MECHANICAL THRUST RESTRAINT CHART 1										
PIPE SIZE, in	90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND		DEADEND/VALVE	
	PVC	DIP	PVC	DIP	PVC	DIP	PVC	DIP	PVC	DIP
4	21	16	9	7	5	4	2	2	45	29
6	28	23	12	10	6	5	3	3	63	40
8	37	29	16	12	8	6	4	3	83	53
10	44	35	18	15	9	7	5	4	99	63
12	51	41	21	17	11	8	5	4	116	74
14	57	46	24	19	12	10	6	5	132	83
16	64	51	27	21	13	11	7	5	149	94
18	70	56	29	24	14	12	7	6	164	104
20	76	61	32	26	16	13	8	6	179	113
24	87	70	36	29	18	14	9	7	208	131

THRUST RESTRAINT CHART BASED UPON THE FOLLOWING:

PVC/DIP	PIPE MATERIAL, AS NOTED
SP	SOIL TYPE (designer to confirm)
1.5	SAFETY FACTOR (minimum)
3	TRENCH TYPE (designer to confirm)
2.5	DEPTH OF BURY, ft (designer to confirm)
150	TEST PRESSURE, psi (minimum)

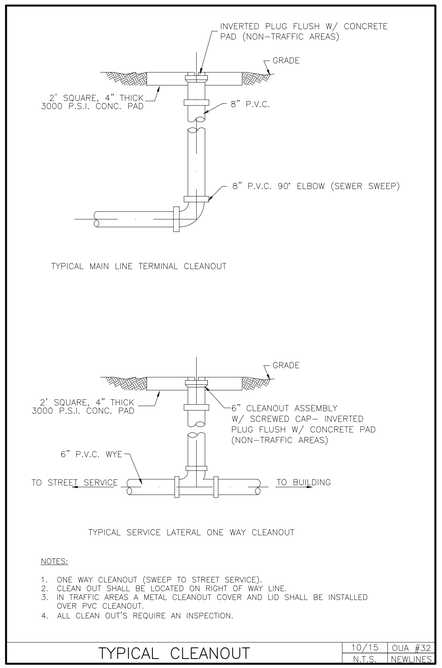
THE MINIMUM LENGTH OF PIPE OUT OF ANY VALVE OR FITTING SHOULD BE 20 LF. FITTINGS NOT SHOWN TO BE CALCULATED UTILIZING THE CRITERIA LISTED ABOVE AND SUBMITTED IN A SHOP DRAWING VALUES SHOWN IN CHART INDICATE LENGTH (LF) OF PIPE TO BE RESTRAINED ON EITHER SIDE OF ITEM LISTED

NOTE 1:ANY CONDITION OTHER THAN THOSE LISTED ABOVE (including poly-wrapped DIP) SHALL REQUIRE REVISION OF THE TABLE IN ACCORDANCE WITH EBAA IRON, INC., RESTRAINT LENGTH CALCULATOR (V. 5.4). (http://www.ebaa.com/engineering.htm or http://rcp.ebaa.com)

NOTE 2:THE REVISED CHARTS SHALL BE SUBMITTED TO OUA AS A SHOP DRAWING SUBMITTAL.

WATER THRUST RESTRAINT

10/15	OUA #50
N.T.S.	NEWLINES

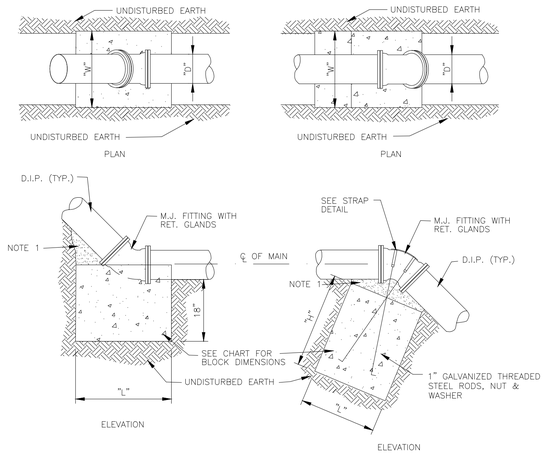


NOTES:

1. ONE WAY CLEANOUT (SWEEP TO STREET SERVICE).
2. CLEAN OUT SHALL BE LOCATED ON RIGHT OF WAY LINE.
3. IN TRAFFIC AREAS A METAL CLEANOUT COVER AND LID SHALL BE INSTALLED OVER PVC CLEANOUT.
4. ALL CLEAN OUT'S REQUIRE AN INSPECTION.

