

**CITY OF CENTRAL POINT
PUBLIC WORKS DEPARTMENT**

**Standard Specifications
And
Uniform Standard Details
For
Public Works Construction**

2014

**City of Central Point
Department of Public Works
Standard Specifications
And
Uniform Standard Details**

Introduction and General Information

Authority

These Standard Specifications and Uniform Standard Details are authorized pursuant to City of Central Point Municipal Code 15.40.010.

Notwithstanding anything to the contrary contained herein, or as may have been inadvertently omitted, the standards for design, materials, workmanship and construction set forth in this manual of Standard Specifications and Uniform Standard Details shall constitute the minimum standards to be accepted by the City. However, in any particular case, the Public Works Director shall have discretion to require a higher or different standard of design, materials, workmanship and/or construction when in his judgment; it is in the best interest of the public's health, safety and welfare considering all the circumstances of the particular project.

Scope

The provisions of these Standard Specifications and Uniform Standard Details are applicable to all Public Works construction and improvements within, or associated with the City of Central Point, Oregon

Background

Beginning in 1980 and during the mid eighties Robert Blanton P.E., and Larry Blanchard, Public Works Director developed the first edition of a manual for Standard Specifications and Uniform Standard Details. In 1987 the city council passed CPMC 15.40.010, which authorized the manual for use in public works construction. At the time it was viewed as being one of the more complete stand alone public works standards and specification documents in the Rogue Valley.

In the intervening years since 1987, several major technological changes have occurred in the construction industry mainly in the areas of construction materials and equipment. This ^{5th} Edition attempts to bring these Standard Specifications and Uniform Standard Details up to date with current industry methods and materials.

What is new about the Standards and Specifications?

- Copper is no longer allowed for services from the water main to the customer service. Municipex will be the only material specified for ¾" to 1" residential services. This change was made to reduce cost of service lines, and reduces need for cathodic protection on the water mains.
- Dielectric unions are now required behind the customer meter on copper water services.

- Cluster mailboxes are now mandated per HB3361, with ADA language added for required clearances.
- Steps are no longer installed in manholes.
- All driveways are required to be either AC or concrete.
- Bypasses are required on 3" and 4" water meters
- 2" meters require a bypass and test port.
- Water line parts must meet new lead content requirements of S.3874
- A specific vertical datum plane is now required on all plans, NAVD88.
- Standards and detail drawings added for TOD areas. Specifically, sidewalk scoring patterns, irrigation details for hanging baskets on light poles, tree well and grate.
- Drawing W-4B is now drawing W-4. This is due to the removal of the Crispin type of air relief valve being removed from the approved list.
- Added soils infiltration testing and corrosive soils testing to the General Design Criteria of section 100.
- Barriers to Low Impact Development have been removed and drawings added.

Organization

This manual is organized in decimal division format similar to APWA or ODOT standards and specification. For example, the design requirements for Section 300, Street Construction and Section 600, Water System Construction would be found in sub-sections 20 of 300.20.00 or 600.20.00 respectively. Materials would be found in sub-section 30 and so on. You will occasionally note that the lowest sub-divisions of the manual have skips or space between the numbers. This is intentional and will allow the section to be expanded without renumbering the major section.

This 5th edition, Public Works Standards and Specification and Uniform Details, will be published and available to developers, engineers and contractors in a 3-ring binder, tabbed format and electronically. As new technology, materials and methods become accepted by the Public Works Department, supplements to these Standards and Specifications will be issued to manual holders so that they can be easily updated.

Acknowledgements

We would like to acknowledge the following institutions, organizations and municipalities as we took the liberty of using or referencing their examples and to some degree certain language from their publications. We have noted many of the institutional references used in individual sections of this manual. We also would like to thank our local engineering and contracting firms that took their valuable time for providing input to this document.

Medford Water Commission, Oregon Department of Transportation, Oregon chapter of American Public Works Association, American Water Works Association, Asphalt Institute, Avista Utilities, Pacific Power and RH2.

Conclusion

It is our hope that you will find this manual useful and informative. If you have suggestions for changes or additions, please feel free to forward them to the Department of Public Works for consideration and inclusion in future supplements or editions.

CITY OF CENTRAL POINT

DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS and UNIFORM DETAILS 5th Edition

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
Introduction and General Information	
Section – 100 General Design	1 – 24
100.00.00- Scope	1
110.10.01- References	2
110.10.02- Definitions	2
120.00.00- Design	9
120.00.01- Providing for future development	9
120.00.02- Violations	9
120.10.02- Plan review	10
120.10.03- Plan format	10
120.10.04- Protection of existing facilities	11
120.20.00- Drawings	11
120.20.01- Required drawings	11
120.20.02- Easements and right-of-ways	13
120.20.10- General design criteria	14
120.20.11- Public improvements	15
120.20.12- Submittals	16
120.20.13- Costs	17
120.30.00- Quality assurance	17
120.30.01- Construction staking	17
120.30.02- Inspections	17
120.30.03- Sampling and testing	18
120.30.04- Design changes	18
130.00.00- Materials	19
140.00.00- Construction	19
140.00.01- General	19
140.00.02- Prequalified contractors list	19
140.00.03- Public works permit required	19
140.00.04- Public works permit issuance	19
140.10.00- Requirements	19
140.10.01- General	19

140.10.02- Procedural	20
140.10.03- Construction requirements	21
140.20.00- Utilities	22
140.20.01- Requirements	22
140.30.00- Traffic control	22
140.30.01- Requirements	22
140.40.00- Other requirements	23
140.40.01- Required conditions	23

Section – 200 Site Preparation and Miscellaneous Construction 25 – 32

210.00.00- General	25
210.10.01- Requirements	25
210.10.02- Violations	25
210.10.03- References	25
220.00.00- Design	26
220.00.01- General	26
220.10.01- Site grading plan requirements	26
220.10.02- Bicycle and pedestrian facilities	26
220.10.03- Traffic control	27
220.10.04- Quality assurance	27
230.00.00- Materials	27
230.00.01- General	27
230.10.01- On site materials	27
230.10.02- Off site and imported materials	27
230.10.03- Bicycle and pedestrian facilities	27
230.10.04- Traffic control	28
240.00.00- Construction and workmanship	28
240.00.01- Requirements	28
240.10.01- Removal of rubble, trash and debris	28
240.10.02- Removal of existing pavements, sidewalks, driveway aprons, etc.	28
240.10.03- Tree removal and protection	28
240.10.04- Stripping	29
240.10.05- Relocating existing culverts	30
240.10.06- Relocation of utility Poles	30
240.10.07- Relocating mailboxes	30
240.10.08- Backfilling and finish grading behind curbs and sidewalks	30
240.10.09- Bicycle path construction	30
240.10.10- Reconstruction of existing driveways	31

Section – 300 Street Construction 33 – 80

300.00.00- Scope	33
310.00.00- General	33
310.10.01- References	33
310.10.02- Definitions	34
310.10.03- Tables	36
320.00.00- Design	37
320.10.01- Design standards	37
320.10.02- Traffic impact analysis	37
320.10.03- traffic impact analysis applicability	38
320.10.04- Maintenance of level of service D	41
320.10.05- Street section design	42
320.10.10- General design requirements	43
320.10.11- Standard residential street	43
320.10.12- Minor residential street	43
320.10.13- Residential lanes	43
320.10.14- Standard Collector streets	43
320.10.15- Arterial streets	44
320.10.17- Commercial/Industrial streets	44
320.10.18- Private minimum access drives	44
320.10.19- Alleys	44
320.10.20- Sidewalks	45
320.10.21- Differing sidewalk widths	45
320.10.22- Parking lanes	45
320.10.23- Bicycle lanes	45
320.10.24- Bicycle and pedestrian paths	46
320.10.25- Vehicle lanes	46
320.10.26- Planting strips, medians and shoulder landscaping	46
320.10.27- Drainage and curbs	46
320.10.28- Street widths and rights-of-way widths	47
320.10.29- Cul-de-sacs and turnarounds	47
320.10.30- Driveways and property access	47
320.10.31- Utilities	48
320.10.32- Street lighting	49
320.10.33- Traffic calming	49
320.10.34- Exceptions to address topography and natural features	50
320.10.35- Striping and delineation	50
320.20.00- Quality assurance	51
320.20.01- Construction staking	51
320.20.02- Inspections	51
320.20.03- Sampling and testing	52

320.20.04- Design changes	52
330.00.00- Materials	52
330.10.01- On site Materials	53
330.10.02- Disposal of excess excavated soils	53
330.10.03- Storage of excess excavated soils	54
330.12.00- Supplied materials	54
330.12.01- Sub-grade reinforcement	54
330.12.02- Sub-base aggregate	54
330.12.04- Base aggregate	54
330.12.05- Concrete	54
330.12.06- Hot mix asphaltic concrete (HMAC)	55
330.12.07- General uses	55
330.30.00- Geo-textile construction fabric	55
340.00.00- Construction requirements and workmanship	55
340.10.00- Sub-grade excavation, general	55
340.10.01- Grading	56
340.10.02- Sub-grade reinforcement	56
340.10.03- Compaction	56
340.11.00- Rock excavation	56
340.11.01- Use of explosives	57
340.11.02- Repair of damage	57
340.11.03- Grading in areas classified as rock	57
340.11.04- Compaction in areas classified as rock	57
340.12.00- Unclassified excavation and embankments	58
340.12.01- Grading	58
340.12.02- Compaction	58
341.00.00- Sub-base	58
341.10.01- General requirements	58
341.10.02- Grading	58
341.10.03- Compaction	59
342.00.00- Base course	59
342.10.01- Install base or leveling course materials	59
342.10.02- Grading	59
343.00.00- Hot mix asphalt concrete pavement (HMAC)	60
343.10.01- Provide and place hot mix asphalt concrete (HMAC)	60
343.10.02- hauling, depositing, weather limitations and placement	61
343.10.03- Compaction	61
343.10.04- Additional field testing requirements	61
343.10.05- Maintenance	61
343.10.06- Joints	62
343.10.07- Smoothness	62

344.00.00- Portland cement concrete (PCC)	62
344.00.01- General	62
344.00.02- Quality assurance	62
344.10.01- Miscellaneous concrete structures- Requirements	63
344.10.02- Major concrete structures and PCC pavement- Requirements	64
344.20.00- Curbs and gutters, General	64
344.20.02- Curbs and gutters	64
344.20.03- Straight curbs (non-gutter type)	65
344.20.04- Rolled curbs and gutters	65
344.30.00- Concrete sidewalks, driveway aprons, wheelchair ramps, General	65
344.30.01- Sidewalk and ramp requirements	65
344.30.03- Concrete driveway aprons	66
350.00.00- Miscellaneous construction requirements and workmanship	67
350.10.01- Planter strips, medians and shoulder landscaping	67
350.20.00- Street cutting including curbs, gutters and sidewalks	67
350.20.01- Requirements	68
350.20.02- Curb, gutter and sidewalk cuts	69
Section – 400	Storm Sewer Construction
	81 – 100
400.00.00- Scope	81
410.00.00- General	81
410.10.01- References	81
410.10.02- Tables	82
420.00.00- Design standards	82
420.01.00- General	82
420.10.00- Minimum design requirements	83
420.10.01- Hydrology	83
420.10.02- Ground water control plan	83
420.10.03- Hydraulic design	84
420.10.04- Facility design	84
420.10.05- Private storm drain systems	87
420.20.00- Quality assurance	87
420.20.01- Construction staking	87
420.20.02- inspection	87
430.00.00- Storm system materials	88
430.10.00- Pipe materials	88
430.10.01- Polyvinyl chloride (PVC)	88
430.10.02- High density polyethylene (HDPE)	88
430.10.03- Concrete pipe	89
430.20.00- Trench bedding, pipe zone and backfill	89
430.20.01- Excess excavated trench materials	89
430.20.02- Bedding and pipe zone materials	90

430.20.03- Trench backfill materials	90
430.30.00- Structures	90
430.31.01- Manholes	90
430.32.01- Catch basins	91
430.33.01- Curb and gutter inlets	91
430.34.01- Grating	91
430.40.00- Miscellaneous structures	91
440.00.00- Construction and workmanship	92
440.10.00- Trench excavation, general	92
440.20.01- Pavement removal and replacement (street cuts)	93
440.25.01- Alignment and grade	93
440.25.02- Rock excavation	94
440.25.03- Shoring, sheeting and bracing	94
440.25.04- Excavated materials	94
440.25.05- De-watering	95
440.30.00- Trench backfill and bedding	95
440.30.01- Trench bedding	95
440.30.02- pipe zone backfill	95
440.30.03- Backfill above the pipe zone	95
440.30.04- Concrete cap and concrete encasement	96
440.30.05- Backfill for manholes, catch basins, inlet and similar structures	97
440.35.00- Installation of storm sewer pipe and fittings	97
440.35.01- Distribution of materials	97
440.35.02- Preparation	97
440.35.03- Handling	97
440.35.04- Line and grade	98
440.45.00- Placement and jointing of pipe	98
440.45.01- Concrete, PVC and HDPE pipe	98
440.45.05- Cutting pipe	99
440.60.00- Cleaning and flushing	99
440.60.01- Cleaning	99
440.60.02- Flushing	99
450.00.00- Testing	99
450.00.01- Storm water system infiltration testing requirement	99
450.00.02- Methodology	100

Section – 500	Sanitary Sewer Construction	101 – 110
500.00.00- Scope		101
510.00.00- General		101
510.10.02- References		101
520.00.00- Design standards		102
520.10.00- General		102
520.10.01- Minimum design requirements		102
520.20.00- Quality assurance		103
520.20.01- Construction staking		103
520.20.02- Inspection		103
530.00.00- Sanitary sewer system materials		104
530.00.01- General		104
530.10.00- Trench bedding, pipe zone and backfill		104
530.10.01- Excess excavated trench materials		104
530.10.02- Trench backfill materials		104
530.20.00- Structures		105
530.20.01- Manholes		105
540.00.00- Construction and workmanship		105
540.10.00- Trench excavation, general		105
540.10.01- Pavement removal and replacement (street cuts)		106
540.10.02- Rock excavation		106
540.10.03- Shoring, sheeting and bracing		107
540.10.04- Excavated materials		107
540.10.05- De-watering		107
540.20.00- Trench backfill and bedding		108
540.20.01- Trench bedding		108
540.20.02- Pipe zone backfill		108
540.20.03- Backfill above the pipe zone		108
540.20.04- Concrete cap and concrete encasement		109
540.20.05- Backfill for manholes, catch basins, inlet and similar structures		109
540.30.00- Installation of sanitary sewer pipe and fittings		109
540.30.01- Distribution of materials		109
550.00.00- Testing		109
550.10.01- Sanitary sewer testing requirements		109

Section – 600	Water System Construction	111 – 144
600.00.00- Scope		111
610.00.00- General		111
610.10.01- References		111
610.10.02- Tables		112
620.00.00- Design standards		112
620.10.00- Minimum design requirements		113
620.10.01- Location		113
620.10.02- Separation of facilities		113
620.10.03- Minimum water main and pipe sizing		114
620.10.04- Minimum cover		114
620.10.05- Reinforced flow		114
620.10.06- Fire hydrant location and spacing		114
620.10.07- Service connections		115
620.10.08- Gate and butterfly valves		115
620.10.09- Air and vacuum relief		115
620.10.10- Fire hydrant retention		116
620.10.11- Joint retention		116
620.10.12- Sewer crossings		116
620.10.13- Creek and waterway crossings		117
620.10.14- Valve installation depth		117
620.10.15- Corrosive soil requirements		118
620.20.00- Quality assurance		118
620.20.01- Construction staking		118
620.20.02- Inspections, general		118
630.00.00- Water system materials		119
630.10.00- Pipe materials		119
630.10.01- Certifications		119
630.11.01- Mechanical joint pipe		119
630.11.02- Push-on joint pipe		119
630.11.03- Flanged joint pipe		119
630.11.04- Restrained joint pipe		120
630.11.05- Poly pigs		120
630.12.00- Corrosion inhibiting pipe materials		120
630.20.00- Valves		120
630.20.01- Gate valves and tapping valves (4" through 12")		120
630.20.03- Butterfly valves (Valves larger than 12")		121
630.20.04- Valve boxes		121
630.20.05- Valve operating nut extensions		121
630.25.00- Ductile iron fittings		122
630.25.01- Mechanical joint fittings		122

630.25.02- Push-on Joint fittings	122
630.25.03- Flanged fittings	122
630.25.04- Compact ductile iron fittings	123
630.30.00- Fire hydrant assemblies	123
630.30.01- Fire hydrants	123
630.30.02- Auxiliary valve and valve box	123
630.35.00- End drain assembly (blow-off)	124
630.35.01- Valve boxes, vaults and cover	124
630.35.02- Blow-off valve	124
630.35.03- Ductile iron pipe and plug	124
630.40.00- Tapping sleeves, tapping saddles, couplings	124
630.40.01- Tapping sleeves (4" through 12")	124
630.40.02- Tapping sleeves/tapping saddles (14" and larger)	124
630.40.03- Couplings	125
630.45.01- Poly-vinyl chloride (PVC) pipe and fittings	125
630.50.00- Air relief valve assemblies	125
630.50.01- 1" (For mains and laterals up to 30" diameter)	125
630.50.02- 2" (For mains larger than 30")	125
630.55.00- Service connections	125
630.55.01- Service line parts and accessories	126
630.56.00- Backflow prevention assemblies	128
630.60.00- Trench, bedding, pipe zone and backfill	128
630.60.01- Excess excavated trench materials	128
630.60.02- Bedding and pipe zone materials	128
630.60.03- Trench backfill materials	128
640.00.00- Construction requirements and workmanship	129
640.10.00- Trench excavation, general	129
640.20.01- Pavement removal and replacement (street cuts)	130
640.25.01- Alignment and grade	131
640.25.02- Rock excavation	131
640.25.03- Shoring, sheeting and bracing	131
640.25.04- Excavated materials	131
640.25.05- De-watering	132
640.30.00- Trench backfill	132
640.30.01- Trench bedding	132
640.30.02- Pipe zone backfill	132
640.30.03- Backfill above the pipe zone	133
640.30.04- Concrete cap	133
640.30.05- Backfill for vaults, blow-off and pressure relief valve applications	134
640.30.06- Backfill for service connections	134
640.35.00- Installation of water pipe and fittings	134
640.35.01- Distribution of materials	134

640.35.02- Preparation	134
640.35.03- Handling	135
640.35.04- Line and grade	135
640.35.05- Thrust blocking	135
640.40.00- Polyethylene encasement of ductile iron pipe	135
640.45.00- Laying and jointing of pipe	135
640.45.01- Ductile iron push-on joint pipe and restrained joint pipe	136
640.45.02- Mechanical joint pipe	136
640.45.03- Flanged pipe and fittings	137
640.45.04- Preventing ground water from entering pipe	137
640.45.05- Cutting pipe	138
640.45.06- Horizontal and vertical curves	138
640.50.00- Installation of valves, hydrants and service connections	139
640.50.01- Install valves and valve boxes	139
640.50.02- Install fire hydrant assemblies	139
640.50.03- Install blow-off assemblies	139
640.50.04- Install air relief valves	140
640.50.05- Installation of service connections	140
640.50.06- Cathodic protection	140
640.50.07- Installation of valve operating nut extensions	140
650.00.00- Inspection, testing and disinfection	141
650.10.01- Pipe and bedding	141
650.10.02- Backfill	141
650.20.00- Hydrostatic testing, flushing and disinfection	141
650.20.01- Pressure and leakage testing	141
650.20.02- Flushing	143
650.20.03- Disinfection	143
Section – 700	Underground Utilities
	145 – 158
700.00.00- Scope	145
710.00.00- General	145
710.10.00- References	145
720.00.00- Street lighting	146
720.10.01- Spacing	146
720.10.02- Streetlight type, luminosity and specifications	147
720.10.02.01- Standard lighting	147
720.10.02.02- Decorative Lighting	147
720.10.02.02.01- Developer responsibility	147
720.10.02.02.02- Approved materials specifications	149
720.10.02.02.03- Contacting power source	150
720.10.02.02.04- City of Central Point/Contractor responsibility	150
720.10.03- Street intersections	150

Tables index

<u>Table</u>		<u>Page</u>
300-1A	Arterial street widths and rights of way widths	70
300-1B	Collector street widths and rights of way widths	71
300-1C	Local street widths and rights of way widths	72
300-1D	Minor local street and residential lanes widths and rights of way widths	73
300-1E	Miscellaneous transportation features	74
300-2	Minimum street alignment and grade requirements	75
300-3	Minimum street section requirements	76
300-4	Street intersections and access separation	77
300-5	Minimum sight distance and clear vision requirements	78
300-6	Driveway and property access dimensions	79
300-7	Clear vision areas	80
600-1	Minimum length of pipe for restrained joints	116
600-2	Service connection materials	127
600-3	Bolt torque loads	137
600-4	Pipe deflection	138
910-1	Base aggregate Sieve	176

Uniform Standard Details (in back)

720.10.04- Arm position	150
720.10.05- Utility and conduit trench location	150
720.10.06- Location of above ground utility appurtenances	151
720.10.07- Communication towers	151
730.00.00- Materials	151
730.10.00- Utility materials	151
730.10.01- Sand backfill and bedding	151
730.10.02- Trench backfill	151
730.10.03- Conduit	152
730.10.04- Embedded items	152
730.10.05- non embedded (above ground)	152
730.10.06- Concrete footings and miscellaneous utility structures	152
740.00.00- Construction and workmanship	152
740.00.01- General	152
740.10.00- Trench excavation	153
740.10.01- Existing utility crossing	153
740.10.02- New development	154
740.10.03- Existing street trench excavation	154
740.10.04- Shoring, sheeting and bracing	154
740.20.00- Trench bedding, pipe zone and backfill	154
740.20.01- Bedding and conduit zone materials	154
740.20.02- Trench backfill materials	155
740.20.03- Trench backfill compaction	155
740.20.04- Construct light pole footings	156
750.00.00- Inspection	157
750.10.01- Requirements	157
Section – 800 Erosion and Sediment Control	159 – 174
810.00.00- General	159
810.01.01- Description	159
810.10.01- References	159
820.00.00- Construction site management plan (CSMP)	160
820.10.01- Submittals	160
820.20.00- Site monitoring	161
820.20.01- Erosion and sedimentation control manager (ESCM)	161
820.30.00- Erosion prevention permits	162
820.30.01- Requirements	162
830.00.00- Materials	163
830.10.01- Plastic sheeting	163
830.20.00- Erosion control matting	163
830.20.01- Jute matting	163
830.20.02- Excelsior matting	163

830.20.03- Alternate matting material	163
830.30.00- Silt fences	164
830.30.01- Field fabricated silt fence	164
830.30.02- Manufactured silt fence	164
830.40.00- Other silt barrier materials	164
830.40.01- Straw bales	164
830.40.02- Bio-bags	165
830.40.03- Sandbags	165
830.50.00- Seed	165
830.50.01- Seed certification	165
830.50.02- Seed type	166
830.60.00- Mulching	166
830.60.01- Hydro mulch	166
830.60.02- Grass straw mulch	166
830.70.00- Fertilizer	166
830.70.01- Requirements	166
830.80.00- Protection fence	166
840.00.00- Construction and workmanship	167
840.10.01- General	164
840.10.02- Construction site practices	168
840.10.04- Wet season (November to May0 and temporary work suspension	168
840.10.05- Disturbance limits	168
840.10.06- Perimeter controls	168
840.10.07- Soil and slope protection and stabilization	168
840.10.08- Temporary protection and stabilization	168
840.10.09- Permanent protection and stabilization	169
840.20.00- Seeding	169
840.20.01- Requirements	169
840.20.02- Application methods	170
840.30.00- Mulching	171
840.30.01- Requirements	171
840.40.00- Plastic sheet covering	172
840.40.01- Requirements	172
840.50.00- Erosion control matting	172
840.50.01- Requirements	172
840.60.00- Silt fence	172
840.60.01- Requirements	172
850.00.00- Construction access and control	173
850.10.01- Requirements	173
850.10.02- Straw bales, bio-bags, and sandbags	173
850.10.03- Storm water system inlet protection	173
850.10.04- Protection fencing	173

860.00.00- Maintenance and removal	174
860.10.01- Requirements	174
860.10.02- Maintenance	174
860.10.03- Removal	174
Section – 900 Construction Materials	175 – 184
900.00.00- Scope	175
900.01.00- Materials testing and quality assurance	175
910.00.00- Aggregate	175
910.00.01- Aggregate source certification	175
910.10.00- Crushed rock	176
910.10.02- Base aggregate	176
910.10.03- Sub-base aggregate	176
910.10.04- Clean drain rock	177
910.11.00- Trench backfill and bedding aggregate	177
910.11.01- Requirements	177
911.00.00- Aggregate material tests	178
915.00.00- Sub-grade and trench reinforcement rock	179
915.01.01- Material requirements	179
920.00.00- Rip-rap	180
920.10.01- General requirements	180
925.00.00- Hot mix asphalt concrete paving (HMAC)	180
925.10.01- General requirements	180
925.10.02- Mix design	180
930.00.00- Portland cement concrete (PCC)	181
930.10.01- General	181
930.10.02- Requirements	181
930.10.03- Joint materials	182
935.00.00- Topsoil	182
935.10.01- General	182
935.10.02- Quality control of source	182
940.00.00- Geo-textile construction fabric	183
940.10.01- General	183
940.10.02- Requirements	183
945.00.00- Cement-sand slurry	183
945.10.01- Requirements	183
960.00.00- Miscellaneous materials	184
960.10.01- Locating tape for marking discovered utilities	184

SECTION - 100

GENERAL DESIGN

And

CONSTRUCTION GUIDELINES

100 – GENERAL DESIGN and CONSTRUCTION GUIDELINES

100.00.00 – Scope

This section describes the general design and construction requirements for public works projects. Detailed requirements for each phase of public works design and construction are found within the applicable section. For example, the design requirements for street construction or water systems construction are found in Section 320.00.00 and Section 620.00.00 respectively. Construction requirements for storm sewers would be found in Section 440.00.00 of Storm Sewer Systems.

These Design and Construction Guidelines are hereby published, in conjunction with the 'STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION' in the City of CENTRAL POINT, OREGON' including the "UNIFORM STANDARD DETAILS", as an aid to Engineers in designing public works facilities and improvements such as streets, water systems and storm systems, which are intended for acceptance by the City for maintenance by the Public Works Department. The form has been kept brief and no attempt has been made to cover all possible situations or to provide lengthy explanations. They are intended as supplements to the City of Central Point Municipal Code, and are applicable to all Public Works construction/improvements in the City.

Unless otherwise stated or referenced herein, or shown on the approved drawings, these standards and specifications shall govern and apply to all public works design and construction within the City of Central Point and, in or on any City owned or administered facilities, easements, or right-of-ways outside the City limits. If not stated, referenced or shown herein, or on the approved drawings, the Oregon Standard Specifications for Construction and Oregon Standard Drawings, 2008, shall apply. Any design changes or substituted specifications shall be submitted in writing to the Public Works Department for approval prior to construction.

The Standards set forth for design, materials and construction shall constitute the minimum standards to be accepted by the City; however, in any particular case, the Public Works Director shall have discretion to require a higher or different standard of materials and/or design when in his judgment it is in the best interest of the public's health, safety and welfare, considering all the circumstances of the particular project.

An Engineer may submit requests for alternative or innovative designs or materials, and will be expected to submit complete data in the form of study or test results to support his request. The City may or may not allow the changes.

Where a Subdivision, Local Improvement District, or other Project will create or improve intersections with County Roads, or the State Highways, it shall be the responsibility of the Engineer to coordinate his design and the construction work with the appropriate agency, and to meet the requirements of the agency having jurisdiction.

It is anticipated that revisions to the design standards will be made from time to time. The date appearing on the title page is the date of the latest revision. Supplemental pages,

issued at the time they are approved by the Department of Public Works, will make minor revisions or new sections added to this document. The next complete publication of these standards and specifications will be made at such time as required, if in the view of the Public Works Department, major technological changes occur or a large volume of additional changes or sections are added which dictate a major revision.

110.00.00 – General

110.10.01 – References

References to standards and specifications of these and other agencies, associations, institutions, or municipalities are also located at the beginning of each section of these Standard Specifications.

AASHTO	American Association of State Highway Officials.
ACI	American Concrete Institute.
ACOE	U.S. Army Corps of Engineers
AI	Asphalt Institute
ANSI	American National Standards Institute.
APWA	American Public Works Association.
AWWA	American Water Works Association
ADPI	American Ductile Pipe Institute
DEQ	Oregon Department of Environmental Quality.
DFW	Oregon Department of Fish and Wildlife.
DSL	Oregon Division of State Lands.
FEMA	Federal Emergency Management Agency.
JCRP	Jackson County Roads and Parks
MWC	Medford Water Commission
MUTCD	Manual of Uniform Traffic Devices as published by U.S. Department of Transportation.
ODOT	Oregon Department of Transportation.
ODHS	Oregon Department of Health Services
OMUTCD	Oregon Manual of Uniform Traffic Control Devices
OR-OSHA	Oregon Occupational Safety and Health Division, of Dept. of Insurance and Finance
OSHA	Occupational Safety and Health Administration, US Department of Labor
OSHD	Oregon State Highway Division
OUNC	Oregon Utility Notification Center
PWD	Public Works Department for the City of Central Point.
RVSS	Rogue Valley Sewer Services.

110.10.02 – Definitions

Alley A street or road primarily intended to provide secondary access to the road or side of lots or buildings and not intended for normal vehicular traffic.

<u>Approve</u>	The words "approved", "approve", "approval" or words of like import shall mean to give in writing, limited, conditional or qualified permission to use material equipment or methods, such conditions being in strict compliance with the Standard Specifications. Such approval will be by The Public Works Director or his authorized representatives.
<u>Applicant</u>	The person or firm applying for a Public Works Department Construction Permit. (Usually the same entity making application to develop a commercial or residential project)
<u>As Built</u>	Mylar Drawings, which provide "red-line" changes to final approved constructions plans, which identify the location and elevations of actual installed items. Includes electronic or AutoCAD drawings on disk media.
<u>As Approved</u>	The words As Approved unless otherwise qualified, shall mean, "Approved by the Public Works Director"
<u>Agreement</u>	An agreement between the City and the Developer that defers the construction of specified improvements until a specified date.
<u>As Shown</u>	The term "As Shown" shall be understood to be followed by the words "on the plans."
<u>Best Management Practices (BMPs)</u>	<p>A collection of techniques, processes, activities, or structures used to reduce the pollutant content of a stormwater discharge.</p> <p>Structural BMPs: Mitigation strategies to reduce the impact from either past or future development. These structural practices include but not limited to:</p> <ul style="list-style-type: none">• Infiltration Rain Gardens• Infiltration Stormwater Planters• Runoff Area Disconnection – Vegetated Filter Strips• Porous Pavement• Rainwater Harvesting Systems• Green Roofs• Stormwater Conveyance without a Pipe <p>Non-Structural BMPs: Restoration and protection practices often employed during the early planning phase, but may appear during other project phases. These include but are not limited to:</p> <ul style="list-style-type: none">• Impervious Area Reduction• Runoff Area Disconnection - Contained Planter Over Impervious Area• Tree Preservation & Planting• Native Plant Installation
<u>CCR 's</u>	Conditions, Convents and Restrictions.

- City City of Central Point, Oregon.
- City Council The governing body of the City of Central Point, Oregon.
- Citation Authority The authority granted to the Central Point Police Department or other departments and personnel to issue citations for violation of City ordinances, rules, laws, regulations or other City or State requirements administered by the City of Central Point.
- Comp. Plan Comprehensive Plan, City of Central Point.
- Contract A binding agreement between a contractor and the owner/developer, covering the performance of the work, the furnishing of labor and materials for the construction of public facilities.
- Contractor The person or persons, firm, co-partnership, corporation or joint venture who have entered into a contract with the owner/developer (or the City of Central Point) to perform work. The word "Contractor", although used herein as describing an individual shall be taken to mean a Contractor, his agents, employees, of official subcontractors, or anyone connected with the work herein set forth on behalf of the Contractor. Contractor and individuals performing the work must be qualified and meet state licensing and insurance requirements.
- Council City Council of Central Point, Oregon.
- County County of Jackson, Oregon.
- County Road A public road incorporated into the County roadway system by formal action of the Board of County Commissioners. These roads are assigned numbers and the County assumes maintenance responsibility.
- Critical Root Zone (CRZ) Portion of the root system that is the minimum necessary to maintain vitality or stability of the tree. Encroachment or damage to the critical root zone will put the tree at risk of failure. For measurement purposes, the City utilizes the International Society of Arboriculture's definition, which establishes the CRZ as an area equal to a 1' radius from the base of the tree's trunk for each 1" of the tree's diameter at 4-1/2' above grade (referred to as diameter at breast height (DBH)). See table below.

<i>Diameter at Breast Height</i>	<i>Critical Root Zone Radius</i>
2 inches	2 feet
6 inches	6 feet
20 inches	20 feet
46 inches	46 feet

- CSMP Construction Site Management Plan. Part of the requirements for Section 800, Erosion and Sedimentation Control.
- City Easement Shall mean an easement dedicated to the City of Central Point. Such easement may exclusive (limited) or non-exclusive and may be used for such purposes as pedestrians, city utilities, vehicles, city signs, etc. Normally the easement may be designated for a specific purpose such as a storm drain; however, it may be designated for multiple purposes or facilities.
- DCH Diameter of tree measured at chest height
- Deferred Improvement Agreement An agreement between the City and the Developer or Applicant that defers the construction of required improvements to a future specified date.
- Designated Authority The term "Designated Authority" as used in these specifications shall be taken to designate the party or parties authorized or employed by the owner to observe, test or review quality and sufficiency of the work performed, materials used, and determine compliance with the plans and specifications. The Designated Authority for the City of Central Point is the Public Works Director or one of his authorized representatives.
- Developer An individual or firm who undertakes construction of a public works facility within the corporate limits of the City.
- Directed, Required, etc. Wherever in these specifications the words "directed" "required", "permitted", "ordered", designated" or words of like import are used, they shall be understood to mean the direction, requirement, permission order, or designation of the Publics Works Director.
- Director Public Works Director for the City of Central Point, and is referred to throughout these as if masculine in gender.
- Developer Individual, partnership, firm or corporation proposing construction of public works improvements to be accepted by the City.
- Easement A right in the owner of one parcel of land, by reason of such ownership, to use the land of another for a special purpose not inconsistent with a general property in the owner.
- Engineer Consulting engineer for the Applicant or Developer. A consulting engineer selected by the Public Works Department to perform engineering and design functions for the City.
- ESCM Applicants Erosion and Sedimentation Control Manager

EBC "Equivalent Base Course" equates a 1" thickness of crushed $\frac{3}{4}$ "-0 base aggregate to a 2" thickness of pit run basalt or a $\frac{1}{2}$ " thickness of compacted 4"-0 crushed rock. EBC shall be in excess of the required minimum thickness of base course material required in these Standard Specifications and is normally used to determine and provide additional reinforcement to the street section sub-base.

Inclement Weather For the purposes of these Standard Specifications, inclement weather shall be taken to mean any weather conditions so extraordinary that previous climatic conditions in the locality of the work afford no reasonable warning of the worsened condition or the ability to pursue work with the expectation of meeting the standards and specifications set forth herein. Under formal Public Works Contracts, the PWD will make the determination of inclement weather for payment or contract extension purposes.

Inspector The authorized representative of the City, designated to determine compliance with the plans and specifications of public works projects.

Inter-section Refers to the junction of two or more intersecting streets. For design purposes, naming two approaches of a continuous street at a curve or some other point with different street names does not form an intersection.

Low Impact Development A stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of on-site natural features, site planning, and distributed stormwater management practices that are integrated into a project design. Low Impact Development Approaches (LIDA) can include a combination of structural and non-structural best management practices (BMPs).

Planning Commission The Planning commission makes recommendations to the City council regarding the City's Comprehensive Plan, Facilities, Plans, Capital Improvements Program (C.I.P.), and Zoning Ordinances.

Or Equal The words "or equal," "or approved equal," or words of like import shall mean to possess the same performance qualities and characteristics and fulfill the same function without any decrease in quality, durability, or longevity and shall meet with the approval of the Designated Authority. No inference is intended that items must be identical in all respects if above conditions are satisfied.

Plans The plans, profiles, and detailed drawings which show the locations, character, dimensions, and details of the work to be done, and which are intended to be and are hereby made a part hereof.

Product Data Complete catalog data for the manufactured items of equipment and all component parts, including specific performance data, material description and source, rating, capacity, working pressure, material gage thickness, brand name, catalog numbers, and other necessary information. Where not called for on the approved plans the Contractor shall be required to submit "submittals to PWD for approval before installation.

Public Works Facility Any facility or improvement constructed upon public property, right-of-way or public easement, which is immediately, or eventually to be taken over by the City for maintenance and operation. These facilities include, but are not limited to, streets, sidewalks, curbs parking lots, driveways, drainage facilities, water system works, buildings, bicycle paths, pedestrian paths and parks.

PUE A Public Utility Easement. A dedicated strip of land on private property for the construction and maintenance of utilities by companies franchised or licensed by the City of Central Point to install and operate a utility within the city limits and are further registered as a public utility in the State of Oregon. These companies include but are not limited to companies that provide underground and overhead electric power, natural gas, communications, and television services and shall hereinafter be referred to as the "Utility". These do not normally include City utilities such as water, sewer and traffic appurtenances except by crossing.

Private Easement A strip of private land whereby certain rights have been given to another private party or parties, to construct, maintain or provide access across said land, or to limit certain activities such as visual obstructions or noise. Easements can be either exclusive (limited) or non-exclusive.

Right-of-Way That portion of ground provided or required by the City for use in constructing and maintaining public facilities. The City of Central Point usually owns such right-of-way in fee simple.

Street or Road That portion of right-of-way used for vehicular traffic, and including any appurtenance thereto, storm draining system, sidewalks, traffic control devices, etc.

Shop Drawings All diagrams drawings, illustration brochures, schedules, and all other data submittals required by the contract to be furnished by the Contractor illustrating fabrication, installation, dimensions, and other aspects of the work.

Specifications The directions, requirements, explanations, terms and provisions contained herein as supplemented by such special conditions as may be necessary, pertaining to the various features of the work to be done, the manner and method of performance, and the manner and method of measurement and payment. The specifications include such directions, requirements and explanations as appear in the plans.

Standard Specification Codes, rules and regulations set forth in the City of Central Point, Public Works Standards and Specifications as adopted by the City Council and considered to be the latest issue with all amendments as of the date of these specifications or supplemental specifications as may be issued periodically.

Standards Shall mean those Standard Specifications for Public Works Construction as adopted for use in the City of Central Point, Oregon.

Standard Details Shall mean those standard drawings included in these Standard Specifications or any supplemental standard details as may be issued by the Public Works Department.

Subcontractor Any individual firm or corporation having a contract with the Contractor or with any other subcontractor or for the performance of a part of the work

Shown, etc The words "indicated", "noted", "shown", "called for", or words of like import shall mean, indicated, noted, shown, or called for on the plans for the work referred to.

State State of Oregon.

Stormwater Management Facility A technique used to treat, detain, and/or retain stormwater to preserve or mimic the natural hydrologic cycle on a development site. See also "Best Management Practice, Structural BMP."

Surveyor A professional surveyor licensed in the State of Oregon. Usually the Surveyor for the Applicant or Developer.

Tree Protection Zone (TPZ):

The area equal to twice the radius of the critical root zone (CRZ) including the trunk of the tree being protected from development activities. The table below illustrates how the TPZ is calculated. Disturbance to the tree roots, trunk and crown within this area shall be avoided or minimized to the greatest extent possible to maintain the vitality and stability of the tree.

<i>Diameter at Breast Height</i>	<i>Critical Root Zone Radius</i>	<i>Tree Protection Zone Diameter, including Trunk.</i>
2 inches	2 feet	4+ feet
6 inches	6 feet	13.5 feet
20 inches	20 feet	42 feet
46 inches	46 feet	96 feet

UBC Uniform Building Code.

120.00.00 – Design

120.00.01 – Providing for Future Development

All public improvements shall be designed as a logical part of the development of the surrounding area. Storm sewers and sanitary sewers all are sized to accommodate the entire drainage basin, which they will ultimately serve. Utilities and street improvements will be extended to the boundaries of the development for future extensions to the adjoining areas. The Public Works Director may require over sizing of utility lines to accommodate future growth of the City.

Where existing City utility lines do not adjoin the proposed development, the developer will be required to extend the lines to the development as necessary. Where existing roadway improvements do not extend to the proposed development, the developer may be required to improve the roadway to the development.

120.00.02 – Violations

The City of Central Point Police Department and other designated personnel and departments shall have authority to issue citations for violation of City ordinances, regulations, rules and laws including those of the State of Oregon that may be administered by the City. Some examples pertaining to construction activities are: Tracking out of dirt and mud onto a street; Stockpiling of materials in the street; Improper or inadequate control of traffic in a construction zone; Violation of construction zone signing and speed requirements; Performance of any construction within a City Right of Way without a Public Works Permit.

120.10.02 – Plan Review

Review of public improvement plans is initiated by the submittal of 3 sets of plans that are at least 95% complete. The plans shall include those of other agencies such as RVSS or JCRP. Following review, the plans will be returned “approved” or with comments and a staff report.

In order to be entitled to further review, the applicant's engineer must respond to each comment of the prior review (except that request may be made that requirements as to form of the submittal, such as drafting, not necessary to further review of the plans, be delayed until issues of design are resolved). All submittals and responses to comments must appear throughout the plans to be a bona fide attempt to result in complete plan approval. Upon approval, the Applicant's Engineer shall submit 4 copies of the plans to the Department of Public Works.

In general, the submittal shall include plan and profile for streets, water, storm drainage and sanitary sewers, storm drainage calculations, storm drainage basin map, **stormwater management calculations and plans**, sanitary sewer basin map, erosion control plan, including total square footage of project area, and utility and outside agency notifications and approvals. The plan and may also include applicable traffic studies, legal descriptions and a traffic control plan.

120.10.03 – Plan Format

- a) The plans shall be submitted on “D” size, 24" x 36". Sheets.
- b) Vicinity Maps shall be located on the first sheet of all plans and shall show the location of the project in respect to the nearest major street intersection.
- c) A north arrow shall be shown on each plan view sheet of the plans. Adjacent plans on the same sheet shall have separate north arrow orientation.
- d) The scale shall be as noted below in Section 120.20.00, Drawings except for structural drawings. The scale of corresponding sheets shall be the same throughout the project.
- e) Letter size shall not be smaller than 0.10 of an inch high.
- f) All detail drawings, including Standard Details, shall be included in the drawings.
- g) The location and elevation of a Federal Emergency Management Agency (FEMA), National Geodetic Survey, United States Geological Survey, State Highway, Jackson County, or City of Central Point benchmarks shall be shown. Temporary benchmarks shall be shown or referenced on the plans.
- h) **Vertical datum plane NAVD88 must be used.**

120.10.04 – Protection of Existing Facilities

The locations of existing facilities shall be shown on all applicable construction drawings for public works projects as follows:

1. The exact locations of underground facilities shall be verified in advance of any public works construction, in cooperation with the public or private utilities involved.
2. All existing underground and surface facilities shall be protected from damage during construction of public works projects.
3. Any existing facilities not specifically designated for alteration or removals, which are damaged during construction, shall be restored or replaced to a “same as” or better than condition, at the expense of the Contractor.
4. Suitable notice shall be given to all public and private utility companies in advance of construction for the purpose of protecting or relocating existing facilities.

