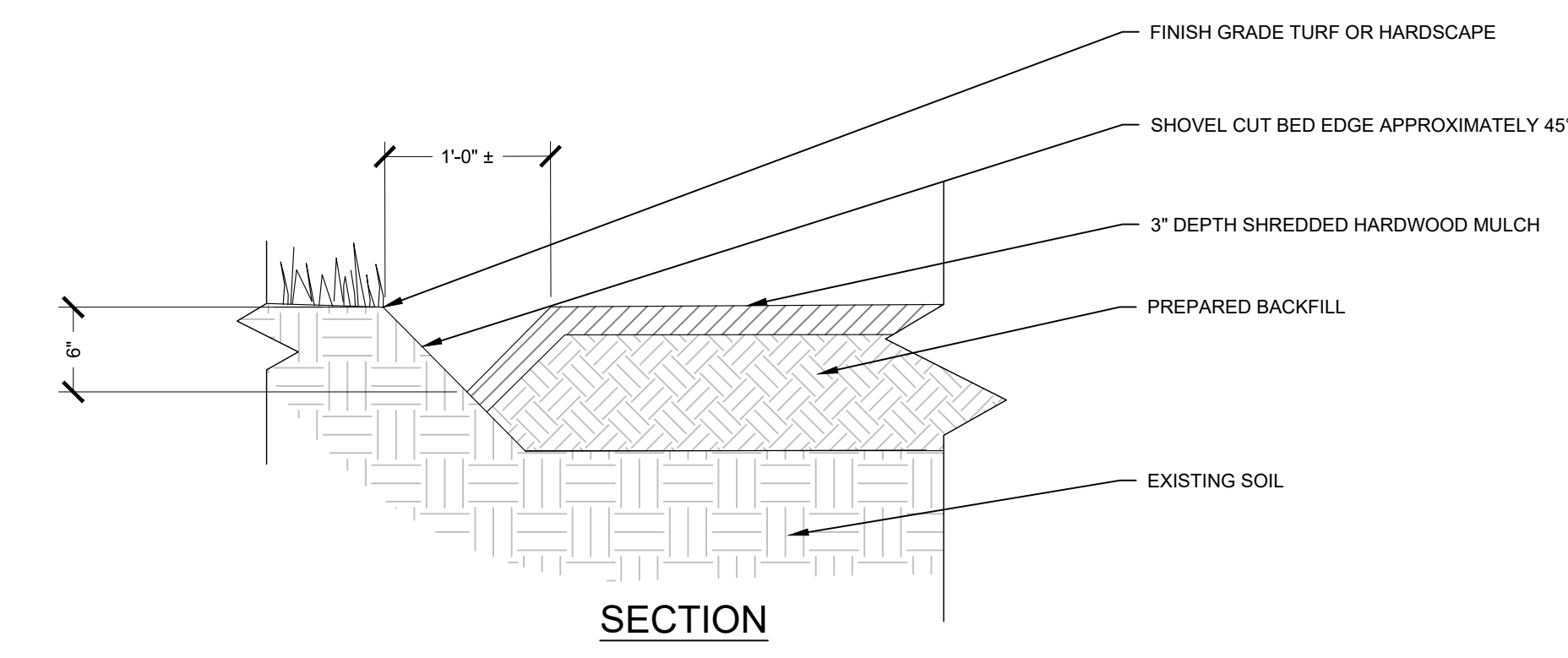
NOTES:

- ENSURE THAT ALL RIVER ROCK ADJACENT TO THE SIDEWALKS IS FLUSH AND LEVEL WITH THE ELEVATION OF THE WALK.
- SLOPED OR ROUNDED BEDS THAT ALLOW THE ROCK TO ROLL ONTO WALK SURFACES ARE UNACCEPTABLE.



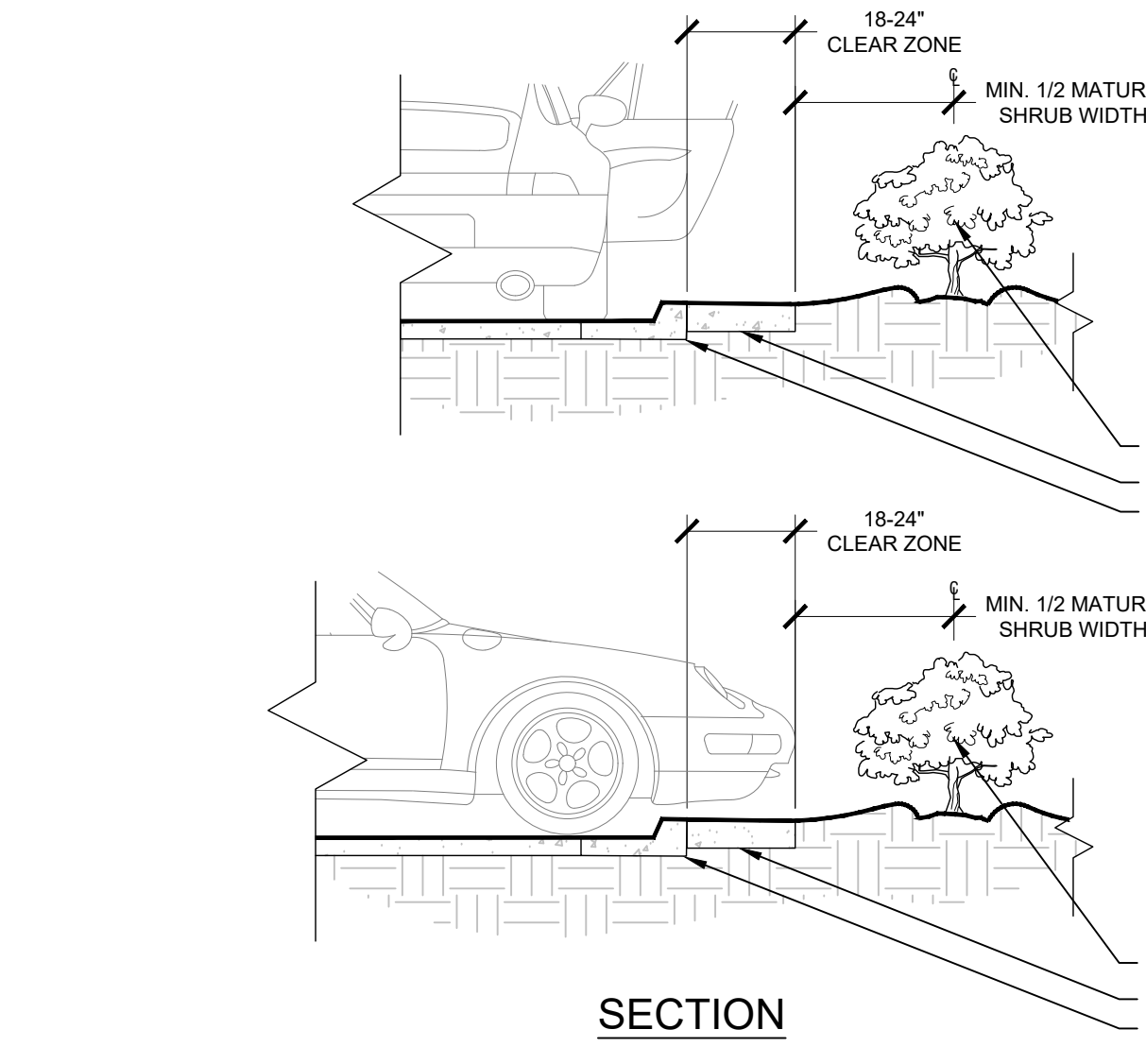
6 ROCK MULCH INSTALLATION

N.T.S.



7 BED EDGE

N.T.S.

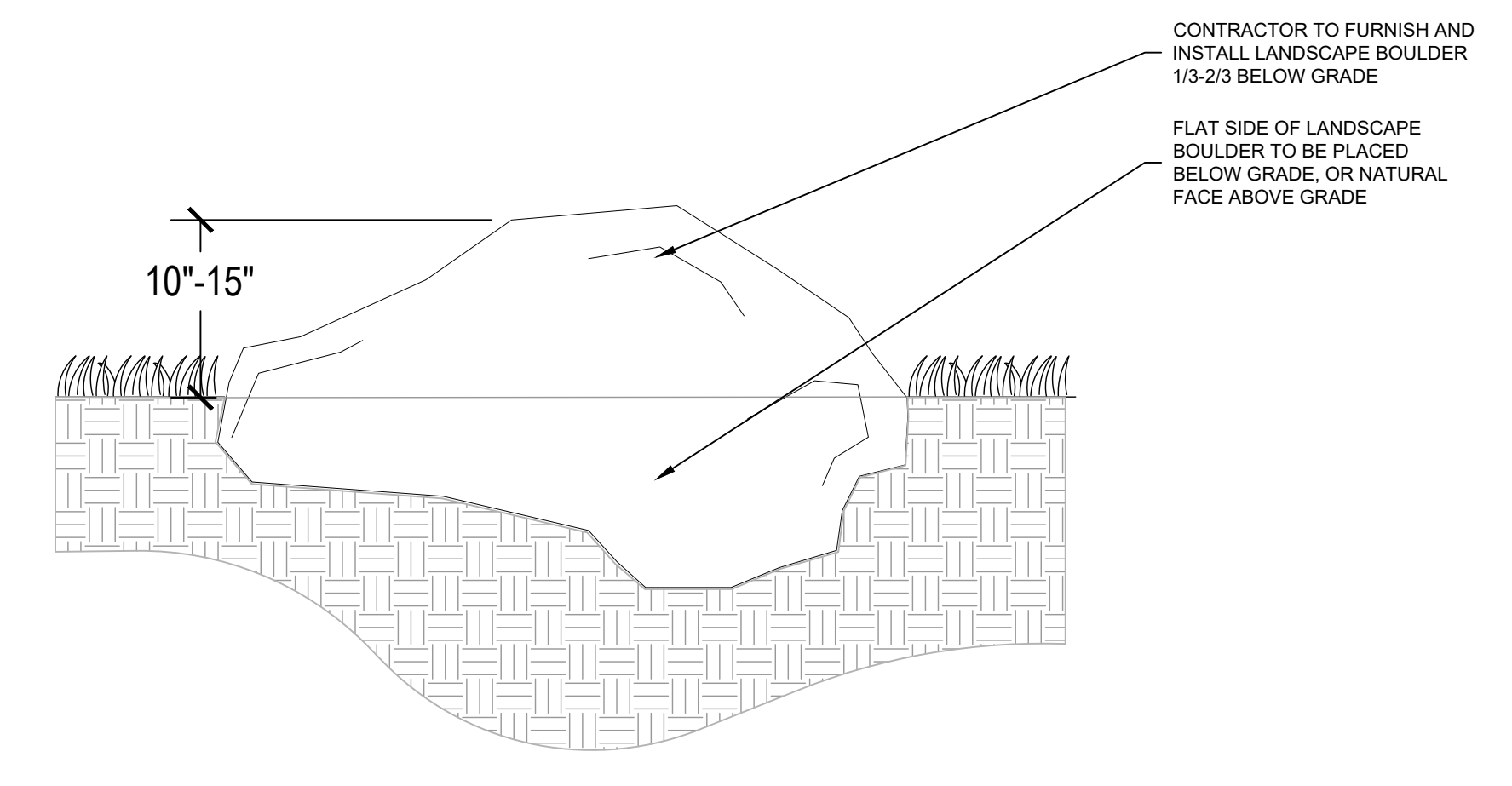


8 SHRUB PLANTING AT CURB

N.T.S.