TYPICAL CLEANOUT

10/15	OUA #32
N.T.S.	NEWLINES



BLOCKING DETAIL FOR VERTICAL SAG — N.T.S.

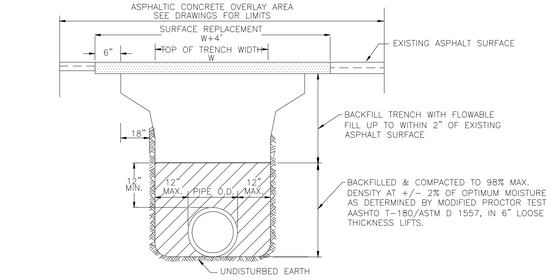
BLOCKING DETAIL FOR VERTICAL CREST — N.T.S.

NOTES:

1. ANY VOID BETWEEN MAIN AND GRAVITY BLOCK TO BE FILLED WITH GROUT BY CONTRACTOR
2. FITTINGS SHALL BE WRAPPED WITH SUITABLE COVERING TO PREVENT ADHERENCE TO GRAVITY BLOCK.
3. USE MEGALUGS ON ALL FITTINGS.
4. THRUST BLOCKS ONLY ON EXISTING LINES AND WHEN PRE-APPROVED BY THE EXECUTIVE DIRECTOR

GRAVITY BLOCKS FOR PRESSURE PIPING

10/15	OUA #14
N.T.S.	NEWLINES



NOTES:

1. BACKFILL MATERIALS AROUND AND UP TO 1 FOOT ABOVE PIPE SHALL CONSIST OF CLEAN EARTH FILL COMPRISED OF SAND, SAND AND CLAY, GRAVEL, CRUSHED ROCK OR OTHER MATERIALS FROM GROUPS A-1, A-2 OR A-3 AASHTO CLASSIFICATION FREE FROM ORGANIC MATTER AND VEGETATION, DEBRIS, LARGE CLODS OR EARTH OR STONES. UNSUITABLE IN-SITU MATERIALS SUCH AS MUCK, DEBRIS, LARGE ROCK AND ROOTS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR.
2. FLOWABLE FILL FROM A POINT 12" ABOVE TOP OF PIPE TO 2" BELOW EXISTING ASPHALT SURFACE, SHALL BE READY-MIXED FLOWABLE FILL CONSISTING OF PORTLAND CEMENT, AGGREGATES, WATER AND MINERAL MIXTURES IN COMPLIANCE WITH F.D.O.T. STANDARD SPECIFICATIONS, SECTION 121.
3. THE PIPE SHALL BE FULLY SUPPORTED ALONG ENTIRE LENGTH.
4. THE PIPE TRENCH SHALL REMAIN DRY DURING PIPE LAYING OPERATIONS.
5. ALL TRENCH WORK SHALL CONFORM TO LATEST STANDARDS AS SET FORTH BY THE FLORIDA TRENCH SAFETY ACT AND OR OSHA.
6. FOUR INCH WIDE DETECTABLE TAPE SHALL BE PLACED APPROXIMATELY 12"-18" BELOW FINISHED GRADE AND DIRECTLY ABOVE ALL PRESSURE PIPING. TAPE, WORDING AND COLOR SHALL CONFORM TO O.U.A. STANDARDS.
7. SURFACE COURSE SHALL BE F.D.O.T. MIX, TO MATCH EXISTING PAVEMENT, WITH A THICKNESS EQUAL TO THE EXISTING OR 2", WHICHEVER IS GREATER.
8. PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED BUTT JOINTS, HEATED, RAKED AND SPRAYED WITH A REJUVENATING AGENT. THE PATCH AREA SHALL BE A SMOOTH PLANE SUCH THAT A STRAIGHT EDGE PLACED ACROSS THE PATCH, PARALLEL TO THE TRAFFIC FLOW AND EXTENDING TO UNDISTURBED PAVEMENT SHALL SHOW NO MORE THAN 1/4" IRREGULARITY IN ANY 15 FT. SECTION. ANY IRREGULARITY SHALL BE CORRECTED IN ACCORDANCE WITH F.D.O.T. SPECIFICATIONS.
9. "COLD PATCH" SHALL BE USED FOR TEMPORARY REPAIRS ONLY, AND FOR A PERIOD NOT TO EXCEED 30 DAYS.
10. TRAFFIC LANE CLOSURES, MOT PLANS AND ROADWAY REPAIRS MATERIALS SHALL BE PER DIRECTION OF ROAD OWNER. CONTRACTOR TO INQUIRE WITH OWNER ABOUT REQUIREMENTS PRIOR TO BID.
11. 3M LOCATOR BALLS SHALL BE INSTALLED AT EACH FITTING IN THE PIPE LINE CHANGING DIRECTION AND AT EACH CONNECTION.
12. 3M LOCATORS TO BE PROVIDED BY DEVELOPER AS SPECIFIED BY O.U.A.