120.20.00 – Drawings

General Requirements –

- a) Stationing – Stationing shall normally begin with 0+00 centerline located at the intersection of an existing street centerline and continue to the end of the project or to the intersection with another street centerline whichever occurs first. Continuous stationing from one street to another is not acceptable.
- b) Where one street or other facility intersects with another, the stationing shall be equated. For example: Street “B” at station 0+00.00 equals Street “A” at station 20+06.08
- c) Stationing of water, storm sewer and other facilities shall normally be referenced to the street centerline stationing unless it is a separate facility outside of the street right-of-way or cannot be referenced in such a manner due to disparity in length or deviation from street centerline.

120.20.01 – Required Drawings

The following drawings will be required before Plans will be approved for construction.
PROJECT PLAN / GRADING PLAN / EROSION CONTROL PLAN/STORMWATER MANAGEMENT.

- a) A scale not smaller than 1” = 100’ horizontal
- b) Plat Information, including all Lot Lines, Right-of-Way Lines, and Easements, and the locations of all natural drainage channels.

- c) Locations and the approximate extent of all existing and proposed cuts and fills.
- d) Grading and Drainage Plan, including existing grades and finish grades at all lot corners, and directions of storm run-off.
- e) Utility Plan, showing the locations and routes of all existing and proposed utility lines, including power, telephone, gas, and cable T.V shall be the responsibility of the Engineer to coordinate all Utility Companies' service lines, and to present a completed Plan showing all utility locations. In addition, the Plan shall contain signatures of acceptance from each Utility Company.
- f) Soil boring or test hole logs and test locations, where such investigation has been made to request or defend design variances.
- g) Erosion Control Management Plan, showing locations of all erosion control structures. Coordinate with grading plan. See Section 800, Erosion and Sediment Control for detailed requirements.
- h) Ground Water Control Plan. Submit this only if ground water is present and it is determined by a hydro-geologist that such plan is required. See Section 420.10.02.

STREET PLANS and PROFILES:

- a) At a scale not smaller than 1" = 50' for the Plan, and not smaller than 1" = 50' horizontal and 1" = 5' vertical for the Profile. As part of the Street Plans and Profiles, CURB RETURN PROFILES will be required at a scale not smaller than 1" = 10' horizontal and 1" = 1' vertical.

Details of valley gutters, at a scale not smaller than 1" = 20' will be required, with finish concrete elevations noted at the gutter flow lines at ends of curb returns and at the bottom of the curb at the center of the curb returns; at the four corners of the valley horizontal and 1" = 5' vertical for the Profile. As a part of the Street Plans and Profiles, CURB RETURN PROFILES will be required at a scale not smaller than 1" = 10' horizontal and 1" = 1' vertical for gutter; at the flow lines at each end of the valley gutter; and at the edges of the valley gutter and the flow-line at the centerline of the street.

STORM SEWER PLANS and PROFILES:

- a) At a scale not smaller than 1" = 50' horizontal and 1" = 5' vertical for the Profile. The Plan shall include pipe locations and manhole locations (station and offset) with invert elevations in and out. The Plan shall show the locations of catch basins; curb inlets and leader pipe, and shall include elevations of inlets and pipe inverts. Profiles shall indicate the manhole locations and pipe invert information, as well as the pipe types, sizes, and grades.

Where storm sewers discharge into natural channels within the limits of the project, details of the discharge, including streambed and stream bank protection shall be included.

WATER PLAN and PROFILE:

- a) At a scale not smaller than 1" = 50' for the Plan and not smaller than 1" = 50' horizontal and 1" = 5' vertical for the Profile. The Plan shall include pipe locations, and shall locate by station and off-set, all valves, fire hydrant assemblies, tees, crosses, ells, sewer line crossings, air relief valves, pressure relief valves, service connections, and blow-off assemblies. Profiles shall show grades, special crossings, and sewer and storm sewer crossings. Special Details will be required for Sewer Line avoidance and for ditch or creek crossings.

Where appropriate, and where clarity will not suffer, two or more of the above-required Plans and Profiles may be combined, such as Street and Storm Sewer Plan and Profile combined, or the Sewer and Water Plan and Profile combined. In some cases it may be possible to combine all four, where confusion will not result or where one or more of the facilities will not occur in a given street.

SPECIAL FACILITIES:

- a) Where special facilities are required, such as a head wall for introduction of natural drainage into pipe, bridges or box culverts, sewage pump stations, detainment basins, or special valve boxes, where special items have been designed for slope support, or where other appurtenances are required that are not included in the Uniform Standard Details, such items shall be clearly detailed and measured. These Special Details may be included on other required sheets of drawings, or may be introduced on separate sheets.

AS-BUILT DRAWINGS:

- a) After all construction work has been completed inspected, and approved by the Public Works Department, the Engineer shall make all required corrections and revisions to the Plans as necessary to complete "As-Built" drawings, and shall submit to the City the revised "As-Built" Plans in the form of reproducible, Mylar prints. In addition the Engineer shall submit a copy of the "As-Built" drawings on magnetic or CD-ROM disk in AutoCAD format. The City will not accept a project for maintenance by the Public Works Department, nor provide services to the Commercial Development, Subdivision or Local Improvement District until such approved Mylar prints and disk copy of the "As-Built" drawings have been submitted.

120.20.02 – Easements and Right-of-Ways

Identify easement and right-of-way dedications and widths on the Final Plat and applicable Construction Drawings. If the number and location of easements and right-of-ways are complex or give rise to confusion, a separate plate may be required.

1. Easements for City infrastructure (i.e. sanitary sewer, water and storm drain) should be a minimum of 15' wide, and should not split lot lines. Easements for public utilities should be designated as Public Utility Easement (P.U.E.). City maintained or owned facilities such as storm drainage, sanitary sewer, and water line easements should be dedicated to the City. Privately maintained or owned facilities over adjacent private

property also require easements. Centerline of buried infrastructure shall be aligned a minimum of 5' from the edge of the easement. If two or more City owned utilities are located within an easement, then a minimum of 20' width shall be required. Easement dedications in final deeds or in CC&R's need a statement, which clearly states that easements must be maintained for suitable, drivable access, as determined and approved by the City PWD.

2. Public streetlights, fire hydrants, waterlines, storm drains, etc. shall not be placed within PUE's but shall be placed within a dedicated City right-of-way.
3. It is the sole responsibility of the permit holder to provide for proper right-of-entry and/or easements prior to starting work on private property. Proof of right-of-entry or properly executed easements, shall be provided to the City. The City shall in no way be construed to be liable for the permit holder's failure to obtain or provide for proof of right-of-entry or easements.

120.20.10 – General Design Criteria

1. Field verify all existing infrastructure elevations and locations (i.e. pipe inverts, curb elevations, etc.), to which the proposed development will connect into existing improvements, prior to final construction plan design.
2. The current Rogue Valley Sewer Services standards and specifications, as adopted by ordinance, are the physical standards for the design and construction of sanitary sewers and storms drains. However, trenching and backfill must conform to City standards as presented in these standards.
3. A Minimum of 6" of clear separation between infrastructure facilities (i.e. pipes, valves, etc.).
4. If the proposed development places structures within Special Flood Hazard Area (SFHA), also commonly referred to as the 100-year and the high risk floodplain, the Developer's engineer will be required to conduct a floodplain encroachment impact analysis that evaluates the cumulative impacts of the placement of these structures on the flood-hazard area, including:
 - a. Cumulative effects of the proposed placement of structures on the base flood elevation (100-year flood elevation);
 - b. Cumulative effects of the proposed placement of structures on the flood zone boundaries;
 - c. Impacts to flood velocity during the base flood;
 - d. Impacts that the identified modifications to the base flood elevation and the flood zone boundary and velocity have on the existing facilities and properties surrounding the proposed development.

5. All work shall be performed in accordance with the requirements of the City's Municipal Code; in particular, the chapter pertaining to Flood Damage Prevention and Hazard Mitigation.
6. All elevations used on the construction plans, on temporary benchmarks, and on the permanent benchmarks shall be tied into an established City vertical and horizontal datum, and shall be noted on the construction plans. The City shall determine how many permanent benchmarks shall be established by, and at the expense of the developer within the proposed subdivision. The City PWD and the Developer's surveyor shall jointly determine the locations of the benchmarks.
7. Infiltration testing of soils in project area shall be conducted, at Developer expense, to determine storm water management needs. Additionally, corrosive soils testing shall be performed in conjunction with infiltration testing, when water line installation is a part of the project.
8. All other work not covered by these standards shall conform to the Oregon Standard Specifications for Construction, 2008 and Oregon Standard Drawings for Design and Construction.
9. The Developer's engineer or surveyor shall provide to the Public Works Department a drawing of the recorded Final Plat map reproduced on Mylar and in an acceptable electronic form in AutoCAD format. The Final Plat shall be tied to a legal Government corner and the State Plane Coordinate System (NAVD88).

120.20.11 – Public Improvements

- 1 Applicant shall submit to the City's Public Works Department (City's PWD) for review and approval, plans and specifications for all improvements proposed for construction or modifications within the City rights-of-way and easements.
- 2 Public improvements, where applicable, include, but are not limited to, streets, alleys, bicycle and pedestrian paths, sidewalks, curbs and gutters, storm drainage and sanitary sewer collection and conveyance systems, stormwater management, water distribution system (up to the water meter and including fire protection), street lighting, and traffic control devices, and street signs and delineation. Note that the public sanitary sewer system is owned and administered by RVSS
- 3 These standards shall apply to all City improvements on city property, and within the existing and proposed right-of-way and easements, which are to be maintained by the City, and to all improvements for which the Development Code requires approval by the City. The Public Works Director shall have discretion to require higher or different standards for materials or design when in his/her judgment it is in the best interest of the public's health, safety and welfare when considering all aspects and circumstances of the project.
4. Requests for variances to these standards shall be based on topography, right-of-way geography or existing physical conditions, which impose an economic hardship

on the applicant. Requests must show that the variance will not compromise safety or cause an increase in maintenance.

120.20.12 – Submittals

1. All design, construction plans and specifications, and as-built drawings shall be prepared to acceptable professional standards as applicable, the Developer shall provide copies of any permits, variances, approvals, and conditions as may be required by other agencies, including, but not limited to Oregon Department of Fish and Wildlife (DFW), Oregon Department of Environmental Quality (DEQ), Oregon Division of State Lands (DSL), Oregon Department of Transportation (ODOT) approval for storm drain connections and easement, landscape berms, U.S. Army Corps of Engineers (ACOE), affected irrigation districts, Rogue Valley Sewer Services (RVSS), and Jackson County Road and Park Services Department (JC Roads), and DSL and ACOE, as applicable (wetland mitigation).
2. Fire District No. 3 must approve all streets and water improvement plans in writing prior to final review by City PWD.
3. The Developer's engineer shall provide suitable engineering certification and justification (i.e. calculations, analyses, plots, etc.) that all connections to existing infrastructure (i.e. street; water, sanitary sewer, storm drain systems; natural drainage systems; etc.) will not interfere with the effective level of service or operation of the infrastructure facilities, and that the existing or improved infrastructure facilities have adequate capacities to accommodate the flows and/or demands imposed on the existing infrastructure as the result of the connection of the proposed development's infrastructure.
4. During construction, any changes proposed by the Developer shall be submitted in writing by the Developer's engineer to the City PWD for approval prior to installation.
5. The Developer shall submit verification of stormwater facility plant survival 2-years following installation.
6. Prior to approval and acceptance of the project, the Developer's engineer or surveyor shall provide the Public Works Department as-built drawings. As-built drawings shall provide "red-line" changes to final approved construction plans which identify the locations and elevations (as appropriate) of actual installed items, including, but not limited to, invert, inlet, and rim elevations; spot elevations identified on drawings; road alignment; water lines, valve's, and fire hydrants; water and sewer lateral stationing; modifications to street section; manhole and curb inlet locations; street light locations; other below grade utility line locations and depths; etc. Provide a "red-line" hard copy (on Mylar), or an approved alternative format, of construction drawings, and an acceptable AutoCAD compatible drawing electronic file to the City at completion of construction.

120.20.13 – Costs

Fee Schedule:

For any development requiring an engineering review, the City of Central Point City Council sets rates for payment based on an estimated staff time to complete the project. The fee schedule is set each June and is available at the Public Works office at City Hall. The rates differ depending on whether it's a partition, subdivision or commercial building. If there are any questions please contact Public Works for clarification.

120.30.00 – Quality Assurance

The quality assurance requirements are repeated in greater detail within each section contained in these Standard Specifications.

120.30.01 – Construction Staking

The Engineer will establish marked centerline stakes, and stakes 7' behind curb faces at minimum 50' intervals along tangents (25' on curves) for sub-grade excavation and embankments. After sub-grade excavation the Engineer will establish stakes 3' behind the face of curbs at 25' intervals for construction of sewer lines and water lines and for construction of curbs. In addition the points of curve radius (pcr), vertical curve points shall be staked. "Blue-top" grade hubs will be set at the centerline of the street at minimum of 25' intervals for placing the base course and leveling course for the street. Paving grade hubs or "red tops" may also be established in addition to controls at the top elevation of the concrete lip of gutter. All grade hubs shall be removed during the paving operation and voids filled. After stakes or hubs are set, protection of the all staking shall be the Contractor's responsibility. If stakes are disturbed or removed in any way, either during construction operations or after working hours, they shall be reset by the Engineer, as he deems necessary, at the Contractor's expense.

120.30.02 – Inspections

The Public Works Department inspector is the authorized representative of the Public Works Director whose instructions and decisions shall be limited to the particular duties and responsibilities delegated to him. These delegated responsibilities include performing all necessary inspections to assure that project construction is in conformance with the approved plans, specifications and materials for any Public Works project or work, which will be accepted into the City system. All work shall be inspected in accordance with the City of Central Point, Public Works Standards and Specifications, including the requirements of other referenced organizations noted herein or as may otherwise be directed by the Public Works Director.

Inspections shall be conducted by Public Works Department personnel during normal business hours of 8:00 AM to 5:00 PM. Inspections must be requested by the Contractor 24 hours in advance of the required inspection. Requests for Public Works inspection may be made through the PWD secretary at (541) 664-7602 ext.241. Arrangements for inspections

during weekends and holidays must be made at least 48 hours in advance.

120.30.03 – Sampling and Testing

All testing of materials to be installed by the applicant, contractor, or franchisee shall be conducted by a testing laboratory approved by the Public Works Department, and currently certified by the State of Oregon or other government authority conduct the required tests.

Unless otherwise directed, tests shall be sampled and conducted in accordance with the agency or institutes standards and specifications for each type of test noted herein. The required tests shall normally be as stated in the City of Central Point Standard Specifications and Details, or as described in the approved plans or contract specifications for a specified material.

The Public Works Department has sole discretion to require additional sampling and tests to confirm or supplement previous tests, identify faulty material or methods of installation.

All field testing and sampling of materials shall be conducted in the presence of the Inspector unless otherwise authorized by the Public Works Department. It shall be the responsibility of the applicant, contractor, or franchisee to schedule the type of test and times the tests will be conducted. The inspector or Public Works Department shall be notified 24 hours in advance of field-testing.

All costs of testing and re-testing shall be borne by the applicant, contractor or franchisee unless previously approved in writing by the Public Works Director or his designee.

120.30.04 – Design Changes

Minor field adjustments in the location of certain construction or materials may be authorized by the inspector on site within the limits of his delegated authority.

Design changes, which may materially impact the engineering design, design life, cost, safety, future development, etc., shall be submitted in writing to the Public Works Department for approval. Submission of materials for review shall include all revised drawings, proposed materials, submittals and any proposed specifications, which clearly illustrate the design change.

Preliminary approval of design change may be made at the discretion of the Public Works Director in cases of emergency or safety. It is understood however, that the applicant, contractor or franchisee is solely responsible for any increased work or cost incurred pending final approval of the design change.

130.00.00 – Materials

Reference to materials in these Standard Specifications is contained in the appropriate section of these Standard Specifications where materials are specific to that section. Materials that are generally common to all phases of construction are described in Section 900, Materials.

140.00.00 – Construction

140.00.01 – General

Each section of these Standard Specifications describes in greater detail the requirements for Public Works infrastructure construction requirements.

140.00.02 – Prequalified Contractors List

All contractors working in City Right of Way, easements, or City Property or City owned infrastructure must be on the “City Approved Contractors List.”

140.00.03 – Public Works Permit Required

Prior to beginning any work in or on City property, existing or proposed City Right-of-Way or Easement, the Applicant, Franchisee, Contractor or Developer shall have in his or her possession, a Public Works Construction Permit. A copy of the permit and all attachments, and approved construction plans and all amendments shall be available at the work area.

140.00.04 – Public Works Permit Issuance

When all requirements as stipulated hereinbefore have been met and construction plans have been signed by the Public Works Director, a public works permit can be issued after payment of appropriate fee(s). Privately funded projects shall be required to provide a warranty bond made out to the City of Central Point in the amount of 1% of the estimate total.

140.10.00 – Requirements

140.10.01 – General

No construction shall commence until the City PWD has reviewed, approved a professionally prepared set of engineered construction plans and specifications for the public improvements or connection to the public improvements (stamped by an Oregon registered professional engineer), and the City PWD has issued a Public Works permit for the proposed improvements.

All contractors working in City Right of Way, easements, or City Property or City owned infrastructure must be on the “City Approved Contractors List.”

140.10.02 – Procedural

During the construction period, the City will maintain one set of approved plans and specifications, and the permit holder or contractor, whoever the case may be, shall retain one set of approved, stamped, and signed plans and specifications at the construction site at all times. Any modification to the approved plans shall be first stamped and signed by the Developer's Engineer and approved by the Public Works Director. The Contractor will be expected to update his plans to reflect all changes or deviations from the approved plans. The inspector shall have access to the Contractors plans so as to record any changes he deems necessary.

A Pre-Construction Conference with the Applicant, Developer, Contractor, Project Engineer, Utilities, and other parties requested to attend or having interest to said project shall meet to discuss the project prior to beginning any construction. The Pre-Construction Conference will discuss the roll of the City's Inspection team and their relation to the Contractor-Developer.

Inspection criteria checklist may be provided to the Contractor outlining necessary inspections, if requested. However, in most cases the normal inspections are:

1. All underground utilities, water, sewer, and storm sewers.
2. All sub-grade preparation, sub-base courses, base courses, leveling courses, base treatments and pavement surfacing courses including surface treatments.
3. All concrete pours, such as curbs, sidewalks, catch basins, manholes and clean-outs.

The Contractor shall give the City a minimum of twenty-four (24) hours advance notice before a required inspection. It is the responsibility of the Developer or Contractor, whichever the case may be, to obtain inspections, schedule materials and field tests and obtain approvals for all work installed.

Failure to give notice for inspection, receive adequate inspections and violation of other regulations, Ordinances, Resolutions, rules and City Codes, as outline herein can result in one or more of the following, as determined by the City of Central Point.

- a) Stoppage of work until problem is resolved.
- b) Suspension of future inspections.
- c) Not certifying project complete or acceptance of the project or work, in order to begin the warranty period and eventual City acceptance for maintenance and operation.
- d) Issuance of a Citation for violation of the City of Central Point Municipal Code and penalties and provision as therein.

140.10.03 – Construction Requirements

All site preparation, erosion control and construction or re-construction shall be accomplished in accordance with the applicable sections contained in these Standard Specifications and as follows:

1. All existing concrete, pipe building materials, structures, clear and grub materials, and other deleterious materials shall be removed from the site and either recycled or properly disposed of in accordance Section 200, Site Preparation and any applicable requirements of the Oregon Department of Environmental Quality.
2. All fill placed in any development project shall be engineered fill that is suitably placed and compacted in accordance with City PWD standards
3. Maintenance of the work area and approach roads is the responsibility of the permit holder. The work area and approach roads shall be maintained in a clean condition, free from obstructions and hazards. A copy of the permit holders Certificate of Insurance shall be available at the work area.
4. The spreading of mud or debris or storage of materials or equipment of any kind upon any public roadway is strictly prohibited and violation shall be cause for citation and/or immediate cancellation of the permit. The City may at any time order immediate clean up and stoppage of work to accomplish clean up.
5. Effective erosion control is required. Erosion control devices must be installed and maintained according to Section 800, Erosion Control and any applicable D.E.Q., DSL or ACOE requirements. The City may at any time order corrective action and stoppage of work to accomplish effective erosion control.
6. Property disturbed by construction activity shall be seeded with a standard grass mix; shrubs, flowers, bark dust, existing signs, pavement markings, mailboxes, etc. shall be reestablished, reinstalled or replaced, with like kind and material.
7. Jump plates and/or temporary hard-surface patch (Cold mix A.C. or Hot Mix base paving) shall be placed on trenches within roadways at the end of each day's work. Cold mix shall be placed around exposed edges of jump plates. Plate locks will be required at leading edge of plates exposed to traffic at speed. No trench, on site or off-site, shall be left at any time in an unsafe condition. The permit holder is responsible for and is liable for hazards or damage resulting from the prosecution of the work.
8. Effective drainage control is required. Drainage shall be controlled within the work site and shall be so routed that adjacent private property, public property and the receiving system is not adversely impacted. The City may at any time order corrective action and stoppage of work to accomplish effective drainage control.

140.20.00 – Utilities

140.20.01 – Requirements

The permit holder is responsible for the coordination with the various utilities and agencies during design and construction. The City will require letters of transmittal or other written verification that the appropriate utilities or agencies have been provided with plans and has had an opportunity to comment upon the proposed improvements.

1. Overhead power lines - If applicable, coordinate efforts with Pacific Power and Light, US West, and Cable companies, to convert any overhead electrical power, telephone, or cable facilities within the proposed development to underground facilities, prior to the acceptance by the City PWD of the public improvements associated with the proposed development. All agreements and costs associated with conversion of these facilities from overhead to underground facilities shall be borne by and between the utility owners and the Developer.
2. All other utility improvements, including telephone, electrical power and lighting, gas, and cable TV, shall meet the current standards of the appropriate agency or company as well as City standards.

140.30.00 – Traffic Control

140.30.01 – Requirements

Traffic Control Devices shall meet the standards of the current Manual Of Uniform Traffic Control Devices, available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402 as supplemented by OMUTCD and the publication entitled "Oregon Temporary Traffic Control Handbook For Operations of 3 Days or Less", 2006 edition.

1. Traffic control shall be provided for by the contractor in accordance with the City's standard specification and, also, in accordance with a City (job specific) approved Traffic Control Plan. A copy of the approved traffic control plan shall be available at the work area.
2. Public roadway shall not be closed to traffic, at any time, without having first obtained written approval from the Public Works Director. The permit holder is responsible for provision of timely notification of traffic flow disruptions to area wide Emergency Services Center (Central Point Police Dept., Fire District No. 3) and Central Point School District.
3. Advance warning of imminent traffic disruption shall be provided to the general motoring public by placement of an advance notification sign at each end of the construction area 72 hours (minimum) before initiation of construction work.

4. Access to existing properties shall be maintained at all times, including normal delivery service and mail service and if not, shall be cause for work stoppage until effective access is established.
5. Traffic control devices, flag-persons, etc., shall be in place prior to initiation of construction work and shall be effectively maintained. No work will be permitted during the hours of darkness, nor between 6 p.m. to 7 a.m., Monday through Friday or between 6 p.m. to 7 a.m. Saturday, Sunday, or holidays.
6. Minimum vehicle travel lane width shall be 12'. Effective pedestrian travel shall also be provided.
7. The City reserves the right to add to or modify traffic control requirements as may be necessary to effectively control traffic and to assure public safety.

140.40.00 – Other Requirements

140.40.01 – Required Conditions

1. Before initiating any construction activity, the permit holder shall contact the City, (541-664-3321) to establish a place, time, and date for a pre-construction meeting.
2. The permit holder or his contractor shall notify the City Public Works Inspector at 664-3321 24 hours prior to commencing work, and 24 hours prior to any required inspection (see attached listing) and after completing work covered by the permit.
3. A copy of the permit and all attachments (OUNC Locate Ticket) and a copy of the approved construction plan and all amendments shall be available at the work area. All work shall conform to the permit terms, conditions and provisions and to the City approved permit plans, and approved plan amendments and to the City's standards and specifications and to these General Conditions. The City, in advance of work performance, must approve changes to any of the aforesaid.
4. All contractors working in City Right of Way, easements, or City Property or City owned infrastructure must be on the "City Approved Contractors List."
5. Excavator(s) must comply with OAR 952-001-0050; excavator(s) shall notify the Oregon Utility Notification Center for utility locations 2 business days, but not more than 10 business days prior to start of work. Damage to utilities shall be corrected at the permit holder's expense.
6. The permit holder shall cause his contractor to provide to the City Inspector, in writing, the name and 24-hour emergency telephone number of a designated "Competent Person" responsible for construction safety as per OROSHA, Chap. 437, Div. 3 Construction, Subdivision P - Excavations. The contractor shall notify the City Inspector of any/all assignment changes.

7. The Contractor must comply with all applicable OSHA safety standards and MUTCD traffic control requirements for the construction site.
8. Contractor must verify all existing utilities for both vertical elevation and horizontal location prior to start of work (pothole before digging if necessary). Should conflicts arise and redesign or relocation of facilities is necessary, it shall be done at the permit holder's expense. The City in advance of work performance must approve changes. Contractor shall coordinate the work with affected utility agencies.
9. Work provided for under the permit shall include repair of existing facilities (roads, ditches, etc.) as may be necessary, in the City Inspectors opinion, to overcome deterioration or damage which occurred in conjunction with the work authorized by the permit. Corrective work shall be done at the permit holder's expense.
10. One as-built Mylar drawing showing all new public improvements, including any revision made to the previously approved construction plans and, also, any improvement which may impact an existing public system or facility, shall be provided to the City by a registered civil engineer along with an engineer's certification of installation compliance (form attached).
11. The City's Inspectors may, at their discretion, require provision of tests and or reports from the permit holder; permit holders engineer or contractor to validate claims of material or construction adequacy/compliance. Such tests/reports shall be provided at the permit holders' expense.
12. The permit holder shall provide a copy of a properly executed Release and Waiver document to the City, for each ownership, disturbed by construction activity, as evidence of disturbance resolution and owner satisfaction.
13. Existing monuments, property corners, and survey markers shall be protected. Replacement shall be at the permit holder's expense.
14. The permit holder shall provide to the City inspector, in writing, the names and 24 hour emergency telephone number of 2 persons who have authority to resolve problems, take corrective action and, in general, will be responsible in case of any emergency. The permit holder shall notify the City Inspector, in writing, of any/all assignment changes.
15. Before placement of the final lift of asphalt, the permit holder shall clean and have RVSS complete a pre-acceptance video inspection of all new sewer lines. The permit holder shall provide RVSS with 30 days of notice for the video inspection. Any deficiencies shall be repaired before placement of final lift.

SECTION - 200

SITE PREPARATION

And

MISCELLANEOUS CONSTRUCTION

200 - SITE PREPARATION and MISCELLANEOUS CONSTRUCTION

210.00.00 – General

210.10.01 – Requirements

This section shall include all labor, equipment, plans, and materials necessary for or incidental to completing the miscellaneous items of work required for preparation of the project site for the construction of improvements, including but not limited to removal of rubble, trash, and debris, removal of existing pavements, removal of existing sidewalks, removal of existing driveways and driveway aprons, tree removal, stripping vegetation from existing surfaces and compacting the exposed surfaces which will receive fill or base materials, removal or relocation of existing culverts, coordinating with utility companies for the moving or removal of utility poles, relocating mail boxes, finish grading behind all curbs and sidewalks, construction of bicycle and/or pedestrian paths, if required, and the reconstruction of existing driveways.

210.10.02 – Violations

The City of Central Point Police Department and other designated personnel and departments shall have authority to issue citations for violation of City ordinances, regulations, rules and laws including those of the State of Oregon that may be administered by the City. Some examples pertaining to construction activities are: Tracking out of dirt and mud onto a street; Stockpiling of materials in the street; Improper or inadequate control of traffic in a construction zone; Violation of construction zone signing and speed requirements; Performance of any construction within a City Right of Way or without a Public Works Permit.

210.10.03 – References

City of Central Point, Department of Public Works, Standards and Specifications included herein as may apply to this section.

City of Central Point TOD Design Requirements and Guidelines as may apply to this section.

City of Central Point Municipal Code as it may apply.

Oregon Standard Specifications for Construction, 2008

Oregon Department of Transportation (ODOT), Oregon Bicycle and Pedestrian current requirements.

Oregon State University Extension Service, Tree Protection on Construction and Development Sites: A Best Management Practices Guidebook for the Pacific Northwest.

State of Oregon, Manual of Uniform Traffic Control Devices

220.00.00 - Design

220.00.01 – General

Site preparation activities shall be limited to the area(s) shown on the approved Site Grading Plan and such activities shall be conducted in accordance with Section 800, Erosion Control and other applicable sections of these Standard Specifications. It shall be the responsibility of the Engineer to coordinate the layout and design of the Site Grading Plan with other aspects of project design, approved site plans, tentative plats, and neighborhood plans including other State or County agencies.

220.10.01 – Site Grading Plan Requirements

The Site Grading Plan shall be prepared and coordinated in conjunction with the required separate Utilities Plan and Erosion Control Plan for each project. The plan shall include the locations of all lots or building sites, existing or proposed utilities, streets, bicycle or pedestrian paths, stormwater management facilities, streams or waterways and existing buildings or other structures.

The plan shall show existing ground contours, finished grade contours including elevations at face of curb and lot corners based on city recognized benchmark elevations. Additionally where applicable, the plan shall include the flood hazard information from the community adopted Flood Insurance Rate Map (FIRM), or a community approved flood study (only where detailed flood hazard data is not available), including the regulatory flood zone boundary, the base flood elevation, and required finished floor elevations.

The plan shall identify all areas to be elevated and filled with either native or imported materials to a grade that will allow the building to have a finish floor elevation of 12" above the base flood elevation. All fill areas to be occupied by buildings shall be capable of supporting foundation loads of 1500 pounds per square foot without excessive settlement. All other fill areas not occupied by buildings, stormwater management facilities, and within a street right-of-way shall be compacted to a minimum of 90% of AASHTO T-99, method A. **Stormwater management facilities shall be flagged and marked off to avoid compaction from construction equipment.**

The site grading plan identify all proposed traffic control areas and show any intended barricades, traffic diverters, detours to be constructed or existing detour routes.

The site grading plan may be presented and illustrated on more than one sheet if the elements of design are confusing, e.g. the traffic control or bicycle paths could be shown on separate sheets so long as they are coordinated with the overall plan.

The plan shall clearly identify by species and size (dbh) of all trees or other shrubs to be removed while noting those to be removed. All other natural or manmade features to be removed, such as walls, fences, rock outcrops, signs, etc., shall be clearly identified.

220.10.02 – Bicycle and Pedestrian Facilities

Bicycle and pedestrian facilities shall be designed in accordance with the guidelines and requirements set forth in the current Oregon Bicycle and Pedestrian Plan.

220.10.03 – Traffic Control

Traffic control areas, barricades, and other related facilities shall be designed as in accordance with applicable provisions of the Oregon, Manual of Uniform Traffic Control Devices and Oregon Short Term Work Zones publication.

220.10.04 – Quality Assurance

The Contractor shall be required to inspect the project area on at least a daily basis and more often if required to assure that the necessary requirements for traffic control and erosion control are in place and functioning properly. The PWD, upon inspection will require immediate response by the Contractor to alleviate or repair any traffic control problem or soil erosion, which it deems necessary.

The PWD will perform periodic and final inspection of any construction or re-construction of miscellaneous structures as needed to assure that plan requirements are met.

230.00.00 – Materials

230.00.01 – General

This section will include only those materials that are specific to site grading. All other materials common to other phases of public works construction are specified in Section 900, Construction Materials.

230.10.01 – On Site Materials

Rubble, Trash, and Debris: The Contractor shall make his own assessment of the types and quantities of materials to be removed under this section. All such materials shall become the property of the Contractor, and shall promptly be removed from the site.

Existing Pavements, Sidewalks, Driveway Aprons, etc.: Contractor shall examine such existing materials whether quantified and listed separately or not and shall make his own assessment of the difficulty involved in the removal of such items. Unless otherwise indicated, all such materials shall become the property of the Contractor, and shall promptly be removed from the site.

230.10.02 – Offsite and Imported Materials

Materials brought onto the project area applicable to this section or other sections of these Standard Specifications shall meet the requirements of Section 900, Construction Materials unless otherwise approved by the Public Works Department.

230.10.03 – Bicycle and Pedestrian Facilities

Materials for construction Bicycle and Pedestrian facilities shall be those generally specified in Section 900, Construction Materials. Special materials shall be approved on a case-by-case basis by the PWD, but shall include those materials commonly applied on similar projects found in the surrounding area of Jackson County or City of Medford.

230.10.04 – Traffic Control

Materials specific to the traffic control industry shall meet Oregon Standard Specifications for Construction, 2008, Section 0225.10 – 0225.17, Materials.

240.00.00 – Construction and Workmanship

240.00.01 – Requirements

This section describes the elements of work necessary to prepare the project area or site for construction and site cleanup upon project completion.

240.10.01 – Removal of Rubble, Trash, and Debris

This section includes the removal of all extraneous items of rubble, trash, and debris from all areas included within the Project Limits, including all areas which will be cut, filled, or graded, or which will receive improvements under the approved plans. In some cases the City may grant permission to burn trash on the site when-conditions permit. Before any burning will be permitted, Fire District Number #3 must issue a Burning Permit for that day and hour. If burning is allowed, the Contractor shall subsequently remove all ashes and remaining debris from the site.

240.10.02 – Removal of Existing Pavements, Sidewalks, Driveway Aprons, etc.

All saw cutting of designated pavement, curbs, gutters and sidewalks shall be done in accordance with Section 350.20.00 – Street Cutting including Curbs, Gutters and Sidewalks.

Where pavement or sidewalk areas are to be removed, the line describing the limits of the removal shall be saw-cut through the entire thickness unless there is an existing expansion joint at that location. Saw-cuts in sidewalks or street pavements greater than 4" in thickness shall be cut to a minimum depth of 75% of the pavement (A.C. or concrete) thickness and then shall be cleanly broken along the lines using appropriate methods and equipment. Adjacent damaged, cracked, uplifted or otherwise disturbed sections shall also be saw cut and removed. Saw-cut edges and sections shall be protected from damage by traffic or construction activity until the new materials have been installed. Chipped or broken edges will not be acceptable, and shall be re-sawn as directed.

Concrete or asphalt pavements shall be loaded and removed from the site whatever approved means the Contractor deems safe and expedient. Concrete or asphalt rubble shall not be placed in fills or used as backfill for pipe trenches or structures. Where approved by the PWD, concrete rubble may be acceptable, if carefully placed for streambed or stream bank protection.

240.10.03 – Tree Removal and Protection

The contractor shall only remove those trees on the approved site plan and construction drawings. When applicable, the Contractor shall remove the entire tree, including all roots to a minimum depth of 2' below finish grades shown on the Plan. Unless otherwise provided, all leaves, limbs, branches, logs, and roots shall become the property of the

Contractor, and shall promptly be removed from the site. The Contractor shall use best management practices to actively protect all trees to remain on-site, including the tree roots, trunk and crown.

All tree(s) to remain on site, as indicated on the approved site plan and construction drawings shall be actively protected by the contractor. The contractor shall establish a tree protection zone (TPZ) that is approved by the City, and shall consist of a radius around the subject tree(s) with an area equal to twice the critical root zone (CRZ) area. The CRZ is the portion of the root system that is the minimum necessary to maintain vitality and stability of the tree. Definitions and example calculations for the CRZ and TPZ are provided in Section 100.

The contractor shall install a fence around the identified TPZ to protect the CRZ of the tree (See standard detail drawing no. M-5). The fence shall remain in place until the development project is complete and it must include appropriate signage to convey the importance of protecting the CRZ to workers. Throughout the course of the project the contractor shall avoid any disturbance to the tree roots, trunk or crown within the TPZ including, but not limited to the following activities: stockpiling materials and/or debris, parking vehicles, piling soil and/or mulch, trenching activities, grading, soil compaction, installing impervious surfaces and attaching anything to tree(s) using nails, screws or spikes. In the event disturbance to the tree roots within the CRZ is unavoidable, work shall be done under the onsite supervision of an International Society of Arboriculture (ISA) certified arborist. For more information regarding tree protection best management practices, refer to "Tree Protection on Construction and Development Sites: A Best Management Practices Guidebook for the Pacific Northwest" by Oregon State University Extension Service.

Any trees that are required to be protected by the City shall require conveyance of a deed restriction to ensure that all future owners and/or occupants of the site are duly informed of the requirement to care for and maintain the presence of the identified significant tree."

240.10.04 – Stripping

All areas that will receive pavements, curbs, or sidewalks shall be stripped of all trash, brush, weeds and other vegetation, to include all roots and sod, to a line at least 1.5 feet outside the edges of sidewalks, or the backs of curbs where no sidewalks are planned.

Where stripped areas are to receive fill, or base materials, without additional excavation, the exposed surfaces shall be compacted to a minimum of 95% of maximum density at optimum moisture when tested in accordance with AASHTO T-99- (A) before any fill or base materials are placed.

Where soils are to be excavated from the stripped areas to a solid mineral material layer, compaction may not be required as determined by the inspector or engineer.

Where stormwater facilities are located adjacent to pavement, curbs or sidewalks, the minimum compaction requirements do not apply. Stormwater facilities shall be marked off to avoid compaction from construction equipment.

All materials removed during the stripping operation shall become the property of the Contractor, and shall promptly be removed from the site, unless otherwise specified.

240.10.05 – Relocating Existing Culverts

Existing culverts that are to be relocated shall be done in accordance with applicable sections of these Standard Specifications and/or Special Specifications that fully and specifically describe the requirements. Relocation of the culvert may consist of a lateral or grade realignment or both. The existing pipe shall be uncovered, removed, and replaced in newly prepared trenches, as detailed on the Plans. The pipe shall be bedded and backfilled to the same requirements as for new pipe with materials specified in Section 900, Construction Materials. Any pipe that is broken during removal or replacement shall be replaced in kind at no additional cost to the Owner.

240.10.06 – Relocation of Utility Poles

The Contractor shall coordinate and prepare for removal, or relocation of utility poles by the Utility Companies. The City of Central Point will order the work to be done by the Utility Companies, and the Applicant or Owner will pay for the moving of poles.

240.10.07 – Relocating Mailboxes

Where the alignment proposed for storm sewer, sanitary sewer, water line, utility trench or street construction will require the relocation of mailboxes, newspaper boxes, or existing fences, the Contractor shall contact the property owners and the U.S. Post Office as required, then relocate the subject facilities as directed, in a condition equal to or better than existing, with as little inconvenience as possible to the property owners.

240.10.08 – Backfilling and Finish Grading Behind Curbs and Sidewalks

After completion of sidewalk construction, or curb construction and where no sidewalks or utilities are called for on the Plans, the Contractor shall backfill, compact, and finish grade, with native materials, to a neat orderly condition. **Un-compacted fills behind curbs or sidewalks will not be accepted unless the area is utilized for stormwater treatment, which shall be marked off to avoid compaction by construction equipment.** Materials may be tamped, wheel-rolled, or consolidated by watering, but shall be compacted to a minimum of 85% of maximum density, AASHTO T-99 (A). Backfilling shall continue, and be neatly graded to the right-of-way limits, or as shown on the Plan.

240.10.09 – Bicycle Path Construction

The Contractor shall construct bicycle or pedestrian paths to the lines, grades and dimensions shown on the plans. The sub-grade shall be compacted to a minimum of 95% of maximum density (AASHTO T-99-D). When the compacted sub-grade and the alignment have been approved, the Contractor shall place the required crushed rock base courses with materials described in Section 900, Materials. The Contractor shall compact the base aggregate to 95% AASHTO T180 (D). Upon inspection and approval of the base course, place, roll and compact the required thickness of Light Duty, type C asphalt mix in accordance with Oregon Standard Specifications for Construction, 2008, Section 00749, Miscellaneous Asphalt Concrete Structures. The finished surface shall be smoothly graded and rolled. All edges and joints shall be neatly formed.

240.10.10 – Reconstruction of Existing Driveways

Where existing driveways have been disturbed by the construction work, as shown on the Plans, the Contractor shall, as soon as reasonably possible, extend or replace the driveway from the right-of-way line to the new curb cut or driveway apron in accordance with applicable provisions of Section 300, Street Construction. The driveway throat width at the curb shall be a minimum of 12' and not greater than 30' unless otherwise shown on the plans or approved by the PWD. The width of the driveway throat at the curb shall be continued to the edge of the right-of-way then tapered to the existing width on private property.

Existing Gravel Driveways: Driveway shall be excavated or filled to an elevation 3" below finish grade and graded to a neatly contoured sub-grade. The sub-grade shall be compacted to a minimum of 95% (AASHTO T-99-A). After the sub-grade has been compacted, 3/4"-0 crushed rock base, conforming to Section 900, Construction Materials, shall be placed in a layer with a 3" minimum compacted thickness, and shall be compacted to a minimum of 95% of maximum density (AASHTO T-180-D). The finish surface shall be smooth and the edges shall be neat.

Existing Portland Cement Concrete driveways: Driveway shall be excavated or filled to an elevation 2" below the bottom of the required concrete slab that is replacing the removed driveway. The sub-grade shall be compacted as described above, and a 2" thick leveling course of 3/4"-0 crushed rock shall be installed and compacted as noted to the elevations required for concrete paving replacement. Concrete paving shall be minimum 3300 psi concrete and meet the requirements described in Section 930.0.0, Portland Cement Concrete (PCC).

Existing Asphalt Driveways: Driveway sub-grades shall be prepared as described above at an elevation 4" below the bottom of the asphalt paving required to replace the removed paving. The sub-grade shall be compacted as specified above, and 3/4"-0 crushed rock shall be placed and compacted to the finish grades required for paving replacement. The asphalt paving material shall be Standard Duty, Type C asphalt mix. The asphalt mix shall be placed and compacted in accordance with Oregon Standard Specifications for Construction, 2008, Section 00749, Miscellaneous Asphalt Concrete Structures. The finished surface shall be smoothly graded and rolled. All edges and joints shall be neatly formed.

(This page intentionally left blank)

SECTION - 300
STREET CONSTRUCTION

300 – STREET CONSTRUCTION

300.00.00 – Scope

This section shall include but not be limited to the items of work necessary for the survey, design, and construction of streets or other public ways within City Rights of Ways and Easements or to be dedicated as such. Such work shall include but not be limited to excavation and embankments; disposal of excess excavated materials, providing and placing sub-base and base materials; construction of curbs, curb and gutter sections; construction of asphaltic or Portland Cement concrete pavements, constructing concrete sidewalks; driveway aprons and wheelchair ramps; concrete bases for street lights or traffic signals and other street related facilities and other miscellaneous street appurtenances.

310.00.00 – General

310.10.01 – References

Except as further defined, supplemented or contained in these standards, all designs, construction, inspection and testing shall be in conformance with standards, specifications and methods referenced in the following publications:

American Association of State Highway Transportation Officials (AASHTO). “A Policy For Geometric Design of Highways and Streets” 2001; “AASHTO Guide for Design of Pavement Structures”, 1993; Standard Specifications for Transportation Materials and Methods of Sampling and Testing, 29th Edition.

Oregon Department of Transportation (ODOT), Oregon Standard Specifications for Construction, 2008

Oregon Department of Transportation (ODOT), Oregon Standard Drawings

Oregon Department of Transportation (ODOT), Oregon Bicycle and Pedestrian Plan current requirements.

State of Oregon, Manual of Uniform Traffic Control Devices (OMUTCD) current requirements, including, Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less, 2006 edition.