NOTES:

- ROCK TO APPEAR THAT IT HAS SETTLED OVER TIME INTO THE LANDSCAPE. BOULDERS TO APPEAR MORE WEATHERED AND ANGULAR IN APPEARANCE, RATHER THAN ROUNDED OR FLAT, AND SHALL BE FREE OF SHARP EDGES.



9 DECORATIVE LANDSCAPE BOULDER

N.T.S.

IRRIGATION KEYNOTES

- 1 POINT OF CONNECTION, SEE INTERIOR PLUMBING PLANS FOR IRRIGATION STUBOUT
- 2 POINT OF CONNECTION APPURTENANCES ARE SHOWN AS DIAGRAMMATIC, CONTRACTOR TO LOCATE FINAL LOCATIONS IN THE FIELD.
- 3 CONTRACTOR TO DETERMINE FINAL LOCATIONS OF LOCKING GATE VALVE, BACKFLOW, FLOW SENSOR, MASTER VALVE, ETC. IN THE FIELD.
- 4 CONTRACTOR TO PROVIDE ELECTRICAL CIRCUIT AS NECESSARY FOR IRRIGATION CONTROLLER
- 5 IRRIGATION CONTROLLER IS SHOWN AS DIAGRAMMATIC. CONTRACTOR TO DETERMINE FINAL LOCATION IN THE FIELD WITH OWNER'S REPRESENTATIVE
- 6 WEATHER SENSOR IS SHOWN AS DIAGRAMMATIC. CONTRACTOR TO AFFIX RAIN SENSOR TO ARCHITECTURE AND TO AVOID FALSE READINGS.
- 7 CONTRACTOR TO PROVIDE CONNECTION FROM CONTROLLER TO FLOW SENSOR
- 8 CONTRACTOR TO FURNISH AND INSTALL 2" DIA. SCH 40 CROSSOVER SLEEVE
- 9 CONTRACTOR TO COORDINATE SLEEVING WITH ALL OTHER CONTRACTORS/TRADES TO ENSURE CROSSOVER SLEEVES ARE PLACED PRIOR TO CONSTRUCTION/SITE IMPROVEMENTS

SEE SHEET IR2.0 FOR IRRIGATION DETAILS & SPECIFICATIONS.

THIS IRRIGATION PLAN IS DESIGNED TO THE FOLLOWING STATS: 65 PSI AND 20 GPM. A BOOSTER PUMP WILL BE REQUIRED AT COST OF CONTRACTOR. CONTACT LANDSCAPE ARCHITECT PRIOR TO INSTALLATION IF SYSTEM HAS +/- 5 PSI THAN DESIGN PRESSURE.

ABOVE QUANTITIES PROVIDED FOR CONVENIENCE ONLY. CONTRACTOR TO CONFIRM ALL QUANTITIES PRIOR TO BIDDING.

REFERENCE MAXIMUM LATERAL DRIPLINE CHART TO DETERMINE MINIMUM NUMBER OF POINTS OF CONNECTION PER DRIP LINE ZONE.

WHERE LAYOUT FLEXIBLE EXISTS CENTER FEED LAYOUTS MUST BE USED. THIS ALLOWS FOR EVEN FLOW OF WATER THROUGH THE ZONE.

RAINBIRD- DRIP INDICATOR TO BE PLACED IN ALL DRIP AREAS AT THE FURTHEST POINT OF EACH DRIP RUN.

ZONES LOWER THAN THE CAPACITY OF THE FLOW SENSOR ARE TO BE WIRED IN THE CONTROLLER WITH ANOTHER ZONE SO THAT THE FLOW SENSOR READS BOTH ZONES AS ONE ZONE IN ORDER TO MEET THE FLOW SENSOR'S LOWEST GPM REQUIREMENT. DRIP ZONES REQUIRED TO REMAIN PIPED AS SEPARATE ZPMES.

ARCHITECTS PROJECT
 Job # 4A0003

CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS AT THE JOB SITE AND NOTIFY THE ARCHITECT OF ANY DIMENSIONAL ERRORS, OMISSIONS OR DISCREPANCIES BEFORE BEGINNING OR FABRICATING ANY WORK. DO NOT SCALE DRAWINGS.

IT IS A VIOLATION OF THE LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ARCHITECT, TO ALTER AN ITEM IN ANY WAY.

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Olive Garden
 ITALIAN KITCHEN

Issue Date: 06-20-24

REVISION
 1 07-08-24
 AGENCY REVISIONS

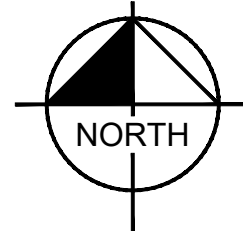
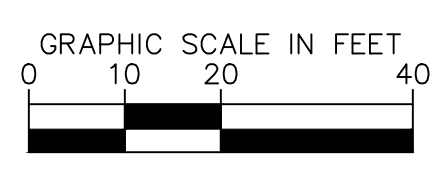
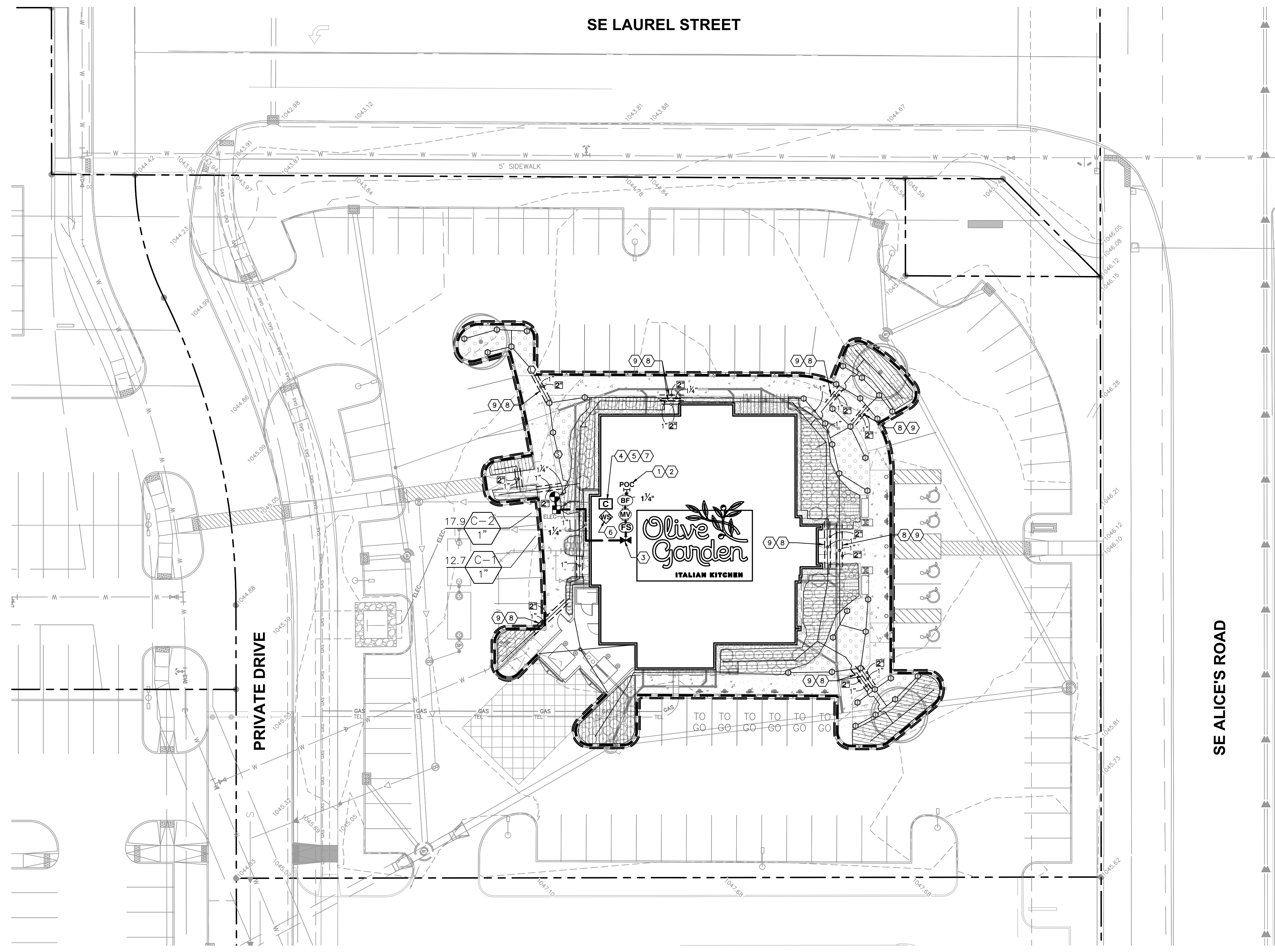
Restaurant #: 6526

OLIVE GARDEN
 P62DOM-BOX-L
 HK Q3 2024 REV.