TRENCH REPAIR DETAILS PAVED AREAS WITH FLOWABLE FILL BACKFILL

10/15	OUA #13B
N.T.S.	NEWLINES

MECHANICAL THRUST RESTRAINT CHART 2							
MAIN RUN, in	BRANCH, in	TEE		LARGE SIZE	SMALL LARGE	REDUCER	
		PVC	DIP			PVC	DIP
4	4	1	1	6	4	33	21
6	4	1	1	8	4	60	38
6	6	1	1	8	6	35	22
8	4	1	1	10	4	81	51
8	6	1	1	10	6	61	39
8	8	7	5	10	8	33	21
10	6	1	1	12	4	101	64
10	8	1	1	12	6	85	54
10	10	21	14	12	8	62	39
12	6	1	1	16	4	138	87
12	8	1	1	16	6	126	79
12	12	36	24	16	8	109	68
16	6	1	1	16	12	63	40
16	8	1	1	18	4	154	97
16	16	65	43	18	6	144	91
18	6	1	1	18	8	129	81
18	8	1	1	20	4	171	107
18	18	79	52	20	6	161	101
20	6	1	1	20	8	148	93
20	8	1	1	20	12	113	71
20	20	92	61	24	4	201	127
24	6	1	1	24	6	194	122
24	8	1	1	24	8	183	115
24	24	118	78	24	12	154	97

THRUST RESTRAINT CHART BASED UPON THE FOLLOWING:

PVC/DIP	PIPE MATERIAL, AS NOTED
SP	SOIL TYPE (designer to confirm)
1.5	SAFETY FACTOR (minimum)
3	TRENCH TYPE (designer to confirm)
2.5	DEPTH OF BURY, ft (designer to confirm)
150	TEST PRESSURE, psi (minimum)

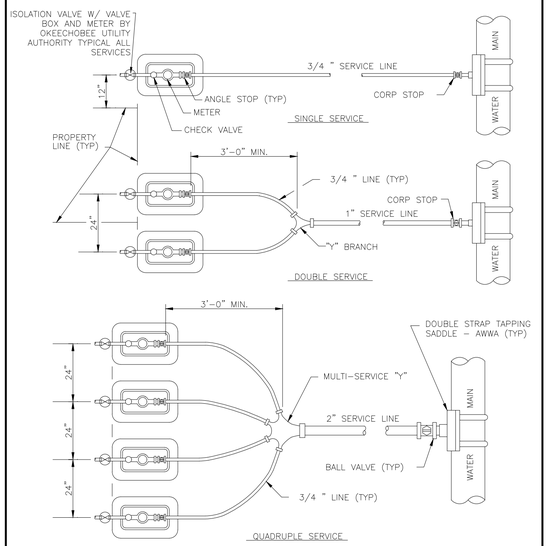
THE MINIMUM LENGTH OF PIPE OUT OF ANY VALVE OR FITTING SHOULD BE 20 LF.
FITTINGS NOT SHOWN TO BE CALCULATED UTILIZING THE CRITERIA LISTED ABOVE AND SUBMITTED IN A SHOP DRAWING
VALUES SHOWN IN CHART INDICATE LENGTH (LF) OF PIPE TO BE RESTRAINED ON EITHER SIDE OF ITEM LISTED