Asphalt Institute. MS-1, Thickness Design of Asphalt Pavements for Highways and Streets and other publications and handbooks, which may pertain or supplement the design and construction of pavement structures as may apply

AASHTO Guide for Design of Pavement Structures as it may apply

Central Point TOD Design Requirements and Standards as it may apply

310.10.02 – Definitions

Alternate Street Section	Refer to sub sections of Section 320.10.10, labeled as “Alternate” descriptions and Table 300-1A for Alternate Street and Right-of-Way widths.
Standard Street Section	Refer to sub sections of Section 320.10.10 labeled as “Standard” descriptions and Table 300-1 for Standard Street and Right-of-Way widths.
APWA	American Public Works Association
TOD	Transit Oriented District. A special district formed by the City of Central Point to orient a neighborhood or section of the City towards alternative modes of travel such as transit, walking and bicycling thus reducing reliance on the automobile. Also provides a mix of housing, services and civic uses. Uses land more efficiently.
Functional Street Classification	General definitions based on AASHTO, ODOT, RVCOG and other institutions engaged in transportation planning to describe the function and hierarchy of streets or roads based on their ability to handle different traffic volumes and speeds from local (the lowest) category to arterial and interstate highways the (highest).
ODOT	Oregon Department of Transportation
MUTCD, OMUTCD	Manual of Uniform Traffic Devices and Oregon Manual of Uniform Traffic Devices
OSHA, OROSHA	Occupational Safety and Health Administration, US Department of Labor, Oregon Occupational Safety and Health Division, Department of Insurance and Finance.
Street Classifications and Descriptions	Refer to Section 320.10.10 through 320.10.20 for detailed descriptions and requirements.
PUE	<u>Public Utility Easement</u> . A dedicated strip of land on private property for the construction, maintenance and access of utilities by companies franchised or licensed by the City of Central Point to install and operate a utility within the city limits and are further registered as a public utility in the State of Oregon. These companies include but are not limited to companies that provide underground and overhead electric power,

natural gas, communications, and television services and shall hereinafter be referred to as the "Utility". These do not normally include City utilities such as water, sewer and traffic appurtenances except by crossing.

Private Easement	A strip of private land whereby certain rights have been given to another party or parties, to construct, maintain or provide access across said land, or to limit certain activities such as visual obstructions or noise. Easements can be either exclusive (limited) or non-exclusive.
Sub-grade	The top surface of the completed earthwork on which sub-base, base and surfacing, pavement or final course of other material is to be placed.
Sub-base Section	The layer or layers of specified course aggregate placed on the sub-grade. Typically a Geo-textile fabric layer separates the sub-base section from the sub-grade.
Base Section	The layer or layers of specified finer aggregate placed on the sub-base below the pavement layer. The top layer immediately below any paving is generally referred to as a leveling course.
Aggregate	Sound, tough, durable, gravel or fragments of rock of uniform quality that has been crushed to a specified gradation.
Sub-grade Reinforcement Rock	The specified material placed in the sub-grade to reinforce weak areas and or bridge such areas of sub-grade that do not or may not meet the required stability and compaction requirements. This rock may be crushed or Pit-Run as specified in Section 915.00.00, Sub-grade and Trench Reinforcement Rock.
Sub-base Aggregate	Crushed rock meeting the requirements described in Section 910.10.03, Sub-Base Aggregate.
Base Aggregate	Crushed rock meeting the requirements described in Section 910.10.02, Base Aggregate.
HMAC	Asphalt paving meeting the requirements described in Section 925.00.00, Hot Mix Asphalt Concrete Paving.
PCC	Concrete meeting the requirements described in Section 930.00.00, Portland Cement Concrete.
Topsoil	Fertile soil meeting the requirements described in Section 935.00.00, Topsoil.

Riprap Large fractured rock meeting the requirements described in Section 920.00.00, Riprap.

Refer to other sections of these specifications and standards or OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION, 2008, Section 110, for other applicable definitions.

310.10.03 – Tables

Table 300-1A Arterial Street Widths and Rights-of-Way Widths

Table 300-1B Collector Street Widths and Rights-of-Way Widths

Table 300-1C Standard Local Street Widths and Rights-of-Way Widths

Table 300-1D Minor Local Street Widths and Rights-of-Way Widths

Table 300-1E Miscellaneous Transportation Features

Table 300-2 Minimum Street Alignment and Grade Requirements

Table 300-3 Minimum Street Section Requirements

Table 300-4 Street Intersection and Access Separation

Table 300-5 Minimum Sight Distance and Clear Vision Requirements

Table 300-6 Driveway and Property Access Dimensions and Spacing

Table 300-7 Clear Vision Areas

320.00.00 – Design

320.10.01 – Design Standards

The purpose of these standards is to provide a consistent policy under which certain physical aspects of street and related design and plan preparation will be observed by the engineer.

The Engineer should be aware that certain alternate street standards for the Transit Oriented District and Transit Oriented Corridor might apply to the design and construction streets in these areas of the city. These alternate standards are fully described in the Central Point TOD Design Requirements and Guidelines. They are also briefly described in lesser detail in these Standards and Specifications.

This section contains design standards to ensure the safe and efficient operation of each facility type for all users and the best use of public space. The requirements in this section are established as minimum standards to follow and apply to both new construction and reconstruction, except as otherwise specified.

Designs shall consider the needs of people with disabilities and the aged, such as visually impaired pedestrians and mobility impaired pedestrians. Every effort should be made to locate street hardware away from pedestrian locations and provide a surface free of bumps and cracks, which create safety and mobility problems. Smooth access ramps shall be provided where required. All designs shall conform to the current American Disabilities Act (ADA) or as adopted by the Oregon Department of Transportation (ODOT), Oregon Bicycle and Pedestrian Plan.

The determination of the pavement width and total right-of-way shall be based on the operational needs for each street as determined by a technical analysis. The technical analysis shall use demand volumes that reflect the maximum number of pedestrians, bicyclists, parked vehicles and motorized vehicle traffic expected when the area using the street is fully developed. Technical analysis shall take into consideration, transportation elements of the Comprehensive Plan, TOD, neighborhood plans, approved tentative plans as well as existing commercial and residential developments. All street designs shall be coordinated with the design of other new or existing infrastructure.

These standards set forth the minimum requirements for materials and street design. The Public Works Director shall have discretion to require a higher or different standard for materials or design when in his judgment it is in the best interest of the public's health, safety and welfare when considering all aspects and circumstances of the project.

The minimum geometric requirements for all street classifications are defined in Tables 300 – 1 through 300 – 7.

320.10.02 – Traffic Impact Analysis

The purpose of this section is to assist in the determination of which road authorities participate in land use decisions, and to implement Section 660-012-0045(2)(e) of the State Transportation

Planning Rule that requires the city to adopt a process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities.

This chapter establishes the standards for when a proposal must be reviewed for potential traffic impacts; when a traffic impact analysis must be submitted with a development application in order to determine whether conditions are needed to minimize impacts to and protect transportation facilities; what must be in a traffic impact analysis; and who is qualified to prepare the study.

A traffic impact analysis shall be prepared by a traffic engineer or civil engineer licensed to practice in the state of Oregon with special training and experience in traffic engineering. If the road authority is the Oregon Department of Transportation (ODOT), consult ODOT's regional development review planner and OAR 734-051-180. If the road is the authority of Jackson County, consult Jackson County's road design requirements.

The Public Works Director may, at his/her discretion, waive the study of certain intersections when it is concluded that the impacts are not substantial.

320.10.03 – Traffic Impact Analysis Applicability

(1) The level of detail and scope of a traffic impact analysis (TIA) will vary with the size, complexity, and location of the proposed application. Prior to any TIA, the applicant shall submit sufficient information to the City for the Public Works Department to issue a scoping letter. If stipulations to reduce traffic are requested by an applicant, it must first be shown by means of an analysis that an unconditional approval is not possible without some form of mitigation to maintain an adequate LOS. This will determine whether a stipulation is necessary.

(2) Extent of Study Area:

The study area shall be defined by the Public Works Department in the scoping letter and shall address at least the following areas:

- a) All proposed site access points;
- b) Any intersection where the proposed development can be expected to contribute 25 or more trips during the analysis peak period. Impacts of less than 25 peak period trips are not substantial and will not be included in the study area. This volume may be adjusted, at the discretion of the Public Works Department, for safety or unusual situations; and
- c) Any intersections directly adjacent to the subject property.

(3) When required: TIA shall be required when a land use application involves one or more of the following actions:

- a) A change in zoning or a plan amendment designation that generates 300 average daily trips (ADT) more than the current zoning;
- b) Any proposed development or land use action that a road authority, including the city, Jackson County or ODOT, states may have operational or safety concerns along its facilities;
- c) An increase in site traffic volume generation by 250 average daily trips (ADT) or more, or 25 Peak Hour Trips (PHT);

- d) An increase in peak hour volume of a particular movement to and from the State highway by 20 percent or more;
- e) An increase in use of adjacent streets by vehicles exceeding twenty thousand pounds gross vehicle weight by 10 vehicles or more per day;
- f) The location of the access driveway does not meet minimum sight distance requirements, as determined by the city engineer, or is located where vehicles entering or leaving the property are restricted, or such vehicles queue or hesitate on the state highway, creating a safety hazard at the discretion of the community development director; or
- g) A change in internal traffic patterns that, at the discretion of the Public Works Director, may cause safety problems, such as back-up onto a street or greater potential for traffic accidents.

(4) Submittals:

Provide two copies of the TIA for Public Works Department to review.

(5) Elements of Analysis:

A TIA shall be prepared by a Traffic Engineer or Civil Engineer licensed to practice in the State of Oregon with special training and experience in traffic engineering. The TIA shall be a thorough review of the effects a proposed use will have on the transportation system. The study area shall include all streets and intersections in the analysis, as defined in subsection (2) above. Traffic generated from a proposed site will be distributed throughout the transportation system using existing count data or the current transportation model used by the City. Any alternate distribution method must be based on data acceptable to the Public Works Department. The following checklist outlines what a TIA shall contain. Incomplete reports shall be returned to the applicant for completion without review:

- a) The scoping letter as provided by the Public Works Department;
 - b) The Final TIA shall be signed and stamped by a Professional Civil or Traffic Engineer registered in the State of Oregon;
 - c) An executive summary, discussing the development, the major findings of the analysis, and the mitigation measures proposed;
 - d) A vicinity map of the proposed site and study area;
 - e) Project characteristics such as zoning, potential trip generations (unless stipulated to less than potential), proposed access(s), and other pertinent factors;
 - f) Street characteristics within the study area including functional classification, number of travel lanes, lane width, shoulder treatment, bicycle path corridors, and traffic control at intersections;
 - g) Description of existing transportation conditions including transit accessibility, accident history, pedestrian facilities, bicycle facilities, traffic signals, and overall traffic operations and circulation;
 - h) Peak period turning movement counts of at least two-hour minimums at study area intersections, less than 2 years old. These counts shall be adjusted to the design year of the project and consider seasonal traffic adjustments when required by the scoping letter;
 - i) A "Figure" showing existing peak period (AM, noon, or PM, whichever is largest) turning movement volumes at study area intersections, as shown in Example 1.
- Approved applications obtained from the City that have not built out but will impact study

- area intersections shall be included as pipeline traffic. An appropriate adjustment factor shall be applied to existing count data if counts were taken during the off-peak season;
- j) Potential “Project” trip generation using the most current edition of the ITE Trip Generation, as required by the Public Works Department at the time of scoping. Variations of trip rates will require the approval of the Public Works Department. Such approval will require submission of adequate supporting data prior to first submittal of the TIA;
 - k) A “Figure” illustrating project turning movement volumes at study area intersections for peak periods, as shown in Example 2. Adjustments made for pass-by traffic volumes shall follow the methodology outlined in the latest edition of the ITE Trip Generation, and shall not exceed 25% unless approved by the Public Works Director;
 - l) A “Figure” illustrating the combined traffic of existing, background, and project turning movement volumes at study area intersections for peak periods, as shown in Example 3;
 - m) Level of Service (LOS) analysis at study area intersections under the following conditions:
 - (A) Existing plus pipeline traffic
 - (B) Existing plus pipeline traffic and project traffic.

A table shall be prepared which illustrates all LOS results. The table shall show LOS conditions with corresponding vehicle delays for signalized intersections and the critical movement at unsignalized intersections. If the proposed use is scheduled to be completed in phases, a LOS analysis shall be prepared for each phase;

- n) A mitigation plan if impacts to the study area reduce level of service (LOS) below minimums. Mitigation measures may include stipulations and/or construction of necessary transportation improvements. Mitigation measures shall be required to the extent that the transportation facilities, under City jurisdiction, operate at an acceptable level of service (LOS) with the addition of project traffic; and
- o) Intersections under jurisdiction of another agency, but still within the City limits, shall be evaluated by either the City’s criteria or the other jurisdiction’s criteria, or both, whichever is considered applicable by the Public Works Department.

If the TIA is not consistent with the scoping letter (including any amendments) then the TIA will be returned to the applicant without review.

(6) Analysis criteria:

- a) All trip distributions into and out of the transportation system must reflect existing traffic count data for consistency or follow the current transportation model used by the City. If alternate splits are used to distribute traffic then justification must be provided and approved by the Public Works Department prior to first submittal of the TIA.
- b) If progression analysis is being evaluated or queuing between intersections is a concern, the peak period used in the analysis must be the same for every intersection along the street and reflect that of the most critical intersection being evaluated. If a common peak period is not requested by the Public Works Department, then the actual peak period of every intersection shall be used.
- c) Counts performed must be a minimum of two hours and include the peak period for analysis purposes. All documentation shall be included in the TIA.
- d) All supporting count data, LOS analyses, pass-by deductions, growth rates, traffic

distributions, or other engineering assumptions must be clearly defined and attached to the TIA when submitted in report form to the City for review.

- e) All LOS analyses shall follow operational procedures per the current Highway Capacity Manual. Ideal saturation flow rates greater than 1800 vehicles per hour per lane should not be used unless otherwise measured in the project vicinity. Queue lengths shall be calculated at the 95th percentile where feasible. Actual peak hour factors should be used for each movement or lane grouping in the analysis. Peak hour factors over 0.90 shall not be used unless justified by specific counts at that location.
- f) Signal timing used in capacity or progression analysis shall follow City timing plans and account for pedestrian crossing times, unless otherwise noted in the scoping letter.
- g) Arrival Type 3 (random arrivals) shall be used unless a coordinated plan is in place during the peak period.

320.10.04 – Maintenance of level of Service D

Whenever level of service is determined to be below level D for arterials or collectors, development is not permitted unless the developer makes the roadway or other improvements necessary to maintain level of service D respectively.

SERVICE LEVELS FOR ARTERIAL AND COLLECTOR STREETS

Typical Traffic Flow Conditions

Service Level A	Relatively free flow of traffic with some stops at signalized or stop sign controlled intersections. Average speeds would be at least 30 miles per hour. The volume to capacity ratio would be equal or less than 0.60.
Service Level B	Stable traffic flow with slight delays at signalized or stop sign controlled intersections. Average speed would vary between 25 and 30 miles per hour. The volume to capacity ratio would be equal or less than 0.70.
Service Level C	Stable traffic flow but with delays at signalized or stop sign controlled intersections to be greater than at Level B but yet acceptable to the motorist. The average speeds would vary between 20 and 25 miles per hour. The volume to capacity ratio would be equal to or less than 0.80.
Service Level D	Traffic flow would approach unstable operating conditions. Delays at signalized or stop sign controlled intersections would be tolerable and could include waiting through several signal cycles for some motorists. The average speeds would vary between 15 and 20 miles per hour. The volume to capacity ratio would equal or be less than 0.90.
Service Level E	Traffic flow would be unstable with congestion and intolerable delays to motorists. The average speed would be approximately 15 miles per hour. The volume to capacity ratio would be 1.00.
Service Level F	Traffic flow would be forced and jammed with stop and go operating conditions and intolerable delays. The average speed would be less than 15 miles per hour.
NOTE:	The average speeds are approximations observed at the various levels of service but could differ depending on actual conditions.

320.10.05 – Street Section Design

The Public Works Department or a designated engineer consultant shall provide the street Section design based on the Asphalt Institute “Thickness Design” Manual, M – 1 and AASHTO Guide for Design of Pavement Structures as they may apply to the functional classification of street, traffic levels and vehicle types. The street section design shall include all testing necessary to determine the strength and density of materials as it relates to the design and subsequent field-testing for quality assurance. Minimum design thickness for functional classifications of streets are shown on Standard Detail Sheet(s) ST-10 through ST-53 and Table 300-3

320.10.10 – General Design Requirements

The Public Works Department general requirements for Standard public street design are shown below. Refer to Tables 300-1 through 300-6 for more geometric details. Street thickness design and other requirements herein are applicable to both Standard and Alternate public streets.

Lane widths are as required in Tables 300-1A through 300-1E and are measured from top face of curb (TFC) or from the edge of pavement if no curb is required. Also see Section 320.10.35, Striping and Delineation.

320.10.11 – Standard Residential Street

Standard residential streets are functionally classified as local streets and provide access to immediately adjacent residential land. Streets in this category typically provide connections between collector streets and residential areas. Design requirements include 2 travel lanes, on-street parking, landscape rows and sidewalks. Additional turn lane(s) may be required where entering a higher order street or where safety and traffic control needs are apparent. Standard residential streets are planned to have an optimum 250 Peak Hour Trips (PHT). Right-of-way width shall be a minimum of 60'. (Drawing ST-15)

320.10.12 – Minor Residential Street

A minor residential street is a facility having the sole function of providing access to immediately adjacent land upon which a maximum of 50 units front and back access. Design requirements include 2 travel lanes, on-street parking on 1 side and landscape rows and sidewalks. Right-of-way width shall be a minimum of 52'. (Drawing ST-10)

320.10.13 – Residential Lanes

A residential lane also falls in the local street functional classification and is limited to serving not more than 8 dwelling units that front and back access. The residential lane is a short street of not more than 200' in length with no on street parking. Design requirements include 2 travel lanes and no on-street parking. Typically these right-of-ways are narrow and sidewalks are constructed in an easement on the property if required, or on one side only. A hammerhead, or bulb type turnaround, meeting Fire District No. #3 specifications, is required. Such turnarounds may not be combined with residential driveways. (Drawing ST-10)

320.10.14 – Standard Collector Streets

A collector street services lower order streets and conducts traffic between arterials. Standard design requirements for a collector shall include two 12' travel lanes and may include short center and right turn lanes when necessary to meet safety and traffic control requirements. Designs shall include facilities for bicycle lanes, sidewalks and landscape rows.

The design of collectors may be subject to regulation and control of on street parking, turning movements and access. Additionally, if the project is retrofitting an older street landscape rows may be eliminated. Landscaping will be required where the right-of-way is

acceptable. Individual residential driveway access for new development shall not be permitted on a collector street if other reasonable means of access are available. Streets in this category are designed for traffic volumes of 2500 – 5000 AVDT.

320.10.15 – Arterial Streets

Arterial streets are intended to provide for high volume travel between or within communities, or to and from collector streets. Minimum standard design requirements for new two-way arterials shall include two to four 12' travel lanes and one 14' center turn lane at all intersections where left turns are allowed.

Additional right turn bays or lanes may also be required where traffic and safety needs are apparent. Facilities for bicycle and pedestrian traffic shall be included in the design of arterial streets. Secondary arterial streets are designed for volumes of 5000 – 10,000 AVDT while Major arterial streets are designed to volumes of 10,000 – 40,000 AVDT.

The design of arterial streets may also be subject to regulation and control of on-street parking, turning movements and access. Individual residential driveway access for new development shall not be permitted on arterial streets if other reasonable means of access are available.

320.10.17 – Commercial / Industrial Streets

These streets are designed and located for primary access to commercial and industrial properties and connection to the major street network. Streets in these categories are designed to accommodate higher traffic volumes and heavier loads. Limited access points and onsite parking are emphasized in industrial areas to reduce congestion and traffic interruption.

Standard design requirements for commercial / industrial streets shall conform to the functional classifications for local, collector and arterial.

320.10.18 – Private Minimum Access Drives

A private minimum access drive is a private residential street upon which a maximum of 3 dwelling units front and take access and does not exceed 150' in length.

320.10.19 – Alleys

Alleys are only allowed for new residential or commercial construction if they are integrated as part of a master planned community. The City may require existing alleys to be re-constructed or surfaced to prevent erosion; enhance bicycle and pedestrian movement; and improve air quality. Adjacent property owners to the alley may also request improvements. Improvements and re-construction of alleys shall be designed in accordance with methods and requirements for streets.

320.10.20 – Sidewalks

All sidewalks shall be constructed of concrete as further specified herein. Sidewalks are required for all new local, collector and arterial streets. The width shall vary according to the functional classification of the street and the intended purpose of the street taking into consideration pedestrian volumes and safety. In commercial / Industrial areas, the sidewalk width requirement may be increased to accommodate additional pedestrian loading and safety. Setback sidewalks may also be considered on streets with high traffic volumes or as private sidewalks outside the City rights-of-way, such as a residential lane. Setback design and planter strip design shall be evaluated on the basis of pedestrian safety, traffic volume and aesthetic appearance.

Certain districts such as a TOD may require alternate sidewalk design. They are also described in more detail in the Central Point TOD Design Requirements and Guidelines.

Clustered mailboxes placed in or adjacent to sidewalks must be provided with accessibility according to the 2010 Oregon Structural Specialty Code, Chapter 11 Accessibility, section 1111.

Sidewalks are generally required on both sides of the street in both residential and commercial / industrial areas. This requirement may be waived in the case of Residential Lanes and in special circumstances in order to reduce excessive impacts to topography, wetlands, drainage ways and other natural features; infill situations to match existing configuration; or in existing unimproved streets. In these situations the sidewalk may be placed adjacent to the street to reduce overall right-of-way.

320.10.21 – Differing Sidewalk Widths

In developments where the sidewalk width has been previously approved for a previous phase under the then existing standard, the same width shall be continued to the nearest street corner of the intersecting new development and blended at the radius with the current standard width. In cases of long sidewalk sections where it is not feasible to continue to the corner, a minimum 10' transition length shall be made between the differing widths for subsequent phases. Where a new development is planned the sidewalk widths shall conform to current standards as measured behind the curb.

320.10.22 – Parking Lanes

Parking lanes are a minimum of 8' wide on all streets unless otherwise approved by the PWD. The non-delineated parking lane is generally combined with the 10' vehicle lane for a total width of 18' in residential areas.

320.10.23 – Bicycle Lanes

Because of the low projected traffic volume and speed, striped bicycle lanes are not required on local streets. However, the design shall comfortably accommodate the shared use of roadway by bicyclists and motorized traffic. Typical bike lane width is 5' to 6' on arterial streets and 5' to 6' on collector streets depending on traffic volume. Bicycle lanes are measured

from the face of curb (FOC) and include the gutter. Bike lanes on Arterial and Collector streets shall be delineated with white striping in accordance with MUTCD requirements.

320.10.24 – Bicycle and Pedestrian Paths

Bicycle and Pedestrian Paths shall be designed in accordance with the ODOT, Oregon Bicycle and Pedestrian Guidelines where required in the approved site plan. These paths range in width from 5' for minor pathways to 8' and 12' for major pathways. Landscaped shoulders are typically required. Table 300-1E Miscellaneous Transportation Features, shows the widths for major and minor pathways. Also refer to the Central Point TOD Design Requirements and Guidelines, and Section 200, Site Preparation for more details regarding design and construction. The pathway sectional depths shall be determined by the PWD based on type of use and the Engineers recommendations.

320.10.25 – Vehicle Lanes

Two vehicle traffic lanes are required on local residential streets. The vehicle lane width is combined with a shared parking lane (non-delineated). In special circumstances, such as where a local street intersects with a collector or arterial street, additional width may be required for safe turning movements. Multiple, delineated lanes are required on collector and arterial streets. Typically lane widths are 12' wide, however, they may vary if integrated into special districts such as a TOD. Refer to Tables 300-1A through 300-1E.

In cases of alleys and private flag lot drives a minimum single vehicle lane width of 20' is required.

320.10.26 – Planting Strips, Medians and Shoulder Landscaping

Planting strips where required and approved on the plans, are typically 5' wide on Standard Residential, and 7' wide on Collector and Arterial Streets. Refer to Street Tree Planting Detail Drawing A-12 for tree planting requirements in the public right-of-way. Residential Lanes require a 2' meter strip between the curb and sidewalk. Alternate widths may be required in special districts or corridors. Refer to tables 300-1A thru 300-1E. Refer to Section 350.10.01 for ODOT referenced construction requirements.

320.10.27 – Drainage and Curbs

Drainage inlets shall be bicycle safe as required by ORS 810.150. Curb inlets as shown on the Standard Detail sheet(s) SD-3, SD-4 and SD-5 shall be used unless otherwise approved by the Public Works Director.

Inlets for stormwater facilities shall be as shown on Standard Detail sheets SD-8, SD-9, SD-10, SD-11 and SD-12.

Combined vertical curb and gutter shall be used on all streets with an enclosed storm drainage system or curbed stormwater facility. Minimum curb and gutter dimensions are shown on the Standard Detail Sheet(s) A-6B. A modified rolled curb and gutter section as shown on the

Standard Detail Sheet A-6B may also be used in residential areas for which they have been approved.

Where standard curb and gutter sections join rolled curb and gutter sections, there shall be a transition of 50' minimum.

320.10.28 – Street widths and Rights-of-Way widths

The basic width requirements for Street and Rights-of-Ways are found in Tables 300 – 1A through 1E.

320.10.29 – Cul-de-sacs and turnarounds

The use of Cul-de-Sacs is discouraged as a transportation planning tool and should be avoided. Where utilized, the maximum length for a cul-de-sac street is 400' as measured from the centerline of the nearest intersecting through street to the center radius point of the cul-de-sac. Cul-de-sacs and/or turnarounds are required at the ends of all non-connecting standard residential streets.

Turnarounds meeting Fire District #3 requirements such as a bulb or hammerhead type may be established as a temporary means to accommodate streets that are to be extended as part of an approved tentative plan. Turnarounds may also be designed at the ends of private drives. Where temporary turnarounds cannot be accommodated within a right-of-way, a public easement shall be required.

The basic requirements for cul-de-sac widths are found in Table 300 – 1E

320.10.30 – Driveways and Property Access

Property access shall be accomplished by the use of driveways. Driveway spacing shall be established based on the classification of the street the driveway will access. For driveway widths and property access dimensions, see Table 300 – 6, and Standard Detail Sheets A-6A and A-10.

All driveways shall be constructed of AC or concrete, unless otherwise specified by PWD.

Widths – Driveway width depends on whether a driveway will provide for one-way or two-way traffic and the functional street classification. The minimum residential and commercial driveway throat width on all streets where access is allowed shall be 12'. The maximum residential driveway throat width shall be 30'. See Table 300-6 for other requirements for residential and commercial streets on arterial and collector streets.

The Public Works Department may require wider driveways when traffic volumes cause ingress / egress difficulties. The PWD may require the Applicant to provide a Traffic Engineering Study to provide recommendations for maximum driveway width.

The Public Works Director may allow wider driveways in residential areas where multi-family dwellings or pad lot construction occur and would be overall less disruptive to pedestrian and wheel chair access.

Connection Type at Street – The type of driveway connection at the street shall be accomplished by a taper connection (typical) or a curb radius connection.

Taper Connection – A taper connection is shown in Standard Detail Sheet(s) A-5A and A-6A.

Curb Radius Connection – This type of connection is typically used when large trucks will be entering the property and unloading or when higher traffic speeds are anticipated. The curb from the driveway will match the existing curb at the street with the proper radius from the driveway to the street. Curb radii shall be designed to accommodate the maximum length vehicle in accordance with current AASHTO requirements and City of Central Point standards.

The PWD will determine the type of connection for each commercial driveway or property access.

Spacing – To provide the traveling public with adequate area for maneuvering for Ingress / egress to the property, the safety of the traveling public is a key factor in the spacing of driveways. See table 300 - 6 and Standard Detail Sheet A-10.

The spacing of driveways from property lines, away from street intersections shall be determined by the Public Works Director by considering classification of street. Joint access driveways for two or more adjoining properties shall be constructed where possible. Typical situations would include pad lots, duplexes, or Cul-de-Sacs.

No driveway or property access shall be installed, reconstructed, or constructed without first obtaining the required approvals and permit from the Public Works Department.

320.10.31 – Utilities

The primary location for franchised commercial utilities is in a Public Utility Easement (PUE) adjacent to the street right-of-way on private property. City utilities such as manholes, hydrants, water meters, blow-off valves and air-vacuum valves are to be located within the street or street right-of-way.

All utility facilities such as electric transformers, junction boxes, hydrants, water meters, etc., and street lights shall be located and designed in a manner so as not to conflict with driveways, sidewalks, loading and unloading areas, and pedestrian or vehicular traffic. Commercial utilities shall be located so as not to conflict with City water, sewer or storm drainage facilities. Refer to section entitled “Underground Utilities” Section 700.

320.10.32 – Street Lighting

Street lighting shall be installed, as further defined under “Underground Utilities” Section 700, at the following locations and intensities:

- (a) Local Streets 5800 lumen HPS 200’ maximum spacing
- (b) Collector Streets 9500 lumen HPS 200’ maximum spacing
- (c) Arterial Streets 22500 lumen HPS 200’ maximum spacing

Cul-de-sac lighting shall be as follows:

- (a) 0’ – 100’ One light at intersection
- (b) 101’ – 200’ One light at the intersection, one light at end of cul-de-sac.
- (c) 201’ – 400’ One light at the intersection, one light at mid-point and one light at end of Cul-de-sac.

When a street of higher classification intersects a street of lower classification the Standard for the street light installation shall be that of the higher standard.

Streetlights installed at intersections shall face the street with the higher street classification. If both streets are of the same classification, the streetlight shall be positioned so that the light equally illuminates both streets. Street light pole arms shall normally be oriented at right angles to the street centerline. All streetlight placements shall be approved by the Public Works Department prior to installation or during construction plan approval, whichever is first.

City Decorative street lighting will only be allowed in Transit Oriented Development (TOD) areas. Decorative street lighting for private development is allowed using Pacific Power ornamental lighting standards. When decorative lighting is used, electrical as-builts will be submitted before any electrical power request is generated for PPL. Drawings specific to TOD decorative street lighting are not available. However, in the instance that this type of lighting is required, the City of Central Point will work with the Developer and Engineer to ensure that lighting matching existing TOD decorative street lighting is used.

320.10.33 – Traffic Calming

Occasionally it is necessary to employ various techniques to reduce vehicle speeds, congestion or to shift traffic to a more appropriate route. Traffic calming measures can also be incorporated in the construction of new streets to prevent problems from developing in newly constructed or future residential areas. Traffic calming devices are intended mainly for use on local residential streets or lanes.

The application of these techniques is based on a case-by-case basis using engineering judgment. Planning and design should be coordinated with nearby residents as well as emergency and other service providers who will be affected by their use. The following techniques are suitable for existing and new streets. All traffic calming devices or measures shall be approved by the Public Works Director in writing.

Traffic Calming Techniques and Devices

Traffic Calming Device	Existing Street	New Streets
Traffic Circles	Yes	Yes
Speed Humps	Yes	Yes
Raised Crosswalks	Yes	Yes
Curb bulb extensions	Yes	Yes
Chicanes (alignment offset)	Yes	Yes
Traffic Diverters	Yes	Yes
Full (Street Closure)		
Half (One Way)		
Diagonal		
Median Barriers	Yes	Yes
Forced Turn Channeling	Yes	Yes
Parking Bays	Yes	Yes
Pavement Surface Modification	Yes	Yes
Speed Actuation Signing	Yes	

320.10.34 – Exceptions to address Topography and Natural Features

Occasionally, streets are constructed in locations that require special consideration such as in steep areas, or near wetlands, canals, creeks, or retention of desirable vegetation or sensitive plants and animals. In these cases, the design should mitigate negative impacts.

Generally, the range of local street types and configurations makes it possible to construct or improve a local street in these areas as well as remain in accordance with Public Works design standards for the required functional street classification.

Standard Detail Sheet(s) ST-10 through ST-53 illustrates the minimum street section design requirements and materials.

320.10.35 – Striping and Delineation

The Engineer shall provide a striping and delineation plan for all arterial and collector streets to the Public Works Department for approval.

Where striping and delineation is required it shall normally be centered over the separate required lane widths and centerline. All delineation and striping shall meet the MUTCD requirements as administered by the State of Oregon, 2008 Oregon Standard Specifications for Construction, Part 00800 and be presented in conformance with applicable Oregon Standard Drawings.

320.20.00 – Quality Assurance

320.20.01 – Construction Staking

The Engineer will establish marked centerline stakes, and stakes 7' behind curb faces at minimum 50' intervals along tangents (25' on curves) for sub-grade excavation and embankments. After sub-grade excavation the Engineer will establish stakes 3' behind the face of curbs at 25' intervals for construction of sewer lines and water lines and for construction of curbs. In addition the points of curve radius (pcr), vertical curve points shall be staked. "Blue-top" grade hubs will be set at the centerline of the street at minimum of 25' intervals for placing the base course and leveling course for the street. Paving grade hubs or "red tops" may be established in addition to control at the top elevation of the concrete lip of gutter. After stakes or hubs are set, protection of the all staking shall be the Contractor's responsibility. If stakes are disturbed or removed in any way, either during construction operations or after working hours, they shall be reset by the Engineer, as he deems necessary, at the Contractor's expense.

320.20.02 – Inspections

The Public Works Department inspector is the authorized representative of the Public Works Director whose instructions and decisions shall be limited to the particular duties and responsibilities delegated to him. These delegated responsibilities include performing all necessary inspections to assure that project construction is in conformance with the approved plans, specifications and materials for any Public Works project or work that will be accepted into the City system. All work shall be inspected in accordance with the City of Central Point, Public Works Standards and Specifications, including the requirements of other referenced organizations noted herein or as may otherwise be directed by the Public Works Director.

In addition to periodic informal inspections the Public Works Department requires a minimum of formally requested or coordinated inspections at the following phases in order to assure that the approved plan requirements and specifications are met before installation or construction of a subsequent phase:

1. Clearing and Grubbing.
2. Sub-grade alignment, grade and density testing including roll testing if required.
3. Sub-base course alignment, grade and roll testing if required.
4. Base course alignment, grade and density testing including beneath the curb section.
5. Check curb and gutter grade and alignment.
6. Check final base course alignment and grades including transverse grades. Perform any remaining density testing. Check base course smoothness.
7. Pavement lay-down, grading, rolling, transverse grades and density. Check final smoothness and surface quality.

Inspections should be coordinated with the inspector and requested by the Contractor at least 24 hours in advance of the required inspection. Arrangements for inspections during weekends and holidays must be made at least 48 hours in advance.

Requests for Public Works inspection may also be made through the PWD secretary at (541) 664-7602 ext.241.

320.20.03 – Sampling and Testing

All testing of materials to be placed or installed in public works construction by the applicant, contractor, or franchisee shall be conducted by a testing laboratory approved by the Public Works Department, and currently certified by the State of Oregon or other government authority conduct the required tests.

Unless otherwise directed, tests shall be sampled and conducted in accordance with the agency or institutes standards and specifications for each type of test noted herein. The required tests shall normally be as stated in the City of Central Point Standard Specifications and Details, or as described in the approved plans or contract specifications for a specified material.

The Public Works Department has sole discretion to require additional sampling and tests to confirm or supplement previous tests, identify faulty material or methods of installation.

All costs of testing and re-testing shall be borne by the applicant, contractor or franchisee unless previously approved in writing by the Public Works Director or his designee.

All field-testing and sampling of materials shall be conducted in the presence of the inspector unless otherwise authorized by the Public Works Department. It shall be the responsibility of the applicant, contractor, or franchisee to schedule the type of test and times the tests will be conducted. The inspector or Public Works Department shall be notified 24 hours in advance of field-testing.

320.20.04 – Design Changes

Minor field adjustments in the location or grades of certain construction, or materials, may be authorized by the inspector on site within the limits of his delegated authority.

Design changes that could materially impact the engineering design, design life, cost, safety, or future development, etc. shall be submitted in writing to the Public Works Department for approval. Submission of materials for review shall include all revised drawings, proposed materials and any proposed specifications that clearly illustrate the design change.

Preliminary approval of design change may be made at the discretion of the Public Works Director in cases of emergency or safety. It is understood however, that the applicant, contractor or franchisee is solely responsible for any increased work or cost incurred pending final approval of the design change.

330.00.00 – Materials

This section is described in two parts: On-site materials which reflect the existing materials at the project site, which if approved, may be used in construction, and, materials which shall be disposed of by the Contractor. Descriptions of on-site materials are set forth below in Section 330.10.01.

Supplied materials are those to be imported to the project site from commercial plants or facilities. Includes manufacturing facilities brought on-site to produce such materials.

The descriptions and requirements of commonly supplied materials to be used in public works construction are defined in Section 900, Construction Materials.

330.10.01 – On site materials

a) Unclassified Material

All native soils to be excavated shall be considered “unclassified”, unless otherwise set forth in the Plans or Special Specifications. The Contractor shall make his own estimates of existing conditions and shall base his methods and costs on his own investigation of the actual types, and hardness of materials to be removed and the equipment that will be required.

b) Rock Excavation

When the Plans or the Special Specifications set forth to classify materials to be excavated, the term “rock” shall be understood to mean solid sandstone, limestone, granite, basalt, or other solid rock of equal hardness in ledges, bedded deposits, or unstratified masses, boulders larger than one-half cubic yard in volume, cemented gravels (conglomerates) or shale, that in the Engineer’s opinion will require the use of systematic drilling and blasting for removal, and that in fact did require systematic drilling and blasting for removal.

Materials may be classified as “rock” when mutually, agreed by the Engineer and the Contractor that the “rock” may be removed by power-operated hand tools such as pneumatic pavement breakers.

It shall be the Contractor’s responsibility, when directed by the Engineer, to remove all over-burden, soil, or other such material and expose the rock surface in a satisfactory manner so that the Engineer may examine the surface and obtain any measurements he requires. Where specified in a Public Works funded project only the actual volume of the rock will be measured for payment for “rock excavation”.

c) Common Excavation

When materials to be excavated are “classified”, any material that cannot be classified as “rock” will be classified as “Common” excavation.

330.10.02 – Disposal of Excess Excavated Soils

All approved, excavated soils not required for sub-grade beneath streets or sidewalks, for backfill behind curbs, or for finish grading in the rights-of-way may be used for fills on the site as shown on the Grading Plan. All materials not utilized or suitable for site grading shall be removed from the site.

330.10.03 – Storage of Excess Excavated Soils

The PWD may approve the temporary storage of excess excavated soils future use provided they meet the requirements of Section 800, Erosion and Sedimentation Control.

330.12.00 – Supplied Materials

See Section 900 – Construction Materials for testing requirements and specifications of supplied materials generic to most phases of construction.

330.12.01 – Sub-grade Reinforcement

Materials that conform to the requirements set forth in Section 915.00.00, Sub-grade and Trench Reinforcement Rock may be substituted where an increased section is needed to stabilize poor sub-grade conditions or bridge sub-standard areas; where imported structural fill materials are to be imported to raise sub-grades; or where “equivalent base courses” are to be used in addition to the required minimum base course thickness.

330.12.02 – Sub-base Aggregate

Materials that conform to the requirements set forth in Section 910.10.03, Sub-base Aggregate shall be used in the “street sub-base section” where specified on the approved plans.

330.12.04 – Base Aggregate

Materials that conform to the requirements set forth in Section 910.10.02, Base Aggregate shall be used in the “street base section” and as a “leveling course” where specified on the approved plans.

330.12.05 – Concrete

Concrete materials that conform to the requirements set forth in Section 930.00.00, Portland Cement Concrete (PCC) shall be used in the construction of all concrete drainage structures where specified on the approved plans. Included but not limited to are, sewerage structures such as manholes and catch basins, thrust blocking for the water system, for curbs; curb and gutter sections including curb inlets; for sidewalks, driveway aprons, wheelchair ramps; and for streetlight bases. Unless otherwise specified, all concrete shall be 3300-psi compressive strength after 28 days of curing. **All concrete supplied shall be planted mixed. Bags mixed onsite in a mixer or wheelbarrow are allowed. See section 930.00.00.**

A concrete slump requirement for various structures is listed in Section 930.10.02, Requirements.

330.12.06 – Hot Mix Asphaltic Concrete (HMAC)

Asphalt paving materials that conform to the requirements set forth in Section 925.00.00, Hot Mix Asphalt Concrete Paving (HMAC) shall be used in the paving of all streets, paths and street curb returns where specified on the approved plans.

330.12.07 – General Uses

- a) Class “B” mix shall generally be used for all initial paving lifts and leveling courses where the finished thickness is 2” or greater in depth at the shallowest point.
- b) Class “C” mix shall generally be used for patching removed or damaged pavement; Overlays less than 1” but greater than $\frac{3}{4}$ ” in thickness and other minor areas such as shoulders, berms and asphalt curbs. Light duty mix in this category may be substituted for use on pedestrian or bicycle pathways.
- c) Class “D” mix shall be considered for overlays where the finished lift thickness is less than $\frac{3}{4}$ ”.
- d) Mixing temperatures, hauling and placing temperatures, rolling, equipment and compaction shall conform to Section 00745 of the Oregon Standard Specifications for Construction, 2008.

330.30.00 – Geo-textile Construction Fabric

Where specified on the plans, all woven and non-woven geo-textile fabric shall conform to the requirements set forth in Section 940.00.00 Geo-textile Construction Fabric.

340.00.00 – Construction Requirements and Workmanship

340.10.00 – Sub-grade Excavation, General

- a) Prior to starting any work the Contractor shall provide a Traffic Control Plan to the PWD. Notify the Emergency Dispatch Center (Central Point Police Department) if there will be substantial interruption of traffic as determined by PWD.
- b) The Contractor shall excavate to sub-grade any and all materials to the lines and dimensions shown on the Plans, and Standard Details as staked by the Engineer.
- c) Excavated soils may be used for engineered embankments as described in Section 340.12.00 below unless otherwise set forth in the Special Specifications.
- d) Excess excavated soils not incorporated into engineered embankments shall be disposed of as specified in 330.10.02.

e) The locations of existing underground utilities are shown on the Plan with as much accuracy as possible, based on existing records, but are not guaranteed. In accordance with OAR 952-001-0010 through 952-001-0100, the Contractor shall call the Oregon Utility Notification Center at 1-800-332-2344, or dial 811, at least 48 hours before beginning any excavation for accurate location of utilities, and shall be responsible for all damage to existing underground facilities.

f) The Contractor shall be required to provide the necessary personnel and signing to control traffic for the duration of the project in accordance with MUTCD and ODOT "Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less, 2006 edition.

340.10.01 – Grading

All excavated areas shall be smoothly graded to conform to the lines, dimensions and elevations shown on the plans, Standard Details and as staked by the Engineer. Unless otherwise directed by the PWD, all excavated sub-grade areas shall be graded to a tolerance range of 0.05' above and 0.10' below the specified grade elevation when measured from established control hubs. Finished sub-grade alignments shall be within 0.20' of the specified location.

340.10.02 – Sub-grade Reinforcement

When unstable, wet, frozen or boggy areas of the excavated sub-grade are encountered they shall be allowed to drain and be reinforced with materials meeting the requirements set forth in Section 910.10.03, Sub-base Aggregate or Section 915.00.00, Sub-grade and Trench Reinforcement (ballast). Grading requirements shall be as described above in Section 340.10.01.

340.10.03 – Compaction

After excavation has been completed to the required sub-grade elevations and before any sub-base materials may be placed, the entire area of the sub-grade surface shall be compacted to a minimum of 95% of maximum density at optimum moisture as determined by AASHTO T 99 A.

Test points selected for density testing of base course layers shall be selected at random by the inspector to adequately represent the full cross section and length of areas to be tested. The stationed centerline distance between test points shall not exceed 50'.

The PWD may also require proof rolling in addition to the field density tests described above when in the opinion of the inspector, the condition of the material appears unstable or moisture levels exceed the amount determined for the specified soil.