420 SE
 ALICE'S RD.
 WAUKEE,
 IOWA

Drawing
 IRRIGATION
 PLAN

IR1.0



IRRIGATION SCHEDULE

| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION | QTY | PSI |
|----------------------|---|------------|-----|
| ⊙ ⊙ ⊙ LST SST RET | RAIN BIRD R-VAN-STRIP 1804-SAM-P45 SHRUB ROTARY, 5FT X15FT. (LCS AND RCS), 5FT.X30FT. (SST) HAND ADJUSTABLE MULTI-STREAM ROTARY W/ 1800 TURF SPRAY BODY ON 4IN. POP-UP, WITH CHECK VALVE AND 45 PSI IN-STEM PRESSURE REGULATOR. 1/2IN. NPT FEMALE THREADED INLET. | 2 | 45 |
| 14 ADJ 14 F | RAIN BIRD R-VAN14 1804-SAM-P45 TURF ROTARY, 8FT.-14FT. 45-270 DEGREES AND 360 DEGREES. HAND ADJUSTABLE MULTI-STREAM ROTARY W/1800 TURF SPRAY BODY ON 4IN. POP-UP, WITH CHECK VALVE AND 45 PSI IN-STEM PRESSURE REGULATOR. 1/2IN. NPT FEMALE THREADED INLET. | 37 | 40 |
| ■ | RAIN BIRD XCZLF-100-PRF LOW FLOW, 0.2-10 GPM, WITH 1IN. LOW FLOW VALVE VALVE AND 1IN. PRESSURE REGULATING RBY FILTER AND 40PSI PRESSURE REGULATOR. | 1 | |
| ▨ | AREA TO RECEIVE DRIPLINE RAIN BIRD XFS-06-18 XFS SUB-SURFACE PRESSURE COMPENSATING DRIPLINE W/COPPER SHIELD TECHNOLOGY, 0.6 GPH EMITTERS AT 18" O.C. LATERALS SPACED AT 18" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. UV RESISTANT. | 1,908 L.F. | |
| SYMBOL | MANUFACTURER/MODEL/DESCRIPTION | QTY | |
| ⊙ | RAIN BIRD PEB-PRS-D 1", 1-1/2", 2" PLASTIC INDUSTRIAL VALVES. LOW FLOW OPERATING CAPABILITY, GLOBE CONFIGURATION, WITH PRESSURE REGULATOR MODULE. | 1 | |
| ⊗ | NIBCO T-113 CLASS 125 BRONZE GATE SHUT OFF VALVE WITH WHEEL HANDLE. SAME SIZE AS MAINLINE PIPE DIAMETER AT VALVE LOCATION. SIZE RANGE - 1/4" - 3" | 1 | |
| MV | RAIN BIRD100 BP 1" 1" MASTER VALVE | 1 | |
| BF | FEBCO 825Y 1" REDUCED PRESSURE BACKFLOW PREVENTER | 1 | |
| CI | RAIN BIRD ESP4ME3 4 STATION, HYBRID MODULAR OUTDOOR CONTROLLER. FOR RESIDENTIAL OR LIGHT COMMERCIAL USE. LNK WIFI MODULE AND FLOW SENSOR READY. | 1 | |
| ⊕ | RAIN BIRD WR2-RFS WIRELESS RAIN/FREEZE SENSOR. | 1 | |
| FS | RAIN BIRD FS-100-P 1IN. FLOW SENSOR. PLASTIC PVC MODEL. SUGGESTED OPERATING RANGE 5.4 GPM TO 54 GPM. SIZE FOR FLOW NOT ACCORDING TO PIPE SIZE. | 1 | |
| — | IRRIGATION LATERAL LINE: PVC SCHEDULE 40 | 1,086 L.F. | |
| --- | IRRIGATION MAINLINE: PVC SCHEDULE 40 | 59.0 L.F. | |
| ---- | PIPE SLEEVE: PVC SCHEDULE 40 | 132.1 L.F. | |

CRITICAL ANALYSIS

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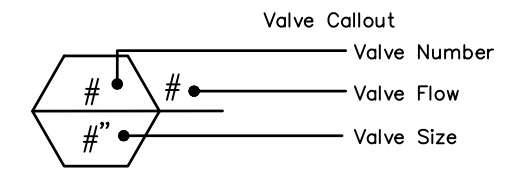
P.O.C. NUMBER: 01
 Water Source Information: CONTRACTOR TO FIELD VERIFY AVAILABLE STATIC PRESSURE PRIOR TO CONSTRUCTION. REFER TO INTERIOR PLUMBING PLANS FOR IRRIGATION STUBOUT & POINT OF CONNECTION.

FLOW AVAILABLE
 Water Meter Size: 1"
 Flow Available: 18.2 GPM

PRESSURE AVAILABLE
 Static Pressure at POC: 65 PSI
 Elevation Change: 5.00 ft
 Service Line Size: 1"
 Length of Service Line: 20 ft
 Pressure Available: 61 PSI

DESIGN ANALYSIS
 Maximum Station Flow: 17.87 GPM
 Flow Available at POC: 18.2 GPM
 Residual Flow Available: 0.33 GPM

Critical Station: C-2
 Design Pressure: 40 PSI
 Friction Loss: 3.42 PSI
 Fittings Loss: 0.34 PSI
 Elevation Loss: 0 PSI
 Loss through Valve: 2.67 PSI
 Pressure Req. at Critical Station: 46.4 PSI
 Loss for Fittings: 0.12 PSI
 Loss for Main Line: 1.16 PSI
 Loss for POC to Valve Elevation: 0 PSI
 Loss for Backflow: 11.3 PSI
 Loss for Master Valve: 1.72 PSI
 Critical Station Pressure at POC: 60.7 PSI
 Pressure Available: 61 PSI
 Residual Pressure Available: 0.3 PSI



IRRIGATION SPECIFICATIONS AND NOTES

- 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. PERMITS AND FEES: OBTAIN ALL PERMITS AND PAY REQUIRED FEES TO ANY GOVERNMENTAL AGENCY HAVING JURISDICTION OVER THE WORK. INSPECTIONS REQUIRED BY LOCAL ORDINANCES DURING THE COURSE OF CONSTRUCTION SHALL BE ARRANGED AND REQUIRED. ON COMPLETION OF THE WORK, SATISFACTORY EVIDENCE SHALL BE FURNISHED TO THE OWNER'S CONSTRUCTION REPRESENTATIVE TO SHOW THAT ALL WORK HAS BEEN INSTALLED IN ACCORDANCE WITH THE STATE AND LOCAL BUILDING AND PLUMBING CODES AND ALL OTHER CODE REQUIREMENTS.
2. 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.
3. 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.
4. COORDINATION: COORDINATE AND COOPERATE WITH OTHER CONTRACTORS TO ENABLE THE WORK TO PROCEED AS RAPIDLY AND EFFICIENTLY AS POSSIBLE.
5. INSPECTION OF SITE:
A. REVIEW SITE CONDITIONS. SUBMISSION OF PROPOSAL IS CONSIDERED EVIDENCE THAT THE EXAMINATION HAS BEEN CONDUCTED. SHOULD UTILITIES NOT SHOWN ON THE PLANS BE FOUND DURING EXCAVATIONS, PROMPTLY NOTIFY THE OWNER'S CONSTRUCTION REPRESENTATIVE FOR INSTRUCTIONS TO FURTHER ACTION. FAILURE TO DO SO WILL MAKE CONTRACTOR LIABLE FOR ANY AND ALL DAMAGE THEREAFTER ARISING FROM HIS OPERATIONS SUBSEQUENT TO DISCOVERY OF SUCH UTILITIES NOT SHOWN ON PLANS.
B. 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.
6. PROTECTION OF EXISTING PLANTS AND SITE CONDITIONS: THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT SITE CONDITIONS TO REMAIN. SHOULD DAMAGE BE INCURRED, THE REPAIR THE DAMAGE TO ITS ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.
7. 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.
8. 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.
9. WORK SCHEDULE: WITHIN 10 DAYS AFTER AWARD OF THE CONTRACT, SUBMIT TO THE OWNER A WORK SCHEDULE.
10. "AS-BUILT" IRRIGATION DRAWINGS: PREPARE AN "AS-BUILT" DRAWING OR A FULL SET OF PLANS TO SHOW DEVIATIONS FROM THE BID DOCUMENTS MADE DURING CONSTRUCTION OF THE MAIN LINE PIPE, CONTROLLER LOCATIONS, REMOTE CONTROL VALVES AND QUICK COUPLING VALVES. THE DRAWINGS TO BE ALSO INDICATE AND SHOW APPROVED SUBSTITUTIONS OF SIZE, MATERIAL AND MANUFACTURER NAME AND CATALOG NUMBER. THE DRAWINGS ARE TO BE DELIVERED TO THE TENANT'S CONSTRUCTION REPRESENTATIVE BEFORE FINAL ACCEPTANCE OF WORK.
11. FINAL ACCEPTANCE: FINAL ACCEPTANCE OF THE WORK MAY BE OBTAINED FROM THE OWNER'S CONSTRUCTION REPRESENTATIVE UPON THE SATISFACTORY COMPLETION OF ALL WORK.
12. 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 OR DAMAGE TO ANY PART OF THE PREMISES RESULTING FROM LEAKS OR OTHER DEFECTS IN MATERIAL, EQUIPMENT AND WORKMANSHIP. REPAIRS, IF REQUIRED, SHALL BE DONE PROMPTLY AT NO COST TO THE OWNER.
13. 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 OR WITHIN CONTROLLER CABINET.

| PVC PIPE SIZE | SOLVENT WELD SCH 40 FITTINGS | BELL AND GASKET FITTINGS | SOCKETED PIPE |
|---------------|------------------------------|--------------------------|---------------|
| 1/2" | 2" | -- | 2" |
| 3/4" | 2 1/2" | -- | 2 1/2" |
| 1" | 3" | -- | 3" |
| 1 1/2" | 4" | -- | 4" |
| 2" | 6" | -- | 6" |
| 2 1/2" | 8" | -- | 8" |

- C. MATERIALS:**
1. GENERAL: ALL MATERIALS THROUGHOUT THE SYSTEM SHALL BE NEW AND IN PERFECT CONDITION.
2. PLASTIC PIPING: ALL MAIN LINES AND LATERAL LINES SHALL BE SCHEDULE 40 UNDRIVE PVC PIPE AND SHALL COMPLY WITH ONE OF THE FOLLOWING STANDARDS: ASTM D 1785, ASTM D 2061, ANMA C 805, OR ANMA C 806. SERRIP PIPE SHALL HAVE A MINIMUM WALL THICKNESS AS REQUIRED BY SD-26. PVC GASKETS SHALL CONFORM TO ASTM D 3139. GASKETS SHALL CONFORM TO ASTM F 407. 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 2466. CONFORMING TO ASTM D 2466 AND D 2467.
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 SCIENCE LAMCO, OR APPROVED.
4. SOLVENT CEMENT: PVC CEMENT SHALL MEET ASTM D 2566 AND PVC CLEANER-TYPE SHALL MEET ASTM F 606.
5. SPRINKLER HEADS: SCHEDULE 40 PVC FOR RISERS 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) THREADS SHALL SHOW BEYOND FITTINGS WHEN PIPE IS MADE UP. ASSEMBLIES SHALL BE AS DETAILLED.
6. AUTOMATIC CONTROLLER: SEE LEGEND.
7. REMOTE CONTROL VALVES: SEE LEGEND.
8. CONTROL WIRING: CONVENTIONAL SYSTEMS TO USE 24 VOLT SOLID DIE APPROVED FOR DIRECT BURIAL IN GROUND. MINIMUM WIRE SIZE: 14 GAUGE. ALL SPLICES SHALL BE MADE WITH VALVE BOX. TWO-WIRE SYSTEMS TO UTILIZE CONTROL WIRING PER MANUFACTURER'S STANDARDS.
9. SLEEVES FOR CONTROL WIRING: UNLESS ALL WIRING IS INDICATED ON DRAWINGS, MINIMUM PVC SCHEDULE 40 PLASTIC PIPE.
10. SERRIP PIPE: PER MANUFACTURER'S STANDARDS.
11. QUICK COUPLING VALVES: SHALL BE NOTED ON DRAWINGS.