NOTE 1:ANY CONDITION OTHER THAN THOSE LISTED ABOVE (including poly-wrapped DIP) SHALL REQUIRE REVISION OF THE TABLE IN ACCORDANCE WITH EBAA IRON, INC., RESTRAINT LENGTH CALCULATOR (V. 5.4). (http://www.ebaa.com/engineering.htm or http://rcp.ebaa.com)

NOTE 2:THE REVISED CHARTS SHALL BE SUBMITTED TO OUA AS A SHOP DRAWING SUBMITTAL.

WATER THRUST RESTRAINT

10/15	OUA #51
N.T.S.	NEWLINES



NOTES:

1. AUTHORIZED SERVICE LINE MATERIAL SHALL BE POLYETHYLENE TUBING.
2. MULTIPLE SERVICE/METER INSTALLATIONS OF MORE THAN 4 METERS PER SERVICE AND SERVICE LINES LARGER THAN 2" IN DIAMETER SHALL BE HANDLED ON AN INDIVIDUAL BASIS.
3. NO FITTINGS BETWEEN CORP. STOP & ANGLE VALVE OR CORP. STOP & "Y" BRANCH FOR MULTIMETER INSTALLATIONS.

TYPICAL SERVICE FOR MULTIPLE SERVICES (TWO OR MORE)

10/15	OUA #2
N.T.S.	NEWLINES

ALL CONCRETE TO BE CLASS 'B' 3500 PSI (UNLESS OTHERWISE NOTED)

DATE	DESCRIPTION	ENGINEER	CAD
4/20/26	REVISED GRADING PER FDOT MODIFICATIONS	TL	PDC
1/08/26	REVISED PER WWTP SITE	TL	GL
8/29/23	REVISED PER CONTRACTOR COMMENTS	TL	PDC/JQ
8/2/23	REVISED WETLAND GRADIENT AND IMPERMEABLE BARRIERS COMMENTS	TL	PDC
7/5/23	REVISED PER SFWMD LETTER COMMENTS DATED 6/26/23	TL	PDC/CC
4/25/23	REVISED AS PER COUNTY LETTER DATED 4/25/23	SLD	JCS/AA

THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADOPTION BY STEVEN L. DOBBS, P.E., SHALL BE WITHOUT LIABILITY TO NEWLINES ENGINEERING & SURVEY AND STEVEN L. DOBBS ENGINEERING, LLC.

UTILITIES NOTES & DETAILS

PHASE 1 - COMMERCIAL AREAS

LOCATED IN SECTIONS 34&35, TOWNSHIPS 38&39 SOUTH, RANGE 34 EAST, GLADES COUNTY, FLORIDA

NEWLINES LAND CONSULTANTS

STEVEN L. DOBBS, P.E.

FLORIDA CERTIFICATE OF AUTHORIZATION NO. 00020206

STEVEN L. DOBBS ENGINEERING, LLC

1062 JAKES WAY OKEECHOBEE, FL 34974, PHONE (863) 824-7644

PROJECT No.	21534
DRAWN BY	YB/MB
SCALE	NTS
DATE	4/28/2026
SHEET No.	16 OF 21

Z:\2021\21534-Steven Dobbs- Harvey Estates\CAD (2)\04-COMMERCIAL\1.1 SHUL AND MKVAH\1.1 COMMERICAL SHEET.DWG 2026-04-28