340.11.00 – Rock Excavation

Where materials classified as "rock" under Section 330.10.01, On-Site Materials, are encountered during excavation to sub-grade, the Engineer will establish a new sub-grade for the

pavement section at a minimum of 12" below the finish grade elevation of paving to allow for a minimum of 8" of crushed aggregate base and 3" of HMAC paving. See Standard Detail sheets ST-10 through ST-53 of these Standard Specifications.

340.11.01 – Use of Explosives

Where blasting is anticipated or required for excavation, loosening and removal of any materials or objects, The Contractor, and if applicable, his employees shall be properly trained, certified and licensed in accordance with all applicable County, State and Federal laws, rules and requirements for the storage, use and handling of explosives, blasting caps and accessories.

The Contractor shall provide insurance in amounts provided for in the General Conditions of any Public Works Contract, or where applicable, the amounts required by state or federal statute against damage to surrounding properties, equipment and work, and shall name as an additional insured, the City, its employees and agents, the Engineer, his employees and agents, and the Owner, including his employees and agents. These "additional insured" shall be held harmless from damages occurring during the "rock excavations". When the use of explosives is necessary for the prosecution of the work, the Contractor shall use the utmost care so as not to endanger life or property, cause slides or disturb materials outside the neat lines of the trenches or excavations.

The Contractor shall be responsible for any and all damages to property or injury to persons resulting from blasting or accidental or premature explosions that may occur in connection with his use of explosives.

340.11.02 – Repair of Damage

In case injury from blasting occurs to any portion of the work or to the material surrounding or supporting the same, the Contractor, at his own expense, shall remove such injured work, repair the work, and replace the material surrounding or supporting the same, or shall furnish such material and perform such work or repair or replace as the Engineer shall order. Any damage whatever to any existing structures due to blasting shall be promptly, completely and satisfactorily repaired by the Contractor at his own expense.

340.11.03 – Grading in areas classified as rock

All excavated areas classified as rock shall be smoothly rolled and graded to conform to the lines, dimensions and elevations shown on the plan, Standard Details and as staked by the Engineer. Excavated rock sub-grade areas shall be graded to a tolerance range of 0.10' above and 0.20' below the specified grade elevation when measure from established control hubs. Finished sub-grade alignments shall be within 0.20' of the specified location.

340.11.04 – Compaction in areas classified as rock

All excavated areas classified as rock shall be rolled with vibratory equipment capable of breaking down larger material and manipulating such material into adjacent voids. Compaction shall be determined adequate through visual observation by the inspector when a minimum of 3

successive passes over the same tread area by a loaded rock truck or similar equipment produce less than ½” of accumulated deflection.

340.12.00 – Unclassified Excavation and Embankments

340.12.01 – Grading

All un-classified excavated or embankment areas of sub-grade shall be smoothly graded to conform to the lines, dimensions and elevations shown on the approved plans, Standard Details and as staked by the Engineer. The sub-grade shall be graded to a tolerance range of 0.05’ above and 0.10’ below the specified grade elevation when measure from established control hubs. Finished sub-grade alignments shall be within 0.10’ of the specified location.

Excavated materials approved for engineered embankments shall be free of muck, vegetation and other deleterious debris. Unless otherwise shown on the plans, or directed by the PWD, embankments shall be placed in uniformly compacted lifts of less than 6” in thickness. Each lift shall be spread, rolled and moistened or dried to achieve a consistently dense structure.

340.12.02 – Compaction

Excavated materials placed in engineered embankments and under sidewalks shall be compacted to a minimum of 95% of maximum density at optimum moisture when tested in accordance with AASHTO T 99 A.

Test points selected for density testing of base course layers shall be selected at random by the inspector to adequately represent the full cross section and length of areas to be tested. The stationed centerline distance between test points shall not exceed 50’.

341.00.00 – Sub-base

341.10.01 – General Requirements

After the sub-grade has been inspected, tested and approved, install Geo-textile fabric as specified in section 940.00.00, Geo-textile Construction Fabric and 4” minus crushed rock as specified in Section 910.10.03, Sub-base Aggregate. Each layer shall be compacted to a minimum density as specified in Section 341.10.03 below.

Sub-base layers shall be extended a minimum of 2’ behind the face of curb.

341.10.02 – Grading

The top surface of each layer shall be reasonably parallel to the finish grade of paving. Where the total compacted depth of the sub-base course exceeds 6” or more in depth it shall be constructed in 2 or more layers of nearly equal thickness. Unless otherwise shown on the plans or directed by the PWD, the maximum compacted thickness of any one layer shall not to exceed 75 percent of the total required course thickness or 8” of compacted layer thickness whichever

is less. The sub-base material shall be smoothly rolled and graded to conform to the lines, dimensions and elevations shown on the plans, Standard Details, and as staked by the Engineer.

Sub-base material shall be graded and compacted within a tolerance range of 0.10' above and 0.20' below the specified grade elevation when measure from established control hubs. Finished sub-base alignments shall be within 0.10' of the specified location.

341.10.03 – Compaction

Sub-base materials shall be processed and compacted with rolling equipment capable of compacting and manipulating such material into adjacent voids creating a dense, uniformly graded mass. Compaction shall be determined adequate through visual observation by the PWD inspector when 3 successive passes within the same tread by a loaded rock truck or similar equipment produce less than ½" of deflection when measured from an undisturbed section or grade reference hub.

Where unstable areas are identified, they shall be allowed to dry out and the material removed and replaced. The area shall be re-compacted and graded as necessary to meet the requirements noted above for compaction and proof-rolling. When removing and replacing sub-base material or ballast material in the sub-grade, the contractor shall be required to replace the Geo-textile fabric with a minimum 1' overlap at all edges.

All areas of deficient grade and uniformity shall be re-graded, compacted to the specified standards, and inspected prior to placing any base course layers.

342.00.00 – Base Course

342.10.01 – Install Base or Leveling Course Materials

Before constructing curb and gutter sections, ¾"-0 crushed rock, as specified in Section 910.10.02, Base Aggregate shall be placed in a minimum 4" thick compacted layer as a leveling course under the curb and gutter section. See Standard Detail A-5A, Sidewalks of these Standard Specifications.

Base course layers shall be extended a minimum of 2' behind the curb. After curbs, or curb and gutter sections have been constructed and approved, the Contractor shall place crushed rock base course materials, as specified in Section 330.12.04 above, to the finished base layer grades as shown on the Plans, Standard Details, and as staked by the Engineer.

342.10.02 – Grading

The top surface of each layer shall be closely parallel to the finish grade of paving. Where the total compacted depth of the base course exceeds 6" or more in depth it shall be constructed in 2 or more layers of nearly equal thickness.

The maximum compacted thickness of any one layer shall not to exceed 75 percent of the total required course thickness or 8" of compacted layer thickness whichever is less. The base course material shall be processed, and smoothly rolled, and graded to conform to the lines, dimensions and elevation shown on the plans, Standard Details, and as staked by the Engineer. Base course material shall be graded to a uniformly compacted surface within a tolerance range of 0.02' above and 0.02' below the specified grade elevation when measure from established centerline control hubs and/or curb and gutter.

The final transverse slope of the base section shall be a minimum of 3% from the centerline of the street to the edge of gutter. Care shall be taken to assure grading will provide drainage of intersection corner radii.

The final surface shall not deviate at any point more than 0.02' from the bottom of a 12' straight edge laid in any direction on the surface on either side of the roadway crown. Finished base course alignments including curbs shall be within 0.05' of the specified location.

Base course materials shall be compacted to a minimum of 95% of maximum density at optimum moisture when tested in accordance with the AASHTO T 180, method D as corrected for oversize (AASHTO T 224) for determining the maximum density for crushed rock base.

Test points selected for density testing of base course layers shall be selected at random by the inspector to adequately represent the full cross section and length of areas to be tested. The stationed centerline distance between test points shall not exceed 50'.

The PWD may also require proof of rolling in addition to the field density test described above when the opinion of the inspector the condition of the material appears unstable or moisture levels exceed the amount determined for the specified base course material. Stability shall be determined adequate through visual observation by the inspector when 3 successive passes within the same tread by a loaded rock truck or equipment having similar wheel loading produce less than 1/2" of deflection when measured from an undisturbed section or grade reference hub.

Where unstable areas are identified, they shall be allowed to dry out and the material removed and replaced. The area shall be re-compacted and graded as necessary to meet the requirements noted above for compaction and proof-rolling.

343.00.00 – Hot Mix Asphalt Concrete Pavement (HMAC)

343.10.01 – Provide and Place Hot Mix Asphalt Concrete (HMAC)

After completion and approval of the finished base course of crushed rock, the Contractor shall install the required depth of HMAC pavement of the type shown on the plans and further specified in Section 925.00.00, Hot Mix Asphalt Concrete Paving, to the lines, grades and dimensions shown on the Plans, Standard Details and as staked in the field.

The following paving requirements for HMAC are referenced to sections of Oregon Standard Specifications for Construction, 2008 and are substituted where applicable.

343.10.02 – Hauling, Depositing, Weather Limitations and Placement

- a) Mixing, transporting, and placing shall conform to the requirements described in Section 00745.40 – 00745.48, Oregon Standard Specifications for Construction, 2008.
- b) Prior to any placing of HMA the Contractor will be required to submit a Paving Operation Plan to the City for the Public Works Director's approval not less than 72 hours prior to beginning paving.
- c) The plan shall include a list of the minimum number, type, and size of the paving equipment used, or present at the job site, for hauling, placing, and compaction of HMA pavement. The plan shall also include the anticipated hauling time from the supplier's plant; and the width, sequence, and direction of the panels to be paved.
- d) The finished elevation of pavement shall be held $\frac{1}{4}$ " (0.021') above lip of gutter.
- e) The final transverse slope of the full half street panel shall be 3% as measured from the top lip of gutter to the crown. A slightly rounded crown where the street half panels join is acceptable provided drainage is maintained to the gutter or street edge.

343.10.03 – Compaction

Compaction shall be in accordance with applicable provisions of Oregon Standard Specifications for Construction, 2008, Section 00745.49 and as follows:

- a) If the mix design submitted by the Contractor has been prepared using the Marshall method, the asphaltic concrete shall be compacted to a minimum of 95% of maximum density, based on test core densities measured by the paraffin method.
- b) If the mix design was prepared by the ODOT laboratory, the asphaltic concrete shall be compacted to a minimum of 92% of theoretical maximum density (Rice Density) as determined by ODOT TM 306.

343.10.04 – Additional Field Testing Requirements

Extraction and Gradation – In addition to required asphalt plant testing, a minimum of 2 representative field samples shall be taken daily at the approximate 1/3 and 2/3 points in the project (or sub-project) that will be laid down during the shift for asphalt content extraction and aggregate gradation testing. The samples shall normally be taken immediately behind the paving screed a minimum of 1' from the inside edge of the panel. No sample will be taken in the first 25 tons.

343.10.05 – Maintenance

Correct any defects in materials and workmanship in accordance with Oregon Standard Specifications for Construction, 2008, Section 00745.60.

343.10.06 – Joints

Joints in HMAC pavement shall be constructed in accordance with Oregon Standard Specifications for Construction, 2008, Section 00745.61, Longitudinal Joints and Section 00745.62, Transverse Joints except as follows:

Saw cut joints shall be required where joining all new pavement sections with existing pavement sections. All saw cut joints shall receive a tack coat with emulsified asphalt CSS-1 or CSS-1h prior to placement of HMAC.

343.10.07 – Smoothness

The tolerances for smoothness shall be as defined in Standard Specifications for Construction, 2008, Section 00745.70 except that if a 10' straight edge is used, the surface shall not vary more than 3/16"(0.0156').

344.00.00 – Portland Cement Concrete (PCC)

344.00.01 – General

All concrete placement, and protection of concrete, shall be subject to the weather limitations and requirements defined in Oregon Standard Specifications for Construction, 2008, 00540.49, Weather Conditions for Concreting.

All concrete form work and base grading shall be inspected and approved by Public Works Department prior to placement of any concrete. Concrete placed without prior approval is subject to removal by the Contractor/Applicant at his own expense.

All PCC and joint materials shall conform to the requirements of Section 930.00.00, Portland Cement Concrete.

344.00.02 – Quality Assurance

a) Miscellaneous Concrete Structures

1. Finish – PCC shall be finished as specified in the following sub-sections unless otherwise shown on the plans.
2. Joints – Joints shall be constructed and finished in such a manner as to be flush or slightly below adjoining surfaces to avoid tripping hazards.
3. Cracking – Panels or sections that incur cracks greater than 1/16" whether caused by shrinkage, freezing, curing or other indeterminate means shall be removed and replaced with appropriate isolation joints.

All cracks occurring in panels or sections of PCC that are vertically displaced or caused by loading prior to full curing of concrete shall be removed and replaced with appropriate isolation joints.

4. Chipping or Spalling – Sections or panels that have chipped or spalled as result of freezing shall be removed and replaced. Panels with minor chipping or spalling greater than 2 square inches of area shall be repaired with an epoxy based cement grout.
Areas or sections that have received impact damage to such an extent the structure is weakened or cracked by such action shall be entirely removed and replaced between adjacent control or isolation joints.

The determination of repair, removal and replacement of any cracked, chipped or otherwise damaged miscellaneous PCC shall be made at the sole discretion of the PWD.

b) Major Concrete Structures

1. Finish – Finishing of major concrete structures shall be in accordance with Oregon Standard Specifications for Construction, 2008, Section 540.53, Surface Finish Other Than Bridge Decks.
2. Cracking and Damage – A determination of the remedy, repair, replacement, or additional construction of or to all part(s) of any major concrete structure shall be made jointly by the Engineer and PWD. Upon examination of such damage the Engineer shall deliver a letter to the PWD describing the competency and required remedy, reconstruction or replacement of the structure.

344.10.01 – Miscellaneous Concrete Structures - Requirements

This work consists of furnishing, placing and finishing PCC (concrete) curbs, gutters, islands, sidewalks, driveways, formed or extruded curbs and gutters, ramps, catch basins, and other miscellaneous surfaces and stairs with metal handrail.

Unless otherwise specified, the above described work shall be constructed in accordance with the specifications detailed in Oregon Standard Specifications for Construction, 2008, Section 00759, Miscellaneous Portland Cement Concrete Structures, all supplemental specifications, and in close conformity to the lines, grades and dimensions shown on the plans, standard details and as staked in field by the Engineer. Unless otherwise specified or shown on the plans, PCC shall attain 3300-psi compressive strength at 28 days.

All curbs, gutters and sidewalks to be cut for the purpose of repair or relocation of driveways and ramps shall be cut at existing control or isolation joints. Where existing joints do not exist, the cut shall be made at the nearest incremental interval shown on the Standard Detail Sheet A-5A. See Section 350.20.02, Curb, Gutter and Sidewalk Cuts.

Isolation joints shall be constructed at least ½” wide with joint materials conforming to Section 930.10.03, Joint Materials. Concrete shall be allowed to cure free from contact, strain, and public traffic a minimum of 7 calendar days. The PWD may require a longer curing period at its discretion.

344.10.02 – Major Concrete Structures and PCC Pavement - Requirements

All other major concrete structures such as bridges, pavements, box culverts, wing walls, abutments, columns and other similar structures, unless otherwise specified, shall be constructed in accordance with applicable sections of Oregon Standard Specifications for Construction, 2008, Section 00540, Structural Concrete, Section 00595, Reinforced Concrete Box Culverts, Section 00755, Continuously Reinforced Concrete Pavement.

All PCC materials shall conform to the requirements of Section 930.00.00, Portland Cement Concrete. Unless otherwise specified by City Engineer or shown on the plans, PCC for these types of miscellaneous structures shall attain 3300-psi compressive strength at 28 days.

344.20.00 – Curbs and Gutters, General

Construction of curb cuts for driveway aprons will not generally be allowed as part of the construction of extruded or formed curb and gutter sections along new or re-constructed streets except at existing driveway locations unless previously approved by the Public Works Department as a condition of the construction plans.

Pre-approved curb cut locations shall not be re-located or adjusted by the Developer / Applicant for a period of 2 years from the date of acceptance of the original curb and gutter.

Concrete shall be allowed to cure free from contact, strain, and public traffic for at least 7 calendar days or longer as directed.

344.20.02 – Curbs with Gutters

Concrete curb and gutter section including curb cuts if located, shall be constructed to the finish grades and alignments shown on the Plans and staked in the field, and to the shapes detailed on Sheet A-6B of the Standard Details, using concrete as specified in Section 344.00.00 above. The maximum allowable slump is 1” for extruded curbs and gutters and 3” for formed curbs and gutters.

The concrete surfaces shall be floated and lightly brushed as required to produce a smooth even finish, free from bubbles, pockets, or blemishes. The sections shall have control joints at intervals not exceeding 10’, and isolation joints at intervals not exceeding 50’. All joints shall be neatly marked and finished using jointing or edging tools. To the extent possible isolation joints shall not be located at dropped curb sections.

344.20.03 – Straight Curbs (Non-gutter type)

Straight concrete curbs, where called for, including curb cuts, shall be formed and poured to the finish grades and alignments shown on the Plans, and staked in the field, and to the shapes detailed on Sheet A-6B of the Uniform Standards, using concrete material as specified in Section 344.00.00 above. The concrete surfaces shall be floated and lightly brushed as required to produce a smooth even finish free from bubbles, pockets or blemishes. Curbs shall have control joints at maximum intervals of 10', and expansion joints at maximum 50' intervals and at the ends of all curb returns. All joints shall be neatly marked with edging tools or jointing tools.

344.20.04 – Rolled Curbs and Gutters

Rolled concrete curb and gutter sections including curb cuts if located, shall be constructed to the finish grades and alignments shown on the Plans and staked in the field, and to the shapes detailed on Sheet A-5B of the Standard Details, using concrete as specified in Section 344.00.00 above. The maximum allowable slump is 1" for extruded curbs and gutters and 3" for formed curbs and gutters. Transitions between rolled curb sections and straight curb sections will be constructed as shown on the plans.

The concrete surfaces shall be floated and lightly brushed as required to produce a smooth even finish, free from bubbles, pockets, or blemishes. The sections shall have control joints at intervals not exceeding 10', and isolation joints at intervals not exceeding 50'. All joints shall be neatly marked and finished using jointing or edging tools. To the extent possible isolation joints shall not be located at dropped curb sections.

344.30.00 – Concrete Sidewalks, Driveway Aprons, Wheelchair Ramps, General

All sidewalks, driveway aprons, wheel chair ramps and other similar street side structures shall be constructed of PCC as described in Section 930.00.00, Portland Cement Concrete.

Where required, sidewalks, driveway aprons and wheelchair ramps and other similar structures shall be constructed after the curb and gutter sections have been installed and cured. The location and widths of driveways shall conform to the requirements shown in Table 300 – 6 unless otherwise approved by the Public Works Department. Construction shall conform to the lines, grades and dimensions shown on the plans, standard detail sheets and as staked in the field by the Engineer. Commercial driveways including the sidewalk section in the driveway entrance shall be reinforced as required on the standard detail sheets.

344.30.01 – Sidewalk and Ramp Requirements

Sidewalks shall slope toward the curb at ¼" per 12" (2.0%) and shall be a minimum of 4" thick in residential areas. A minimum of 6" thickness is required in commercial applications and for rolled curbs. Sidewalks shall conform to the Standard Detail sheet A-5A and A-5B of these Standard Specifications. Wheelchair ramps shall conform to the slopes and dimensions as detailed on Standard Detail sheets A-8 and A-9. The minimum concrete thickness shall be 4" except at the driveway entrances and rolled curbs where it shall be 6".

Sub-grades behind curbs shall be compacted to 95% of maximum density at optimum moisture when tested in accordance with AASHTO T-99-A and graded to a minimum depth of 8" below the tops of curbs at the locations to receive base rock and concrete sidewalks. An area to receive a wedge shaped, concrete thickened edge immediately behind the curb shall also be excavated and slope downward to the bottom of the curb and gutter section.

A 4" lift of ¾"-0" crushed rock as specified in Section 910.10.02, Base Aggregate shall be placed and graded the full width of the area to receive concrete including thickened edges and footings. The crushed rock shall be compacted to 95% of maximum density at optimum moisture when tested in accordance with AASHTO T 180 D.

After receiving a Public Works inspection and approval of the formwork and grading, 4" of concrete as specified in Section 344.00.00 above and having a maximum slump of 4" shall be placed and finished as follows:

Sidewalks and wheelchair ramps shall be tamped, floated, troweled, and lightly broomed for a non-slip surface. Edges shall be tooled to a smooth neat finish and the surface shall be joint-marked at intervals not exceeding 5. All wheel chair ramps shall have truncated domes installed and/or tooled as shown on Standard Detail Sheet(s) A-8 and A-9 to provide a warning to the impaired user and prevent slipping.

At intervals not exceeding 50', a ½" thick isolation joint shall be installed. Isolation joints shall also be installed at tops of all driveway aprons, at the outside edges of wheelchair ramps, and at the ends of all curved sections, such as curb returns, as detailed on Standard Detail Sheets A-5A, A-6A, A-6B and A-9. To the extent possible sidewalk joints shall line up with curb joints.

344.30.03 – Concrete Driveway Aprons

When Driveway Aprons are included in the project, they shall be installed at the locations shown on the Plans, and to the widths shown on the Plans. Residential and Commercial driveway aprons shall include a minimum 6" leveling course of compacted ¾"-0" crushed base aggregate as specified in Section 910.10.02 shall be placed and graded the full width of the area to receive concrete including thickened edges and footings. The sub-grade shall be compacted to a 95% of maximum density at optimum moisture when tested in accordance with AASHTO T-99-A before placing the base rock. The crushed rock base course shall be placed and compacted to 95% of maximum density at optimum moisture when tested in accordance with AASHTO T-180-D.

Residential driveway aprons shall be formed with the lines and slopes detailed on Standard Detail Sheet A-5A and shall be a minimum of 6" thick PCC. Commercial driveways and alleys shall be a minimum of 6" thick PCC and reinforced with #4 reinforcing steel installed in a grid pattern @ 16" on center. Unless otherwise detailed and approved, all driveways shall be a minimum 12' wide.

After receiving an inspection and approval of the formwork and grading, the concrete as specified in Section 344.00.00 above and having a maximum slump of 4" shall be placed and finished as follows:

Driveway aprons shall be tamped, floated, troweled, and then broomed in the direction of the slope. The edges and joints shall be neatly tooled as shown on Standard Detail sheet A-6A. Isolation joints, control joints and the joint marking pattern shall be made at intervals as shown on the Standard Detail sheets A-5A and A-6A. As a minimum, isolation joints are required at the tops of all driveway flares where joining level sidewalk and at connection to existing concrete. Where curbs and gutter are cut to accommodate driveway aprons, the isolation joint shall be extended to the edge of pavement.

Isolation joints shall be constructed at least ½” wide with asphalt impregnated fiberboard joint materials conforming to Section 344.00.00 above.

Control joint marking along the base (front) of the apron shall be made as shown on Standard Details A-5A and A-6A and extended through the sidewalk section. To the extent possible, joints in the apron shall line up with joints in the curb and gutter section. In certain cases where a portion of an existing driveway apron is cut, the existing dropped curb width (approx. 7”) shall be extended along the apron to the bottom of the new flare. A transition shall be made in the apron from the dropped curb at bottom of flare to the normal curb width at top of flare. Joint marking of the adjoining private driveway shall line up with the driveway apron and/or sidewalk joints to prevent cracking.

350.00.00 – Miscellaneous Construction Requirements and Workmanship

350.10.01 – Planter Strips, Medians and Shoulder Landscaping

These items shall be constructed as shown on the approved plans in accordance with applicable sub-sections of Part 01000, Right of Way Development and Control and Section 01120, Irrigation Systems, Oregon Standard Specifications for Construction, 2008.

350.20.00 – Street Cutting including Curbs, Gutters and Sidewalks

General – Street cuts may only be made after obtaining a permit from the Public Works Department. Generally street cuts shall be made only on streets or overlays after a 5-year moratorium period has elapsed from the date of acceptance. All street cuts shall be made in conformance to Standard Detail Sheet(s) T-1. Also refer to Standard Detail Sheet U-1B, Utility Trench.

On projects having numerous cross trenches or where there has been extensive damage to the surface, the City may require a 0-33 seal coat or an asphaltic concrete overlay of the entire paved surface, after the asphaltic concrete patching has been completed. On longitudinal trenches of 200’ or greater in length, unless otherwise approved by the Engineer, the existing pavement shall be removed and replaced to full paving machine width (normally 10’). Drag boxes or other pull-type asphalt spreader will not be permitted for longitudinal trench pavement replacement.

Special approval on “moratorium streets” may be granted by the PWD where no other reasonable alternative is available for accessing underground utilities. The applicant,

franchisee, and / or contractor shall be required to make certain deposits and warranties as follows:

350.20.01 – Requirements

The Applicant, Franchisee and/or Contractor is/are required to do the following:

- a) A permit from the City of Central Point Park and Public Works Department is required prior to any work being done within any city right-of-way (ROW).
- b) Deposit a non-refundable street cut fee in the amount of 7.52% of the construction cost associated with the project;
- c) Shall warrant the repaired street free of defect for a period of 5 years from the date of acceptance by the PWD.

And provide further, that in addition to repair of the street in accordance with all applicable specifications and standards of Section 300, Street Construction, the applicant, franchisee and/or contractor shall perform the following:

- d) Submits a Traffic Control Plan to the PWD prior to beginning any work. Provide traffic control in accordance with ODOT and MUTCD standards and ODOT “Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less”, 2006 edition, during all phases of construction and repair.
- e) Re-saw the pavement a minimum of 12” behind the original trench cut or undisturbed trench wall, whichever is greater.
- f) Backfill trench and any failed edges of trench with 1-sack cement / sand slurry mix. The PWD at its discretion may require 2-sack cement sand / slurry mix in areas of high traffic.
- g) Remove slurry including all loose material to existing asphalt depth but not less than a minimum 3” depth. In areas of high traffic, the PWD will require a minimum of 4” thickness HMAC.
- h) Tack all pavement edges prior to patching.
- i) Re-install HMAC class “C” pavement to match existing depth but not less than a 3” compacted thickness over the entire patch. Where the total thickness exceeds 3” the patch shall be placed in 2 lifts. Each lift shall be rolled a minimum of 4 passes with a vibratory roller to achieve compaction and smoothness.
- j) Seal all finished edges and saw cuts using a sand seal composed of emulsified asphalt and fine sand in the presence of the inspector.
- k) Provide and maintain any temporary measures needed to promote safe traffic movement with steel jump plates, cold patching, warning signs or lights, etc. All jump plates shall be secured in place with plate locks on leading edges exposed to traffic at speed and cold mix AC along other edges. Cold mix shall be placed in such a manner as to provide a smooth transition from the jump plate to the existing pavement grade.

l) The Contractor shall re-establish any delineation of cross walks, fog lines, bicycle lanes, and etc. to the standards and with materials required by the PWD including hot-tape application.

Where street cuts are required on non-moratorium streets the PWD may waive, modify certain requirements on a case-by-case basis.

350.20.02 – Curb, Gutter and Sidewalk Cuts

- a) Saw cuts in concrete curb, gutter, and sidewalk sections shall be made only at existing panel joint lines or isolation or control joints unless otherwise directed by the PWD.
- b) The entire panel shall be removed and replaced to the existing grades of the panel and/or any adjoining panels or, if applicable, to the newly required lines grades and dimensions shown on the plans, Standard Detail sheets, as staked in the field, or as directed by the PWD. All disturbed base material, base material lost as a result of removal or in the absence of such adequate material, shall be replaced with $\frac{3}{4}$ "-0 crushed rock material conforming to the requirements of Section 910.10.02.
- c) Isolation joints, control joints and joint marking shall be made at intervals as shown On the Standard Detail sheets A-5A, and A-6A. As a minimum isolation joints are required at the tops of all driveway flares where joining level sidewalk and at existing concrete.
- d) Where curbs and gutter are cut, removed and replaced the isolation joint shall be extended to the edge of pavement.

Table 300-1A
Arterial Street Widths and Rights of Way Widths

Lane Configuration	Lane Widths	Turn Lanes and Width	Parking Lanes and Width (4)	Bicycle Lanes and Width	Street Width at FOC (1)(4)	Sidewalk Width (2)	Landscape Row Width (3)	Minimum Rights of Way Widths (1)
3 Lane (minor)	2 @ 12'	1 @ 14'	Optional	2 @ 6'	50'	2 @ 6'	7.5'	79'
3 Lane (minor) Alternative	2 @ 11'	1 @ 12'	2 @ 8'	2 @ 5'	60	2 @ 12'	Tree Wells	86'
4 Lane (minor)	4 @ 12'	(7)	Optional	2 @ 6'	60'	2 @ 6'	7.5'	89'
5 Lane	4 @ 12'	1 @ 14'	Optional	2 @ 6'	74'	2 @ 6'	7.5'	103'
5 Lane Alternative	4 @ 11'	None	2 @ 8'	2 @ 5'	2 @ 35'	2 @ 12	12' center median and tree wells	108'

NOTES:

1. Minimum ROW and street widths may vary according to requirements for left turn lanes, right turn bays, parking lanes, sidewalks, and landscape rows. The individual lane widths are considered minimum unless otherwise approved by the Public Works Department.
2. The smaller sidewalk width shall be used only in conjunction with a curbside landscape rows.
3. Planter Strips are required except as approved by the Public Works Department. Minimum 7' width sidewalks shall be designed if landscape rows are deleted.
4. Parking lanes are not normally permitted on Arterial streets. They may be permitted in existing commercial business districts or may partially substitute for right turn bays and transit pullouts. Widths are increased accordingly.
5. Lane widths include striping and gutter widths. Where striping and delineation is required it shall normally be centered over the separate required lane widths or centerline. All delineation and striping shall meet the MUTCD requirements as administered by the State of Oregon.
6. Public Utility Easements are required in addition to the Right-of-Way widths shown.
7. Right-of-Way may be increased at intersections to accommodate short refuge and left turn lane sections.

Table 300-1B
Collector Street Widths and Rights of Way Widths

Lane Configuration	Lane Widths	Turn Lanes and Width	Parking Lanes and Width	Bicycle Lanes and Width	Street Width (1)(4) at FOC	Sidewalk Width (2)	Landscape Row Width (3)	Minimum Rights of Way Widths (1)
2 Lane (Retrofit)	2 @ 12'	None	None	2 @ 6'	36'	2 @ 5'	7.5'	63'
2 Lane Business/ Residential	2 @ 10'	May or may not have a turn lane.	2 @ 8'	2 @ 5'	46'	2 @ 8' or 2 @ 12'	6	72' or 76'
3 Lane	2 @ 12'	1 @ 14'	None	2 @ 6'	50'	2 @ 5/6'	6'	74' or 76
3 Lane	2 @ 12'	1 @ 14'	2 @ 8'	2 @ 6'	66'	2 @ 5/6'	6'	90' or 92'

NOTES:

1. Minimum ROW and street widths may vary according to requirements for left turn lanes, right turn bays, parking lanes, sidewalks, and landscape rows. The individual lane widths are considered minimum unless otherwise approved by the Public Works Department.
2. The smaller sidewalk width shall be used only in conjunction with a curbside landscape row.
3. Landscape rows are required except as approved by the Public Works Department. Minimum 7' width sidewalks shall be designed if planter strips are deleted.
4. Parking lanes may normally be permitted on Collector Streets. They may also partially substitute for right turn bays and transit pullouts. Widths are increased accordingly.
5. Lane Widths include striping and gutter widths. Where striping and delineation is required it shall normally be centered over the separate required lane widths or centerline. All delineation and striping shall meet the MUTCD requirements as administered by the State of Oregon.
6. Public Utility Easements are required in addition to the Right-of-Way widths shown.
7. Right-of-Way may be increased at intersections to accommodate short refuge and left turn lane sections.
8. Short center and right turn lanes may be required to meet safety and traffic control requirements.

**Table 300-1C
Standard
Local Street Widths and Rights of Way Widths**

Lane Configuration	Lane Widths	Turn Lanes and Width	Parking Lanes and Width (4)	Bicycle Lanes and Width	Street Width (1)(4) at FOC	Sidewalk Width (2)	Landscape Row Width (3)	Minimum Rights of Way Widths (1)
Residential								
2 Lane - new	2 @ 10'	N/A	2 @ 8'	N/A	36'	2 @ 5'	2 @ 6'	60'
2 Lane - retrofit	2 @ 10'	N/A	2 @ 8'	N/A	36'	2 @ 5'	n/a	52'

NOTES:

1. Minimum ROW and street widths may vary according to requirements for left turn lanes, right turn bays, parking lanes, sidewalks, and landscape rows. The individual lane widths are considered minimum unless otherwise approved by the Public Works Department.
2. The smaller sidewalk width shall be used only in conjunction with residential streets.
3. Landscape rows may be required as approved by the Public Works Department.
Residential parking lanes are combined with the travel lane (un-delineated). Commercial parking areas may be delineated in combination with loading areas, etc.
4. Lane Widths include striping and gutter widths. Where striping and delineation is required it shall normally be centered over the separate required lane widths or centerline. All delineation and striping shall meet the MUTCD requirements as administered by the State of Oregon.
5. Public Utility Easements are required in addition to the Right-of-Way widths shown.
6. Right-of-Way may be increased at intersections to accommodate short refuge and left turn lane sections.

Table 300-1D
Minor Local Street and Residential Lanes
Widths and Rights of Way Widths

Lane Configuration	Lane Widths	Turn Lanes and Width	Parking Lanes and Width (3)	Bicycle Lanes and Width	Street Width at FOC	Sidewalk Width	Landscape Row Width (1)	Minimum Rights of Way Widths (1)
Minor Local								
2 Lane - Retrofit	2 @ 10'	N/A	1 @ 8'	N/A	28'	2 @ 5'	N/A	42'
2 Lane - New	2 @ 10'	N/A	1 @ 8'	N/A	28'	2 @ 5'	2 @ 6'	52'

NOTES:

1. Minimum ROW and street widths may vary according to requirements for left turn lanes, right turn bays, parking lanes, sidewalks, and landscape rows. The individual lane widths are considered minimum unless otherwise approved by the Public Works Department.
2. Landscape rows may be required as approved by the Public Works Department.
3. Residential parking lanes may be combined with a reduced travel lane (un-delineated). Lane Widths include gutter widths.
4. Public Utility Easements are required in addition to the Right-of-Way widths shown.
5. Hammerhead turnarounds, knuckles or bulbs meeting Fire District Number 3 requirements are required for all dead drives, residential lanes or alleys.
6. 18" mountable curbs may be required in lieu straight curbs where approved.

**Table 300-1E
Miscellaneous Transportation Features**

Functional Class and Type of Street	Minimum Travel Lanes and Width (3)	Turn Lanes and Width	Parking Lanes and Width	Bicycle Lanes and Width	Street Width or Radius at FOC (1), (2)	Sidewalk Width	Planting Strip (Optional except as noted)	Rights of Way Widths
Industrial	2 @ 17'	0	2 @ 8'	0	50'	2 @ 6'	2 @ 7.5'	79'
Alleys	Varies, see dwg ST-42	0	0	0	20'	0	0	21' to 29'
Private Drives	Varies, see dwg ST-42	0	0	0	21'	0	0	None
Cul de sac Radius(4)	Local Streets Res. Lanes				See note 4			See note 4
Bicycle Paths	5'			5' to 12'				Varies
Pedestrian Paths	5'			5' to 12'				None
Multi-Use Paths	8' to 12'			8' to 12'				None

Notes:

1. Cul de Sac's for Local Streets may be configured as end bulb or side bulb providing minimum Cul de Sac street width and radius are met. Minor local street Cul de Sac's may be designed with a reduced radius where approved providing they meet Fire District Number 3 requirements and meet minimum turning requirements (no backing) for utility vehicles.
2. Hammerhead turnarounds, knuckles or bulbs meeting Fire District Number 3 requirements are required for all dead drives, residential lanes or alleys.
3. Required for all private and minor land partitions of 3 or less. Width includes an 18" mountable curb section on each side. Water meters require drivable lids.
4. Contact Fire District #3 for the most up to date turning template information.

**Table 300-2
Minimum Street Alignment and Grade Requirements**

Functional Class & Type	Minimum Centerline Curve Radii	90 Degree Corner Radius at F.O.C.	Corner Radius at R.O.W.	Centerline Maximum Grade	Centerline Minimum Grade	Transverse Panel Grade (Crown)	Minimum Vertical Curve Length (g1 + g2)
Arterials						3.0%	
Major	300'	See AASHTO Table 11-2	Parallel to F.O.C. Radius	6%	0.5%	3.0%	See AASHTO Tables 111-39 through 41
Secondary	300'	"		6%	0.5%	3.0%	
Collector	100'	"	"	8%	0.5%	3.0%	"
Local Streets							
Residential Street	100'	28'	"	12%	0.5%	3.0%	"
Residential Lane	100'	20'	"	12%	0.5%	3.0%	50'
Alleys	100'	20'	"	12%	0.5%	3.0%	50'
Private Drives	100'	20'	"	12%	0.5%	3.0%	N/A

Notes:

1. All street sections shall have a minimum transverse grade of 3% as measured from the crown to the top of the concrete lip of gutter.

**Table 300-3
Minimum Street Section Requirements (1)**

Functional Class and Type	Paving Section	Base Section	Sub-base Section	Geo-textile Fabric (2)
Major Arterial	4" Class B	8" ¾"-0 crushed rock	12" 4" crushed rock	Woven
Minor Arterial	4" Class B	8" ¾"-0 crushed rock	12" 4" crushed rock	Woven
Collector	3" Class B	6" ¾"-0 crushed rock	10" 4" crushed rock	Woven
Local Residential Street	3" Class B	6" ¾"-0 crushed rock	8" 4" crushed rock	Woven
Alley	3" Class B	6" ¾"-0 crushed rock	8" 4" crushed rock	Woven
Private Drive	3" Class B	6" ¾"-0 crushed rock	8" 4" crushed rock	Woven

Notes:

1. All required materials shall be in conformance with Section 900, Construction Materials and Section 320, Design
2. Woven Geo-textile fabric shall be Linq Industries GTR 200 or approved equal.

**Table 300-4
Street Intersections and Access Separation**

Street of Alignment	Major Arterial	Secondary Arterial	Collector	Local	New Driveway
Major Arterial	1000'(1)	1000'(1)	1000'	750'	See Note(2)
Secondary	1000'(1)	750'	500'	500'	See Note(2)
Collector	1000'	750'	500'	300'	Allowed
Local	750'	500'	300'	150'	Allowed

NOTES:

1. Major arterial streets, when aligned with other major arterial streets, shall be designed on a case-by-case basis and may require minimum spacing greater than 1000', but in no case shall spacing be less than 1000'.
2. Driveways are generally not allowed to access onto arterial streets unless no other reasonable access is available.
3. The Public Works Department, at the discretion of the Public Works Director, may allow a 300' distance between access driveways on major arterial streets.

Table 300-5

Minimum Sight Distance and Clear Vision Requirements

Sight Distance at Intersections (1)

20 MPH	30MPH	40MPH	50MPH	60MPH
200'	300'	400'	500'	600'

Notes:

1. Corner sight distance measured from a point of the minor road at least 10' from the edge of the major road pavement and measured from a height of eye of 3.5' on the minor road to a height of object of 4.25' as referenced on Standard Detail Sheet A-11, as distances d1 and d2.

**Table 300-6
Driveway and Property Access Dimensions**

	Driveway Throat Width	Curb Radius at Street	Minimum Spacing from Intersection	Spacing From Property Line	Minimum Spacing Between Driveways
	Min / Max	Min / Max		Min / Max	Minimum
<u>Major Arterial</u>					
Residential	N/A(1)	N/A(1)	(3)	N/A(1)	N/A(1)
Commercial	24' – 30'(1)	(2)	(4)	(6)	(7)
<u>Secondary Arterial</u>					
Residential	12' – 30'(1)	N/A(1)	(3)	N/A(1)	N/A(1)
Commercial	36' – 36'(1)	(2)	(4)	(4)(5)	(7)
<u>Collector Street</u>					
Residential	12' – 30'	20' – 35'	(3)	15'(5)	30'
Commercial	12' – 30'	(2)	(4)	20'(5)	40'
<u>Local Street</u>					
Residential Street	12' – 30'	20' – 20'	(3)	7'(5)	12'
Residential Lane	12' – 30'	20' – 20'	(3)	7'(5)	12'
Commercial / Ind.	12' – 30'	(2)	(4)	7'(5)	12'

Notes:

1. Property access to arterial streets is generally not allowed unless no other reasonable access is available. The Public Works Department shall determine maximum driveway or property access width. The PWD may require a traffic engineering study by the applicants engineer when determining width or access locations.
2. Minimum curb radius shall be designed for the maximum wheelbase intended in conformance with AASHTO and City of Central Point specifications.
3. The driveway throat shall be located the farthest distance away from a street intersection or 30', whichever is greater.
4. The driveway throat shall be located the farthest distance away from a street intersection or 200', whichever is greater.
5. Maximum spacing from non-intersection property lines shall be the farthest distance on the lot from the property line and still meet all other driveway spacing standards.
6. Spacing of driveway or property access from non-intersection property lines on an Arterial street shall be determined by the Public Works Department. The PWD may require a Traffic Engineering Study by the Applicants engineer, when determining spacing of driveways.
7. The Public Works Department shall determine minimum distances between driveway or property access. The PWD may require a Traffic Engineering Study by the Applicants Engineer when determining spacing between driveways.
8. The PWD may require joint access driveways for two or more adjoining properties to be constructed where possible. Typical situations would include pad-lots, duplexes, or Cul-de-Sac.

**Table 300-7
Clear Vision Areas
Type of Street – Sight Triangle Distances**

Type of Intersection	Local	Collector	Secondary Arterial	Major Arterial
Residential Access	15'	25'	55'(2)	(1), (2)
Commercial Access	25'	25'	55'	(1), (2)
Industrial Access	55'	55'	55'	(1), (2)
Alley and Private Drives	15'	25'	55'(2)	(1), (2)
Residential Lanes	25'	55'	55'	(1)
Residential Streets	25'	55'	55'	(1)
Collector Streets	55'	55'	55'	(1)
Secondary Arterial	55'	55'	55'	(1)
Major Arterial	(1)	(1)	(1)	(1)

Notes:

1. The Public Works Department may require the Applicant or Developer to provide a Traffic Engineering Study for clear vision, traffic and sight distance in the event a minimum 55' sight triangle appears to inadequate.
2. New residential, commercial and industrial access is generally not allowed unless no other reasonable access is available. This must be approved in writing by the Public Works Department.

SECTION - 400

STORM WATER

SEWER SYSTEM

400 – STORM WATER SEWER SYSTEM

400.00.00 – Scope

This section shall include but not be limited to all items of work necessary and incidental to the planning, survey, design and construction of the City of Central Point storm water sewage system or systems as may be administered by the City within dedicated City rights-of-ways or easements, or as may be dedicated to the City. This section shall also apply to private storm water sewage systems insofar as they may affect the city storm water system through connection.

This work shall also include any appurtenances and other work, such as pavement removal and replacement, trench excavation and backfill, providing and installing storm water pipe and fittings, connection to existing storm sewers; providing and installing manholes and catch basins, providing and installing catch inlets and grates, providing and installing field drains and culvert inlet assemblies, providing and installing detention basins including orifice boxes, **installing stormwater stormwater management facilities as part of a low impact development strategy for onsite stormwater management**; installing necessary incidental curbs and gutter; and testing, flushing of the new storm water sewage system.

It shall be the responsibility of Applicants, Engineers or Contractors to visit the site of the proposed work and become fully acquainted with the conditions relating to the construction, so that they fully understand the facilities, restrictions, and difficulties involved in the construction work proposed under the Contract or development. They shall satisfy themselves as to the quantities involved, including materials, equipment, and labor.