- D. WORKMANSHIP:**
1. LAY OUT WORK AS ACCURATELY AS POSSIBLE TO THE DRAWINGS. THE DRAWINGS, THOUGH CAREFULLY DRAWN, ARE GENERALLY DIAGNOSTIC TO THE EXTENT THAT SWING JOINTS, OFFSETS, AND ALL FITTINGS ARE NOT SHOWN.
2. THE 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 APPROVED IN WRITTEN FORM, ALONG WITH ANY CHANGE IN CONTRACT PRICE.

- E. INSTALLATION:**
1. EXCAVATION AND TRENCHING:
A. PERFORM ALL EXCAVATIONS AS REQUIRED FOR THE INSTALLATION OF THE WORK, INCLUDING SHORING OF EARTH BANKS TO PREVENT CAVE-IN, RESTORE ALL SURFACES, EXISTING UNDERGROUND INSTALLATIONS, ETC., DAMAGED OR CUT AS A RESULT OF THE EXCAVATIONS TO AND IN A MANNER APPROVED BY THE OWNER.
B. 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:
1) 24" MINIMUM BELOW BOTTOM PAVEMENT FOR BLEEDING INSTALLATION DETAIL FOR MAIN LINE IF MINIMUM FOR NON-RESURFACED LATERALS.
2) MINIMUM COVER OVER IRRIGATION LINES TO BE AS SHOWN EXCEPT WHERE TRAFFIC AREAS ARE AS FOLLOWS:
12" COVER OVER LATERALS
18" COVER OVER MAINLINE
C. MAINTAIN ALL WARNING SIGNS, SHORING, BARRIERS, FLARES AND RED LANTERNS AS REQUIRED BY THE SAFETY ORDERS OF THE DIVISION OF INDUSTRIAL SAFETY AND LOCAL ORDINANCES.

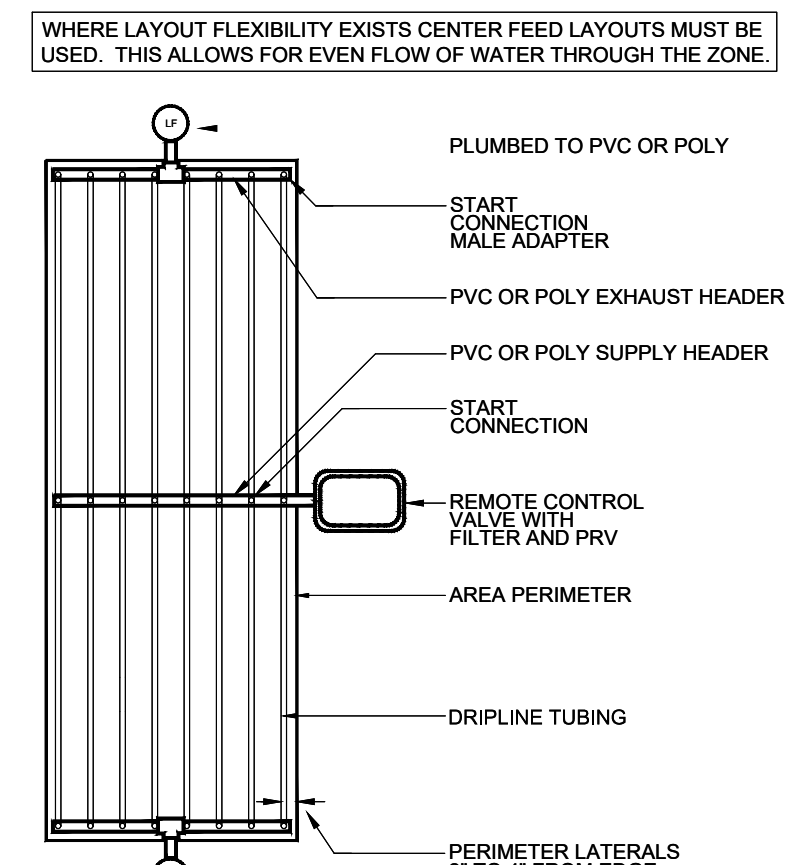
2. PIPE LINE ASSEMBLY:
A. INSTALL REMOTE CONTROL VALVES WHERE SHOWN AND GROUP TOGETHER WHERE PRACTICAL. PLACE NO CLOSER THAN 18 INCHES TO WALK EDGES, WALLS, AND OTHER PAVEMENTS. PLACE A MINIMUM OF 24" FROM BUILDINGS.
B. PLASTIC PIPE AND FITTINGS SHALL BE SOLVENT WELDED USING BOX ENDS AND METHODS MANUFACTURED BY THE PIPE. DISCOPY OTHER SCHEDULE CONNECTIONS ARE REQUIRED. PIPE AND FITTINGS SHALL BE THOROUGHLY CLEANED OF DIRT, OIL, AND MUST BE DRY BEFORE APPLYING SOLVENT WITH A NON-SYNTHETIC BRISTLE BRUSH.
C. PIPE MAY BE ASSEMBLED AND WELDED ON THE SURFACE. SERRIP PIPE FROM USE TO SIDE OF TRENCH DOWN TO LOW FOR EXPANSION AND CONTRACTION.
D. MAKE ALL CONNECTIONS BETWEEN PLASTIC PIPE AND METAL VALVES OR STEEL PIPE WITH THREADED FITTINGS USING PLASTIC MALE ADAPTERS.

3. SPRINKLER HEADS (SPRINKLE):
A. INSTALL ALL SPRINKLER DRINKLINE AS DETAIL ON DRAWINGS.
B. DO NOT SCALE PLANS FOR EXACT HEAD LOCATION.
C. STAKE DRINKLINE LINES WITH MINIMUM 8" (6" IN STAPLES AT MINIMUM FOUR (4) FEET ON CENTER.
4. CLOSING OF PIPE AND FLUSHING LINES:
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.
B. THOROUGHLY FLUSH OUT ALL WATER LINES BEFORE INSTALLING HEADS, DRINKLINE, VALVES, AND OTHER HYDRANTS.
C. TEST IN ACCORDANCE WITH PARAGRAPH ON HYDROSTATIC TESTS.
D. UPON COMPLETION OF THE TESTING, COMPLETE ASSEMBLY AND ADJUST SPRINKLER HEADS FOR PROPER DISTRIBUTION.

5. INSPECTIONS:
A. SPRINKLER DRINKLINE 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.
B. PIPE INSTALLATION DEPTH INSPECTION: ALL PIPES IN THE SYSTEM SHALL BE INSTALLED TO DEPTHS AS PREVIOUSLY DESCRIBED IN SECTION F OF THESE SPECIFICATIONS.
C. OPEN TRENCH INSPECTION: THE TRENCH AND ALL JOINTS AND EVERY TRENCH IN PIPE SIZE, WILL BE OPEN WHERE OPEN TRENCH INSPECTION IS REQUIRED.
D. INSPECTIONS WILL BE PERFORMED THROUGHOUT THE DURATION OF THE INSTALLATION. INSPECTION MAY BE MADE BY THE COVERING AGENCY OWNER TO ENSURE COMPLIANCE WITH DESIGN INTENT, SPECIFICATIONS, AND THE IRRIGATION CODES.