It shall be the responsibility of the Applicant(s) or Engineer(s) to obtain the necessary permits from City, State and Federal agencies prior to performing any construction activities within City limits.

410.00.00 – General

410.10.01 – References

Oregon Administrative Rules (OAR) and Oregon Revised Statutes (ORS) current standards and revisions as may apply to Public Storm Water Sewer Systems.

Oregon Department of Environmental Quality (DEQ) current standards and revisions as may apply to Public Storm Water Sewer Systems.

Oregon Department of Transportation (ODOT) requirements and Oregon Standard Specifications for Construction, 2008 and Standard Drawings as they may apply to Public Storm Water Sewer Systems.

American Society for Testing and Materials (ASTM)

American Association of State Highway Transportation Officials, AASHTO, "Standard Methods of Test"

American Concrete Institute (ACI)

City of Central Point Municipal Code (CPMC) as may apply to Public Storm Water Systems.

City of Central Point Public Works Standards and Specifications as they apply to Storm Water systems.

Rogue Valley Sewer Services (RVSS) Standards and Specification as they apply to Storm Water systems.

State of Oregon, Manual of Uniform Traffic Control Devices (OMUTCD) current requirements, including, "Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less", 2006 edition.

410.10.02 – Tables

None

420.00.00 – Design Standards

420.01.00 – General

It shall be the responsibility of the Engineer to investigate the drainage area of the project, including the drainage areas of the channels or storm sewers entering and leaving the project. If a contiguous annexed drainage area of given size exists, the Engineer may use information that has formerly been established if it includes criteria for the drainage area at complete development under current zoning and Comprehensive Plan Designations. If the City does not have such information, the Engineer shall present satisfactory information to support his Storm Sewerage Design.

The Engineer shall also be required to provide all hydrology and hydraulic computations to the Public Works Department (PWD) that are necessary to substantiate the storm sewer design. The design shall be sufficient to prevent conditions of flooding, including standing water, inside and outside of the proposed project area. The storm water sewer system design shall be in conformance with applicable provisions of Oregon DEQ, DSL

and ODFW and, United States COE and consistent with the US EPA's National Pollution Discharge Elimination Phase II stormwater requirements.

420.10.00 – Minimum Design Requirements

420.10.01 – Hydrology

Basic Criteria for Storm Sewerage Design shall be as follows:

1. Local Drainage Areas located in a high risk (1% annual chance) Flood Zone as a result of a Federal Emergency Management Agency (FEMA) Study, shall have storm drains of sufficient capacity to carry runoff for a typical 10-year storm, unless the main discharge pipe or stream will have greater than 100 cubic foot per second discharge "Q" during a 10-year storm. When the discharge "Q" of storm drains exceeds 100 CFS, but is less than 200 CFS, that storm drain shall be designed to carry the runoff expected for a 50-year storm. When the main storm drain will have a discharge "Q" in excess of 200 CFS during a 50-year storm, that storm drain shall be designed to carry the runoff expected for a 100-year storm.
2. Local Drainage Areas not located in a high risk Flood Zone shall be designed to 24 hour rainfall requirements.
3. Unless the Engineer can otherwise demonstrate through hydraulic design that the existing facilities such as culverts, bridges or pipe, including any planned future development, will carry the computed discharge, the Engineer will be required to design and dedicate detention basins or other facilities for the purpose of reducing the discharge until the downstream facilities have been improved or enlarged, or until other solutions have been found.
4. The Public Works Department will require both, a pre-condition analysis and, a post condition analysis of the project area that considers all planned or estimated build-out of future facilities in order to substantiate the project design.

420.10.02 – Ground Water Control Plan

Many areas in the City of Central Point have a high water table that fluctuates greatly with rainfall amounts as well as surrounding use.

1. In all instances the Applicant (or Engineer) shall retain the services of a registered Hydro-Geologist to determine if ground water is present in the areas affected by construction of storm sewer systems.
2. If it is determined that ground water is present, the Hydro-Geologist in consultation with the Engineer shall develop and submit a Ground Water Control Plan.

The plan shall include as a minimum maps and tables showing the, locations, depths, quantities, flow rates, seasonal variations and any other information necessary to fully appraise the City of the conditions. The plan shall also include the Engineer's and Hydro-Geologist's recommended solution to accommodate, and if necessary maintain the ground water flows and quantities through the area under consideration.

420.10.03 – Hydraulic Design

The Public Works Department requires that storm sewer systems to be dedicated to the City shall be designed as a “closed system” in order to minimize the effect of ground water infiltration, silt and other undesirable substances **with the exception of LIDA stormwater management facilities**. Weep holes and grade rings above the street sub-grade level or hydraulic grade line in non-street installations, are exempted from the watertight requirement. The system shall also be designed to be “self cleaning” to the extent possible. However, 6” sumps will be required in all new catch basins and curb inlets. The minimum requirements are as follows:

1. Cleaning Velocity and Minimum Grade – A minimum cleaning velocity of 2-fps will be maintained throughout all segments of pipe between catch basins or manholes regardless of the type of pipe used. In no case shall the pipe gradient be less than 0.005-ft per foot (0.5%).
2. Cleaning velocity shall also be maintained through catch basins and manholes except at specially designed sediment cleaning structures as discussed below in Section 420.10.04, Facility Design. Street curb gutters shall be designed to maintain cleaning velocities between curb inlets including the corner radii.

420.10.04 – Facility Design

1. Storm Sewer Pipes - Storm sewer mains shall normally be located 2' south or 2' west of the centerlines of streets. Eccentric manhole cones shall be positioned so as to preserve the true intersection of streets for the location of monuments.
2. Minimum Pipe Diameter – The minimum pipe diameter for any City storm drain shall be 12” I.D., **with the exception of stormwater management facilities** Stormwater management facilities shall have a 6-inch minimum pipe diameter for perforated pipe within the facility and a 10-inch minimum pipe size for facility outlet piping.

Storm sewer feeders and laterals shall be normally located behind the curb section to accommodate curb inlets and catch basins. Where the storm sewer main is located near the street center- line, lateral leader pipes shall be constructed from the catch basins to a corresponding storm sewer manhole. Blind connections will not be allowed. Minimum cover of 24” over pipes within the traveled way shall be required unless Class V, Reinforced Concrete Pipe is used.

A concrete cap as shown in Standard Detail T-4, Shallow Trench Section Under Traveled Way, shall be required for all other pipe with less than 24" of cover. In no case shall the depth of cover over reinforced concrete pipe, as measured at the bell or concrete cap, be less than 12" within the paved section.

3. Curb and Gutter - Curbs, and curb and gutter sections shall not exceed 350' in length between catch basins or curb inlets. Leader pipe from catch basins or curb inlets to manholes shall not be less than 12" I.D. pipe.
4. Catch Basins – Catch basins shall be designed as shown on Standard Detail SD-3 or SD-4 as applicable. Standard 2-1/2A catch basins shall have a maximum of 3, 12" pipe entrances or exits in the basin. Standard 4A catch basins shall be used for all pipes greater than 15" I.D. diameter. Screened weep holes shall be installed at a level slightly above the sub-grade in the sub-base layer as shown on Standard Details.

The catch basin depth shall not exceed 4' as measured from the catch basin lip to the invert of the entrance of the lowest pipe. Catch basins shall be constructed with a 6" sump in the bottom to collect debris.

5. Manholes – Manholes shall be spaced at no more than 400' apart and shall be designed as shown on Standard Detail(s) SD-1 through SD-2A and shall be self-cleaning and free flowing. All pipe inverts shall be located in the base of the manhole unless otherwise approved.

The PWD may require that screened weep holes be installed in the circumference of the manhole rings above the sub-grade level if high ground water concentrations are present during construction.

Manhole lids shall be stamped with a "D" to differentiate storm drain manholes from sanitary manholes, which will be stamped with an "S".

6. Special Sediment Cleanout Structures – The Engineer shall include in the storm system design, a minimum of 1 manhole or other approved structure with a sump below the invert(s) of the entrance and exit pipes capable of collecting sediments from the upstream storm piping system. The facility shall be designed to accommodate the quantity of sediment flowing into system over a 1 year period and afford access to crew and equipment for periodic cleaning. See Standard Detail SD-2B, Storm sewer Manhole with sediment basin.

For storm systems entering a creek, open ditch or other natural waterway, the structure shall be located above the high water mark in a City Storm Sewer Easement.

The invert elevation of out flowing pipes shall be angled downstream and installed at sufficient elevation above the predicted stream level for high stream

flow events to prevent backflow into the cleanout structure or the upstream storm sewer system.

Where the outfall of the pipe entering the stream is expected to be below the stream level during high water, a swing-gate (flap-gate) or other approved device shall be installed to prevent backflow into the upstream storm sewer system. All other cleanout structures shall normally be located within the street right-of-way.

7. Headwalls and Debris Racks - Where natural drainages or streams are introduced into piped storm sewers in developed areas, properly designed, grated head walls will be required. Headwalls shall be designed to pass all debris normally encountered in major stream channels. Debris racks or grates may be designed for ditches and other minor channels. Applicable standard details are shown in Oregon Standard Drawings, 2008.
8. Other Miscellaneous Structures – Other storm sewer system structures shall be designed in accordance with standard engineering practice as necessary to accomplish a completed storm water sewer system design. Design details shall be consistent with applicable Oregon Standard Drawings, 2008.
9. Storm Sewer Outfalls - Where storm sewer piping discharges into natural drainages or creeks, satisfactory streambed and bank protection will be required. Flap gates, duckbills or other devices shall be designed to prevent stream flow from backing up the storm drain system flow during flood events.
10. Stream Bed and Stream Banks - In areas of fragile soils, such as decomposed granite, silts or sand, where streams or natural drainages pass through a development within an easement or right-of-way, stream bed and stream bank protection will be required. In other areas, evidence of stable streambed and stream bank conditions shall be required.
11. Alignment and Grade - All storm sewer piping shall be laid on straight line and grade between manholes and catch basins unless otherwise approved by the PWD. The finished pipe alignment and grade shall not exceed 0.04' for deviation from line or 0.02' for grade and any such variation shall not result in a level or reverse sloping pipe invert at any point in the line.

In some instances, if necessary, and if conditions permit, curves in the lines, either vertical or horizontal, may be allowed and must be approved in writing by the PWD during preliminary design phases. In such cases, curves shall be properly anchored, and pipe or joint deflections shall not exceed manufacturer's recommendations.

In all cases, minimum cleaning velocities and pipe grades shall be as required in Section 420.10.03, Hydraulic Design.

12. Stormwater Overflow Structures – Construct per drawings SD-__ or approved equal. Overflow structures must drain to an approved structure.

420.10.05 – Private Storm Drain Systems

All private storm drain system main lines which shall connect to the City storm drain system shall meet the same standards and criteria for design and construction as herein contained in this section. All laterals less than 10” in diameter and within the private development shall meet the requirements of the Uniform Plumbing Code as administered by the State of Oregon.

All storm drain mainlines shall connect to a properly sized catch basin or manhole within the City system. The private storm main shall be designed to be easily cleaned and maintained.

420.20.00 – Quality Assurance

420.20.01 – Construction Staking

Construction staking for the storm sewer system shall normally be accomplished after clearing and grubbing has been completed and the street section has been excavated (cored out). Staking and hubs will be required that define the location, offset distances, pipe diameter, depth of cut and invert elevations of the storm sewer pipe and structures. The Contractor is required to maintain construction staking at his own expense until project completion.

Properly calibrated “pipe lasers”, where used, shall be set to the required grades as shown on the approved plans and used in conjunction with other surveying equipment to lay the pipe to the proper grade and alignment. Alternatively, batter boards and string line, or other approved methods may be set to control pipe invert grades and alignments.

420.20.02 – Inspection

In addition to periodic informal inspections the Public Works Department requires a minimum number of formally requested inspections at the following phases in order to assure that the approved plan requirements and specifications are met:

1. Alignment, grade, bedding, and pipe jointing.
2. Installation of pipe zone material.
3. Backfill operations, including density testing of layers in the variable and upper zones.
4. TV storm drain line prior to paving to ensure proper installation of pipe.

Inspections should be coordinated with the inspector and must be requested by the Contractor at least 24 hours in advance of the required inspection. Arrangements for

inspections during weekends and holidays or after 5:00 PM must be made at least 48 hours in advance.

Requests for Public Works inspection may also be made through the PWD secretary at (541) 664-7602 ext.241.

Also see Section(s) 440.60.00, Cleaning and Flushing and 450.00.00, Testing.

430.00.00 – Storm System Materials

This section describes the materials specific only to the construction of the storm water sewage system. Section 900, Construction Materials describes and specifies the materials commonly used in most phases of City of Central Point, Department of public works projects.

430.10.00 – Pipe Materials

430.10.01 – Polyvinyl Chloride (PVC)

Polyvinyl Chloride (PVC) Pipe and Couplings: When specified, or allowed as an alternate for storm drain pipe construction, (PVC) pipe shall conform to the requirements of ASTM D3034 or ASTM F-789-82. Normally only 12" and 15" diameters will be allowed. Pipe diameters exceeding 15" are not allowed except as approved by the PWD.

Fittings shall conform to the applicable requirements of ASTM D1785, ASTM D 2729, ASTM D2466, ASTM D3034, or ASTM F-789. The minimum SDR shall be 35 and the minimum stiffness shall be 46 psi. Pipe shall have an integral bell and spigot conforming to ASTM – 477 or may be laid with twin gasket couplings. All fittings shall have rubber gasketed joints. Wall thickness for 12" pipe shall not be less than 0.360" and the wall thickness for 15" pipe shall not be less than 0.437".

When perforated (PVC) pipe is specified in the approved plans or is authorized by the PWD, it shall conform to the requirements of ASTM D1785, Schedule 40. Unless otherwise specified, the perforations shall consist of two rows of 2" by ¼" slots transverse to the axis of the pipe.

430.10.02 – High Density Polyethylene (HDPE)

The product supplied under this specification shall be double wall, high density corrugated polyethylene, smooth interior pipe and fittings meeting ASTM D3350 Cell Classification 325420 C and shall meet the following requirements. All (HDPE) pipe and fitting materials shall be able to withstand highway traffic loading with only 1' of cover

and offer strength to withstand embankment heights up to 20' or more. Manning's "n" value for use in design shall not be less than 0.010

Pipe 12" to 48" in diameter shall conform to AASHTO M294-97 Type S.
Pipe 54" and 60" shall meet AASHTO MP7-97.

Watertight joints for closed storm systems. Joints shall be Hancor Sure-Lok WT, ADS Pro-Link WT, or approved equal and shall have joints meeting ASTM 3212 requirements. Rubber gaskets shall be supplied and installed that meet ASTM F477.

430.10.03 – Concrete Pipe

Plain Concrete Pipe: Storm sewer pipe 12" I.D. may be Class III un-reinforced concrete pipe with bell and spigot joints and rubber gaskets, conforming to ASTM C-14. For closed, watertight systems the joint and gasket requirements shall be as described below.

Reinforced Concrete Pipe: Storm sewer pipe 15" I.D. and larger shall be Class III reinforced concrete pipe with bell and spigot joints and rubber gaskets, conforming to the requirements of ASTM C-76. For closed, watertight systems the bell and spigot shall be modified to accept the rubber gaskets and withstand a field test in accordance with ASTM C 969 (leakage allowance of 200 gal./ inch of diameter/mile/day).

Cement Mortar, as required for jointing concrete pipe and for connections to small pipe manholes or catch basins shall conform to the requirements of ASTM C 387, or be proportioned 1 part Portland cement to 2 parts clean plaster sand (100% passing #8 sieve). Admixtures may be used not exceeding the following percentages by weight of cement – hydrated lime 10%, diatomaceous earth or other inert materials – 5%. The mortar shall be of such consistency that it will readily adhere to the pipe. Mortar that has been mixed for more than 30 minutes shall not be used.

Large storm drain manholes where the pipe opening has been formed or cutout to receive pipes larger than 24" shall be sealed with a non-shrink waterproof grout. An 8"X8" collar shall be formed and poured around the connection.

430.20.00 – Trench Bedding, Pipe Zone and Backfill

430.20.01 – Excess Excavated Trench Materials

Unless otherwise established by test borings or test excavation that "rock" as described in Section 330.10.01 exists at the locations of storm sewer mains, laterals or related appurtenances, it shall be assumed that all excavation will be unclassified excavation, and the Contractor shall remove all materials encountered. Excess excavated materials shall be disposed of as set forth in Section 330, of these Standard Specifications.

430.20.02 – Bedding and Pipe Zone Materials

Storm Sewer Pipe – All material used in the bedding and pipe zone areas shall be ¾"-0 crushed rock as described in Section 910.11.00, Trench Backfill and Bedding Aggregate, of these Standard Specifications.

Where incompetent or unstable trench bottoms are encountered, the PWD may authorize over excavation and stabilization of the trench bottom with 4" crushed rock or ballast material as described in section 910.10.03, Sub-base Aggregate or Section 915.00.00, Sub-grade and Trench Reinforcement Rock (ballast) prior to the placement of bedding material.

430.20.03 – Trench Backfill Materials

(a). New Street construction – All storm sewer mains and lateral lines installed within the Rights of Way for newly constructed streets shall be back filled above the pipe zone to the top of sub-grade with ¾"-0 crushed base rock as described in Section 910.11.00, Trench Backfill and Bedding Aggregate, of these Standard Specifications.

(b). Existing Paved Streets and Shoulders – All storm sewer mains and lateral lines installed, repaired or modified within the street section including sidewalks or adjacent shoulders shall be back filled according to Standard Detail T-1. Extending 3' down from finished grade (upper zone), uncompressible 1 sack sand / cement slurry mixture as described in Section 945.00.00, Cement-Sand Slurry, shall be used. Variable zone may be ¾"-0 crushed rock or Cement-Sand Slurry as above. Paving materials shall meet the requirements of Section 925.00.00, Hot Mix Asphaltic Concrete Paving (HMAC). Also refer to Section 350.20.00, Street Cutting including Curbs, Gutters and Sidewalks.

Trenches within the shoulder but not under any portion of the paved street section, Standard Detail T-2, shall be back filled with ¾"-0 crushed rock meeting the requirements of Section 910.11.00, Trench Backfill and Bedding Aggregate.

(c). Natural Ground – Storm sewer mains and lateral lines outside the street Rights of Way may be back filled above the pipe zone with materials described in Section 910.11.01 (g), Trench Backfill Outside of Street R/W.

430.30.00 – Structures

430.31.01 – Manholes

Manholes shall be constructed in accordance Standard Detail(s) SD-1, Manholes for Small Pipe SD-2A, Manholes for Large Pipe. Concrete materials for bases, barrel sections and adjustment rings shall conform to the requirements of Section 930.00.00, Portland Cement Concrete. Pre-cast sections, bases and rings shall meet the permeability requirements set forth in ASTM C 14 and ASTM C 497. Manhole bases

shall be a minimum of 6" thick. If high ground water conditions exist, 2" weep holes may be required above sub-grade, at the discretion of the PWD.

430.32.01 – Catch Basins

Catch basins shall be constructed in accordance with Standard Detail(s) SD-3, Concrete Curb Inlet and SD-4, Type B Inlet. Concrete materials shall conform to the requirements of Section 930.00.00, Portland Cement Concrete. All catch basins shall be constructed with two, 3" dia. PVC pipe weep holes with wire ¼" galvanized wire mesh, located on each side of the box at sub-grade.

430.33.01 – Curb and Gutter Inlets

Curb and Gutter inlets shall normally be pre-cast or constructed in accordance with Standard Detail(s) SD-3, Concrete Curb Inlet. Where applicable, SD-4, Type B Inlets are typically constructed with rolled curbs and gutters. The PWD may require a modified SD-4, Type B inlet without grating. *Stormwater management facility curb inlets shall be constructed in accordance with SD-8, SD-9, SD-10, SD-11, SD-12, or approved equal.* Concrete materials shall conform to the requirements of Section 930.00.00, Portland Cement Concrete.

430.34.01 – Grating

Where required on the plans, grates for curb inlets shall be of bicycle safe, welded frames fabricated as shown Standard Detail SD-5, Curb Inlet B Frame and Grate. Steel materials shall conform to ASTM A 36. Cast iron grates may be substituted pending PWD approval. Grates and frames for other structures shall be designed in accordance with applicable sections of Oregon Standard Specifications for Construction, 2008 and Standard Drawings.

430.40.00 – Miscellaneous Structures

Special Sediment Cleanout Structures – Sediment Cleanout Structures shall be designed in accordance with Standard Detail SD-2B, Storm Sewer Manhole with Sediment Basin using materials described above in Section 430.31.01, Manholes. All manhole cleanout structures shall be constructed with four, 2" dia. PVC pipe weep holes with zinc galvanized wire mesh, located equally around the circumference at street sub-grade.

440.00.00 – Construction and Workmanship

440.10.00 – Trench Excavation, General

It is the intent of these Standard Specifications that the progress of the work shall move forward in a systematic and efficient manner so that as little inconvenience as possible to the public will result during the course of construction.

No work within a City right of way or easement shall commence until the Applicant has applied for and received a Public Works Department “Construction Permit” or unless during emergencies has been authorized by the PWD to conduct such work. Oregon DEQ, DSL, DFW or U.S. COE may also require permits or special conditions when working in or adjacent to stream channels.

Prior to beginning work the Applicant or Contractor shall submit a Traffic Control Plan to the PWD for approval. Prior to beginning work the Contractor shall notify the PWD and the Emergency Dispatch Center of the address, periods of work, road closures and detours and other operations critical to public safety. Applicant shall obtain all utility locates in accordance with OAR 952-001-0010 through 952-001-0100. Call **1-800-332-2344, or dial 811**.

Except by permission of the Public Works Department, at no time shall the trenching equipment be farther than 200' ahead of each pipe laying crew.

Backfill of the trench shall be accomplished so that no section of approved pipe shall be left open longer than 48 – hours unless otherwise authorized by the Public Works Department. Backfill and cleanup in traffic ways including sidewalks shall be completed as each section of pipe has been inspected, tested, and approved. The work site, including “track out” on existing streets shall be cleaned up at the end of each workday.

All construction and trenching operations shall be conducted in a safe manner and in accordance with OR-OSHA requirements.

The Contractor shall promptly repair and re-grade all existing drainage ditches, natural drainage courses and all other drainage facilities, including culverts, damaged or removed during the construction.

The Contractor shall give prompt consideration for reopening street, roads and driveways to the public after the pipe has been installed. No traffic-way shall be closed while work is suspended over weekends or holidays and closures during workdays shall be as brief as practicable.

Provide and maintain any temporary measures needed to promote safe traffic movement over the trench with steel jump plates, cold patching, warning signs or lights, etc. All jump plates shall be secured in place with plate locks on leading edge exposed to traffic

at speed and cold mix A.C or Hot Mix base along all other edges. Cold mix shall be placed in such a manner as to provide a smooth transition from the jump plate to the existing pavement grade.

No trench, on site or off-site, shall be left at any time in an unsafe condition. The permit holder is responsible for and is liable for hazards or damage resulting from the prosecution of the work.

The Contractor shall be required to provide the necessary trained personnel and signing to control traffic for the duration of the project in accordance with MUTCD and ODOT "Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less", 2006 edition.

Where private accesses are to be closed, the property owner(s) shall be notified by the Contractor at least 24-hours in advance of the closure. Access for fire and emergency equipment shall be maintained at all times. Also see Section 350.20.00, Street Cutting including Curbs, Gutters and Sidewalks

440.20.01 – Pavement Removal and Replacement (Street Cuts)

Where new storm sewer lines cross existing pavements, the Contractor shall pre-saw the lines of the pavement or concrete to the full depth of the pavement before attempting to remove the paving or curbs and gutters.

All work shall be done in accordance with Sections 350.20.00, Street Cutting Including Curbs, Gutters and Sidewalks. Paving and concrete materials shall meet the requirements defined Section 930.00.00, Portland Cement Concrete (PCC) and 925.00.00, Hot Mix Asphaltic Concrete Paving (HMAC)

Where the contractor discovers existing water, sewer and utilities lines during his excavation he shall promptly notify the Public Works Department. In accordance with other applicable sections of these Standard Specifications the Contractor at his expense shall be required to support, repair or cause to be repaired, and protect the pipe or utility. If the pipe or utility is not damaged, a "warning mound" of sand shall be placed immediately above the facility to a depth of 12" and marked with a heavy duty, highly visible metallic/ plastic locating tape laid across the full width of the trench before backfilling with the specified materials. The requirements for the plastic locating tape are described in Section 960.00.00, Miscellaneous Materials.

440.25.01 – Alignment and Grade

Trenches shall be excavated to the lines and grades shown on the approved plans and profiles, as staked and as shown on the Standard Detail Sheet(s) T-1 through T- 6, Trench Section unless otherwise specified or shown on the approved plans. The Contractor shall assure that the trench width is adequate to allow bedding material to be placed and tamped beneath the haunches of the pipe up to the spring line. The minimum

trench width for pipes less than 24" in diameter is the outside pipe diameter plus 18". For pipes larger than 24" the trench width shall be the pipe diameter plus 24".

440.25.02 – Rock Excavation

Where "rock" is encountered, as described in Section 330.10.01, it shall be excavated to a depth at least 4" greater than the grade required on the plans or as shown on Sheet T-1 through T-6 of the Uniform Standards.

The trench shall then be back filled to the proper trench grade with ¾"-0 crushed base rock conforming to Section 910.11.00, Trench Backfill and Bedding Aggregate, of these Standard Specifications, and compacted to a minimum of 95% (AASHTO T-180-D). When using explosives for rock excavation the Contractor shall follow all the rules and requirements of Sections 340.11.01, Use of explosives and 340.11.02, Repair of Damage.

440.25.03 – Shoring, Sheet piling and Bracing

The Contractor's "competent person" shall determine all requirements, including but not limited to, equipment, materials, shoring, sheet piling, bracing, trench widths, trench slopes including any methodology or techniques thereof in order to comply with all applicable OR-OSHA provisions and requirements for trench excavation and related activities.

Trench support shall remain in place until the pipe has been placed, inspected, tested, and repaired if necessary; and until the backfill in the pipe zone has been placed and compacted as specified to a minimum of 6" above the top of the pipe.

440.25.04 – Excavated Materials

Where approved excavated materials may be used in the backfill above the pipe zone, for pipes outside the street right-of-way. The excavated materials shall be piled along the trench side by the Contractor's competent person in accordance with OR-OSHA requirements in such a manner that will not endanger the work and or obstruct traffic ways, sidewalks, gutters, storm drains and driveways.

Fire hydrants under pressure, valve boxes, meter boxes, fire and police call boxes, and other utility controls shall not be obstructed, and shall remain accessible at all times.

Gutters shall be left clear or other satisfactory provisions shall be made for street drainage. Natural watercourses shall not be obstructed. If necessary, temporary channels or smaller pipes shall be installed at low water periods to route natural flows around the project area. When excavated materials will not be used for trench backfill, they shall promptly be removed and disposed of as set forth in Section 330.10.02, Disposal of Excess Excavated Soils, and Section 800, Erosion and Sediment Control, of these Standard Specifications. Special permits or conditions may be required by other agencies if working in or adjacent to a stream channel.

440.25.05 – De-Watering

The contractor shall provide and maintain ample means and devices with which to promptly remove and dispose of all water entering the trench excavation during the time that the trench is being prepared for the pipe laying, during pipe laying operations; for such additional time as may be required for the setting or hardening of concrete aprons or other structures; during the times that backfill is being placed, and at such other times as may be specified in Special Specifications. The Contractor shall dispose of the water in a suitable manner without damage, erosion or sedimentation to adjacent property as further described in Section 800, Erosion and Sediment Control.

440.30.00 – Trench Backfill and Bedding

440.30.01 – Trench Bedding

$\frac{3}{4}$ "-0 crushed rock bedding material as specified in Section 910.11.01(d), Pipe Zone, shall be placed the full width of the trench and manipulated so as to uniformly support the pipe on a firm unyielding minimum 4" deep cushion along the full length of the pipe including the bell.

Bell holes shall be excavated in the trench bottom as necessary to obtain the 4" cushion depth of bedding at each pipe joint. Crushed rock bedding shall extend above the bottom of the pipe to the spring-line of the pipe equally on both sides of the pipe so that the pipe is not displaced during backfilling and so that the pipe is fully supported at the specified line and invert grade.

440.30.02 – Pipe Zone Backfill

Upon approval of alignment and grade of the pipe, $\frac{3}{4}$ "-0 crushed rock as specified in Section 910.11.00, Trench Backfill and Bedding Aggregate, shall be carefully placed in lifts not exceeding 6" in depth on both sides of the pipe from the spring line up to 6" above the pipe, and shall be thoroughly compacted, equally, on both sides of the pipe so that the pipe is not deformed or displaced either vertically or laterally from grade during tamping.

Pipe zone material installed above the pipe may be mechanically tamped provided an adequate cushion is maintained to prevent damage, deformation or contact with the pipe.

440.30.03 – Backfill above the Pipe Zone

Within the street Right of Way, above the pipe zone, backfill conforming to the requirements of Section 910.11.00, Trench Backfill and Bedding Aggregate and as illustrated by Standard Detail T-1 through T-6, Trench Section, shall be placed and compacted in lifts not exceeding 8" in depth. The PWD may authorize the installation of

increased lift thickness where high frequency vibrators mounted on large excavators are used. In all cases, the backfilled trench sections shall be compacted to the following densities:

On new street sections from finish sub-grade elevation (*upper zone*) to the top of the variable zone or 6" above the top of pipe, whichever is less, the ¾"-0 crushed rock backfill above the pipe zone shall be compacted to a minimum of 95% of maximum density (AASHTO T-180 D). On existing streets the upper zone backfill section is measured as 36" from finished pavement to the top of the pipe zone since there usually is not a layer of sub-base material being placed. From the top of the pipe zone to a level 36" below the top of sub-grade (variable zone), the ¾"-0 crushed rock backfill above the pipe zone shall be compacted to a minimum of 90% of maximum density (AASHTO T-180 D).

Under all existing paved street sections, a 1 sack cement-sand slurry mix conforming to Section 945.00.00, Cement-Sand Slurry shall be used as backfill in the upper zone as shown on Standard Detail T-1.

Outside the Street Right of Way – Unless otherwise directed backfill above the pipe zone shall be placed in lifts not exceeding 12" in depth and compacted to the following densities:

From the top of the pipe zone to finish grade, the backfill above the pipe zone shall be compacted to a minimum of 90% of maximum density. AASHTO Methods T- 180 A-D shall be used in accordance with the type of backfill material installed. The type of backfill material used may be approved select native material, ¾"-0 crushed rock or decomposed granite. Muck, vegetative material, or other incompetent materials shall not be installed.

440.30.04 – Concrete Cap and Concrete Encasement

Concrete Cap - On all pipes where the total cover is less than 24" and where otherwise required on the plans, a concrete cap, with materials conforming to Section 930.00.00, Portland Cement Concrete (PCC), shall be poured from 2" below the spring line of the pipe to a minimum of 6" above the top of the pipe, and to the full width of the pipe trench. A 6-mil plastic membrane shall be placed next to the pipe to prevent adhesion of the concrete. See Section 420.10.04, Facility Design for minimum cover requirements for Reinforced Concrete Pipe.

Concrete Encasement – Where shown on the plans or as required by the PWD, a concrete encasement, with materials conforming to Section 930.00.00, Portland Cement Concrete (PCC), shall be formed and poured with a minimum thickness of 6" around all sides of the pipe. A 6-mil plastic membrane shall be placed next to the pipe to prevent adhesion of the concrete.

440.30.05 – Backfill for Manholes, Catch Basins, Inlet and similar Structures

Back fill for these applications shall be accomplished in the same manner with materials and to the same standards as backfill for pipe trenches.

440.35.00 – Installation of Storm Sewer Pipe and Fittings

440.35.01 – Distribution of Materials

Material shall be distributed on the job no faster than it can be used to good advantage. Pipe which cannot be physically lifted by workmen from the trucks hauling the pipe shall be unloaded by a forklift or other approved means in a manner that will not damage the pipe.

No pipe of any size or type shall be dropped from the bed of the truck to the ground or otherwise mishandled. No more than one week's supply of pipe material shall be distributed to the site in advance of placement, unless approved by the Engineer. All piping materials, manholes, pre-cast curb inlets and other fittings shall be protected from breakage, contamination and weathering.

440.35.02 – Preparation

All pipe and fittings shall be inspected by the Contractor or his authorized representative before being lowered into the prepared trench to insure that no cracked, broken, or defective pipe, fittings or pre-cast units are being used in the work. The ends of the pipe shall be cleaned thoroughly with a brush, or other approved means, when necessary to remove concrete splatter, soil and other foreign material. Extreme care shall be exercised to insure that the inside surfaces of the bell or coupling are smooth and free from any projections or deformity which would interfere with the assembly or water tightness of the joint.

Foreign matter and dirt shall be removed from the inside of pipe before it is lowered into the trench, and it shall be kept clean by approved means during and after placement.

440.35.03 – Handling

Proper implements, tools and facilities shall be provided and used by the Contractor for the safe and proper protection of the work. All pipe and pre-cast units shall be carefully lowered into the trench in such a manner as to avoid any physical damage. Under no circumstances shall concrete pipe be dropped or dumped into the trenches. All deformed or damaged pipe, pre-cast units and fittings or said items suspected of damage, will be plainly marked as "damaged" or "defective", rejected and shall be removed from the job site.

440.35.04 – Line and Grade

It will be required that storm sewer piping be laid on straight line and grade between manholes unless otherwise approved by the PWD. The finished pipe alignment and grade shall not exceed 0.04' for deviation from line or 0.02' for grade and any such variation shall not result in a level or reverse sloping pipe invert at any point in the line. Minimum cover shall not be less than 3' unless otherwise approved by the PWD.

440.45.00 – Placement and Jointing of Pipe

Unless otherwise directed, all pipes shall be laid upgrade with the bell end facing in the direction of placement.

440.45.01 – Concrete, PVC and HDPE Pipe

Pipe and fittings conforming to the materials described in Section 430, Storm System Materials above, shall be laid and jointed in strict accordance with the manufacturer's recommendations, as approved by the Public Works Department and in accordance with the requirements of the approved plans and Detail Specifications. The Contractor shall provide all special tools and devices such as special jacks, chokers, clamps and similar items required for the installation. Lubricant for the pipe gaskets shall be furnished or recommended by the pipe manufacturer and shall be non-petroleum based.

Prior to joining of pipe the bell and spigot shall be wiped clean and no dirt shall remain in the barrel. The rubber gasket and spigot end shall be properly lubricated and installed to assure a watertight joint.

After the joint has been made, the pipe shall be aligned and checked for grade. The trench bottom shall form a continuous and uniform bearing and support for the pipe at every point between joints. Sufficient pressure shall be applied in making the joint to assure that the joint is "home" as defined in the standard installation instructions provided by the pipe manufacturer.

To assure proper pipe alignment and joint make-up, sufficient pipe zone material shall be placed to secure the pipe from movement before the next joint is installed. The contractor shall take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the back filling operation.

The Contractor shall take the necessary precautions required to prevent excavated or other foreign material from getting into the pipe during the laying operation. At all times when laying operations are not in progress, at the close of the day's work, or whenever the workmen are absent from the job, the open end of the last laid section of pipe shall be closed and blocked to prevent entry of foreign material or creep of the gasketed joints.

440.45.05 – Cutting Pipe

The cutting of pipe for inserting fittings, couplings or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe so as to leave a smooth end at right angles to the axis of the pipe.

Acceptable methods of cutting pipe are sawing with a band or powered hacksaw or with a portable, gasoline engine driven abrasive saw.

When pipe is cut in the field, it shall be cut as recommended by the pipe manufacturer, and the cut end shall be ground back or dressed as recommended by the pipe manufacturer and approved by the Public Works Department.

440.60.00 – Cleaning and Flushing

440.60.01 – Cleaning

The Contractor shall be required to remove all forms, sand, gravel, dirt and other debris from the catch basins including the street, and, curb and gutter sections before flushing the storm water sewer system. The removed material shall be swept up, loaded and removed from the street section. In no case shall the material or debris be flushed down the system.

440.60.02 – Flushing

Upon cleaning as described above, the Contractor shall flush the street, curbs and gutter, catch basins and storm water sewer system with clean water with sufficient velocity to remove dirt and silt from the system. Flushing shall be done in the presence of the inspector.

450.00.00 –Testing

450.00.01 – Storm Water System Infiltration Testing Requirement

The contractor shall be required to perform a test to determine the water tightness of the storm system. Such test shall measure the inflow rate of ground water penetration into the pipe between catch basins. The test shall be performed in the presence of the inspector during a surface dry street condition with no water flowing in the gutter.

The performance standard is as follows:

**0.002 gal. / Inch of I. D. pipe diameter / foot of pipe length / hour
(As converted to gallons per minute)**

Formula:

$$\frac{0.002xDxLxT}{60}$$

Where:

0.002 = Flow rate in gallons per inch of pipe diameter

D = Pipe diameter in inches

L = Length of pipe run being tested

T = Time in hours

60 = Converts to minutes

Example: A 48" diameter pipe 100' in length.

$(0.002) (48) (100) = 11.904$ gal. Per hour / 60 = .1984 GPM. Flow rate is 0.2 GPM rounded up.

Field test is based on Oregon Standard Specifications for Construction, 2008, Section 00445.70, Finishing, Clean Up and Testing.

450.00.02 – Methodology

The Contractor shall provide the methods and equipment to properly conduct the test. The upstream end of the pipe or pipe system to be tested shall be sufficiently blocked or sealed to prevent inflow of water from the preceding section. The downstream opening of the pipe section where the test is conducted shall be partially blocked with no seepage to provide a means of collecting the water. An adequate container or other means shall be provided to collect and measure the outflow of water.

SECTION - 500
SANITARY SEWER
SYSTEM

500 – SANITARY SEWER SYSTEM

500.00.00 – Scope

This section shall include but not be limited to all items of work necessary for, and incidental to the planning, survey, design and construction of the sanitary sewage system or systems as may be owned or administered by the Rogue Valley Sewer Services (RVSS) within dedicated City of Central Point rights-of-ways or easements, or as may be dedicated to the City of Central Point or RVSS. This section shall also apply to private sanitary sewage systems insofar as they may affect the sanitary sewer system through connection.

This work shall also include any appurtenances, such as curb, gutter sidewalk, pavement removal and replacement; trench excavation and backfill, providing and installing sanitary sewer pipe and fittings, connection to existing sanitary sewers; providing and installing manholes and cleanouts; and testing, of the new sanitary sewage system.

It shall be the responsibility of Applicants, Engineers or Contractors to visit the site of the proposed work and become fully acquainted with the conditions relating to the construction, so that they fully understand the facilities, restrictions, and difficulties involved in the construction work proposed under the Contract or development. They shall satisfy themselves as to the quantities involved, including materials, equipment, and labor.

It shall be the responsibility of the Applicant(s) or Engineer(s) to obtain the necessary permits and approvals from RVSS, City, State and Federal agencies prior to performing any construction activities within City limits.

510.00.00 – General

The sanitary sewer system including all sewer mains, lateral piping, manholes and pumping stations are owned and administered by the Rogue Valley Sewer Services (RVSS). This section shall be limited to the City of Central Point, Public Works Department requirements that are coincidental to construction of sanitary sewer facilities within a City of Central Point right-of-way or City easement. Generally, all technical aspects of design, construction, approvals, inspections and testing of sanitary sewers shall be conducted by RVSS.

510.10.02 – References

Rogue Valley Sewer Services (RVSS) current standards and requirements

Oregon Administrative Rules (OAR) and Oregon Revised Statutes (ORS) current standards and revisions, including plumbing codes as may apply to Sanitary Sewer Systems.

Oregon Department of Environmental Quality (DEQ) current standards and revisions as may apply to Public Sanitary Sewer Systems.

Oregon Health Department (OHD) current standards and revisions as may apply to Public Sanitary Sewer Systems and Public Water Systems.

City of Central Point Municipal Code (CPMC) as may apply to sewer facilities, but as limited by RVSS ownership and administration of said Sanitary Sewer Systems.

City of Central Point Public Works Standards and Specifications as may apply to any related and coincidental street, water system, and storm sewer construction.

520.00.00 – Design Standards

520.10.00 – General

It shall be the responsibility of the Engineer to coordinate the design of the sanitary sewer with any existing or proposed water system facilities, storm water systems, and streets including any appurtenances. The Engineer and/or Applicant shall be responsible to investigate the area of the project and obtain all required approvals and permits from RVSS, Public Works Department, Jackson County, and State of Oregon with respect to construction of sanitary sewer systems. The Engineer may use information that has formerly been established by the City and is on file, including previous construction. The sanitary sewer system design shall be in conformance with RVSS requirements and specifications, including any applicable provisions of the Oregon Plumbing Code, Oregon DEQ, and Oregon OHD.

520.10.01 – Minimum Design Requirements

1. All requirements as set forth by the Rogue Valley Sewer Services.
2. Sanitary sewers shall be located 10' north or 10' east of centerlines of streets.
3. Minimum depth of sewer lines in the street right-of-way shall be such that service connections will have a minimum cover of 3' at the property line.
4. Ductile iron pipe, or concrete embedding and encasement for backfill shall be required at all crossings of streams, natural drainages and irrigation canals.
5. Separation - Separation between water system facilities and sanitary sewer facilities shall be in accordance with current Oregon Health Division Rules for Public Water Systems, Chapter 333 except that in all cases where running

parallel with each other, there shall be a 10' separation (centerline to centerline) between water and sewer facilities. See Section 600, Water System for additional requirements.

6. Crossings – Crossings of water and sanitary sewer lines shall be in accordance with current Oregon Health Division Rules for Public Water Systems, Chapter 333 except that where sewer lines cross water lines, a minimum clearance of 1.5' will be required between the pipes. In cases where vertical separation of pipes may not be obtained, concrete encasement and/or support of the pipe shall be made. See Section 600, Water System for additional requirements.
7. Existing Utilities – See Section 540.10.01
8. Approvals – All construction requires approval by the PWD prior to issuance of a Public Works Permit for Construction within a City right-of-way or easement, whether existing or proposed as part of residential or commercial development. Plans for sanitary sewer design and construction submitted for acceptance by the PWD, shall be first approved by RVSS and if applicable, Oregon DEQ. Plans will be then be reviewed for acceptance by the PWD to assure that no conflicts with other City facilities are present and that plans will accommodate future development. All technical requirements for sanitary sewer design and construction will be reviewed by RVSS.

520.20.00 – Quality Assurance

520.20.01 – Construction Staking

Construction staking for the storm sewer system shall normally be accomplished after clearing and grubbing has been completed and the street section has been excavated (cored out). Staking and hubs will be required that define the location, offset distances, pipe diameter, depth of cut and invert elevations of the sanitary sewer pipe and structures.

520.20.02 – Inspection

Inspection of sanitary sewer construction by Public Works Department will be limited to the following:

1. Backfill operations, including density testing of layers in the variable and upper zones above the pipe zone.
2. Final grading, including pavement or concrete replacement.

Inspections shall be conducted by Public Works Department personnel during normal business hours of 8:00 AM to 5:00 PM. Inspections must be requested by the Contractor 24 hours in advance of the required inspection. Requests for Public Works inspection

may be made through the PWD secretary at (541) 664-7602 ext.241. Arrangements for inspections during weekends and holidays must be made at least 48 hours in advance.

RVSS will conduct inspection of the following phases in order to assure that the approved plan requirements and specifications are met:

1. Alignment, grade, bedding, and pipe jointing.
2. Installation of pipe zone material.
3. Testing and videotaping of sanitary sewer pipe installation.
4. Testing and Certification of manholes.

RVSS may be contacted at 541-779-4144. Also see Section 550.00.00, Testing.

530.00.00 – Sanitary Sewer System Materials

530.00.01 – General

All sanitary sewer piping materials including pipe zone materials shall be those specified and required by RVSS. Section 900, Construction Materials describes and specifies the materials commonly used in trench backfill phases (above the pipe zone) of City of Central Point, Department of public works projects.

530.10.00 – Trench Bedding, Pipe Zone and Backfill

530.10.01 – Excess Excavated Trench Materials

Unless otherwise established by test borings or test excavation that “rock” exists at the locations of sanitary sewer lines, laterals or service connections, it shall be assumed that all excavation will be unclassified excavation, and the Contractor shall remove all materials encountered. Excess excavated materials shall be disposed of as set forth in Section 330, of these Standard Specifications.

530.10.02 – Trench Backfill Materials

1. New Street construction – Per RVSS requirements
2. Existing Paved Streets and Shoulders – All sanitary sewer mains and lateral lines installed, repaired or modified within the street section including sidewalks or adjacent shoulders shall be back filled according to Standard Detail T-1. Extending 3’ down from finished grade (upper zone), uncompressible 1 sack sand / Cement slurry mixture as described in Section 945.00.00, Cement-Sand Slurry, shall be used. Variable zone and pipe zone may be per RVSS requirements. Paving materials shall meet the requirements of Section

925.00.00, Hot Mix Asphaltic Concrete Paving (HMAC). Also refer to Section 350.20.00, Street Cutting Including Curbs, Gutters and Sidewalks. Trenches within the shoulder but not under any portion of the paved street section shall be back filled with ¾"-0 crushed rock meeting the requirements of Section 910.11.00, Trench Backfill and Bedding Aggregate.

3. Natural Ground – Sanitary sewer mains and lateral lines outside the street Rights of Way may be back filled above the pipe zone with materials per RVSS requirements.

530.20.00 – Structures

530.20.01 – Manholes

Manholes shall be constructed in accordance with standards and specifications set forth by RVSS.

540.00.00 – Construction and Workmanship

540.10.00 – Trench Excavation, General

It is the intent of these Standard Specifications that the progress of the work shall progress in a systematic and efficient manner so that as little inconvenience as possible to the public will result during the course of construction.

No work within a City right of way or easement shall commence until the Applicant has applied for and received a Public Works Department “Construction Permit” or unless during emergencies has been authorized by the PWD to conduct such work.

Prior to beginning work the Applicant or Contractor shall notify the PWD and dispatch center of the address, periods of work, road closures and detours and other operations critical to public safety. Applicant shall obtain all utility locates in accordance with OAR 952-001-0010 through 952-001-0100. Call **1-800-332-2344, or dial 811.**

Except by permission of the Public Works Department, at no time shall the trenching equipment be farther than 200' ahead of each pipe laying crew.

Backfill of the trench shall be accomplished so that no section of approved pipe shall be left open longer than 48 – hours unless otherwise authorized by the Public Works Department. Backfill and cleanup shall be completed as each section of pipe has been inspected, tested, and approved.

All trench excavation operations shall be conducted in a safe manner in accordance with OSHA requirements as administered by the State of Oregon.

The Contractor shall promptly repair and re-grade all existing drainage ditches, natural drainage courses and all other drainage facilities, including culverts, damaged or removed during the construction.

The Contractor shall give prompt consideration for reopening street, roads and driveways to the public after the pipe has been installed. No traffic-way shall be closed while work is suspended over weekends or holidays. Closures during workdays shall be as brief as practicable.

The Contractor shall be required to provide the necessary trained personnel and signing to control traffic for the duration of the project in accordance with MUTCD and "Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less", 2006 edition. Where private accesses are to be closed, the property owner(s) shall be notified by the Contractor at least 24-hours in advance of the closure. Access for fire and emergency equipment shall be maintained at all times. Also see Section 350.20.00, Street Cutting including Curbs, Gutters and Sidewalks.

540.10.01 – Pavement Removal and Replacement (Street Cuts)

Where new sanitary sewer lines cross existing pavements, the Contractor shall pre-saw the lines of the pavement or concrete to the full depth of the pavement before attempting to remove the paving or curbs and gutters.

All work shall be done in accordance with Sections 350.20.00, Street Cutting Including Curbs, Gutters and Sidewalks. Paving and concrete materials shall meet the requirements defined Section 930.00.00, Portland Cement Concrete (PCC) and 925.00.00, Hot Mix Asphaltic Concrete Paving (HMAC)

Where the contractor discovers existing water, sewer and utilities lines during his excavation he shall promptly notify the Public Works Department. In accordance with other applicable sections of these Standard Specifications the Contractor at his expense shall be required to support, repair or cause to be repaired, and protect the pipe or utility. If the pipe or utility is not damaged, a "warning mound" of sand shall be placed immediately above the facility to a depth of 6" and marked with a heavy duty, highly visible plastic strip laid across the full width of the trench before backfilling with the specified materials. Such plastic strip shall meet the requirements of 960.00.00, Miscellaneous Materials.

540.10.02 – Rock Excavation

When using explosives for rock excavation, the Contractor shall follow all the rules and requirements of Sections 340.11.01, Use of Explosives, and 340.11.02, Repair of Damage.

540.10.03 – Shoring, Sheeting and Bracing

In trenches excavated in sand, gravel, or sandy or silty soil, or wherever necessary to prevent caving or trench side failures, the Contractor shall adequately shore, sheet, and brace the trench walls. Where sheeting and bracing are used, trench widths shall be increased accordingly.

Trench support shall remain in place until the pipe has been placed, inspected, tested, and repaired if necessary; and until the backfill in the pipe zone has been placed and compacted as specified to a minimum of 6" above the top of the pipe.

All cages, sheeting, shoring and bracing or alternative excavation methods shall conform to the requirements of OSHA as administered by the State of Oregon or other appropriate authority having jurisdiction over such matters.

540.10.04 – Excavated Materials

Where approved excavated materials may be used in the backfill above the pipe zone, for pipes outside the street right-of-way. The excavated materials shall be piled along the trench side in a manner that will not endanger the work, obliterate construction staking and/or obstruct traffic ways, sidewalks and driveways.

Fire hydrants under pressure, valve boxes, meter boxes, fire and police call boxes, and other utility controls shall not be obstructed, and shall remain accessible at all times.

Gutters shall be left clear or other satisfactory provisions shall be made for street drainage. Natural watercourses shall not be obstructed. If necessary, temporary channels or smaller pipes shall be installed at low water periods to route natural flows around the project area. When excavated materials will not be used for trench backfill, they shall promptly be removed and disposed of as set forth in Section 330.10.02, Disposal of Excess Excavated Soils, and Section 800, Erosion and Sediment Control, of these Standard Specifications.

540.10.05 – De-Watering

The contractor shall provide and maintain ample means and devices with which to promptly remove and dispose of all water entering the trench excavation during the time that the trench is being prepared for the pipe laying, during pipe laying operations; for such additional time as may be required for the setting or hardening of concrete aprons or other structures; during the times that backfill is being placed, and at such other times as may be specified in Special Specifications. The Contractor shall dispose of the water in a suitable manner without damage, erosion or sedimentation to adjacent property as further described in Section 800, Erosion and Sediment Control.

540.20.00 – Trench Backfill and Bedding

540.20.01 – Trench Bedding

Trench bedding requirements shall be as required by RVSS.

540.20.02 – Pipe Zone Backfill

Pipe zone requirements shall be as required by RVSS.

540.20.03 – Backfill above the Pipe Zone

Within the street Right of Way, above the pipe zone, backfill conforming to the requirements of Section 910.11.00, Trench Backfill and Bedding Material and as illustrated by Standard Details T-1 thru T-6, Trench Section, shall be placed and compacted in lifts not exceeding 8" in depth. The PWD may authorize the installation of increased lift thickness where high frequency vibrators mounted on large excavators are used. In all cases, the backfilled trench sections shall be compacted to the following densities:

On new street sections from finish sub-grade elevation (*upper zone*) to the top of the variable zone or 6" above the top of pipe, whichever is less, the ¾"-0 crushed rock backfill above the pipe zone shall be compacted to a minimum of 95% of maximum density (AASHTO T-180 D). On existing streets the upper zone backfill section is measured as 3' from finished pavement to the top of the pipe zone since there usually is not a layer of sub-base material being placed.

From the top of the pipe zone to a level 3' below the top of sub-grade (*variable zone*), the ¾"-0 crushed rock backfill above the pipe zone shall be compacted to a minimum of 90% of maximum density (AASHTO T-180 D).

Under all existing paved street sections a 1 sack cement-sand slurry mix as conforming to Section 945.00.00, Cement-Sand Slurry shall be used as backfill in the upper zone as shown on Standard Detail T-1.

Outside the Street Right of Way – Unless otherwise directed backfill above the pipe zone shall be placed in lifts not exceeding 12" in depth and compacted to the following densities:

From the top of the pipe zone to finish grade, the backfill above the pipe zone shall be compacted to a minimum of 90% of maximum density. AASHTO Methods T- 180 A-D shall be used in accordance with the type of backfill material installed. The type of backfill material used may be approved select native material, ¾"-0 crushed rock or decomposed granite. Muck, vegetative material, or other incompetent materials shall not be installed.

540.20.04 – Concrete Cap and Concrete Encasement

Concrete Cap - On all pipes where the total cover is less than 24" and where otherwise required on the plans, a concrete cap, with materials conforming to Section 930.00.00, Portland Cement Concrete (PCC), shall be poured from 2" below the spring line of the pipe to a minimum of 6" above the top of the pipe, and to the full width of the pipe trench. A 6-mil plastic membrane shall be placed next to the pipe to prevent adhesion of the concrete.

Concrete Encasement – Where shown on the plans or as required by the PWD, a concrete encasement, with materials conforming to Section 930.00.00, Portland Cement Concrete (PCC), shall be formed and poured with a minimum thickness of 6" around all sides of the pipe. A 6-mil plastic membrane shall be placed next to the pipe to prevent adhesion of the concrete.

540.20.05 – Backfill for Manholes, Catch Basins, Inlet and Similar Structures

Back fill for these applications shall be accomplished in the same manner with materials and to the same standards as backfill for pipe trenches.

540.30.00 – Installation of Sanitary Sewer Pipe and Fittings

With the exception of 540.30.01, Distribution of Materials, all other aspects of sanitary sewer pipe installation shall be as required by RVSS.

540.30.01 – Distribution of Materials

Material shall be distributed on the job no faster than it can be used to good advantage. Pipe which cannot be physically lifted by workmen from the trucks hauling the pipe shall be unloaded by a forklift or other approved means.

No pipe of any size or type shall be dropped from the bed of the truck to the ground or otherwise mishandled. No more than one week's supply of pipe material shall be distributed to the site in advance of placement, unless approved by the Engineer. All piping materials, manholes, ring sections and other fittings shall be protected from breakage, contamination and weathering.

550.00.00 – Testing

550.10.01 – Sanitary Sewer Testing Requirements

The contractor shall be required to perform all testing of sanitary sewer pipe including testing and certification of manholes as required by RVSS and Oregon DEQ.

(This page intentionally left blank)

SECTION - 600
WATER SYSTEM

600 – WATER SYSTEM

600.00.00 – Scope

This section shall include but not be limited to all items of work necessary for and incidental to the planning, survey, design and construction of the City of Central Point water system or systems as may be administered by the City within dedicated City rights-of-ways or easements, or as may be dedicated to the City. This section shall also apply to private water systems insofar as they may affect the city water system through connection.

This work shall also include any appurtenances, such as pavement removal and replacement, trench excavation and backfill, providing and installing water pipe and fittings, connection to existing lines; providing and installing line valves and valve boxes, providing and installing fire hydrant assemblies, providing and installing end drain assemblies (blow-off valves), providing and installing air relief valves, providing and installing water service connections, installing necessary and incidental thrust blocking; and testing, flushing and chlorinating of the new system.

It shall be the responsibility of Applicants, Engineers or Contractors to visit the site of the proposed work and become fully acquainted with the conditions relating to the construction, so that they fully understand the facilities, restrictions, and difficulties involved in the construction work proposed under the Contract or development. They shall satisfy themselves as to the quantities involved, including materials, equipment, and labor.

610.00.00 – General

610.10.01 – References

American Water Works Association (AWWA) Standards, current or updated editions.

Oregon Administrative Rules (OAR) and Oregon Revised Statutes (ORS) current revisions as may apply to Public Water Systems and Cross Connection Control.

American Association of State Highway Transportation Officials, AASHTO, “Standard Methods of Test”

American Public Works Association (APWA), 2009. “Standard Specifications for Public Works Construction”.

American Concrete Institute (ACI)

Ductile Iron Pipe Research Association (DIPRA)

City of Central Point Municipal Code (CPMC) as may apply to Public Water Systems and Cross Connection Control.

Medford Water Commission (MWC)

City of Central Point Public Works Standards and Specifications as may apply to water systems, related construction and cross connection control.

Oregon Occupational Safety and Health Division (OR-OSHA) Rules and Regulations as they may apply to water systems, related construction and cross connection control.

State of Oregon, Manual of Uniform Traffic Control Devices (OMUTCD) current requirements, including, "Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less", 2011 edition.

610.10.02 – Tables

- 600-1 Restrained Joints
- 600-2 Service Connection Materials
- 600-3 Bolt Torque Loads
- 600-4 Pipe Deflection

620.00.00 – Design Standards

The purpose of these standards is to provide a consistent design policy under which the physical aspects of water system design, plan preparation and related construction can be brought to completion.

This section contains design standards and specifications to ensure the safe and efficient operation of the City water system including cross connection control and elimination. The requirements in this section are established as minimum standards to follow and apply to both new construction and reconstruction of all City water storage and delivery systems.

Designs shall consider the existing water system, master plans, neighborhood plans and approved tentative plans. The Applicant, engineer and contractor shall provide the necessary testing, exploration, survey and research to adequately design water system facilities, which will connect to and be a part of, or an extension of the City water system.

All requirements of the Oregon State Plumbing Specialty Code and the Oregon State Health Department, as they pertain to Public Water Systems, shall be strictly adhered to. **All materials supplied shall meet the requirements of the One Hundred Eleventh Congress Senate Bill 3874 (S. 3874), the Reduction of Lead in Drinking Water Act.** All materials shall be manufactured in the USA, unless otherwise approved by the PWD.

620.10.00 – Minimum Design Requirements

620.10.01 – Location

Water lines shall normally be located 10' south or 10' west of centerline of streets. The longitudinal placement of water lines and valves within the intended vehicle wheel path shall be avoided.

Exceptions to these requirements may be made in order to avoid cutting and replacing pavement, to avoid conflicts with other existing underground facilities and to permit sanitary sewers to be installed on the low sides of streets. As nearly as practical, mains shall be installed in the same relative location on a particular street with the distance from the centerline of the street being varied as little as possible.

Mains shall not be installed in alleys and the installation of mains within easements across privately owned property is to be done only when absolutely necessary such as the avoidance of dead-end conditions. Such easements, when required, shall be a minimum of 15' in width except that the Public Works Department may require additional widths for major trunk lines and multiple utility easement locations. Easements where required, shall be located adjacent to property lines of a single property and shall not straddle property lines. Conditions of the easement shall include provisions that the property included in the easement shall not be used for any purpose which would interfere with the unrestricted use for water system purposes including the maintenance, repair, construction or re-construction of such. Under no circumstances will the City grant permission for the construction of any building or structure of any type excluding fences within the easement.

620.10.02 – Separation of Facilities

Separation of water mains, including service lines, and sanitary sewers shall be in accordance with current Oregon State Health Division Rules OAR 333-061-0050(9), figure 1, and/or as modified in these Standards except in all cases where running parallel with each other, there shall be a minimum 10' separation unless otherwise approved by the Public Works Department.

Excepting sanitary sewers as noted above, the minimum horizontal spacing between water mains and storm sewers, gas lines, electrical utilities, shall be 5' horizontally and 12" vertically as measured from the outside of the pipe or conduit. Separation between other public utilities such as Gas, TV or Telephone and similar utilities shall be as determined by the individual utility company or franchisee.

In all cases where utilities cross in close proximity to one another, a cement sand slurry shall be required for separation between any city lines and any utility. In some cases, depending on size and type of facility, concrete bridging piers or supports will be required to span the water facility. The vertical spacing at sewer crossings shall be designed and constructed in accordance with OAR 333-061-0050(9).

620.10.03 – Minimum Water Main and Pipe Sizing

The minimum size for distribution lateral water mains in residential areas shall be 8". The minimum size in multiple-dwelling, commercial and industrial areas shall be 12" except that in the sole discretion of the Public Works Department, 8" lateral lines may be allowed if flows meet domestic and fire protection needs in the area. Where fire demands or line losses might demand larger sized pipe, the Engineer will be required to submit hydraulic computations to support the use of 8" pipe, or to establish the size required.

In certain cases, such as cul-de-sacs, where water lines will not be extended, where not more than 10 dwelling units are to be served, and no fire hydrants are to be served by the line, a 6" diameter water line may be approved, at the discretion of the PWD.

Where no fire hydrants are served, and no more than 5 dwelling units are served, a 4" diameter water line may be approved, at the discretion of the PWD, where the line length will be less than 200'.

620.10.04 – Minimum Cover

Unless otherwise approved by the Public Works Department (PWD), the minimum and standard depth for water lines shall be 36" from **top of AC** (finish grade) to the top of the water line as measured at the bell portion of the pipe.

620.10.05 – Reinforced Flow

All water distribution systems, including lateral mains, shall be designed for reinforced flow (looped system) wherever possible. The installation of permanent dead end mains shall be avoided. Looping shall be defined as a minimum distance of 500' between mainline connections.

620.10.06 – Fire Hydrant Location and Spacing

Fire hydrants shall be located outside the curb return at street intersections or as nearly as possible. The centerline of the fire hydrant shall normally be set to the correct bury depth within the Right-of-Way, 12" behind the sidewalk but in no case shall any part of the hydrant be less than 2" behind the sidewalk. In the absence of sidewalk or curb, the centerline of the hydrant shall be set 12" inside the Right of Way. The minimum length of bury shall be 3-1/2' and the hydrant shall be adjusted so that the bottom of the flange is approximately 1" above the back of sidewalk or ground line. See Standard Detail Sheet W-3 Fire Hydrant for additional detail.

Fire Hydrant locations, spacing, and demand criteria will be determined by Fire District No. 3, and approved by the City. The minimum required spacing between fire hydrants shall be 300'. The maximum distance from a fire hydrant to the rear of a commercial building shall be 150'. The minimum flow shall be 1000 – GPM.

620.10.07 – Service Connections

Except as described in Section 630.55.00 below, minimum size piping for service connections shall be 1" diameter. Service connection pipe sizes and meter sizes for multiple dwelling units, commercial, and industrial services shall be established in conformance with "Fixtures Demands Curves", as set forth in the Oregon State Plumbing Specialty Code. Meters shall not be installed in driveways, sidewalks or other traffic areas unless circumstances make it unavoidable. In this instance, placement of meters shall be at the discretion of the PWD.

Service connection angle stops that require height adjustment (to fit meter into meter box) after final Public Works inspections, will be adjusted at developer/owner expense.

620.10.08 – Gate and Butterfly Valves

Valve sizes shall normally be sized the same as the mains in which they are to be installed unless otherwise approved.

Gate valves and / or butterfly valves shall normally be located at street intersection Tees or Crosses. There shall be a sufficient number of valves so located that not more than 3 valves must be operated to affect any one particular shut-down, and the spacing of valves shall be such that the length of any one shut-down in high value areas shall not exceed 800' nor 1,200' in other areas. As a minimum, tee intersections shall be valved in at least 2 branches and a cross intersection shall be valved in at least 3 branches to provide the most efficient method of isolating line when shutting down for repair or connection. Major trunk lines shall have in-line valves spaced not less than every 2000' and where practical every 1300'.

Water lines located or stubbed out for planned future extension is serving more than 4 dwelling units shall have a gate valve and cap installed to minimize shut down periods. Tees shall be flange x mechanical joint. The connection between the tee and the valve shall be a flange connection. The valve shall be a flange x mechanical joint valve. If a Foster adapter is used, then the rest of this paragraph does not apply.

Where the connection of the valve to the tee in the street is impossible or impractical, the valve shall be located at the extension of the right-of-way line. Such line shall be restrained if dead-ended. Valves shall be located in such a manner that each section of line may be isolated for repair or maintenance while leaving contiguous sections served by the reinforced (looped) system.

620.10.09 – Air and Vacuum Relief

To the extent possible the water system shall be designed to avoid the need for air relief valves. Where water lines will be constructed in hilly areas, air and vacuum valves, pressure air valves, combination air valves, or universal air valves will be required and shall be located at the high points in the system. Blow-off assemblies will be required as directed by the Public Works Department at dead end lines or lines to be extended in the future.

620.10.10 – Fire Hydrant Retention

Fire hydrant assemblies shall be thrust block anchored unless mechanically retained with “megalug” ® or approved equal retainers in accordance with Public Works Standards and Specification. Refer to Standard Detail W-3, Fire hydrant.

620.10.11 – Joint Retention

Dead-end water lines or waterlines to be extended shall be mechanically retained with “Megalug” ® restrained glands or approved equal, in accordance with the following table:

Table 600-1

<u>Pipe Diameter</u>	<u>Minimum Length of Pipe With Restrained Joints</u>
4"	24'
6"	34'
8"	45'
10"	54'
12"	64'

620.10.12 – Sewer Crossings

Sewer crossings shall be designed and installed in accordance with current Oregon Health Division requirements defined in OAR 333-061-0050(9), unless modified by this section or as otherwise approved in writing by the Public Works Department.

In Situations where a water line or service line and a sanitary sewer lateral cross, the separation between the two shall be as follows:

- a) Wherever possible, the bottom of the water line shall be 1-1/2' or more above the top of the sewer line and one full length of the water line shall be centered at the crossing.
- b) Where the water line crosses over the sewer line but with a clearance of less than 1-1/2', the sewer line shall be exposed to the sewer line joints on both sides of the crossing to permit examination of the sewer pipe. If the sewer pipe is in good condition, and there is no evidence of leakage from the sewer line, the 1-1/2' separation may be reduced to 8". The contractor must center one length of water line at the crossing. If the Public Works Department determines that the conditions are not favorable or finds evidence of leakage from the sewer line, the sewer line shall be replaced with a full length of PVC pressure pipe, AWWA Standard C900 or ductile iron Class 54 (AWWA-151) pipe.
- c) Where water line crosses under the sewer line, the Contractor shall expose the sewer line for examination by the Public Works Department as indicated in (b) of this section. If conditions are favorable and there is no evidence of leakage from

the sewer line, the sewer line may be left in place, but must be supported with a reinforced concrete beam for preventing of settlement when it spans the water line trench, and special precautions must be taken to assure that the backfill material over the waterline in the vicinity of the crossing is thoroughly tamped in order to prevent settlement which could result in the leakage of sewage. If the Public Works Department determines that conditions are not favorable or finds evidence of leakage from the sewer line, the provisions of (b) of this section shall apply.

- d) In all cases where the existing sewer pipe consists of concrete, "Orangeburg" or other similar types of pipe material it shall be replaced with shall be replaced with a full length of PVC pressure pipe, AWWA Standard C900 or ductile iron Class 54 (AWWA-151) pipe centered at the crossing so that any joints will be at least 9' from the crossing or to the edge of the City right-of-way whichever is less.

Whenever a sanitary sewer is uncovered and the sewer pipe leaks or is broken, then ductile iron water pipe, Class 54, PVC pressure pipe, or sewer pipe conforming to AWWA Standard C900 must be used to replace the sewer pipe. One full length of the ductile iron pipe or PVC pipe shall be centered at the water pipeline crossing so that the joints of both pipes shall be at least 9' from the crossing centerline. Care must be taken to assure smooth inverts at the new sewer joints. All repairs including labor, pipe materials; backfill, pavement and other street materials shall be at Contractors expense.

620.10.13 – Creek and Waterway Crossings

The channel at the crossing of any horizontal angle shall be defined as the highest elevation of the stream bank or the 100-year flood elevation datum whichever is less.

Ductile iron pipe conforming to AWWA C151, thickness Class 54 shall be used for all creek or waterway crossings whether buried or exposed. At a minimum, all pipes through the crossing including a full length of pipe at either side of the channel shall be mechanically restrained using materials conforming to Section 630.11.04, Restrained Joint Pipe. All vertical or horizontal bends shall be thrust blocked and anchored as specified in Section 640.35.05, Thrust Blocking and as shown on Standard Detail(s) W-1 and W-2 of these Standards.

No valves, blow-off assemblies or similar facilities shall be located in any creek or waterway channel. However, the blow-off outlet or pipe may be directed to the channel where directed or otherwise shown on the plans.

620.10.14 – Valve Installation Depth

Where the water line depth and valve installation causes the operating nut to be greater than 30" below finish grade, a valve operating nut extension shall be supplied and installed. The top of the extension shall not be less than 12" nor more than 30" from finish grade. See standard drawings W-14 and W-18

620.10.15 – Corrosive Soil Requirements

The Engineer shall conduct initial soil tests within the planned area of water line system construction to determine the presence of soils or electrolytic compounds that have the ability or potential ability to corrode the water line system including mains, lateral lines, service lines, valves, couplings and other components which may be affected.

Soil sampling, analysis and remediation shall be conducted in accordance with the requirements set forth in ANSI/AWWA C105/A21.5-99, American National Standard for Polyethylene Encasement For Encasement of Ductile Iron Pipe Systems including applicable provisions of Appendix A, Notes on Procedures for Soil Survey Tests and Observations and their Interpretation to Determine Whether Polyethylene Encasement Should be Used. **Also, soil resistivity measurements shall be performed in accordance with ASTM G57, Standard Test Method for Field Measurement of Soil Resistivity Using Wenner Four-Electrode Method.**

620.20.00 – Quality Assurance

620.20.01 – Construction Staking

Construction staking for the water system shall normally be accomplished after clearing and grubbing has been completed and the street section has been excavated (cored out). Staking and hubs will be required that define the location, offset distances, pipe diameter, depth of cut and invert elevations of the water pipe and fittings.

620.20.02 – Inspections, General

In addition to periodic informal inspections the Public Works Department requires a minimum of formally requested inspections at the following phases in order to assure that the approved plan requirements and specifications are met:

1. Bedding, pipe jointing, alignment and grade.
2. Installation of pipe zone material.
3. Backfill operations including density testing of layers in the variable and upper backfill zones.

Inspections should be coordinated with the inspector and must be requested by the Contractor at least 24 hours in advance of the required inspection. Arrangements for inspections during weekends and holidays must be made at least 48 hours in advance.

Requests for Public Works inspection may also be made through the PWD secretary at (541) 664 -7602 ext.241.

Also see Section 650, Inspections, Testing and **Disinfection** for detailed requirements.

630.00.00 – Water System Materials

630.10.00 – Pipe Materials

All water system piping, with the exception of service laterals less than 3” in diameter and mainline over 12”, shall be ductile iron Class 54 pipe, or as required by the PWD. **All water system piping over 12” diameter, shall be a thickness or class approved by the PWD.** All creek crossings shall have a standard minimum Class 54 wall thickness. All piping shall be as manufactured by United States Pipe & Foundry Company **or** by Pacific States Cast Iron Pipe Company or approved equal.

630.10.01 – Certifications

All piping and materials to be incorporated into a City project or to be dedicated to the City shall be legibly marked and / or stamped in accordance with AWWA standards. The Public Works Department may require additional documentation such as invoices or factory records to substantiate the quality, **Country of origin** or types of materials being installed.

630.11.01 – Mechanical Joint Pipe

Mechanical joint pipe shall be standard thickness cement-mortar lined conforming to the requirements of AWWA C104. Joints shall conform to AWWA C111 and shall be as manufactured by United States Pipe & Foundry Company or Pacific States Cast Iron Pipe Company or approved equal. Joint accessories shall be furnished with the pipe by the manufacturer. Bolts shall be low-alloy steel or ductile iron in accordance with AWWA C111.

630.11.02 – Push-On Joint Pipe

Push-on ductile iron pipe shall be standard thickness cement-mortar lined conforming to the requirements of AWWA C104. The rubber ring gasket shall be suitable for the specified pipe sizes and pressures and shall be furnished with the pipe. A non-toxic vegetable soap lubricant shall be supplied in sufficient quantities for installing the furnished pipe.

630.11.03 – Flanged Joint Pipe

Flanged joint ductile iron pipe shall be thickness Class 54 and conform to AWWA C151. The pipe shall be cement-mortar lined conforming to the requirements of AWWA C104. Bolts and installation shall be in accordance with Appendix A of AWWA C115. Gaskets shall be red rubber, 1/8” thickness, meeting the requirements of ANSI/AWWA, A21.11-00, Appendix A. Flanges shall be ductile iron unless otherwise noted on the approved detail specifications and plans.

630.11.04 – Restrained Joint Pipe

Restrained joint pipe shall conform to AWWA C 151 and be thickness Class 54 cement-mortar lined conforming to the requirements of AWWA C104. The pipe shall be furnished with spigot ends and push-on joint bells suitable for transmitting the thrust created by a dead end condition based on diameter and minimum pressure of 150 psi. Mechanical joint pipe shall be restrained by ductile iron MEGALUG® restraint assemblies as manufactured by EBAA Iron, ROMAGRIP by ROMAC, or an approved equal. Restrained push-on joints shall be Perma-lock as manufactured by Pacific States Cast Iron Pipe Company or approved equal. The minimum number of setscrews by size of gland shall be as follows:

4" - 2	14" - 10
6" - 3	16" - 12
8" - 4	18" - 12
10" - 6	20" - 12
12" - 8	24" - 16

630.11.05 – Poly Pigs

“Poly-Pigs” shall be constructed of open cell polyurethane foam conforming to municipal series, bare type 5-7 lbs per cu. ft. density. Plugs shall have the ability to negotiate through all fittings normally encountered in municipal water systems.

630.12.00 – Corrosion Inhibiting Pipe Materials

Corrosion inhibiting materials for encasement of ductile iron pipe shall meet the requirements set forth in ANSI/AWWA C105/A21.5-99, American National Standard for Polyethylene Encasement For Encasement of Ductile Iron Pipe Systems.

630.20.00 – Valves

630.20.01 – Gate Valves and Tapping Valves (4” through 12”)

Gate valves and tapping valves for use as line valves and as auxiliary valves for fire hydrant assemblies shall be cast-iron body, bronze-mounted, resilient-seated valves with a full rubber encapsulated wedge and floating stem nut. Interior coating shall be hot-applied fusion-bonded type epoxy conforming to the performance standards of AWWA C550.

Valves shall have non-rising stems with “0” – ring seals and 2” square operating nuts, and shall open when turned counter clockwise. All valves with mechanical joint connections shall be furnished with glands and gaskets, and ductile iron nuts and bolts, glands, and gaskets. All valves shall have the manufacturer’s initials, pressure rating and year of manufacture cast in the body. All gate valves shall conform to AWWA C509.

Gate valves manufactured by the Mueller Company, the Kennedy Valve Company, or an approved equal, will be accepted.

630.20.03 – Butterfly Valves (Valves larger than 12”)

Butterfly Valves, with the exception of 12” tapping valves, shall conform to the above specification for large gate valves. All valves larger than 12” shall be butterfly valves.

Butterfly valves shall be short-bodied flanged or wafer type, or shall have mechanical joints. They shall be epoxy coated and of lined, rubber seated type conforming to AWWA C504, Class 150 B, and shall be iron body valves.

Butterfly valves shall be suitable for direct burial, and shall have direct burial, totally enclosed, fully gasketed, grease-packed integral manual operators, with 2” square operating nuts. The valves shall open counter clockwise, and the minimum number of turns from open to closed position shall be not less than 2 turns for each inch of valve size. Valves shall be designed to withstand submersion in water to a pressure of 10-psi.

Butterfly valves which are manufactured by the Kennedy Valve Company and Mueller Company, or approved equal, will be accepted. Flanges for gate valves and butterfly valves shall be drilled in accordance with ANSI – 125 lb. Standard. Mechanical joints shall conform to AWWA C111. The minimum number of turns from closed to open position shall be not less than 2 turns per inch of valve size.

630.20.04 – Valve Boxes

Valve boxes shall be the three piece sliding adjustable “Medford” type consisting of a top section, cover and extension. The top section shall be cast-iron, and shall be similar and equal to the type as manufactured by East Jordan Iron Works or Tyler. The top section shall be 15” in length and 6” inside diameter. The cover shall be labeled “Water”, shall fit the valve box snugly and shall not rock on its seat. The valve box extension shall be 6” outside diameter well casing steel pipe and 12-gage or heavier wall thickness. The extension shall be within 8” of finished grade. **8mil plastic shall be wrapped around the joint between the valve can bottom and the well casing. This is required so that slurry backfill does not infiltrate this joint and cement it together.**

630.20.05 – Valve Operating Nut Extensions

Where required, valve operating nut extensions that meet the depth requirements shown on the plans or as required by the PWD shall be supplied by the valve manufacturing company. Where the valve manufacturing company cannot supply the extensions, they may be fabricated according to Standard Detail W-14.

630.25.00 – Ductile Iron Fittings

630.25.01 – Mechanical Joint Fittings

Mechanical joint cast or ductile iron fittings shall conform to AWWA C153. Cement-mortar lined is required on all fittings. Joints shall conform to AWWA C111. Joint accessories shall be furnished with fittings. T-bolts shall be of domestic origin, high strength, low-alloy Cor-Ten steel or ductile iron in accordance with ANSI/AWWA C111/A21.11-90. Unless otherwise noted, the pressure rating shall be 250 psi.

The weights of mechanical joint fittings shall be as designated in the standard tables included in AWWA C153. The weights of joint accessories shall not be included as a part of the weight of the fittings.

Fittings shall be as manufactured by Tyler, Trinity Valley, U.S. Pipe, Pacific States Pipe, American, Griffin, Union Foundry, or an approved equal.

630.25.02 – Push-On Joint Fittings

Push-on joint ductile iron fittings shall conform to AWWA C153. Joints shall conform to AWWA C111 for push-on rubber gasket joints and shall be “TYTON ®” as manufactured by United State Pipe & Foundry Company and others or approved equal.

No plain end fittings will be allowed in restrained joint conditions. Unless otherwise noted, the pressure rating shall be 250 psi. Joint gaskets, including gasket lubricant, shall be furnished with the fittings. Cement-mortar lining is required on all fittings. Fittings shall be as manufactured by Tyler, Trinity Valley, U.S. Pipe, Pacific States Pipe, American, Griffin, Union Foundry, or an approved equal.

630.25.03 – Flanged Fittings

Flanged cast or ductile iron fittings shall conform to AWWA C153. Flanges shall have bolt circles and bolt holes matching those of ANSI B16.1. Unless otherwise noted, the pressure rating shall be 250 psi.

Bolts for joining cast iron flanges shall be carbon steel of at least Grade 3 with American Standard Regular unfinished hexagon heads and the nuts shall be of steel with American Standard Regular hexagon dimensions, all as specified in American Standard Wrench Head Bolts and Nuts (ANSI B18.2). Bolts and nuts shall be cadmium plated in sizes to and including 7/8” diameter.

All bolts and nuts shall be threaded in accordance with American Standard for Screw Threads (ANSI B1.1), Course Thread Series, Class 2A and 2B fit. Fittings must be cement-mortar lined in accordance with AWWA C104. Fittings shall be as manufactured by Tyler, Trinity Valley, U.S. Pipe, Pacific States Pipe, American, Griffin, Union Foundry, or an approved equal.

Gaskets shall be red rubber, 1/8" thickness, meeting the requirements of ANSI/AWWA, A21.11-00, Appendix A.

630.25.04 – Compact Ductile Iron Fittings

Mechanical joint ductile iron compact fittings shall conform to AWWA C153. Joints shall conform to AWWA C111. Joint accessories shall be furnished with the fittings. Bolts shall be of domestic origin, high strength, low-alloy steel or ductile iron in accordance with AWWA C111. The pressure rating shall be 350 psi. Fittings must be cement-mortar lined in accordance with AWWA C104. Fittings shall be as manufactured by Tyler, Trinity Valley, U.S. Pipe, Pacific States Pipe, American Griffin, Union Foundry, or an approved equal.

630.30.00 – Fire Hydrant Assemblies

Fire hydrant assemblies shall include the MJ Swivel Tee for dry connection and Tapping Sleeve with flange connection for wet taps. Use the MJ x MJ Gate Valve for dry connections and the FL x MJ Tapping Valve for wet taps. Included also in the assembly is the Valve Box, 6" ductile iron pipe, the fire hydrant, and all thrust blocking or "MEGALUG"® restraints, as detailed on Standard Detail Sheet W-3.

630.30.01 – Fire Hydrants

Fire hydrants shall be of the compression type conforming to AWWA C502, and shall have 5-1/4" valve opening with 6" mechanical joint end connection. The hydrant shall open when turned counter clockwise and shall have two 2-1/2" hose nozzles and one 4-1/2" pumper nozzle. The nozzles and operating nut shall be National Standard.

All hydrants shall have corrosion resistance protection on the interior of the hydrant shoe, coating shall conform to corrosion resistance protection on the interior to the hydrant shoe, and coating shall conform to AWWA C550.

The hydrants shall be painted a chrome yellow color, and shall be equipped with a safety break flange located above the ground line. The depth of bury of the hydrants shall be such that when the hydrant is set at the grade indicated on the Plans that the ground line marked on the hydrant shall be at the sidewalk or ground surface. Only the following hydrants will be accepted:

Mueller – Super Centurion 250
Kennedy – Guardian K-81
Waterous – Pacer

630.30.02 – Auxiliary Valve and Valve Box

Valve shall be as detailed, and as described in section 630.00.00, Fire Hydrant Assemblies above. Valve boxes shall conform to section 630.20.04, Valve Boxes above.

630.35.00 – End Drain Assembly (Blow-Off)

630.35.01 – Valve Boxes, Vaults and Cover

Valve boxes for End Drain Assemblies shall as described in section 630.20.04, Valve Boxes. Refer to Standard Details W-9A through W-10b

630.35.02 – Blow-Off Valve

Blow-off valves shall be a 2" gate valve with resilient seats, galvanized threaded fittings and a 2" square-operating nut. **Permanent** blowoff valves shall be furnished **per Standard Drawing W-9B**.

630.35.03 – Ductile Iron Pipe and Plug

The ductile iron pipe and fittings shall conform to sections 630.10.00, Pipe Materials and Section 630.25.00, Ductile Iron Fittings.

630.40.00 – Tapping Sleeves, Tapping Saddles, Couplings

630.40.01 – Tapping Sleeves (4" through 12")

Tapping saddles for 4" through 12" pipe shall be 202NS or approved equal. See Table 600-2.

Tapping sleeves for pipe sizes 4" through 12" diameters shall be SST ROMAC(flange connection), or an approved equal.

Only stainless steel tapping sleeves will be accepted on D.I. pipe, unless otherwise approved by PWD. All sleeves shall have a test plug.

630.40.02 – Tapping Sleeves / Tapping Saddles (14" and larger)

Tapping saddles for 14" pipe and larger shall be 202NS or approved equal.

Tapping sleeves for 14" pipe and larger shall be Romac FTS420, Smith Blair 622, Ford FTS or approved equal. Fabricated steel tapping sleeves shall be coated with a minimum of 8 to 12 mils of fusion-bonded epoxy. Fabricated steel sleeves shall be furnished with grade 304 stainless steel bolts and nuts. All sleeves and saddles shall have test plug.

All connections to live City water systems shall be made by the Public Works Department or a contractor that is authorized by the Public Works Department to make the live connection. In such cases, a public works inspector shall be present during the live tap.

630.40.03 – Couplings

All couplings shall meet current AWWA Standards. All center and end rings shall be ductile or cast iron on 4" and larger pipe and meet acceptable ASTM Standards except where specifically stated otherwise. Gaskets shall be made of materials compounded for water service. Nuts and bolts shall be corrosion resistant, mastic coated, high strength, low-alloy steel with heavy hex nuts, meeting requirements of AWWA C111. Couplings shall be as manufactured by Romac or approved equal.

630.45.01 – Poly-vinyl chloride (PVC) Pipe and Fittings

Poly-vinyl chloride (PVC) Pipe and Fittings shall be Schedule 80 PVC pipe with standard fittings as detailed.

630.50.00 – Air Relief Valve Assemblies

630.50.01 – 1" (For Mains and Laterals up to 30" in diameter)

Air relief valves shall be A.R.I. air valve (D-040), as shown on standard detail sheet W-4, or approved equal. Armorcast P6000486 10x20x12 meter box and lid will be used for this application.

630.50.02 – 2" (Mains larger than 30")

Air relief valves shall be A.R.I. air valve (D-040), as shown on standard detail sheet W-4. Armorcast P6000486 10x20x12 meter box and lid will be used for this application.

630.55.00 – Service Connections

This section covers single box service connection materials for ¾" through 3" residential and commercial / industrial service connections installed concurrent with new water system construction. Also refer to Standard Detail Sheets W-5, W-6 and W-7 and for additional parts and assembly.

Service taps to existing live water mains shall be made by the Public Works Department or a city authorized contractor. Minimum City service tap shall be 1" diameter.

Where uninterrupted service is required to a public facility under constant use such as a motel, restaurant or hospital, **and the meter size is 2" or larger**, the Applicant **must install a lockable** service bypass line. **This minimizes** delays of service during periods of repair or maintenance. **The bypass must be inspected and approved by Public Works.** Also, refer to Section 630.56.00, Backflow Prevention Assemblies.