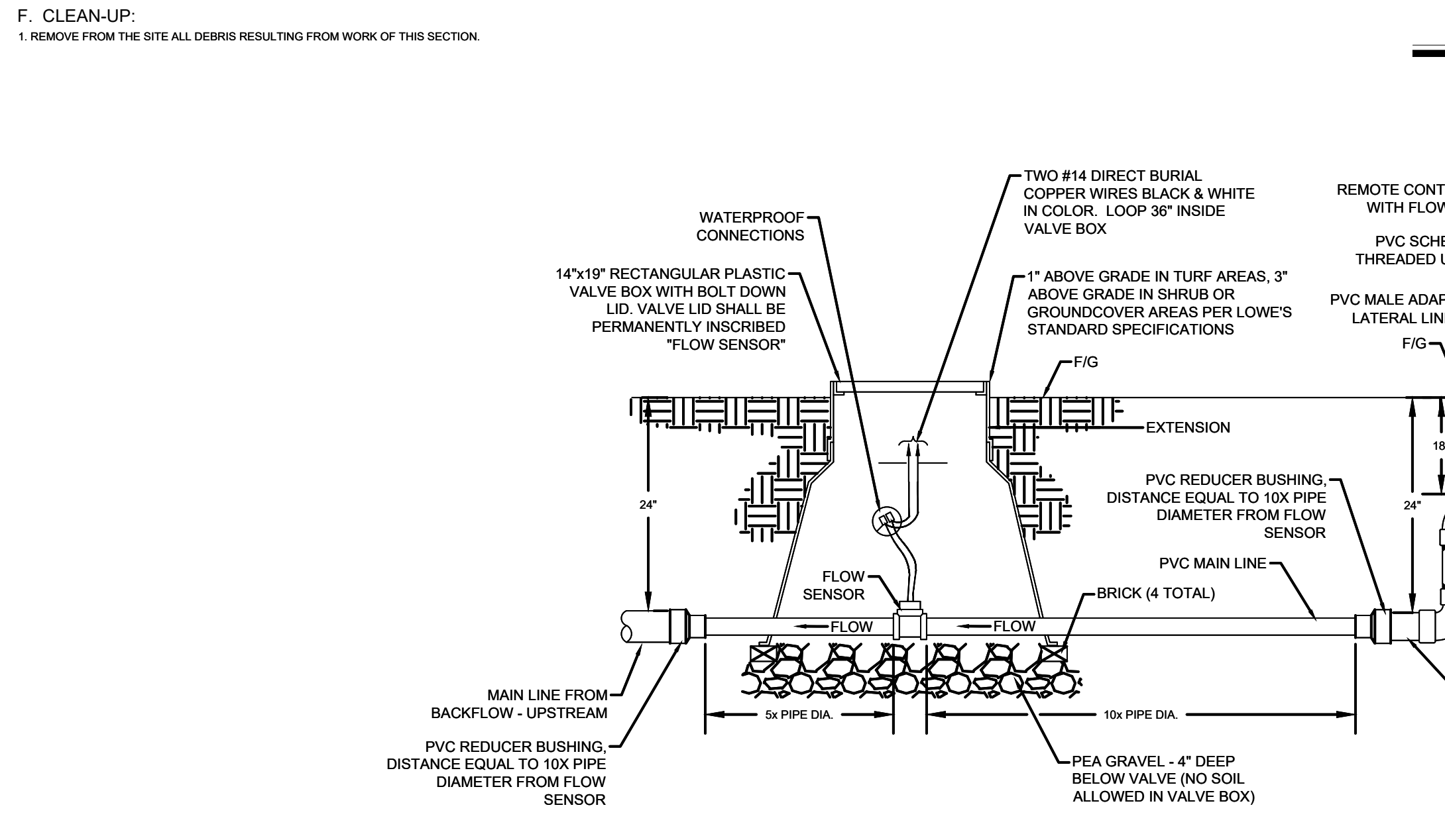
6. HYDROSTATIC TESTS:
A. REQUEST THE PRESENCE OF THE OWNER AND/OR OWNER'S REPRESENTATIVE IN WRITING AT LEAST 48 HOURS IN ADVANCE OF TESTING.
B. TESTING TO BE ACCOMPANIED AT THE EXPENSE OF THE CONTRACTOR AND IN THE PRESENCE OF THE OWNER.
C. CENTER LINE MARKING WITH SMALL AMOUNT OF BACKFILL TO PREVENT AROUNDING OR SLIPPING UNDER PRESSURE.
D. APPLYING A CONTINUOUS AND STATIC WATER PRESSURE OF 125 PSI PER INCH WELDED PLASTIC JOINTS HAVE CURED AS FOLLOWS:
1) MAIN LINES AND SUBMANS TO BE TESTED FOR 2 HOURS.
2) NO PRESSURE LOSS IS ALLOWED FOR SOLVENT WELDED MAINLINE PIPE.
E. FOR PVC AND DRINKLINE GASKET PIPE THE ALLOWABLE LEAKAGE SHALL NOT EXCEED THE NUMBER OF GALLONS PER HOUR AS DETERMINED BY THE FOLLOWING FORMULA:
 $L = 100 \times \frac{1}{N}$
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

7. REMEDIATION RESULTING FROM TESTS:
F. REPAIR LEAKS RESULTING FROM TESTS.
8. AUTOMATIC CONTROLLER:
A. CONNECT REMOTE CONTROL FROM CONTROLLER IN A CLOCKWISE SEQUENCE TO CORRESPOND WITH STATION SETTING BEGINNING WITH STATIONS 1, 2, 3, ETC.
9. BACKFILL AND COMPACTING:
A. INSTALL CONTROL WIRING, SPRINKLER MAINS AND LATERALS IN COMMON. TRENCHES WHEREVER POSSIBLE.
B. INSTALL CONTROL WIRING AT LEAST 18" BELOW FINISHED GRADE AND SHADE WIRE SIZE TO SIDE IN TRENCH BELOW MAIN LINE. EXPANSION CURLS SHALL BE PROVIDED WITH 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.
C. CONTROL WIRE SPLICES WILL BE ALLOWED ONLY FROM OVER 100 FT. CONNECTIONS SHALL BE IN VALVE BOX AND LOCATION TO BE SHOWN ON AS-BUILT PLANS.
D. ALL WIRING PASSING UNDER EXISTING OR FUTURE PAVING, CONSTRUCTION, ETC., SHALL BE ENCASED IN PLASTIC OR GALVANIZED STEEL CONDUIT EXTENDED AT LEAST 24" BEYOND EDGES OF PAVING OR CONSTRUCTION.
E. RUN TWO BRASS WIRES IN EACH DIRECTION FROM CONTROLLER TO REMOTE VALVE TO BE WIRE AS BACKFILL WIRING.
10. BACKFILL AND COMPACTING:
A. 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 SHALL BE 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.
B. BACKFILL FOR ALL TRENCHES, REGARDLESS OF THE TYPE OF PIPE COVERED, SHALL BE COMPACTED TO MINIMUM STANDARD SPECIFICATIONS.
C. COVER OF THE DRAINAGE SHALL BE PLANTED BY THOROUGHLY FLOODING THE BACKFILL. JETTING PROCESS MAY BE USED IN THOSE AREAS.
11. PROTECTIVE MOUND OF EXISTING TREES:
A. AN AUGER IS TO BE USED TO TUNNEL UNDER EXISTING TREES IF IRRIGATION IS INSTALLED WITHIN THE PROTECTIVE RADIUS OF EXISTING TREES AND ONE (1) IF THERE IS NO OTHER OPTION OR TO DO SO CREATES AN UNREASONABLE OBSTRUCTION.
F. CLEAN-UP:
1. REMOVE FROM THE SITE ALL DEBRIS RESULTING FROM WORK OF THIS CONTRACT.



ALL BARBED FITTINGS TO UTILIZE EITHER STAINLESS STEEL HOSE CLAMPS, STEEL CRIMP, OR COMPRESSION RING.

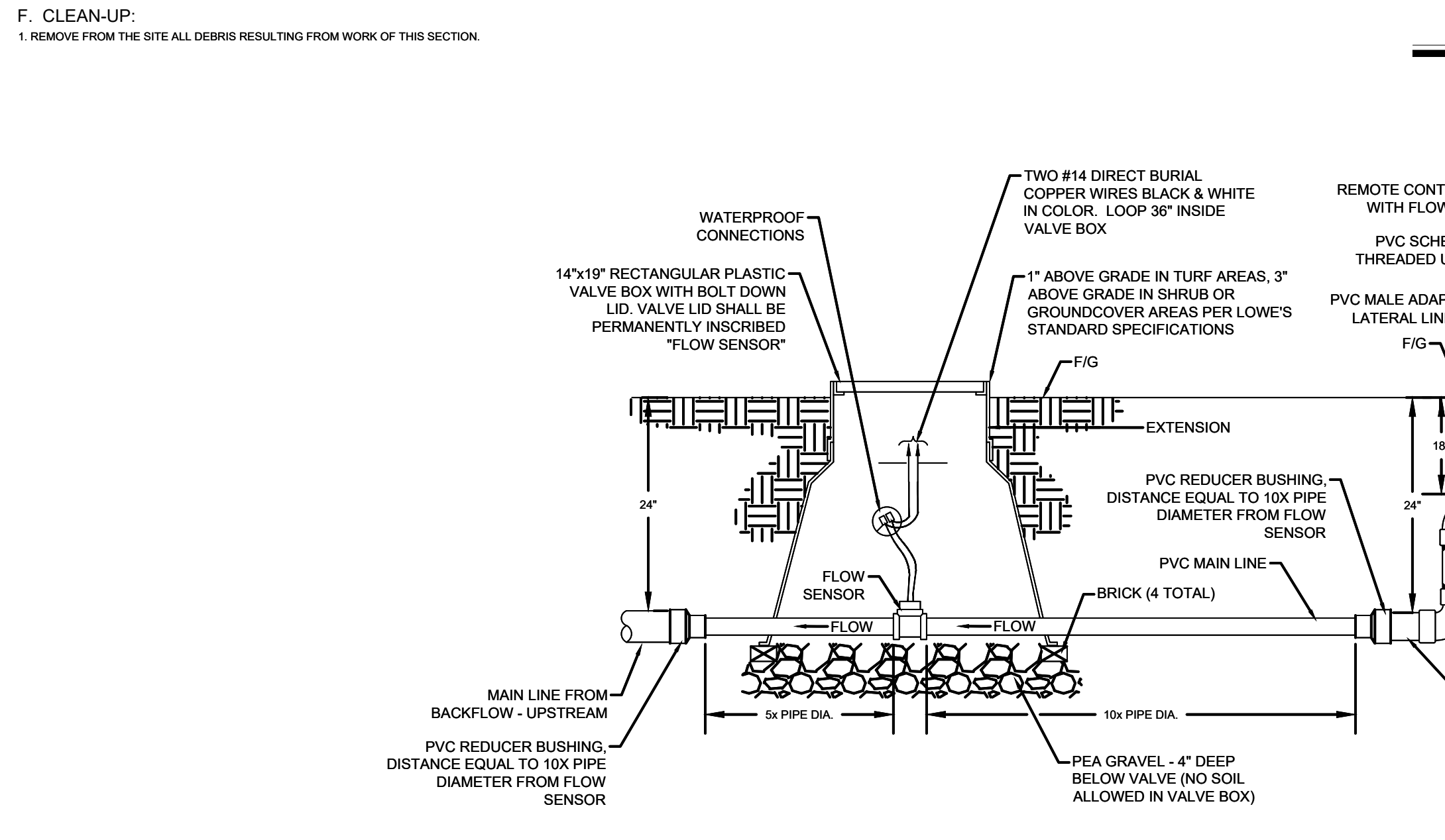
| DRIPPER SPACING | DRIPPER FLOW RATE (GPH) | 0.25 | 0.4 | 0.6 | 0.9 | 1.25 | 1.875 | 2.5 | 3.75 | 5.0 |
|-----------------|-------------------------|------|-----|-----|-----|------|-------|-----|------|-----|
| 12" | 331 | 242 | 190 | 144 | 468 | 344 | 270 | 204 | 342 | 200 |
| 20" | 413 | 302 | 238 | 180 | 584 | 429 | 338 | 257 | 430 | 326 |
| 35" | 518 | 380 | 299 | 227 | 737 | 540 | 426 | 323 | 542 | 412 |
| 45" | 594 | 436 | 343 | 260 | 845 | 620 | 489 | 371 | 622 | 472 |
| 60" | 655 | 480 | 378 | 287 | 932 | 684 | 539 | 410 | 685 | 522 |
| 75" | 691 | 500 | 383 | 298 | 969 | 713 | 561 | 428 | 718 | 544 |



Flow Sensor and Master Valve
Scale: N.T.S.