630.55.01 – Service Line Parts and Accessories

Service connection parts and accessories accepted by the Public Works Department are required as follows unless otherwise approved prior to installation or in conjunction with construction plan approval:

Table 600-2 Service Connection Materials

Meter Size (inch)	City Service Piping Size/Type	Corporation Stop (no pack joints allowed)	Angle Meter Valve (No Ball Valves) (no pack joints allowed)	Meter Box & Lids	Customer Meter Valve (with handles)
¾"	1" Municipex (requires tracer wire 14ga. Solid core UF(blue) (see note 7,8)	300psi Ball corp, cc inlet, CTS comp outlet. Mueller- 300 B25008N Ford- FB 1000-4-Q McDonald- 74701BQ1 Use 202NS saddle if applicable	1"x¾" 300psi ball angle Mtr valve CTS comp X Mtr swivel Mueller- 300 B24258N Ford- BA43-342W-Q-NL McDonald- 74602BQ (1"x3/4"x3/4")	Armorcast Rotocast polyethylene 12X20 box or approved equal. Solid cover with touch pad hole. Doubles use B-24 fiberglass box and lid TRPL(Armorcast, Fiberlyte or approved equal)(3)	300psi Ball valves meter swivel X FIP Mueller- 300-B24351N Ford- B13-332W McDonald- 76101MW
1"	1" Municipex (requires tracer wire 14ga. Solid core UF(blue) (see note 7,8)	300psi Ball corp, cc inlet, CTS comp outlet. Mueller- 300 B25008N Ford- FB 1000-4-Q McDonald- 74701BQ1 Use 202NS saddle if applicable	1"x1" 300psi ball angle Mtr valve CTS comp X Mtr swivel Mueller- 300 B24258N Ford- BA43-444W-Q-NL McDonald- 74642BQ1	Armorcast Rotocast polyethylene 12X20 box or approved equal. Solid cover with touch pad hole. Doubles use B-24 sized fiberglass box and TRPL lid (Armorcast, Fiberlyte or approved equal) (3)	300psi Ball valves meter swivel X FIP Mueller- 300-B24351N Ford- B13-332W McDonald- 76101MW
1-½"	2" Sch. 80 PVC/Tracer wire required 14ga. Solid core UF (blue)	2" Mueller 2360 resilient wedge gate valve, or appr. equal, w/ Std. 2" sq. operating nut, 2" FIP X FIP Requires ROMAC 202NS double strap tapping saddle w/ 2" cls nipple.	1-½" 300psi Ball angle meter valves FIP X meter flange. Requires 2" to 1-½" male adapter and reducer. Mueller- 300-B-24286N Ford- BFA13-666W McDonald- 746048	Armorcast Rotocast polyethylene 17X30 box or approved equal. Solid cover with touch pad hole. (3)	1-½" 300psi Ball valves meter flange X FIP. 1-½" Gasket Incl. all nuts and bolts. Mueller- 300-B24337N Ford- BF13-666W McDonald- 76101MW
2"	2" Sch. 80 PVC/Tracer wire required 14ga. Solid core UF (blue)	2" Mueller 2360 resilient wedge gate valve, or appr. equal, w/ Std. 2" sq. operating nut, 2" FIP X FIP Requires ROMAC 202NS double strap tapping saddle w/ 2" cls nipple.	See Standard Drawing W-6A	Armorcast Rotocast polyethylene 17X30 box or approved equal. Solid cover with touch pad hole. (3)	See Standard Drawing W-6A
3"	4" DI	4" Mueller 2300 resilient Gate Valve, or approved equal, flange X MJ. As specified in 630.20.01 above w/ 4" tapping sleeve. See also dwg W-15	4" Mueller 2300 resilient Gate Valve, or approved equal, MJ X MJ. As specified in 630.20.01 above w/4" tapping sleeve. See also dwg W-15.	Utility Vault minimum size 4.5' X 9'. See also dwg W-15	4" Mueller 2300 resilient Gate Valve, or approved equal, MJ X MJ. As specified in 630.20.01 above w/ 4" tapping sleeve. See also dwg W-15

NOTES:

1. Dual ¾" services shall be in a B24 sized polyethylene box(except in sidewalks) with lid drilled for touch read meter system. Service trees not allowed. 1meter per service line
2. Traffic rated lids will be required in driveway areas.
3. In areas where meter box will be set in sidewalk, concrete Christy B12,B24 or B36 boxes will be required, wrapped with 8mil plastic.
4. All materials supplied shall meet the requirements of One Hundred Eleventh Congress Senate Bill 3874 (S. 3874), the Reduction of Lead in Drinking Water Act.
5. Dielectric unions will be placed behind customer meters by City of Central Point forces, when required.
6. Services that are bored will require a 2" schedule 40 sleeve for a 1" service, and a 4" schedule 40 sleeve for 2" services.
7. Substitutes for Municipex may be approved upon review by the City of Central Point Public Works Department.
8. Municipex requires use of stiffener/insert at all joints.
9. All ball valves and AMV's shall be full port.

630.56.00 – Backflow Prevention Assemblies

All backflow prevention assemblies and shutoff valves installed in connection with the City of Central Point water system shall be on the current Oregon Health Authority, Drinking Water Section, “Approved Backflow Prevention List”. All installations shall be in accordance with CPMC 13.20, applicable OHD requirements, and current Oregon Plumbing Specialty Codes.

630.60.00 – Trench, Bedding, Pipe Zone and Backfill

630.60.01 – Excess Excavated Trench Materials

Unless otherwise established by test borings or test excavation that “rock” exists at the locations of water lines, service connections or hydrant, it shall be assumed that all excavation will be unclassified excavation, and the Contractor shall remove all materials encountered. Excess excavated materials shall be disposed of as set forth in Section 330, of these Standard Specifications.

630.60.02 – Bedding and Pipe Zone Materials

- (a). Water System Mains – All material used for backfill in the bedding and pipe zone areas shall be ¾”-0 crushed rock base as described in Section 910.11.00, Trench Backfill and Bedding Aggregate, of these Standard Specifications.

Where incompetent or unstable trench bottoms are encountered, the Public Works Department may authorize over excavation and stabilization of the trench with 4” crushed rock as described in section 910.10.03, Sub-base Aggregate or Section 915.00.00, Sub-grade and Trench Reinforcement Rock(ballast) prior to the placement of bedding material.

- (b). Service Lines – The bedding and pipe zone material around service lines up to 2” in diameter shall be clean or reject sand as described in Section 910.11.01 (c), Bedding for Water Service Lines and Utilities. Decomposed granite, pea gravel and red cinders, are not approved and shall not be used.

1” Services that are bored shall be sleeved in 2” schedule 40, 2” services that are bored shall be sleeved in 4” schedule 40.

630.60.03 – Trench Backfill Materials

- (a). New Street construction – All water mains and service lines installed within the Rights of Way for newly constructed streets shall be back filled above the pipe zone to the top of sub-grade with ¾”-0 crushed base rock as described in Section 910.11.00, Trench Backfill and Bedding Aggregate, of these Standard Specifications.

- (b). Existing Paved Streets and Shoulders – All water mains and service lines installed, repaired or modified within the street section including sidewalks or adjacent shoulders shall be back filled according to Standard Detail T-1. Extending 3' down from finished grade (upper zone), uncompressible 1 sack sand / cement slurry mixture as described in Section 945.00.00, Cement-Sand Slurry, shall be used. Variable zone may be $\frac{3}{4}$ "-0 crushed rock or Cement-Sand Slurry as above. Paving materials shall meet the requirements of Section 925.00.00, Hot Mix Asphaltic Concrete Paving (HMAC). Also refer to Section 350.20.00, Street Cutting Including Curbs, Gutters and Sidewalks.

Trenches within the shoulder but not under any portion of the paved street section, Standard Detail T-2, shall be back filled with $\frac{3}{4}$ "-0 crushed rock meeting the requirements of Section 910.11.00, Trench Backfill and Bedding Aggregate.

- (c). Natural Ground – Water mains and service lines outside the street Rights of Way may be back filled above the pipe zone with materials described in Section 910.11.01 (g), Trench Backfill Outside of Street R/W.

640.00.00 – Construction Requirements and Workmanship

640.10.00 – Trench Excavation, General

It is the intent of these Standard Specifications that the progress of the work shall progress in a systematic and efficient manner so that as little inconvenience as possible will result to the public during the course of construction.

No work within a City right of way or easement shall commence until the Applicant has applied for and received a Public Works Department “Construction Permit” or unless during emergencies has been authorized by the PWD to conduct such work.

Prior to beginning work the Applicant or Contractor shall submit a Traffic Control Plan to the PWD. The Contractor shall notify the PWD, and Emergency Dispatch Center (Central Point Police Department) when directed by the PWD, of the address, periods of work, road closures and detours and other operations critical to public safety. Applicant shall obtain all utility locates in accordance with OAR 952-001-0010 through 952-001-0100. Call **1-800-332-2344, or dial 811**. Also refer to Section 140.30.00, Traffic Control.

Except by permission of the Public Works Department, at no time shall the trenching equipment be farther than 200' ahead of each pipe laying crew.

Backfill of the trench shall be accomplished so that no section of approved pipe shall be left open longer than 48 – hours unless otherwise authorized by the Public Works Department. Backfill and cleanup shall be completed as each section of pipe has been inspected, tested, and approved.

All trench excavation operations shall be conducted in a safe manner in accordance with OSHA requirements as administered by the State of Oregon (OROSHA).

The Contractor shall repair and re-grade all existing drainage ditches, natural drainage courses and all other drainage facilities, including culverts, damaged or removed during the construction.

The Contractor shall give prompt consideration for reopening street, roads and driveways to the public after the pipe has been installed. No traffic-way shall be closed while work is suspended over weekends or holidays and closures during workdays shall be as brief as practicable.

Provide and maintain any temporary measures needed to promote safe traffic movement over the trench with steel jump plates, cold patching, warning signs or lights, etc. All jump plates shall be secured in place with plate locks on leading edge exposed to traffic at speed and cold mix A.C or Hot Mix base along other edges. Cold mix shall be placed such a manner as to provide a smooth transition from the jump plate to the existing pavement grade.

No trench, on site or off-site, shall be left at any time in an unsafe condition. The permit holder is responsible for and is liable for hazards or damage resulting from the prosecution of the work.

The Contractor shall be required to provide the necessary personnel and signing to control traffic for the duration of the project in accordance with MUTCD and ODOT "Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less", 2006 edition.

Where private accesses are to be closed, the property owner(s) shall be notified by the Contractor at least 24-hours in advance of the closure. Access for fire and emergency equipment shall be maintained at all times. Also see Section 350.20.00, Street Cutting including Curbs, Gutters and Sidewalks.

640.20.01 – Pavement Removal and Replacement (Street Cuts)

Where new water lines cross existing pavements, the Contractor shall pre-saw the lines of the trench sides to the full depth of the pavement before attempting to remove the paving or curbs and gutters.

All work shall be done in accordance with Sections 350.20.00, Street Cutting including Curbs, Gutters and Sidewalks, and 350.20.02, Curb, Gutter and Sidewalk Cuts. Paving and concrete materials shall meet the requirements defined Section 930.00.00, Portland Cement Concrete and 925.00.00, Hot Mix Asphaltic Concrete Paving (HMAC).

Where the contractor discovers un-located existing water, sewer and utilities lines during his excavation, he shall promptly notify the Public Works Department and OUNC. In accordance with other applicable sections of these Standard Specifications the Contractor at his expense shall be required to support, repair or cause to be repaired,

and protect the pipe or utility. If the pipe or utility is not damaged, a mound of sand shall be placed immediately above the facility to a depth of 12" and marked with a heavy duty, highly visible highly visible metallic/ plastic locating tape laid across the full width of the trench before backfilling with the specified materials. The requirements for the metallic/plastic locating tape are described in Section 960.00.00, Miscellaneous Materials.

640.25.01 – Alignment and Grade

Trenches shall be excavated to the lines and grades shown on the Plans and Profiles, as staked and as shown on the Standard Detail Sheet T-1 through T-6, Trench Section unless otherwise specified or shown on the approved plans. The minimum trench width for pipes less than 24" in diameter is the outside pipe diameter plus 18".

640.25.02 – Rock Excavation

Where "rock" is encountered, as described in Section 330.10.01(b), it shall be excavated to a depth at least 4" greater than the grade required by Sheet T-1 of the Uniform Standards.

The trench shall then be back filled to the proper trench grade with $\frac{3}{4}$ "-0 crushed base rock conforming to Section 910.11.00, Trench Backfill and Bedding Aggregate of these Standard Specifications, and compacted to a minimum of 95% (AASHTO T-180-D). When using explosives for rock excavation, the Contractor shall follow all the rules and requirements of Sections 340.11.01, Use of Explosives and 340.11.02, Repair of Damage.

640.25.03 – Shoring, Sheet piling and Bracing

The Contractor's "competent person" shall determine all requirements, including but not limited to, equipment, materials, shoring, sheet piling, bracing, trench widths, trench slopes including any methodology or techniques thereof in order to comply with all applicable OR-OSHA provisions and requirements for trench excavation and related activities.

Trench support shall remain in place until the pipe has been placed, inspected, tested, and repaired if necessary; and until the backfill in the pipe zone has been placed and compacted as specified to a minimum of 6" above the top of the pipe.

640.25.04 – Excavated Materials

Where approved excavated materials may be used in the backfill above the pipe zone, for pipes outside the street section. The excavated materials shall be piled along the trench side by the Contractor's "competent person" in accordance with OR-OSHA requirements in such a manner that will not endanger the work and or obstruct traffic ways, sidewalks, gutters, storm drains and driveways.

Fire hydrants under pressure, valve boxes, meter boxes, fire and police call boxes, and other utility controls shall not be obstructed, and shall remain accessible at all times.

Gutters shall be left clear of all debris, silt, and gravel and not allowed to enter the storm drain sewer system. Natural watercourses shall not be obstructed. When excavated materials will not be used for trench backfill, they shall promptly be removed and disposed of as set forth in Section 330.10.02, Disposal of Excess Excavated Soils, and Section 800, Erosion and Sediment Control of these Standard Specifications. Special permits or conditions may be required by other agencies if working in or adjacent to a stream channel.

640.25.05 – De-Watering

The contractor shall provide and maintain ample means and devices with which to promptly remove and dispose of all water entering the trench excavation during the time that the trench is being prepared for the pipe laying, during pipe laying operations; for such additional time as may be required for the setting or hardening of thrust blocks; during the times that backfill is being placed, and at such other times as may be specified in Special Specifications. The Contractor shall dispose of the water in a suitable manner without damage, erosion or sedimentation to adjacent property as further described in Section 800, Erosion and Sediment Control.

640.30.00 – Trench Backfill

640.30.01 – Trench Bedding

$\frac{3}{4}$ "-0 crushed rock bedding material as specified in Section 910.11.00, Trench Backfill and Bedding Aggregate, shall be placed the full width of the trench and thoroughly tamped so as to uniformly support the pipe on a firm unyielding minimum 4" deep cushion along the full length of the pipe including the bell.

Bell holes shall be excavated as necessary to obtain the 4" cushion depth of bedding at each pipe joint. Bedding shall extend above the bottom of the pipe to approximately one – third of its outside diameter, and shall be thoroughly tamped – equally on both sides of the pipe so that the pipe is not displaced during tamping, and so that the pipe is fully supported at the specified line and invert grade.

In certain cases where the depth of trench exceeds 8' in depth, is safety hazard, and where heavy sub-surface water flow is present the Public Works Department may authorize the use of clean, washed 1" rock (pea gravel) bedding beneath the pipe.

640.30.02 – Pipe Zone Backfill

$\frac{3}{4}$ "-0 crushed rock pipe zone backfill as specified in Section 910.11.00, Trench Backfill and Bedding Aggregate, shall be carefully placed in lifts not exceeding 6" in depth on both sides of the pipe, and shall be thoroughly compacted, equally, on both sides of the pipe so that the pipe is not damaged, or displaced, either vertically or laterally from grade during tamping.

Upon approval of pipe alignment and tamping beneath the haunches, the pipe zone material shall continue for the full trench width to an elevation at least 6" above the top of the pipe. Pipe zone material installed above the pipe may be mechanically tamped provided an adequate cushion is maintained to prevent damage or contact with the pipe.

640.30.03 – Backfill above the Pipe Zone

Within the street Right of Way, above the pipe zone, backfill conforming to the requirements of Section 910.11.00, Trench Backfill and Bedding Aggregate and as illustrated by Standard Detail T-1, Trench Section, shall be placed and compacted in lifts not exceeding 8" in depth. The PWD may authorize the installation of increased lift thickness where high frequency vibrators mounted on large excavators are used. In all cases, the backfill shall be compacted to the following densities:

Upper zone - On new street sections from finish sub-grade elevation to the top of the variable zone or 6" above the top of pipe, whichever is less, the ¾"-0 crushed rock backfill above the pipe zone shall be compacted to a minimum of 95% of maximum density (AASHTO T-180 D). On existing streets the upper zone backfill section is measured as 36" from finished pavement to the top of the pipe zone since there usually is not a layer of sub-base material being placed.

Variable zone - From the top of the pipe zone to a level 36" below the top of sub-grade, the ¾"-0 crushed rock backfill above the pipe zone shall be compacted to a minimum of 90% of maximum density (AASHTO T-180 D).

Under all existing paved street sections a 1 sack cement-sand slurry mix as conforming to Section 945.00.00, Cement-Sand Slurry shall be used as backfill in the upper zone as shown on Standard Detail T-1.

Outside the Street Section – Unless otherwise directed backfill above the pipe zone shall be placed in lifts not exceeding 12" in depth and compacted to the following densities:

From the top of the pipe zone to finish grade, the backfill above the pipe zone shall be compacted to a minimum of 90% of maximum density. AASHTO Methods T- 180 A-D shall be used in accordance with the type of backfill material installed. The type of backfill material used may be approved select native material, ¾"-0 crushed rock or decomposed granite. Muck, vegetative material, or other incompetent materials shall not be installed.

640.30.04 – Concrete Cap

On all pipes where the total cover is less than 24" and where otherwise required on the plans, a concrete cap with materials conforming to Section 930.00.00, Portland Cement Concrete (PCC), shall be poured from 2" below the spring line of the pipe to a minimum of 6" above the top of the pipe, and to the full width of the pipe trench. A 6-mil plastic membrane shall be placed next to the pipe to prevent adhesion of the concrete.

640.30.05 – Backfill for Vaults, Blow-off and Pressure Relief Valve Applications

Back fill for these applications shall be accomplished in the same manner and to the same standards as backfill for pipe trenches.

640.30.06 – Backfill for Service Connections

Service connections shall be bedded and surrounded with a minimum of 6" above and 6" below the pipe, the full width of the trench with clean reject sand as described in Section 910.11.01(c) prior to back filling with ¾"-0 crushed rock as described in Section 910.11.00 and as shown on Sheet W-5 and W-7 of the Standard Details. Decomposed granite and pea gravel is not approved and shall not be used.

640.35.00 – Installation of Water Pipe and Fittings

640.35.01 – Distribution of Materials

Material shall be distributed on the job no faster than it can be used to good advantage. Pipe which cannot be physically lifted by workmen from the trucks hauling the pipe shall be unloaded by a forklift or other approved means.

All piping materials, valves, hydrants and other fitting shall be protected from contamination and weathering.

All piping materials including valves, couplings, tees and other fittings shall be clearly marked or tagged with the manufacturers name, part or model number, and ASTM/AWWA reference number.

640.35.02 – Preparation

All pipe delivered with visible damage to any portion of the pipe or bell, or having any grease similar material lodged inside the pipe will be rejected.

All pipe and fittings shall be first inspected by the Contractor or his authorized representative before being lowered into the prepared trench to insure that no cracked, broken, or defective pipe or fittings are being used in the work. The ends of the pipe shall be cleaned thoroughly with a brush and non-petroleum based cleaner, or other approved means, when necessary to remove blisters, grease, soil and other foreign material. Extreme care shall be exercised to insure that the inside surfaces of the bell or coupling are smooth and free from any projections or deformity which would interfere with the assembly or water tightness of the joint.

Foreign matter and dirt shall be removed from the inside of pipe before it is lowered into the trench, and it shall be kept clean by approved means during and after laying

640.35.03 – Handling

Proper implementation, using clamps, tools, equipment and facilities shall be provided by the Contractor to conduct safe operation and proper protection of the work. All pipe and fittings shall be lowered into the trench in such a manner as to avoid any physical damage. Under no circumstances shall pipe or fittings be dropped or dumped into the trenches. All damaged fittings or pipe suspected of damage shall be clearly marked and/or tagged as “Rejected” and shall be removed from the job site.

640.35.04 – Line and Grade

Maximum deviation from true line or grade, as established by the Engineer, shall not exceed 0.10' for line or grade at any joint. Minimum cover shall be 3' unless otherwise approved by the PWD.

640.35.05 – Thrust Blocking

Concrete thrust blocks which meet the requirements of Section 930.00.00, Portland Cement Concrete (PCC), as shown on the plans and as illustrated on Standard Detail Sheet(s) W-1 and W-2 shall be poured against solid, undisturbed earth. No concrete shall be poured until all water has been removed from the excavation.

Suitable forms shall be constructed to obtain the minimum bearing areas, shapes and positions as shown on Standard Detail Sheet(s) W-1 and W-2, Thrust Blocks that will provide full bearing surfaces against solid undisturbed earth.

The thrust blocks shall be cured a minimum of 5 days before hydrostatic or air tests are conducted. Care shall be taken during excavation not to over excavate in the areas where thrust blocks are to be poured.

Upon curing for the specified time period, all forms shall be removed from the excavated trench prior to backfilling.

640.40.00 – Polyethylene Encasement of Ductile Iron Pipe

Where required, polyethylene encasement of ductile iron pipe shall be conducted in accordance with requirements set forth in ANSI/AWWA C105/A21.5-99, American National Standard for Polyethylene Encasement For Encasement of Ductile Iron Pipe, with materials meeting the requirements set forth in 630.12.00, Corrosion Inhibiting Pipe Materials.

640.45.00 – Laying and Jointing of Pipe

The Contractor shall take the necessary precautions required to prevent ground water, excavated or other foreign material from getting into the pipe during the laying operation. At all times when laying operations are not in progress, at the close of the day's work, or

whenever the workmen are absent from the job, the open end of the last laid section of pipe shall be closed and blocked by a watertight plug to prevent entry of foreign material or creep of the gasketed joints. All ground water and sloughed material shall be removed prior to extending the pipe.

Unless otherwise directed, pipe shall be laid with the bell end facing in the direction of placement. For lines on steep grades the bells shall face upgrade.

All newly laid waterlines shall use "poly pigs" as an internal pipeline cleaner. "Poly pigs" shall be installed at locations determined by the Public Works Department.

640.45.01 – Ductile Iron Push-on Joint Pipe and Restrained Joint Pipe

Ductile Iron Pipe with push on type or restrained joints, shall be laid and jointed in strict accordance with the manufacturer's recommendations, as approved by the Public Works Department and in accordance with the requirements of the approved plans and Detail Specifications. The Contractor shall provide all special tools and devices such as special jacks, chokers, clamps and similar items required for the installation. Lubricant for the pipe gaskets shall be specified or furnished by the pipe manufacturer and under no circumstances shall petroleum-based grease be used.

Prior to joining of pipe the bell and spigot shall be wiped clean and no dirt shall remain in the barrel. The rubber gasket and spigot end shall be properly lubricated with specified non-petroleum grease and installed to assure a watertight joint.

After the joint has been made, the pipe shall be aligned and checked for grade. The trench bottom shall form a continuous and uniform bearing and support for the pipe at every point between joints. Sufficient pressure shall be applied in making the joint to assure that the joint is "home" as defined in the standard installation instructions provided by the pipe manufacturer.

To assure proper pipe alignment and joint make-up, sufficient pipe zone material shall be placed to secure the pipe from movement before the next joint is installed. The contractor shall take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the back filing operation.

640.45.02 – Mechanical Joint Pipe

Mechanical joint ductile iron pipe shall be installed in accordance with the manufacturer's recommendations. The ends of the pipe shall be cleaned of all dirt, mud and foreign matter by washing with water and scrubbing vigorously with a wire brush, after which the gland and gasket shall be slipped on the plain end. The end of the pipe shall then be guided carefully into the bell of the pipe previously laid. The spigot shall be centrally located in the bell, the gasket placed in position and the bolts inserted in the holes.

When tightening bolts, the gland should be brought toward the flange evenly, maintaining approximately the same distance between the gland and the face of the flange at all points around the socket. This shall be done by partially tightening the bolts

evenly in a star pattern. This cycle is to be repeated until all bolts are within the range of torque shown in Table 600-3, Bolt Torque Loads. If effective sealing is not attained at the maximum torque, the joint shall be disassembled and reassembled after thorough cleaning and inspection of the gasket.

Prior to placement of pipe zone material, the pipe and fittings shall be checked to assure proper grade, alignment and support as described in Section 640.35.04 above.

640.45.03 – Flanged Pipe and Fittings

Flanged pipe and fittings shall be jointed in accordance with procedures set forth in AWWA C115 (Appendix). Bolts shall be tightened in a star pattern taking care that all bolts are tightened evenly to the loads described in Table 600-3 and that there is no over-stressing of bolts or flanges.

Prior to placement of pipe zone material the pipe and fittings shall be checked to assure proper grade, alignment and support as described in Section 640.35.04 above. In no case shall alignment of pipe be forced through the tightening of bolts.

Table 600-3
Bolt Torque Loads
(From ANSI/AWWA C111/A21.11-00)

Pipe Diameter	Bolt Size		Range of Torque		Length of Wrench *	
	Inch	(mm)	Lbs/Ft	N/m	Inch	(mm)
3	5/8	15.9	45-60	61-81	8	203
4-24	¾	19.1	75-90	102-122	10	254
30-36	1	25.4	100-120	136-163	14	356
42-48	1 1/4	31.8	120-150	163-203	16	406

* The torque loads may be applied with torque-measuring or torque-indicating wrenches, which may also be used to check the application of approximate torque loads applied by a worker trained to give an average pull on a definite length of regular socket wrench.

640.45.04 – Preventing Ground Water from Entering Pipe

At times when pipe laying is not in progress, the open ends of the pipe shall be closed by a water-tight plug or other means approved by the Public Works Department. No ground water shall be permitted to enter the pipe during the laying of pipe. These

provisions apply at all times of the day as well as overnight. If water is in the trench the seal shall remain in place until the trench is pumped completely dry.

640.45.05 – Cutting Pipe

The cutting of pipe for inserting valves, fittings or closure pieces shall be done in a neat and workmanlike manner without damage to the pipe or lining and so as to leave a smooth end at right angles to the axis of the pipe.

Acceptable methods of cutting cast iron pipe are sawing with a band or powered hacksaw or with a portable, gasoline engine driven abrasive saw. Cast iron pipe may also be cut with a lathe or portable milling saw.

Acceptable methods of cutting ductile iron, cement mortar lined pipe are only those done by sawing or milling. Flame cutting of ductile iron pipe by means of oxy-acetylene torch shall not be allowed.

When mechanical joint or push-on joint pipe is cut in the field, it shall be cut as recommended by the pipe manufacturer, and the cut end shall be ground back or dressed as recommended by the pipe manufacturer and approved by the Public Works Department.

640.45.06 – Horizontal and Vertical Curves

All pipes shall be laid in a straight line and grade unless otherwise shown on the approved plans or authorized in writing by the PWD or the Engineer. When pipe is to be laid in either horizontal or vertical curves, in accordance with the Plans, or to avoid an obstruction, the following requirements in Table 600-4 shall be the maximum allowable deflections at each joint, unless special fittings are provided, or the pipe manufacture’s recommendations will allow greater deflection. Pipes larger than those in the following tables shall not have deflections greater than those recommended by AWWA.

Table 600-4 Pipe Deflection

MAXIMUM PERMISSIBLE DEFLECTION IN LAYING PUSH ON JOINT PIPE

Size of Pipe in Inches	Maximum Joint Deflection in Degrees	Deflection in Inches 18'	Deflection in Inches 20'	Approximate Radius of Curve in Feet 18'	Approximate Radius of Curve in Feet 20'
4	5	19	21	205	230
6	5	19	21	205	230
8	5	19	21	205	230
10	5	19	21	205	230
12	5	19	21	205	230
14	3*	11*	12*	340*	380*

*For 14" and larger push-on joints, maximum deflection angle may be increased. Consult the manufacturer.

**MAXIMUM PERMISSABLE DEFLECTION OF MECHANICAL JOINT PIPE
Safe Deflection for 150 PSI Pressure***

Size of Pipe in Inches	Maximum Joint Deflection Degrees	Deflection in Inches in with Pipe Length of 18 Feet	Approximate Radius of Curve in Feet
4	8	35	125
6	7	30	145
8	5	22	195
10	5	22	195
12	5	22	195
14	3	15	285

* For Pressures above 150 PSI, reduce the tabulated deflection by 10% for each 150 PSI added pressures

640.50.00 – Installation of Valves, Hydrants and Service Connections

640.50.01 – Install Valves and Valve Boxes

Valves and Valve Boxes as described in Section 630, Water System Materials, shall be installed at the locations shown on the Plans. The valves shall be properly connected and supported in a vertical position with stems plumb. Valve boxes shall be installed at all valves unless otherwise specified.

The valve box shall be centered on the operating nut and the extension shall be trimmed to proper length so that the box slides over the extension for a minimum of 8” as measured from final grade. The cover shall match the finish grade of paving, and shall be fully supported by paving materials, refer to standard detail W-18. Wrap valve can and well casing joint in 8mil plastic as shown.

Deep valves, over 30” as measured from the operating nut to the rim of the valve box shall be fitted with an operating nut extension as manufactured by the valve manufacturer or approved equal. See Section 630.20.05.

640.50.02 – Install Fire Hydrant Assemblies

Fire hydrant assemblies as specified in Section 630, Water System Materials, including the line tees, auxiliary valves and valve boxes, piping, fire hydrants and thrust blocks shall be installed at the locations shown on the Plans, and shall be assembled, jointed and supported as shown on Standard Detail Sheet W-3 of the Public Works Standards

640.50.03 – Install Blow-Off Assemblies

Blow-off Assemblies, as specified in Section 630, Water System Materials including the ductile iron pipe section with M.J. tapped plugs, the valves and nipples, brass, galvanized or schedule 80 PVC pipe and fittings, shall be installed at the locations shown on the Plans, and shall be jointed and assembled as detailed on Standard Detail W-9A Through W-10B, Mainline Blow-off Assembly(s) of these Standards.

640.50.04 – Install Air Relief Valves

Air relief valves conforming to Section 630, Water System Materials shall be 1" for pipes under 30" in diameter and 2" for pipes greater than 30" in diameter and unless otherwise specified shall include the service saddle, corporation stop, valves and nipples, the air valves, the pipe and fittings, the vents, the vaults, and the covers, as shown on Standard Detail Sheets **W-4**, Air Relief Valves. Air relief valves shall be installed at the locations shown on the Plans.

The air relief valves shall be assembled, jointed and installed in accordance with the detail on Sheets **W-4** of the Public Works Standards, with the vault plumb, and the cover flush with the finish grade.

In certain field applications and for air valves required in the street section, the Public Works Department may specify additional requirements to assure the protection and efficient operation of air valve installations. Designs will be approved by the PWD on a case-by-case basis prior to installation.

640.50.05 – Installation of Service Connections

Water service connection materials, including the trench excavation and backfill, the service saddles, corporation stops, **Municipex** piping, curb stops, and the meter boxes with lids shall conform to Section 630, Water System Materials and as shown in Table 600-2. The connection shall be installed at the locations shown on the Plans, and in accordance with the details shown on Sheet W-7 of the Uniform Standards. The Engineer will set the required hubs and marking stakes.

640.50.06 – Cathodic Protection

In certain soils cathodic protection may be required to prevent corrosion of pipe and fittings. Cathodic protection shall be installed using the materials and methods **as follows and** on Standard Detail Sheet W-8.

Soil resistivity will determine the amount of cathodic protection required for waterline construction. Resistivity is in the units ohm-cm.

- 1. Soil resistivity greater than 3,000 ohms-cm, ductile iron main waterline can be laid bare, with municipex services.**
- 2. Soil resistivity less than 3,000 ohms-cm, ductile iron main waterline shall be poly wrapped, services will be municipex, and extra cathodic protection may be required including sacrificial anodes. These requirements will be based upon design engineer recommendations and review by City Engineer.**

640.50.07 – Installation of Valve Operating Nut Extensions

Where the installation of a valve shall cause the operating nut to be greater than 30" from finish grade a Valve Operating Nut, meeting the requirements set forth in Section 630.20.05 shall be installed as shown on Standard Detail W-14 and W-18, Water Valve Extension.

650.00.00 – Inspection, Testing and Disinfection

Inspection shall be required following each phase of pipe laying / jointing, bedding and backfill.

650.10.01 – Pipe and Bedding

Upon installation of the pipe and bedding materials as required in Section 640.30.00, Trench Backfill and Section 910.11.00, Trench Backfill and Bedding Aggregate, and prior to covering the Contractor shall request and receive an inspection by the Public Works Department. The purpose of this inspection is to assure proper pipe support, alignment, grade and tamping of the material under and around the pipe.

650.10.02 – Backfill

Backfill of water line trenches above the pipe zone section shall include testing for compaction density of each layer to be installed in accordance with AASHTO T-180 D and the requirements of Sections 640.30.00, Trench Backfill. The Public Works Department may require pot holing and testing of selected trench sections below the surface if any compacted layer exceeds 8" of thickness. The Contractor shall request an inspection prior to placing successive lifts of backfill material.

It shall be the responsibility of the Contractor to arrange for testing of material in the presence of the inspector with a testing laboratory approved by the Public Works Department and certified to conduct the required test. Test results shall be painted on the street or sub-grade surface material at the point of testing as well as recorded by the testing agency or institution. The soils testing company shall issue certified copies of all test results to the Public Works Department.

650.20.00 – Hydrostatic Testing, Flushing and Disinfection

650.20.01 – Pressure and Leakage Testing

Pressure and leakage tests shall be made on all newly laid pipe or any valved section of it, or both, unless otherwise specified. The Engineer or his designee will conduct the tests in the presence of the Public Works Department inspector. The Contractor shall furnish all gauges required for the tests and will install the necessary test tees or taps and valves at the ends of all pipe runs to be tested. The Contractor shall furnish all necessary assistance for conducting the test and shall furnish the test pump, pipe connection, hoses, valves and suitable graduated containers for measurement of the water used for testing.

The test shall be conducted after the trench has been back-filled sufficiently to prevent movement of the pipe during testing and flushing. The joints at all valves, tees or couplings to the extent possible other joints shall be left exposed for inspection of visible leakage.

Where any section of pipe is provided with concrete thrust blocking, the pressure test shall not be made until at least five days have elapsed after the concrete thrust blocking is installed. If high-early cement is used for the concrete thrust blocking, the time may be reduced to two days instead of the five previously specified.

The pressure test shall be conducted in the following manner: After the pipe and trench have been back-filled or partially back-filled as herein before specified, the pipe shall be filled with water. The test pressure of the newly installed pipe shall be 1-½ times the normal static water line pressure as measured at the test point, but not less than 150 pounds per square inch. Unless stated otherwise in the detail specifications or authorized by the Public Works Department the duration of each pressure test shall be 30 minutes.

(a) Expelling Air: Before applying the specified test pressure all air shall be expelled from the pipe or pipe system being tested.

(b) Procedure: Each valved section of pipe shall be slowly filled with water to replace any lost; and the specified test pressure, measured at the point of lowest elevation, shall be applied by means of a pump connected to the pipe in a satisfactory manner.

The pump shall then be isolated, and the pressure shall be held in the line for the 30- minute test period noted above. If at the end of the 30-minute test period, a drop in pressure is noted, the pump shall be operated until the required test pressure is again attained. The pump suction tube shall be in a bucket; barrel or similar device so that the amount of water required to restore test pressure may be accurately measured.

(c) Leakage: Leakage shall be defined as the quantity of water necessary to restore the specified test pressure at the end of the test period. No pipe installation will be accepted until the leakage is less than the number of gallons per hour as determined by the following formula:

$$L = \frac{ND}{7400^*} (P)^{1/2}$$

L = allowable leakage in gallons per hour;

N = number of joints in the length of pipe tested;

D = nominal diameter of pipe in inches;

P = average test pressure during the leakage test in pounds per square inch

*Based on 18' pipe lengths. Use a Factor of 6433 if 21' pipe lengths are used.

(d) Correction of Excessive Leakage: Should any test of pipe in place disclose leakage greater than that allowed under (c) above, the Contractor shall, at his own expense, locate and repair the defective joints or pipe until the leakage is within the specified allowance.

- (e) Visible Leaks: All visible leaks and known leaks revealed by the test shall be repaired regardless of the total amount of leakage shown by the test.

650.20.02 – Flushing

After the pipe has been completely laid and connected to the distribution system at one end, and after testing has been completed and accepted, a complete flushing through all hydrants, service lines, air relief valves, blow-off valves and dead ends shall be completed. The Contractor shall provide sufficient trench pumping capacity to pump out the water flushed from the open end.

650.20.03 – Disinfection

Disinfection of new lines by means chlorination shall be completed by the Contractor after flushing. The water shall be fed slowly into the new line with chlorine applied in regulated amounts to produce a dosage of 50 ppm. **At no time shall the chlorinated mixture be allowed to flow into the existing potable water distribution system.**

The treated water shall be retained in the pipe for at least 24 – hours and not more than 36 – hours. A free chlorine residual of not less than 10 ppm shall be produced in all parts of the line after the 24 – hour period has elapsed.

The chlorinating agent shall be a liquid, chlorine gas-water mixture, direct – fed chlorine gas, or a calcium hypochlorite and water mixture that will produce the dosage amounts noted above. Chlorine gas-water mixture shall be applied by means of a solution – feed chlorinating device. Chlorine gas shall be fed directly from a chlorine cylinder equipped with suitable device for regarding the rate of flow and providing for effective diffusion of gas within the pipe. Calcium hypochlorite shall be similar and equal to commercial products known as H.T.H., Perchloron or Chlor. A solution consisting of 5% powder to 95% water by weight should be prepared. The calcium hypochlorite and water mixture, first made into a paste and then thinned into slurry, shall be injected or pumped into the newly laid line under the conditions specified herein before.

The method of placing concentrated quantities of commercial **disinfectant** in the line as it is being laid is not a satisfactory method of **disinfection** and will not be allowed.

During the chlorination process, all valves and hydrants within the newly constructed system shall be operated to allow all newly installed pipe and fittings to be **disinfected**.

After chlorination; the water shall be flushed from the line at its extremities, including all service laterals and will be tested after 24-hours by the Public Works Department for chlorine residual and any bacterial content.

During the flushing process, no chlorinated water shall be introduced or allowed to enter the sanitary sewer system. All chlorinated water with a residual content greater than 4 PPM shall be disposed of by dispersal to open ground having a minimum surface area of not less than 1 acre, and will not drain directly to a creek, storm sewer or irrigation facility. Alternatively, the chlorinated water may be de-chlorinated onsite, monitoring

CL2 discharge by a city approved representative or hauled to a de-chlorinating facility or other suitable site for disposal.

Water samples shall be taken by the PWD and delivered to an approved laboratory and tested for bacterial and chemical components at the expense of the Contractor or Developer. Upon satisfactory testing the water shall be equal in chemical content to the permanent source of supply contain no harmful bacteria in accordance with OHD, Drinking Water Division standards. If the water fails to meet the test requirements the pipe shall be re-disinfected and re-flushed by the Contractor as described above until the testing standards are met.

Upon satisfactory testing and disinfection or re-disinfection, and approval, the Contractor or Developer shall be notified by the Public Works Department and under direction thereof shall open the newly installed system to the City water system.

SECTION - 700

UNDERGROUND UTILITIES

700 – UNDERGROUND UTILITIES

700.00.00 – Scope

These standards apply to companies franchised or licensed by the City of Central Point to install and operate a utility within the city limits and are further registered as a public utility in the State of Oregon. These companies include but are not limited to companies that provide underground and overhead electric power, natural gas, communications, and television services and shall hereinafter be referred to as the “Utility”. These do not normally include City utilities such as water, sewer and traffic appurtenances except by crossing.

This section shall include, but is not limited to all materials, equipment, labor and plant necessary for, or incidental to construction of or preparation for underground utilities, any above ground appurtenances so connected, the excavation and backfill of utility trenches, providing and installing conduit as required, installing conduit provided by others, and the construction of footings for street lights and utility boxes, including picking up and installing embedded or above ground items to be provided by others.

710.00.00 – General

In addition to the Public Works Department standards as set forth herein, all of the “Utility(s)” requirements shall be followed in the installation of utility lines and appurtenances. As set forth below in Section 720.00.00, Design, the designs for layout from each of the Utility Companies along with existing utility locations shall be presented on a single utility plan. The utility plan shall also include the existing and planned water and sewer locations along with street and driveway details sufficient to resolve conflicting locations.

The utility plan shall contain the signed approvals of each “Utility”. All underground utilities shall be located within Public Utility Easements (PUE) or a separate utility Right of Way (ROW). In most cases the required 10-foot wide PUE(s) shall be located on the private property contiguous to the street right-of-way lines. See Standard Details ST-10 thru ST-53 and Tables 300-1A thru 300-1E for locations and dimensions.

710.10.00 – References

Pacific Power and Light (PP&L) - current standards as they may apply.

Avista Utilities (Natural Gas) - current standards as they may apply.

Qwest (Telephone Communications) - current standards as they may apply.

Charter Communications (TV) - current standards as they may apply.

OUNC - Oregon Utilities Notification Center

RVSS- Rogue Valley Sanitary Service - current standards as they may apply.

720.00.00 – Design

720.10.00 – Street Lighting

Locations for streetlights will be as required by these standards and shall be shown on the approved project plans. The City has a contract with Pacific Power and Light (PP&L), under which PP&L supplies and installs all streetlights, including supply of the anchor bolts and bolt template(s). The ground rods, required conduit, and other fittings shall meet PP&L design requirements. These materials, including materials noted below in Section 730.00.00, shall be supplied and installed by the Developer or Contractor.

Where special lighting fixtures are required such as in the Transit Oriented Development (TOD) area, the completed lighting shall provide the same amount of illumination at the street level as would the standard lighting fixtures, spacing and pole heights specified herein.

720.10.01 – Spacing

- a) Spacing for streets – Street light pole spacing shall be a maximum of 200' between street light fixtures. However, a streetlight may be placed less than 200' apart.
- b) Spacing for Cul de Sacs – Cul de Sac spacing shall be as follows:

<u>Length of Cul de Sac</u>	<u>Location of Lights</u>
0 – 100'	1 light at intersection
101' – 200'	1 light at intersection, 1 light at end of Cul de Sac
201' – 400'	1 light at intersection, 1 light at the mid-point, and 1 light at end of Cul de Sac

On major arterial streets, lighting will be required on both sides of the street. At major intersections and other intersections with wide street sections where the luminosity at street level is not sufficient to provide adequate safe lighting for vehicle and pedestrians, additional lighting may be required on both sides of the street or at opposite diagonal street corners.

All streetlight locations shall be approved by the Public Works Department prior to installation. See Section 720.10.06, Location of Above Ground Utility Appurtenances below.

720.10.02 – Streetlight Type, Luminosity and Specifications

Streetlights are separated into 2 categories: Standard (cobra head style) and Decorative.

720.10.02.01 – Standard Lighting

Standard streetlights shall be High Pressure Sodium Vapor, Luminaire style, I.E.S type II (2) light pattern with photoelectric operating controls. Luminosity requirements and height as measured from the base to the top of fixture are as follows:

<u>Street Classification</u>	<u>Lumens</u>	<u>Min. Height</u>	<u>Max. Height</u>
Local, Res. Lanes	5800	25	27
Collector	9500	25	27
Arterial	22,000	30	32

Offsite lighting on private property adjacent to city streets shall be located and / or shielded as not to conflict with vehicular or pedestrian safety. Such lighting shall be approved by the PWD in conjunction with the Site Development Plan.

720.10.02.02 – Decorative Lighting

720.10.02.02.01 – Developer Responsibility

The Developer will be required to furnish and install all new street lighting as part of a new development. This will be accomplished in the following manner:

- (a) The City will furnish and install the following materials as part of the inspection and start-up process: 1 pole tag and 1 lock and tag for each electrical enclosure and junction box.
- (b) The Developer or his representative will submit 2 sets of electrical plans for review by the City of Central Point Public Works and Building Departments. Plans must contain the following: Site plan with luminaire locations, service location, conduit route, service 1-line, luminaire specifications, and street light foundation specifications. An electrical permit shall be issued after plan has been reviewed and approved.
- (c) Prior to request for power from Pacific Power, all street lights in subdivisions, land partitions, new developments or any other development applications must be installed complete with bases, luminaires and satisfactorily inspected by City of Central Point Building Department. The City of Central Point Public Works Department must be provided with street light electrical as-builts at this time. These as-builts will be submitted at the time the City of Central Point requests power from Pacific Power.
- (d) To provide power to street lights in commercial and industrial subdivisions and land partitions, the developer may be required to install transformers in addition to the electrical backbone system. After the City of Central Point provides street light locations, the developer's engineer shall determine

- number and location of transformers, with approval by Pacific Power and the City of Central Point.
- (e) Surety - In those cases where surety is allowed or required, it shall be of a form acceptable to the City of Central Point per 16.12.080 of the Municipal code of the City of Central Point. The amount of surety shall be \$7500 per street light.
 - (f) The Contractor shall call 664-3321 ext. 241 to verify location of street light units at least 24 hours **PRIOR** to drilling foundations or laying conduit. The Contractor shall provide trench and backfill per City of Central Point Standard Drawings T-6 and lay conduit as required. All trenching is to be within public utility easements or public right of ways. The Contractor shall call 664-0700 for electrical inspection of trench and conduit at least 24 hours **PRIOR** to backfill. Failure to do so may result in contractor digging new trench to City requirements. The trench is to have a minimum of 18" compacted cover over lighting conduit; 2" of sand is required below lighting conduit and 2" above, for a 4" total around lighting conduit.
 - (g) The Contractor shall dig and set pole foundations, per City of Central Point Standard Drawing SL-2. Contractor shall call 664-3321 ext. 241 for inspection of pole foundations at least 24 hours **PRIOR** to pouring concrete. Pouring without inspection may result in contractor removing bases and installing new bases to City of Central Point requirements. All concrete shall be 3300psi strength after 28 days per section 930.00.00, Portland Cement Concrete. Concrete shall be poured to undisturbed soil. If concrete is poured to forms, compaction of backfill to 95% is required. A 7 day minimum curing period is required for foundation concrete before poles are to be set.
 - (h) When wire is pulled, the free end in the junction box at the transformer shall be of adequate length to make the connection to Pacific Power wires. Junction box installation to be per City of Central Point Standard Drawings E-5. The amount of wire at the foundation shall be of sufficient length to allow contractor to make connection in the pole.
 - (i) The Contractor shall not set poles until Inspector has examined all materials for conformance to specifications. Contractor shall call 664-3321 ext. 241 for material inspection **PRIOR** to setting of pole.
 - (j) The Contractor shall set light pole, install luminaire, lamp and BMC's and perform all wiring and other work necessary for a complete street light installation. BMC-2's are to be set per City of Central Point Standard Drawings E-1 through E-3. At this time, the Contractor should call 664-0700 to request electrical turn-on inspection to include electrical service with breakers, junction boxes, contractor photo cells, and connections at light poles. After successful turn-on inspection the City of Central Point should be contacted at 664-3321 ext. 241 to request turn-on by Pacific Power.
 - (k) Contractor will be required to repair or correct, at his expense, any problem that develops up to the time that the units are successfully placed in service by Pacific Power, including refinishing any units that have been scuffed or scratched. Use of metal chains or cables will not be permitted.