DRIPPER SPACING LENGTH OF A SINGLE LATERAL (FEET)

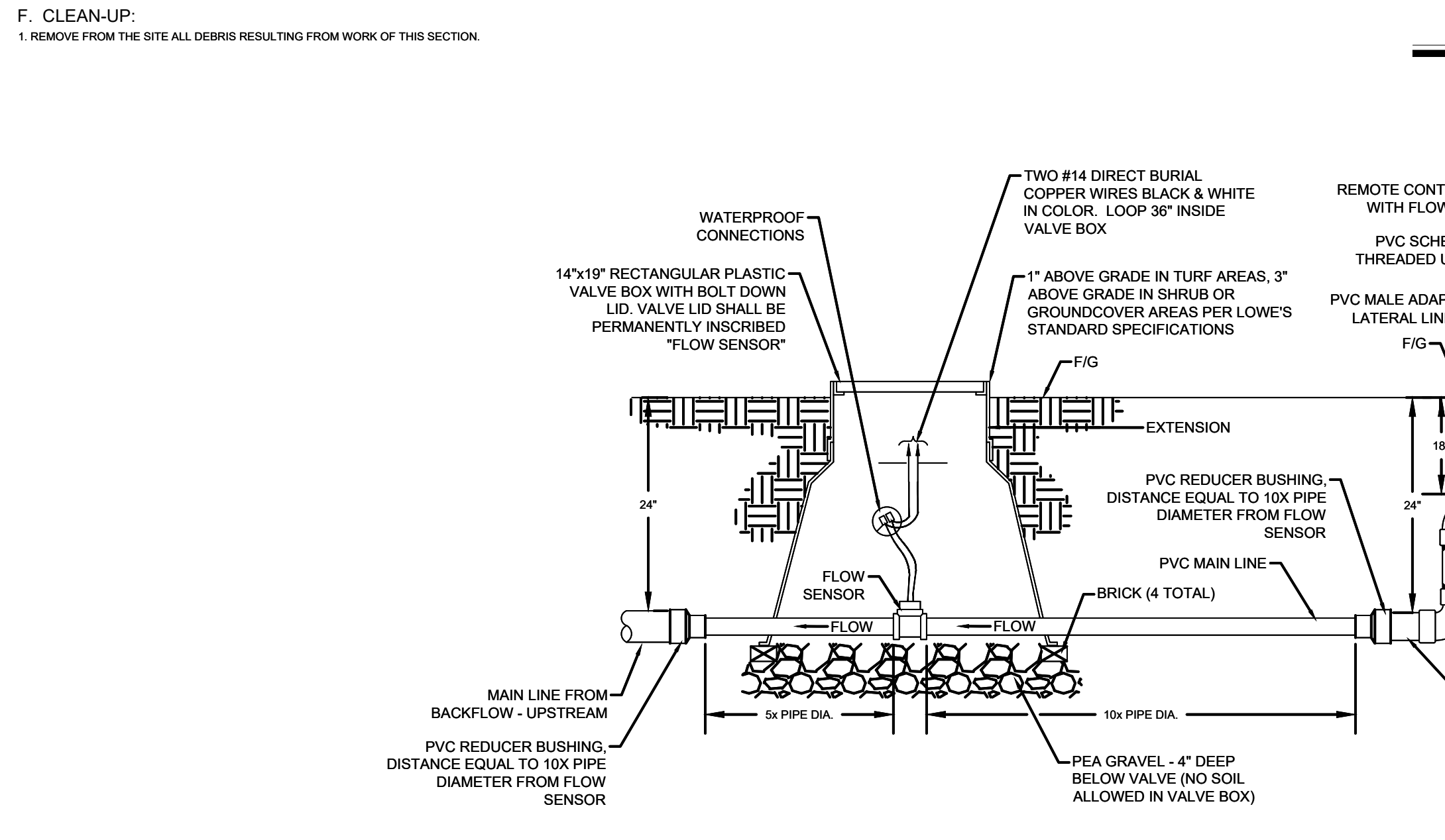
| DRIPPER SPACING | 0.25 | 0.4 | 0.6 | 0.9 | 1.25 | 1.875 | 2.5 | 3.75 | 5.0 |
|-----------------|------|-----|-----|-----|------|-------|-----|------|-----|
| 12" | 331 | 242 | 190 | 144 | 468 | 344 | 270 | 204 | 342 |
| 20" | 413 | 302 | 238 | 180 | 584 | 429 | 338 | 257 | 430 |
| 35" | 518 | 380 | 299 | 227 | 737 | 540 | 426 | 323 | 542 |
| 45" | 594 | 436 | 343 | 260 | 845 | 620 | 489 | 371 | 622 |
| 60" | 655 | 480 | 378 | 287 | 932 | 684 | 539 | 410 | 685 |
| 75" | 691 | 500 | 383 | 298 | 969 | 713 | 561 | 428 | 718 |



Dripline
Scale: N.T.S.

DRIPPER SPACING LENGTH OF A SINGLE LATERAL (FEET)

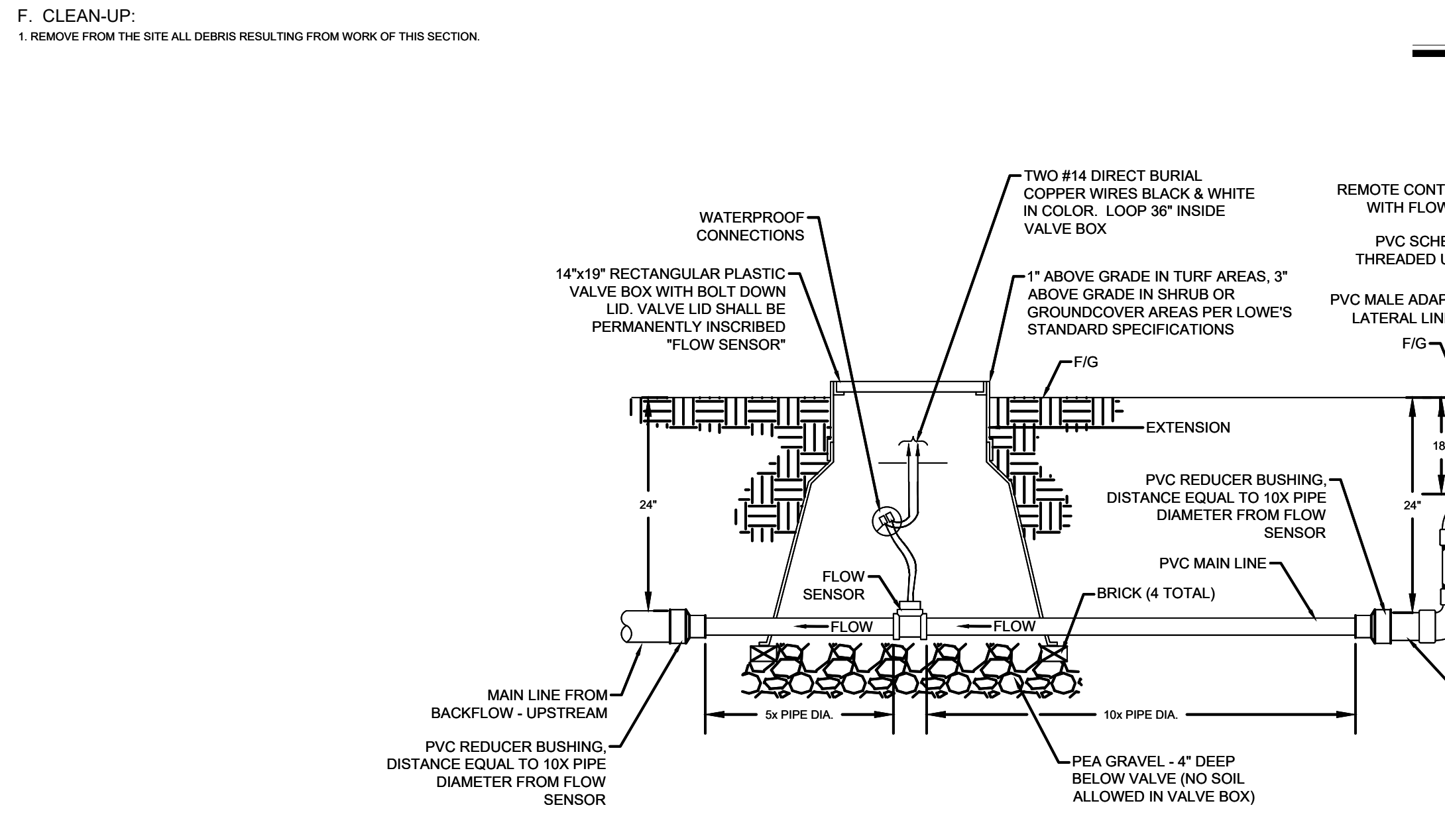
| DRIPPER SPACING | 0.25 | 0.4 | 0.6 | 0.9 | 1.25 | 1.875 | 2.5 | 3.75 | 5.0 |
|-----------------|------|-----|-----|-----|------|-------|-----|------|-----|
| 12" | 331 | 242 | 190 | 144 | 468 | 344 | 270 | 204 | 342 |
| 20" | 413 | 302 | 238 | 180 | 584 | 429 | 338 | 257 | 430 |
| 35" | 518 | 380 | 299 | 227 | 737 | 540 | 426 | 323 | 542 |
| 45" | 594 | 436 | 343 | 260 | 845 | 620 | 489 | 371 | 622 |
| 60" | 655 | 480 | 378 | 287 | 932 | 684 | 539 | 410 | 685 |
| 75" | 691 | 500 | 383 | 298 | 969 | 713 | 561 | 428 | 718 |



Quick Coupling Valve
Scale: N.T.S.

DRIPPER SPACING LENGTH OF A SINGLE LATERAL (FEET)

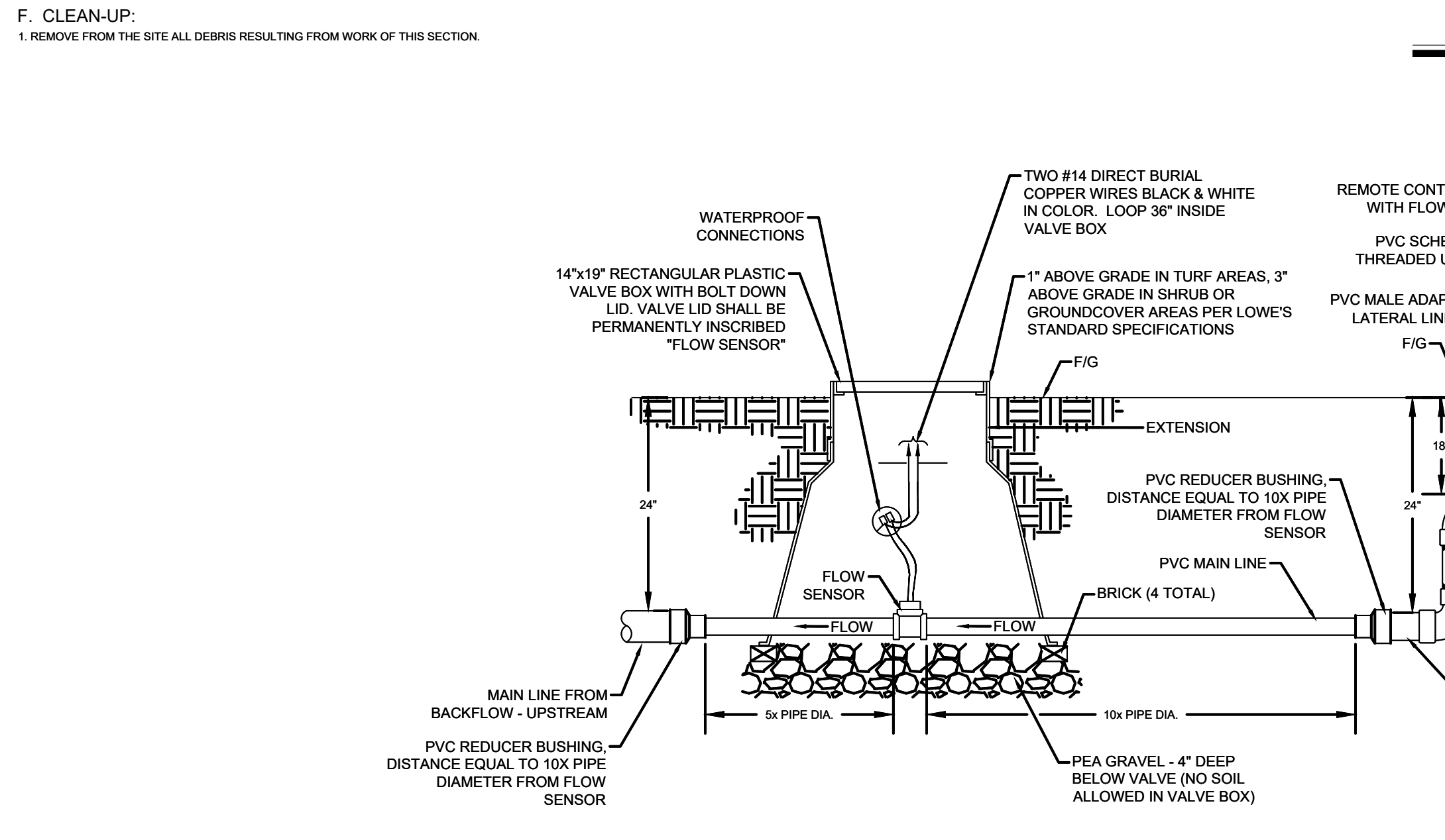
| DRIPPER SPACING | 0.25 | 0.4 | 0.6 | 0.9 | 1.25 | 1.875 | 2.5 | 3.75 | 5.0 |
|-----------------|------|-----|-----|-----|------|-------|-----|------|-----|
| 12" | 331 | 242 | 190 | 144 | 468 | 344 | 270 | 204 | 342 |
| 20" | 413 | 302 | 238 | 180 | 584 | 429 | 338 | 257 | 430 |
| 35" | 518 | 380 | 299 | 227 | 737 | 540 | 426 | 323 | 542 |
| 45" | 594 | 436 | 343 | 260 | 845 | 620 | 489 | 371 | 622 |
| 60" | 655 | 480 | 378 | 287 | 932 | 684 | 539 | 410 | 685 |
| 75" | 691 | 500 | 383 | 298 | 969 | 713 | 561 | 428 | 718 |



Line Flushing Valve (W/ Shut-off Valve)
Scale: N.T.S.

DRIPPER SPACING LENGTH OF A SINGLE LATERAL (FEET)

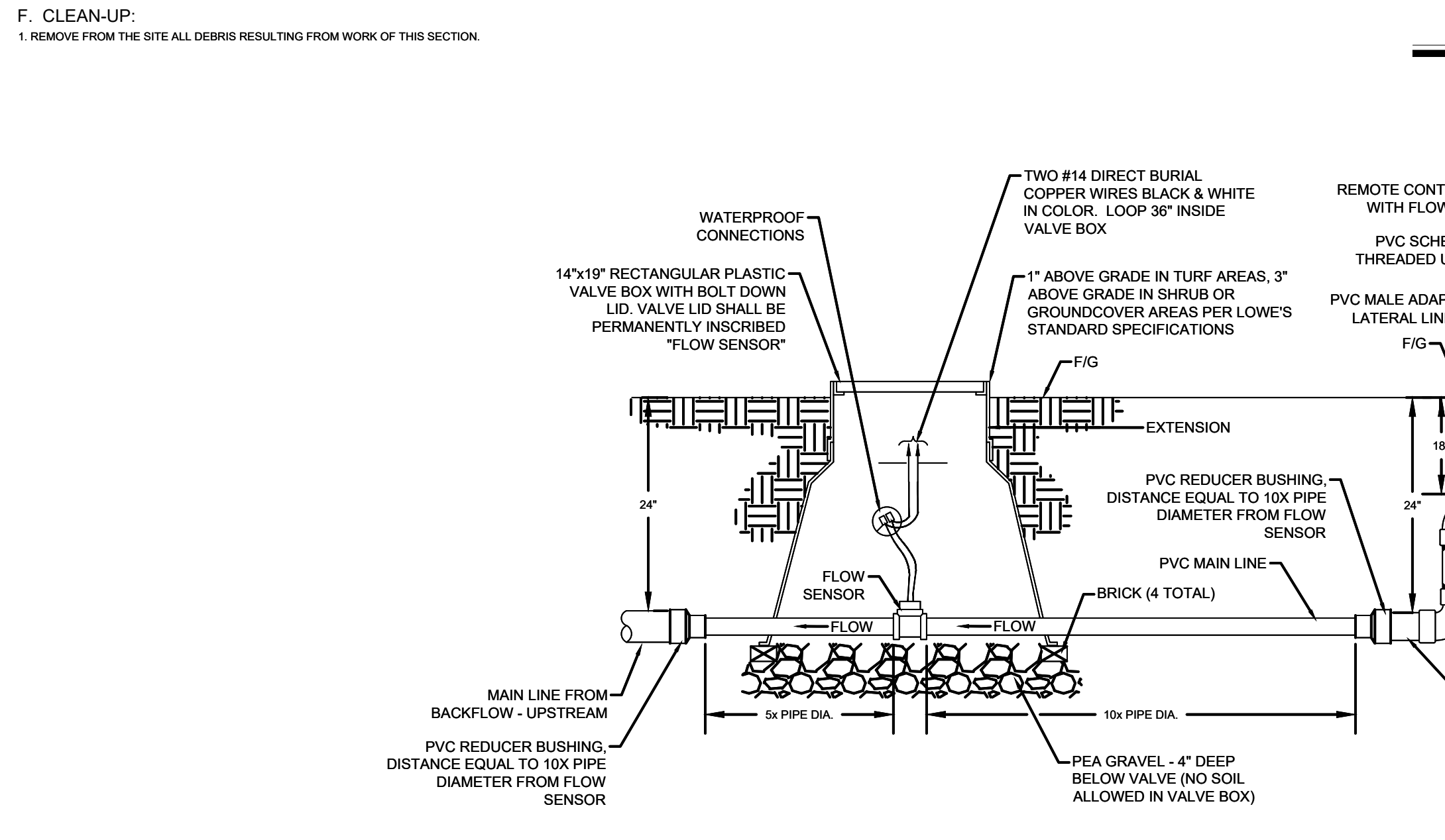
| DRIPPER SPACING | 0.25 | 0.4 | 0.6 | 0.9 | 1.25 | 1.875 | 2.5 | 3.75 | 5.0 |
|-----------------|------|-----|-----|-----|------|-------|-----|------|-----|
| 12" | 331 | 242 | 190 | 144 | 468 | 344 | 270 | 204 | 342 |
| 20" | 413 | 302 | 238 | 180 | 584 | 429 | 338 | 257 | 430 |
| 35" | 518 | 380 | 299 | 227 | 737 | 540 | 426 | 323 | 542 |
| 45" | 594 | 436 | 343 | 260 | 845 | 620 | 489 | 371 | 622 |
| 60" | 655 | 480 | 378 | 287 | 932 | 684 | 539 | 410 | 685 |
| 75" | 691 | 500 | 383 | 298 | 969 | 713 | 561 | 428 | 718 |



Indicator - Swing Joint
Scale: N.T.S.

DRIPPER SPACING LENGTH OF A SINGLE LATERAL (FEET)

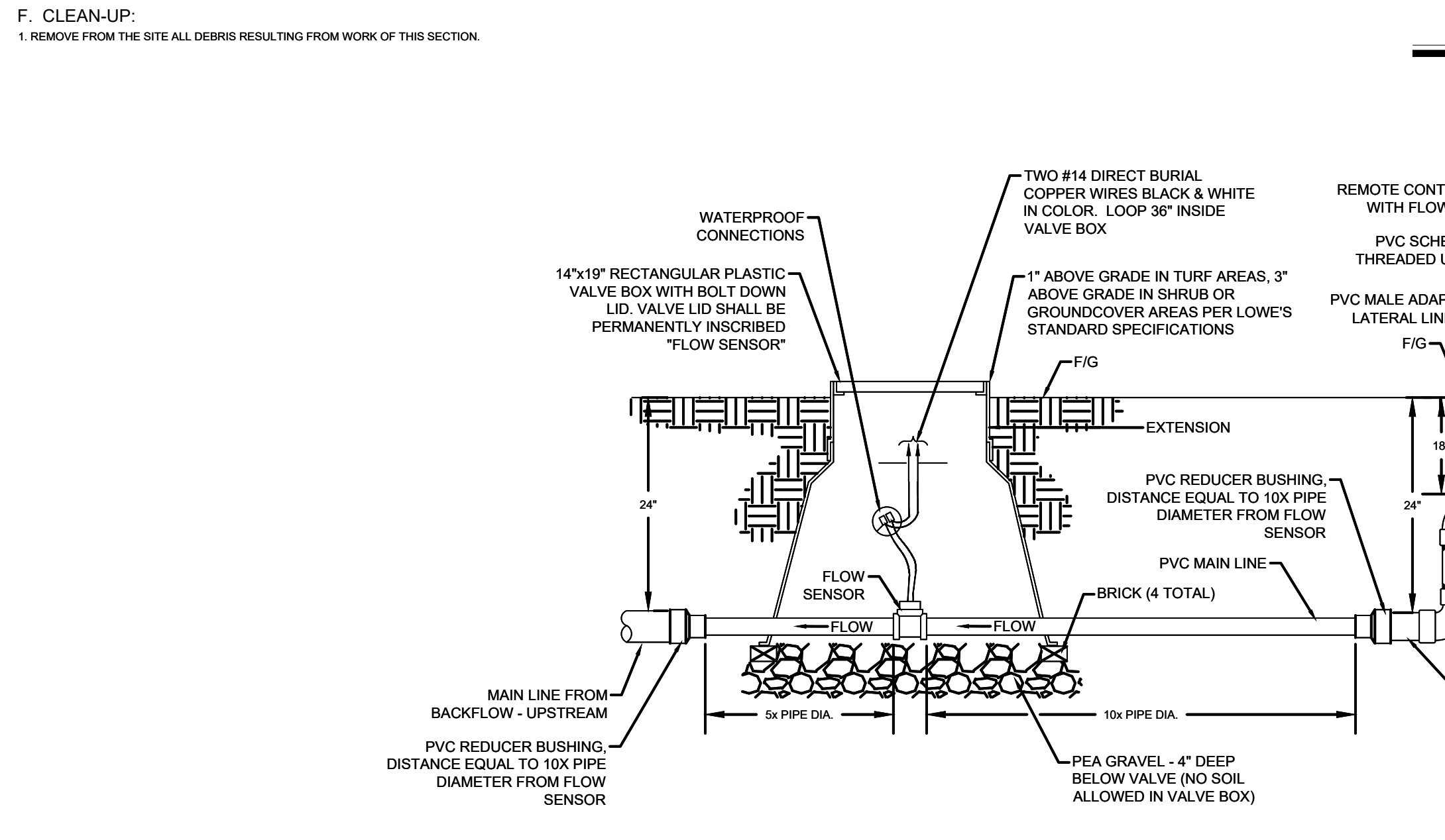
| DRIPPER SPACING | 0.25 | 0.4 | 0.6 | 0.9 | 1.25 | 1.875 | 2.5 | 3.75 | 5.0 |
|-----------------|------|-----|-----|-----|------|-------|-----|------|-----|
| 12" | 331 | 242 | 190 | 144 | 468 | 344 | 270 | 204 | 342 |
| 20" | 413 | 302 | 238 | 180 | 584 | 429 | 338 | 257 | 430 |
| 35" | 518 | 380 | 299 | 227 | 737 | 540 | 426 | 323 | 542 |
| 45" | 594 | 436 | 343 | 260 | 845 | 620 | 489 | 371 | 622 |
| 60" | 655 | 480 | 378 | 287 | 932 | 684 | 539 | 410 | 685 |
| 75" | 691 | 500 | 383 | 298 | 969 | 713 | 561 | 428 | 718 |



Wireless Rain/Freeze Sensor
Scale: N.T.S.

DRIPPER SPACING LENGTH OF A SINGLE LATERAL (FEET)

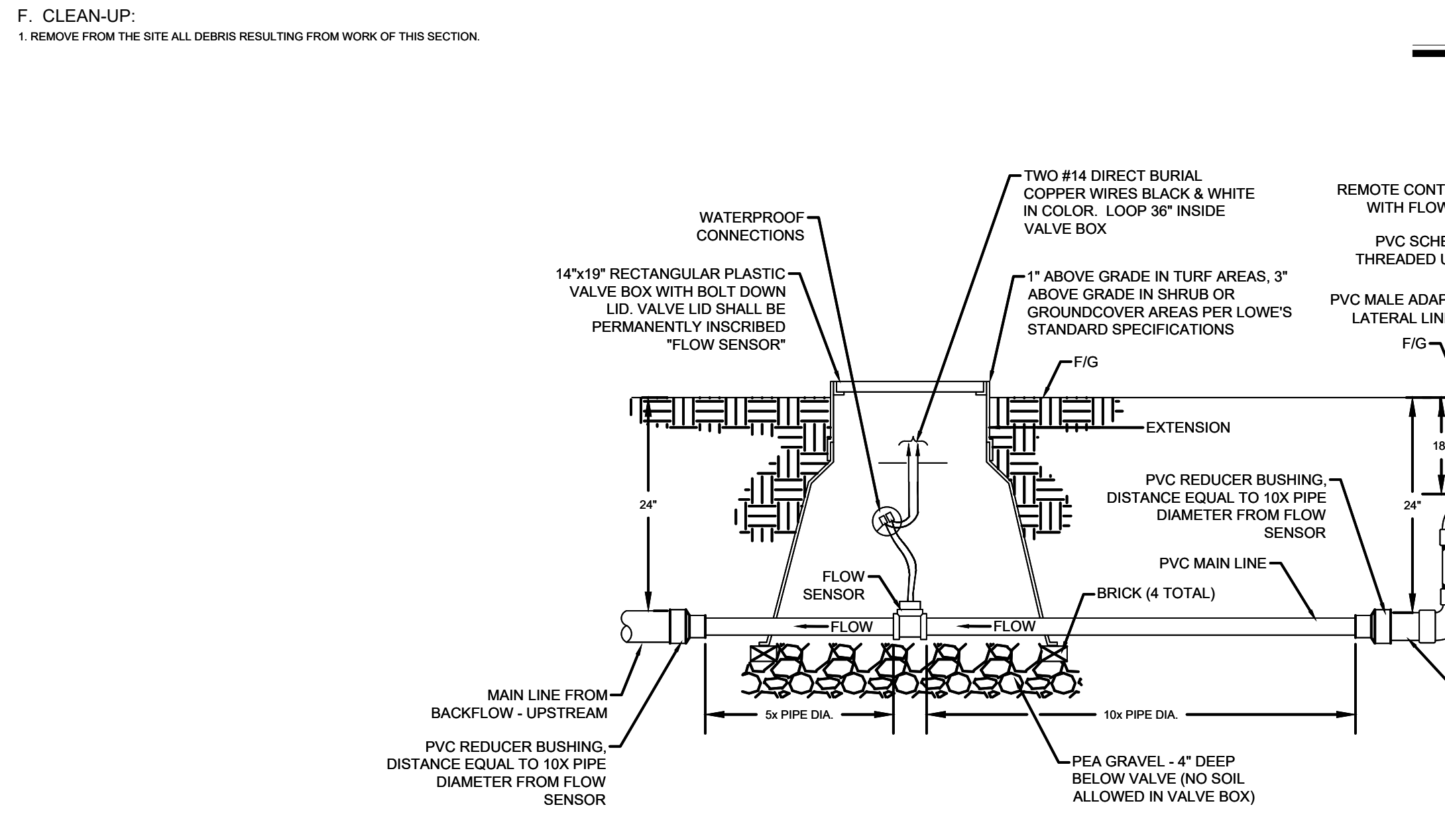
| DRIPPER SPACING | 0.25 | 0.4 | 0.6 | 0.9 | 1.25 | 1.875 | 2.5 | 3.75 | 5.0 |
|-----------------|------|-----|-----|-----|------|-------|-----|------|-----|
| 12" | 331 | 242 | 190 | 144 | 468 | 344 | 270 | 204 | 342 |
| 20" | 413 | 302 | 238 | 180 | 584 | 429 | 338 | 257 | 430 |
| 35" | 518 | 380 | 299 | 227 | 737 | 540 | 426 | 323 | 542 |
| 45" | 594 | 436 | 343 | 260 | 845 | 620 | 489 | 371 | 622 |
| 60" | 655 | 480 | 378 | 287 | 932 | 684 | 539 | 410 | 685 |
| 75" | 691 | 500 | 383 | 298 | 969 | 713 | 561 | 428 | 718 |



Techline CV Center Feed Layout
Scale: N.T.S.

DRIPPER SPACING LENGTH OF A SINGLE LATERAL (FEET)

| DRIPPER SPACING | 0.25 | 0.4 | 0.6 | 0.9 | 1.25 | 1.875 | 2.5 | 3.75 | 5.0 |
|-----------------|------|-----|-----|-----|------|-------|-----|------|-----|
| 12" | 331 | 242 | 190 | 144 | 468 | 344 | 270 | 204 | 342 |
| 20" | 413 | 302 | 238 | 180 | 584 | 429 | 338 | 257 | 430 |
| 35" | 518 | 380 | 299 | 227 | 737 | 540 | 426 | 323 | 542 |
| 45" | 594 | 436 | 343 | 260 | 845 | 620 | 489 | 371 | 622 |
| 60" | 655 | 480 | 378 | 287 | 932 | 684 | 539 | 410 | 685 |
| 75" | 691 | 500 | 383 | 298 | 969 | 713 | 561 | 428 | 718 |



Quick Coupling Valve
Scale: N.T.S.

DRIPPER SPACING LENGTH OF A SINGLE LATERAL (FEET)

| DRIPPER SPACING | 0.25 | 0.4 | 0.6 | 0.9 | 1.25 | 1.875 | 2.5 | 3.75 | 5.0 |
|-----------------|------|-----|-----|-----|------|-------|-----|------|-----|
| 12" | 331 | 242 | 190 | 144 | 468 | 344 | 270 | 204 | 342 |
| 20" | | | | | | | | | |