720.10.02.02.02 – Approved Materials Specifications

All Contractor supplied material used in street light installations shall be as follows:

Base Mounted Cabinet (BMC-2)

Refer to City of Central Point Standard Drawings E-1 through E-3 for details and specifications.

Junction Boxes

- 17" x 24" x 12" deep- Plastic junction box for use in dirt areas to be Brooks Products, Inc. – 12 series.
- 14" x 20" x 12" deep- Concrete junction box for use in sidewalk areas to be Oldcastle Precast, Inc., Cat. No. 36-1017 PB with solid cover
Cat. 36-1017C-L.

Conduit

- (a) For conduit in Arterial, Collector and Parking: All conduit in foundations will be 1-1/4" rigid steel electrical. Conduit in trenches will be 1-1/4" schedule 40 PVC electrical, unless plans specify larger size. All bends or turns in conduit will be factory rigid steel electrical 90's or 45's. All stand-alone road projects will require continuous conduit between all pole foundations.
- (b) For conduit in Residential, Walkway and Alley: All conduit in foundations will be 1-1/4" rigid steel electrical. Conduit in trenches will be 1-1/4" Schedule 40 PVC, unless plans specify larger size. All bends or turns in conduit will be factory rigid steel electrical 90's or 45's.

Wire

- (a) Underground circuits in conduit to be No. 8 THW/THHN stranded copper, 600 volt, unless plans specify larger size. Voltage requirements will vary according to transformer availability. The following wire requirements correspond to each voltage. Circuits in PVC conduit will require a continuous No. 6 green ground wire.

Requested Voltage:

120V
240V
277V
208V

Wiring Required:

1-hot leg, 1-neutral, equipment ground
2-hot legs, 1-bond wire, equipment ground
1-hot leg, 1-neutral, equipment ground
2-hot legs, 1-bond wire, equipment ground

Hot legs are to be black, the neutral or bond wire is to be white. No phase tape shall be allowed. Equipment ground is to be green.

- (b) Wire in poles, from pole base to luminaire, to be No. 10 THW/THHN stranded copper, 600 volt.

720.10.02.02.03 – Contacting Power Source

- (a) Set junction box within 1' of Pacific Power secondary terminal pad. When junction box is set to grade there is to be a minimum of 3" between conduit stub and top of junction box. Leave sufficient wire for Pacific Power to make hook up.
- (b) For overhead span, contractor will attach wires to Pacific Power service pole with sufficient length to make connection to service wires.

720.10.02.02.04 – City of Central Point/Contractor Responsibility

The City of Central Point will assume ownership and will pay electrical energy costs for the new street lights as soon as the new lights are accepted and in operation. The Contractor shall warranty the workmanship and materials for a period of 24 months following acceptance by the City of Central Point after which the City of Central Point will assume total responsibility.

Lighting in private areas outside of the City of Central Point or Pacific Power jurisdiction, shall be the responsibility of the Developer and/or the Home Owner's Association including maintenance and electrical energy costs.

These specifications do not apply to projects that are part of the Transit Oriented Development(TOD) area.

720.10.03 – Street Intersections

When a street of higher classification intersects a street of lower classification, the standard for the street light installation at the intersection shall be that of the higher classification.

720.10.04 – Arm Position

Unless otherwise directed, all street light arms shall be positioned at right angles to the street centerline.

Streetlights installed at intersections shall face the street with the higher street classification. If both streets are of the same classification, the streetlight shall be positioned so that the light equally illuminates both streets to the extent possible.

720.10.05 – Utility and Conduit Trench Location

- a) New Construction - In new residential and commercial developments, the major utility runs shall be placed in 4' wide trenches located at the rear of the 10' wide PUE adjacent to the right-of-way. Unless otherwise detailed or specified the trench width for street crossings and other locations of main utility runs shall be also be 4' wide. Utilities shall be arranged, separated and embedded as shown on Standard Detail U-1A, Utility Trench. The trench depth shall be measured below the finish Grades set forth on the Street Profiles or established on the Utility or Grading Plan.

- b) Existing Streets – Mainline utility conduit runs and crossings shall be established as noted in (a) above. Hookup runs and other installations shall be so arranged as to minimize trenching across or in the street section. Utilities within the existing street section shall be and arranged, separated and embedded in trenches as shown on Standard Detail U-1B, Existing Street Utility Trench. Trenches shall be excavated to the minimum widths required for separation of utilities but in no case shall the trench width be less than 18”.

720.10.06 – Location of Above Ground Utility Appurtenances

The location of existing or planned future driveway and street entrances shall be considered when locating street lights poles, overhead power poles, transformer or communication pedestals, and utility boxes. If located on street frontage, they normally shall be located near the front property corner, opposite the driveway entrance. With the exception of power poles and light poles, no structures including those noted above shall be installed within the clear vision triangle where the height of such structure or feature exceeds 42” above the top of curb and interrupts sight vision as set forth in Table 300-5 and shown on Standard Detail A-11. In addition, a 5’ clear space shall be maintained in proximity of all fire hydrants.

720.10.07 – Communications Towers

This section will be written in the future

730.00.00 – Materials

730.10.00 – Utility Materials

This section will only describe utility materials common to the construction and installation of franchised utilities such as natural gas, electrical power, cable TV, and telephone/communications. All materials specific to each utility application shall be as required or specified by the “utility”. Materials common to all phases of construction are described in Section 900, Construction Materials.

730.10.01 – Sand Backfill and Bedding

Sand for backfill and bedding in the 12” "bedding zone" of the trench shall be clean natural sand, such as concrete sand, plaster sand, or "reject" sand as described in Section 910.11.01(c), Bedding for Water Service lines and Utilities.

730.10.02 – Trench Backfill

- a) *New Construction* (not in a street section) – Trenches outside the street right-of-way within a Public Utility Easement (PUE) shall be backfilled with the various materials as described in Section 910.11.01 (g), Trench Backfill Outside of Street R/W.

- b) *Existing Streets, and New Construction (within a street right-of-way)* – Trenches constructed or repaired within the street section shall be backfilled with materials described in Section 910.11.01 (e), Variable Zone Trench Backfill (3/4"-0 crushed base rock) and (f), Upper Zone Trench Backfill (1 sack cement / sand slurry) as applicable.

730.10.03 – Conduit

Conduit, as required for telephone lines shall be minimum Schedule 40 PVC pipe or Schedule 80 for power lines of the sizes shown on the Plans or as described in the Special Specifications. Individual "Utility" material requirements for types and specifications of conduit or direct bury applications shall apply if in excess of the minimum requirements unless otherwise shown and approved on the plans.

730.10.04 – Embedded Items

The Contractor shall arrange to pick up the items to be embedded in the Light Pole Footings from the Pacific Power and Light Company, including ground rods, anchor bolts, conduit, and the templates.

730.10.05 – Non Embedded (above ground)

Above ground items such as light poles, transformers, telephone or communication pedestals, and utility boxes shall meet applicable industry standards and shall be supplied by the "Utility". Any such items to be placed within the street right-of-way shall be approved by the Public Works Department during the Project Utility Meeting.

Streetlights for residential and commercial applications shall be Luminaire style, I.E.S type II (2) light pattern with photoelectric operating controls.

730.10.06 – Concrete footings and miscellaneous utility structures

Concrete for light pole footings, pads and other similar structures shall conform to Section 930.00.00, Portland Cement Concrete (PCC)

740.00.00 – Construction and Workmanship

740.00.01 – General

It is the intent of these Standard Specifications that the progress of the work shall progress in a systematic and efficient manner so that as little inconvenience as possible to the public will result during the course of construction.

No work within a City right of way or easement shall commence until the Applicant has applied for and received a Public Works Department "Construction Permit" or unless during emergencies has been authorized by the PWD to conduct such work.

Prior to beginning work the Applicant or Contractor shall submit a Traffic Control Plan to the PWD. Prior to beginning work the Contractor shall notify the PWD and Emergency Dispatch Center of the address, periods of work, road closures and detours and other operations critical to public safety. Applicant shall obtain all utility locates in accordance with OAR 952-001-0010 through 952-001-0100. Call OUNC 1- 800- 332- 2344 or dial **811**.

Except by permission of the Public Works Department, at no time shall the trenching equipment be farther than 200' ahead of each utility crew.

Backfill of the trench shall be accomplished so that no section of approved utility lines shall be left open longer than 48 – hours unless otherwise authorized by the Public Works Department. Backfill and cleanup shall be completed as each section of utility trench has been inspected, tested, and approved.

All trench excavation and backfilling operations shall be conducted in a safe manner in accordance with OSHA requirements as administered by the State of Oregon.

The Contractor shall promptly repair and re-grade all existing drainage ditches, natural drainage courses and all other drainage facilities, including culverts, damaged or removed during the construction.

The Contractor shall give prompt consideration for reopening street, roads and driveways to the public after the conduit has been installed. No traffic-way shall be closed while work is suspended over weekends or holidays and closures during workdays shall be as brief as practicable.

The Contractor shall be required to provide the necessary trained personnel and signing to control traffic for the duration of the project in accordance with MUTCD and ODOT "Oregon Temporary Traffic Control Handbook for Operations of 3 Days or Less", 2006 edition.

Where private accesses are to be closed, the property owner(s) shall be notified by the Contractor at least 24-hours in advance of the closure. Access for fire and emergency equipment shall be maintained at all times. Also see Section 350.20.00, Street Cutting including Curbs, Gutters and Sidewalks.

740.10.00 – Trench Excavation

740.10.01 – Existing Utility Crossing

Where the contractor discovers unmarked (un-located) existing City water and sewer lines during his excavation he shall promptly notify the Public Works Department and the OUNC per OAR 952-001-0070. In accordance with other applicable sections of these Standard Specifications the Contractor shall be required to support, repair or cause to be repaired such "unmarked or "un-located" utilities, including protection of the pipe or utility. Where the City utility has been "located" and "marked" on the street surface the

repair of damage shall be at the Contractor's expense. In the case of substantiated cases of "un-marked" or "un-located" City utilities, the Contractor may submit a billing invoice for repair expenses in accordance with City procedures. **Regardless of fault, repairs to City waterline will be completed by City forces.**

If the pipe or utility is not damaged, a "warning mound" of sand shall be placed immediately above the facility to a depth of 12" and marked with a heavy duty, highly visible highly visible metallic/ plastic locating tape laid across the full width of the trench before backfilling with the specified materials. The requirements for the plastic locating tape are described in Section 960.00.00, Miscellaneous Materials.

740.10.02 – New Development

In new residential developments the major utility runs shall be placed in 4' wide trenches located at the rear of the 10' wide PUE adjacent to the right-of-way. Unless otherwise detailed or specified the trench width for street crossings and other locations shall be 4.0' wide. Utilities shall be arranged and embedded as shown on Standard Details U-1A and U-1B, Utility Trench. The trench depth shall be measured below the finish Grades set forth on the Street Profiles or established on the Utility or Grading Plan. Excess excavated materials shall be disposed of as set forth in Section 330, of these Standard Specifications.

740.10.03 – Existing Street Trench Excavation

Trenches shall be excavated as shown on Standard Details U-2, Existing Street Utility Trench and T-1, Trench Section Under Existing Paving, to the minimum widths required for separation of utilities. The minimum trench width below the pavement shall be 18". Also, refer to Sections 350.20.00, Street Cutting including Curbs, Gutters and Sidewalks, and 350.20.02, Curb, Gutter and Sidewalk Cuts. Excess excavated materials shall be disposed of as set forth in Section 330, of these Standard Specifications.

740.10.04 – Shoring, Sheet piling and Bracing

The Contractor's "competent person" shall determine all requirements, including but not limited to, equipment, materials, shoring, sheet piling, bracing, trench widths, trench slopes including any methodology or techniques thereof in order to comply with all applicable OR-OSHA provisions and requirements for trench excavation and related activities.

Trench support shall remain in place until the pipe has been placed, inspected, tested, and repaired if necessary; and until the backfill in the pipe zone has been placed and compacted as specified to a minimum of 6" above the top of the pipe.

740.20.00 – Trench Bedding, Pipe Zone and Backfill

740.20.01 – Bedding and Conduit Zone Materials

Conduit and Direct Bury – Unless required by the “Utility” and approved by the PWD, all material used in the bedding and to 8” above the conduit (“conduit bedding zone”) shall be clean sand as described in Section 910.11.01(c), Bedding for Water Service Lines and Utilities.

740.20.02 – Trench Backfill Materials

- (a). *New Street construction* – All utility main runs and crossings installed within the Rights of Way for newly constructed streets shall be back filled above the “conduit bedding zone” to the top of sub-grade with ¾”-0 crushed base rock as described in Section 910.11.00, Trench Backfill and Bedding Aggregate, of these Standard Specifications.
- (b). *Existing Paved Streets and Shoulders* – All main utility runs and crossings installed, repaired or modified within the existing street section including sidewalks or adjacent shoulders shall be back filled according to Standard Detail U-1B. Extending 3’ down from finished grade (upper zone), uncompressible one (1) sack sand / cement slurry mixture as described in Section 945.00.00, Cement-Sand Slurry, shall be used. Variable zone may be ¾”-0 crushed rock or Cement-Sand Slurry as above. Paving materials shall meet the requirements of Section 925.00.00, Hot Mix Asphaltic Concrete Paving (HMAC). Also refer to Sections 350.20.00, Street Cutting including Curbs, Gutters and Sidewalks, and 350.20.02, Curb, Gutter and Sidewalk Cuts.

Trenches within non-adjacent shoulders, but not under any portion of the paved street section shall be back filled with ¾”-0 crushed rock meeting the requirements of Section 910.11.00, Trench Backfill and Bedding Aggregate.

- (c). *Natural Ground* – Utility main runs and crossings above the “conduit bedding zone” and outside the street Rights of Way may be back filled above the pipe zone with materials described in Section 910.11.01 (g), Trench Backfill Outside of Street R/W.

740.20.03 – Trench Backfill Compaction

Within the street Right of Way, above the “conduit bedding zone”, backfill conforming to the requirements of Section 910.11.00, Trench Backfill and Bedding Aggregate, and as illustrated by Standard Detail U-1B, Utility Trench, shall be placed and compacted in lifts not exceeding 8” in depth. The PWD may authorize the installation of increased lift thickness where high frequency vibrators mounted on large excavators are used. In all cases, the backfilled trench sections shall be compacted to the following densities:

New street sections - From finish sub-grade elevation (*upper zone*) to the top of the variable zone or the “conduit bedding zone”, whichever is less, the ¾”-0 crushed rock

backfill above the pipe zone shall be compacted to a minimum of 95% of maximum density (AASHTO T-180 D). On existing streets the upper zone backfill section is measured as 2-1/2' from finished pavement to the top of the conduit zone since there usually is not a layer of sub-base material being placed.

From the top of the "conduit bedding zone" to a level 3' below the top of sub-grade (*variable zone*), the ¾"-0 crushed rock backfill above the pipe zone shall be compacted to a minimum of 90% of maximum density (AASHTO T-180 D).

Existing Streets - Under all existing paved street sections a 1 sack cement-sand slurry mix as conforming to Section 945.00.00, Cement-Sand Slurry shall be used as backfill in the upper zone as shown on Standard Detail T-1. Also see Section 350.20.00, Street Cutting including Curbs, Gutters and Sidewalks.

Public Utility Easements – Unless otherwise directed, backfill above the conduit-bedding zone shall be placed in lifts not exceeding 12" in depth and compacted to the following densities:

From the top of the conduit-bedding zone to finish grade, the backfill above the conduit zone shall be compacted to a minimum of 90% of maximum density. AASHTO Methods T-99 A or T-180 D shall be used in accordance with the type of backfill material installed. The type of backfill material used may be approved select native material, ¾"-0 crushed rock or decomposed granite. Muck, vegetative material, or other incompetent materials shall not be installed.

Open Ground – In trenches outside of the street Right of Way and adjacent PUE, selected excavated native materials shall be placed in the trench above the bedding zone to a level approximately 6" below finish grade, leveled out, and shall then be mechanically tamped or wheel-rolled, using rubber-tired equipment such as an approved loader, dump truck, or backhoe, making at least 3 passes along the trench.

After compacting as specified, the trench shall be refilled to 4" to 6" above the finish grade, and shall then be wheel-rolled again. The surface of the ground at the trench and adjacent to the trench shall then be brought to a smooth finish grade with excess excavated materials spread evenly over the surface. The Contractor shall protect the Utility stub-outs and other structures during backfilling.

740.20.04 – Construct Light Pole Footings

Excavation - The excavations for the light pole footings for PPL owned Cobra Heads shall be made at the locations shown on the plans and on Sheet SL-2 of the Uniform Standards. TOD decorative light pole footings shall be constructed in accordance with approved engineering plans. The excavation may be made using an appropriate sized auger, and cutting out the corners with a shovel, bar, or other appropriate hand tools. Small side excavations shall be made to accommodate the conduit, as detailed. All loose soils shall be removed from the entire excavation before pouring concrete.

Forming - The top 4" of the footing shall be formed to the required dimensions, leveled with the rear edge of sidewalk unless other wise shown on the plans or approved. A 2"

space is required between the light pole footing and edge of sidewalks, curbs or other similar concrete structures to accommodate forming and prevent cracking of the adjacent structure.

The footing shall not be formed below ground. If the footing is over-excavated, it shall be backfilled with concrete at the time of the pour.

Placing Embedded Items - The anchor bolts, copper ground rod, and conduit for the light pole footing shall be properly located and firmly supported using a template provided by the utility.

Pouring Concrete - Concrete meeting the requirements of Section 930.00.00, Portland Cement Concrete shall be poured into the prepared excavation taking care not to displace the embedded utility items and anchor bolts. The concrete shall then be thoroughly vibrated and tamped. Concrete shall be poured neat against undisturbed earth except at the conduit extensions, and shall be poured to finish grade as shown on Standard Details, with bolts extending as directed by the appropriate standard detail, and the conduit and ground rod extending above the finish concrete, as directed by the appropriate standard detail.

Finishing and Grouting - Surface of the exposed concrete footing shall receive a medium broom finish. The space between the top of the footing and bottom of the pole anchor plate shall be filled with a cement-sand grout mixture and troweled to a 45-degree bevel. The wet grout shall be brush finished to a smooth appearance.

750.00.00 – Inspection

750.10.01 – Requirements

Prior to pouring the concrete footings, the Contractor shall arrange for an inspection. The PWD will inspect the footing excavations and the required forming to assure proper location and grade. The PWD may require testing to determine the strength of the concrete. The cylinders for testing will be taken at random by a materials testing laboratory approved by the PWD.

(This page intentionally left blank)

SECTION - 800

EROSION CONTROL

And

SEDIMENT PREVENTION

800 – EROSION CONTROL and SEDIMENT PREVENTION

810.00.00 – General

810.01.01 – Description

All construction sites of any size, included but not limited to, commercial or residential developments, lot(s), utilities, streets, or other types of construction related activities that may produce any soil erosion, sediments or other undesirable substances shall implement and maintain erosion and sedimentation prevention best management practices for preventing and minimizing such erosion, or sedimentation that may adversely affect storm water quality and adjacent property.

This work consists of installation, maintenance and removal of erosion and sediment prevention measures such as berms, dikes, swales, weirs, dams, sediment traps, sediment basins, erosion matting, temporary and permanent seeding, sodding, temporary and permanent mulching, slope drains, sediment fences and other sediment barriers, gravel construction accesses used to prevent erosion and off-site sedimentation.

No construction work may proceed until the Public Works Department has issued an “Erosion Prevention Permit” in combination with a “Public Works Construction Permit”.

810.10.01 – References

Oregon Administrative Rules (OAR) and Oregon Revised Statutes (ORS) current standards and revisions as may apply to Erosion and Sediment Control.

Oregon Department of Fish and Wildlife (ODFW) current standards and revisions as may apply to Erosion and Sediment Control.

Oregon Department of State Lands (ODL) current standards and revisions as may apply to Erosion and Sediment Control.

Oregon Standard Specifications for Construction and Standard Drawings, 2008, as they may apply to Erosion and Sediment Control.

Oregon Department of Environmental Quality current standards and revisions as may apply to Erosion and Sediment Control.

American Society for Testing and Materials (ASTM) as they may apply to Erosion and Sediment Control materials.

American Public Works Association (APWA), 2009, “Standard Specifications for Public Works Construction” as may apply to Erosion and Sediment Control.

City of Central Point Municipal Code (CPMC) as may apply to Erosion and Sediment Control Public Storm Water Systems.

Rogue Valley Sanitary Services, Standards and Specifications as may apply to Erosion and Sediment Control and Storm Water systems.

City of Central Point, Department of Public Works, Standards and Specifications as may apply to Erosion and Sediment Control and Storm Water systems.

Rogue Valley Stormwater Quality Design Manual, Jan. 2006

Illicit Discharge Detection and Elimination Manual, Oct. 2004

820.00.00 – CONSTRUCTION SITE MANAGEMENT PLAN (CSMP)

820.10.01 – Submittals

The Construction Site Management Plan (CSMP) shall be prepared for all projects.

The Applicant shall submit a CSMP for approval to the Public Works Department in conjunction with any commercial or private development plans prior to issuance of a Public Works Department Construction Permit.

Contractors shall submit a CSMP developed in coordination with the project work schedule not less than 10 working days prior to the start of construction for all other work not included in the development process noted above. This would normally include but not be limited to utility work projects, publicly funded construction or re-construction projects and maintenance projects.

The Construction Site Management Plan shall contain sufficient information to describe the site development and the system(s) intended to control erosion and prevent off-site damage from erosion and sedimentation. The CSMP shall include, but not be limited to, the following:

1. A site location and vicinity map.
2. A site development drawing at a standardized engineering scale, such as 1"=40', containing the following site conditions:
 - a) Soil type
 - b) On-site elevations and/or topographic information adequate to determine drainage patterns and slopes.
 - c) Hydrology, including surface drainage and wetlands.
 - d) Existing vegetation.
 - e) Natural resource sites and designated buffer areas.
3. Plans that show site control measures for preventing erosion and sedimentation into the City's storm water sewer systems and related resources, including supporting calculations, such as hydraulics and soil loss equation, and assumptions for a 5-year or 10-year storm event as required by City design policy.
4. Off-site and on-site access routes for construction and maintenance vehicles.

5. Borrow and waste disposal areas.
6. Debris and garbage disposal areas.
7. Vegetation specifications for temporary and permanent stabilization.
8. Construction schedule, including the implementation of construction site management practices and expected time period of land disturbance activities.
9. Manners of storage and disposal of materials (e.g., sand, lumber, insulation, paints, thinners, fertilizers, fuels).
10. Temporary and permanent storm drainage facilities.
11. Measures to be undertaken to minimize the extent of exposed soils.
12. Areas where construction vehicles' wheels will be washed.
13. Methods and places for concrete-wash disposal.
14. Disturbed areas and other areas that are physically protected from potential disturbance, such as fencing.

The PWD will provide a written evaluation of the submitted CSMP to the applicant indicating any required modifications within 15 business days of receipt. During the life of the contract, the Applicant or Contractor shall submit any proposed changes to the approved CSMP to the PWD for approval before implementing the changes.

PWD approval of the CSMP does not necessarily reflect concurrence by the City of Central Point that the proposed measures will work. The Engineer or Contractor shall inspect, maintain, and adjust the erosion and sedimentation control measures in place to prevent and minimize negative impacts to storm water quality. Inspecting, maintaining, and adjusting the erosion control measures in place, is considered incidental work and no separate payment will be made.

The Contractor shall install additional measures to the CSMP as directed by the Engineer to improve the functionality of the CSMP.

820.20.00 – Site Monitoring

820.20.01 – Erosion and Sedimentation Control Manager (ESCM)

The contractor shall designate one employee, thoroughly experienced in all aspects of construction, as Erosion and Sedimentation Control Manager (ESCM). Any change in the appointment of this individual during the term of the contract requires written submission and approval by the Engineer. The ESCM duties include:

1. Inspect erosion controls on active construction sites daily.
2. Inspect erosion controls on inactive sites at least monthly.
3. Inspect erosion controls during rainy periods on both inactive and active sites at least daily.
4. Immediately correct and modify erosion and sedimentation controls, maintaining compliance with the approved CSMP at all times.
5. Update the CSMP on a weekly basis to reflect necessary changes made.
6. Accompany the Engineer and/or the PWD on inspections and, if requested, on inspections made by other regulating agency representatives.
7. Mobilize crews to make immediate repairs to the controls or install controls during

working and nonworking hours.

No work shall start until the CSMP and ESCM have been approved by the PWD and a Public Works Construction Permit has been issued.

820.30.00 – Erosion Prevention Permits

820.30.01 – Requirements

Erosion Prevention Permits in combination with Public Works Construction Permits are required for all construction related activity that will:

1. Disturb any area of land being developed or constructed upon, which has the potential for erosion, production of sediment or production of other undesirable materials that may adversely affect storm water. Or:
2. is located in a sensitive area.

Criteria for a Sensitive Area:

- a. The slope of the parcel in the area of disturbance is greater than 10%
- b. The site contains highly erodible soils or soils that produce sediment; or
- c. The parcel or tax lot of record has the potential to directly drain into a water or wetland feature, or its designated buffer area.
- d. Is located in such a manner as to adversely affect the City storm water sewer system.
- e. Is located in such a manner as to erode soil material from or deposit sediment on adjacent property.

The Contractor shall have a certified professional prepare the permit application and the CSMP. The Contractor shall be responsible for performing all construction activities in accordance with the approved Erosion Prevention Permit and the CSMP.

Non Compliance

The Contractor's operation will be suspended whenever construction related activities are being done contrary to and in violation of applicable requirements of Central Point Municipal Code (CPMC), these specifications or the Erosion Prevention Permit.

Upon determination that the Contractor is violating (CPMC), these specifications, or the Erosion Prevention Permit, the City may issue a citation and/or penalty. Where such citation is issued, the Contractor shall pay to the City or property owner(s), or both if deemed by the court of jurisdiction, the penalties for each and every such day in violation. The Contractor shall also be required to promptly repair and remedy any damages to property at his own expense.

830.00.00 – MATERIALS

830.10.01 – Plastic Sheeting

Plastic sheeting shall be Polyethylene plastic with a minimum thickness of 6 mils.

830.20.00 – Erosion Control Matting

830.20.01 – Jute Matting

The yarn shall be loosely twisted construction and shall not vary in thickness by more than one half of its normal diameter. The weave shall provide openings of about 1 square inch.

Furnish the matting in widths of 45" or more, continuous lengths of not less than 150 feet, and weigh not less than 0.9 pounds per square yard.

Use 12 gauge staples or heavier steel wire that is bent to a U-shape 2" wide. Staples shall not be less than 10" long unless the Engineer allows a shorter length for hardpan soil conditions.

830.20.02 – Excelsior Matting

Excelsior matting shall consist of a machine-produced blanket of curled-wood fibers, of which 80% are 6" or longer. Furnish a blanket of uniform thickness, with the fiber evenly distributed over the entire area of the mat.

Cover the topside of the matting with a maximum 3" x 3" size mesh of high wet-strength, twisted Kraft paper, or a maximum 2" x 2" biodegradable, extended plastic mesh. Make the matting smolder-resistant without the use of chemical additives.

Excelsior matting shall have a minimum dry weight of 0.8 pounds per square yard ($\pm 10\%$). Furnish in minimum 36" wide rolls.

Wire staples for excelsior matting shall be the same as specified for jute matting.

830.20.03 – Alternate Matting Material

Submit any proposed alternate material with specifications, costs, and manufacturer's literature to the Engineer for consideration. Alternate material may be used only if approved by the Engineer.

830.30.00 – Silt Fences

The Geo-textile Fabric shall conform to Section 940, Geo-Textile Construction Fabric and the following:

	Test Methods	Units	Requirements		
			Supported Silt Fence	Unsupported Silt Fence	
				Geotextile Elongation >50%(I)	Geotextile Elongation <50%(I)
Grab Strength	ASTM	Lbs	90	124	124
MD	D 4632	force	90	100	100
CD					
Permeability (1)	ASTM D 4491	Sec	0.05	0.05	0.05
Apparent Opening Size	ASTM D 4751	In.	0.20 max. Avg. roll value	0.20 max. Avg. roll value	0.20 max. Avg. roll value
Ultraviolet Stability (Retained Strength)	ASTM D 4355	%	70% after 500 hrs of exposure		70% after 500 hrs of exposure

830.30.01 – Field Fabricated Silt Fence

As a basis of acceptance, furnish either a manufacturer’s brochure or a manufacturer’s certification. The silt fence system shall be able to withstand sediment, water, and wind loads associated with the intended use.

830.30.02 – Manufactured Silt Fence

Submit catalog descriptions of the silt fence system to the Engineer for approval prior to installation. As a minimum the silt fence system shall have post pockets and be able to withstand sediment, water, and wind loads associated with the intended use.

830.40.00 – Other Silt Barrier Materials

830.40.01 – Straw Bales

Standard 40 to 60 pound rectangular bales of cereal grain straw or grass seed straw which are wire-bound or string-tied.

830.40.02 – Bio-bags

18" x 8" x 30" bags made of ½" plastic mesh, weighing approx. 45 pounds, and filled with clean, 100 percent recycled wood product waste.

830.40.03 – Sandbags

24" X 12" X 6" tightly woven sacks of durable weather-resistant material filled with sand filler material.

830.50.00 – Seed

830.50.01 – Seed Certification

All rates are for pure live seed. Submit bag tags for verification.

Deliver all grass seed in standard, sealed containers. Label each container with the following:

- a) The kind and variety of the seed.
- b) The kind and variety of each seed in a mixture, of 3 % or more.
- c) Percent of germination (each kind).
- d) Percent of pure seed (each kind).
- e) Percent and kind of other crop.
- f) Percent of inert (not to exceed 1.5%).
- g) Percent of weed seed.
- h) Percent of noxious weed seed.
- i) Date of test.

In addition, tag all grass seed "Oregon Certified Seed" or the equivalent tag from another state, and be from the most recent crop available. Test and label each kind according to the Oregon Seed Law and Federal Seed Act. Test the seed within 9 months of the delivery date and shall not be sprouted, moldy, or show evidence of having been wet or otherwise damaged.

The minimum requirements of Oregon certified seed are as published in the current year's Oregon Certified Seed Handbook available from County Extension Offices or Oregon State University.

Each lot of seed shall be subject to inspection, sampling, and testing upon delivery to the project. Reject seed that is not labeled or that does not conform to specifications replace at the providers expense.

830.50.02 – Seed Type

Erosion control seed will be mixed and applied in accordance to the following:

Temporary application: Annual rye grass or perennial rye grass at 200 pounds per acre.
Permanent application: Perennial rye grass at 200 pounds per acre.

830.60.00 – Mulching

830.60.01 – Hydro Mulch

A cellulose fiber produced from virgin wood, grass straw, or a paper fiber product. Product shall be approved by City PWD.

830.60.02 – Grass Straw Mulch

Straw mulch for non-hydro seeding applications shall be grass straw from bent grass, bluegrass, fescue or ryegrass, singly or in combination. The straw shall not be moldy, caked, decayed or of otherwise low quality. Use a straw binder or tackifier.

- 1) Tracer - Approved Hydro mulch fibers.
- 2) Tackifier(s) - Approved commercial tackifier per Oregon Standard Specifications for Construction, Section 00280.44(d).

830.70.00 – Fertilizer

830.70.01 – Requirements

General Use - 22-16-8 inorganic fertilizer shall be analyzed to contain 22% nitrogen, 16% available phosphoric acid, 8% soluble potash, and include a minimum of 2% sulfur. The fertilizer shall contain not less than 30% available water-insoluble nitrogen derived by incorporating one of the following:

1. A minimum 800 lbs. of urea formaldehyde per ton of fertilizer that has a minimum Activity Index (AI) of 40. The AI will be determined by the Association of Official Agricultural Chemists method.
2. A minimum of 500 lbs. of Isobutylidene Diurea (IBDU) per ton of fertilizer.
3. Non-phosphorous - Polymer coated-sulfur coated urea, PCSCU, (39-0-0)

830.80.00 – Protection Fence

The Fence shall be a minimum of 4' high of poly construction or snow fencing capable of protecting the area from foot traffic. Other suitable barriers or warning devices shall be installed where required to warn or prevent vehicular traffic from entering the area.

840.00.00 – Construction and Workmanship

840.10.01 – General

Install the erosion and sedimentation control measures prior to all clearing, grading, and other land alteration activities, ensuring that erosion and sediment-laden water does not enter the drainage system or waterways or violate applicable water standards. Disturbed areas will be limited to the amount that the Contractor can effectively control. Incorporate all permanent erosion and sedimentation control features into the project prior to construction. During construction activities, all erosion and sedimentation control measures shown on the plans shall be maintained to prevent and minimize negative impacts to water quality and related natural resources. Correct operational procedures and repair equipment that cause erosion, sedimentation, and/or contamination such as fueling operations and leaking equipment. Remove and dispose of contaminated soils.

No construction activities shall be performed which result in:

1. The deposit or discharge of sediment from a site onto adjacent properties or into water features and related natural resources.
2. Degradation of water features due to removal of stream bank vegetation from construction sites.
3. The deposition of mud, dirt, sediment, concrete washout, trash, or other similar construction related material exceeding one-half cubic foot in volume for every 1,000 square feet of disturbed area onto public rights of way and private streets, and into the City's storm water system and related natural resources, either by direct deposit, dropping, discharge, erosion, or tracking by construction vehicles. Any such discharge shall be cleaned-up at the end of the current work shift in which the deposit occurred, or at the end of the current workday, whichever comes first.
4. Exposure of soils and stockpile areas to storm water runoff without secondary containment and treatment measures.
5. Earth slides, mudflows, earth sloughing, or other earth movement that may leave the project limits.
6. The discharge of runoff containing construction related contaminants into the City's storm water system or related natural resources.
7. Release onto the site of hazardous substances, such as paints, thinners, fuels, and other chemical due to improper handling or storage.

Design and implement management measures to meet the above outcomes with the seasonal variation of rainfall, temperature, and other climatic factors relative to the timing of land disturbance activities.

Adjust management measures to meet increased storm water runoff flows and velocities between November 1 and April 30.

No permit or other approval issued by the City shall be deemed to authorize any violation of the above prohibitions.

840.10.02 – Construction Site Practices

The Contractor shall establish and implement construction site management practices that will prevent toxic materials and other debris from entering the City's storm drainage and waterway systems. The Contractor shall:

1. Properly store chemicals (pesticides, fertilizers, fuels, paints, thinners, etc.) at the construction site;
2. Properly dispose of construction waste materials, garbage, rubbish, and sanitary waste
3. Immediately clean up spills of toxic materials
4. Wash excess concrete material in an approved disposal site;
6. Cover stockpiles;
7. Clean construction vehicles before entering streets or public rights of way.
8. Clean up "Track-out" mud and debris resulting from construction vehicles at each end of shift daily.

840.10.04 – Wet Season (November to May) and Temporary Work Suspension

Prior to the wet season (November 1 through April 30) and temporary work suspension the Contractor shall meet with the Engineer to review and update the CSMP to assure that appropriate controls are in place and maintained during the wet season work and temporary work suspension periods.

840.10.05 – Disturbance Limits

Construction site clearing limits will be clearly flagged by the Engineer and/or Contractor. No ground disturbance shall be permitted beyond the flagged boundary. The contractor shall maintain the flagging for the duration of the construction.

840.10.06 – Perimeter Controls

Install all appropriate perimeter controls prior to any site grubbing operation. Perimeter controls include side ditches or berms in fill areas, silt fence along the banks of existing streams, streets, toes of slopes and construction accesses.

840.10.07 – Soil and slope Protection and Stabilization

The Contractor shall temporarily or permanently protect and stabilize all soils that are exposed and disturbed during construction.

Protection and stabilization shall consist of any method or combination of methods that will produce the desired end result.

840.10.08 – Temporary Protection and Stabilization

The Contractor shall immediately protect and stabilize all exposed or disturbed soils which will not be disturbed by grading or other earthwork activities for 14 calendar days or longer. Exemptions to temporary protection and stabilization include areas of embankment sub-grade

or excavation where pavement will be placed.

From September 1 to May 1, there are no exemptions to temporary protection and stabilization requirements.

840.10.09 – Permanent Protection and Stabilization

The Contractor shall complete permanent protection and stabilization within 7 calendar days following the completed construction of finished grades.

Permanent protection and stabilization methods include permanent seeding and mulching, riprap protection, engineered slope protection and stabilization as shown on the plans or as directed by the Engineer.

Permanent seeding work done in conjunction with permanent mulching outside the spring and fall seeding dates shall be considered temporary until 3 weeks into the next permanent seeding season. A suitable stand of grass consists of a uniform stand having a 3" minimum height with bare spots not larger than 6" square will be allowed to a maximum of 3 percent of the seeded area. If a suitable stand of grass has not been achieved by the seeding dates, fertilize and reseed.

Seeding dates are as follows:

- a.) February 1 to April 30 (spring seeding)
- b.) September 1 to October 15 (fall seeding).

During the seeding dates, use Hydro mulch or straw mulch. For all other seeding, use straw mulch.

840.20.00 – Seeding

840.20.01 – Requirements

These specifications apply to all temporary and permanent protection and stabilization. Uniformly apply seed and fertilizer at the rates indicated and by one of the following kinds of equipment as the Contractor elects.

Thoroughly mix seeds when more than one kind of seed is to be used. Seed and fertilizer may be combined in water for application by hydraulic means. When fertilizer and seed are to be applied in dry condition, apply them separately. Applied from separate compartments, the application may be done in one operation.

Place the seed and fertilizer before placing the mulch, except the fertilizer and seed may be applied after mulching under the following conditions:

1. If the mulch is punched into the soil by mechanized means.
2. If it is necessary to hold down the mulch with netting or like material.
3. On 1-½:1 or steeper slopes where a slurry mixture would tend to run down the slope
4. Double the rate of application and add a green dye to visibly aid in uniform application.

Prevent the seed and fertilizer from falling or drifting onto areas occupied by rock base, rock shoulders, plant beds or other areas where grass is detrimental or undesirable.

840.20.02 – Application Methods

For both temporary and permanent protection and stabilization seeding work, apply seed and fertilizer using one of the following kinds of equipment.

1. Grass seed drills or seeders that work fertilizer into the soil and place the seed under about a ¼" soil cover.
2. Hydraulic equipment that continuously mixes and agitates the slurry and applies the mixture uniformly through a pressure-spray system providing a continuous, non-fluctuating delivery. Apply the materials using a sweeping, horizontal motion of the nozzle.

Add a nontoxic tracer to the seed and fertilizer mixture to visibly aid uniform application. Do not exceed 250 pounds per acre when wood cellulose fiber is used as a tracer.

3. Blower equipment using air pressure and an adjustable spout that uniformly applies dry fertilizer and dry seed in separate and successive applications at constant measured rates. Apply the materials using a sweeping, horizontal motion of the spout.
4. Hand-operated mechanical spreaders that uniformly apply dry fertilizer and dry seed separately and successively in prescribed quantities.

Regardless of equipment methods used, prevent drift and displacement of seed and fertilizer. If equipment and methods of application results in wasting material, make corrections as directed.

Do not disturb areas previously completed. If areas are disturbed, re-treat as directed at the Contractor's expense.

Area Preparation:

1. On cut slopes 1-1/2:1 or flatter, roughen the surface parallel with slope contours and loosen soil to a depth of 3" to 5".
2. On cut slopes steeper than 1-1/2:1, when seedbed preparation is difficult, cut furrows along the contours or stair-step during construction. On fill slopes 3:1 or steeper, make dozer tracks so that the ridges run parallel to slope contours.
3. Remove rocks, weeds, debris and other matter detrimental or toxic to the growth of grass from areas to be seeded. On slopes 3:1 or less, remove all loose stones larger than 2" in areas that will be maintained by mowing equipment.
5. When topsoil is specified, loosen existing ground surface to a depth of 4" to 6" before placing topsoil.

Application rate

Uniformly apply at the rate of 200 pounds of seed per acre.

Fertilizer

Apply as specified. The contractor shall notify the Engineer at least 2 calendar days in advance of starting operations, and keep the Engineer advised of the operations.

1. General-Use - Apply general use fertilizer at distances greater than 50' from permanent bodies of water, creek channels, or other running streams including irrigation channels at a rate of 400 pounds per acre.
2. Non-phosphorous - Apply non-phosphorous fertilizers within 50' of permanent bodies of water, creek channels, or other running streams including irrigation channels at a rate of 200 pounds per acre.

840.30.00 – Mulching

840.30.01 – Requirements

These specifications apply to all temporary and permanent stabilization. Evenly apply mulch material according to these provisions and the special provisions within 48 hours after seeding and fertilizing.

Place mulch after seeding and fertilizing, except for those conditions such as hydro seeding allowing the seed and mulch to be applied together.

Replace material that becomes displaced before acceptance of the work.

Mulch areas not accessible to heavy equipment by approved methods.

Prevent damage to prepared areas and to fertilizer, seed and mulch in place.

Prevent mulch material from plants, roadways, gravel shoulders, structures, areas where mulching is not specified, or which collects at the ends of culverts or accumulates to excessive depths, as directed.

If tacking agents are used with mulch, use protective covering on structures and objects where coverage and stains would be objectionable. Protect vehicles and persons from drifting spray.

Apply one of the following mulches at the rate indicated:

1. Place grass straw mulch to a reasonably uniform thickness of 1-½" to 2-½", and average approximately 2" in loose condition. This rate requires between 2 and 3 tons of dry mulch per acre. The grass straw mulch shall be loose enough for sunlight to penetrate and air to circulate; but dense enough to shade the ground, reduce water evaporation, and

materially reduce soil erosion. Retain grass straw mulch in place, with the addition of one of the following tackifiers.

- J-TAC, 40 pounds per acre on slopes of 2:1 or less and 80 pounds per acre on slopes greater than 2:1. Green-colored wood cellulose fiber may be added after the tackifier has been mixed.
 - Wood or grass straw cellulose fiber, 750 pounds per acre.
2. Place waterborne mulch as specified in Oregon Standard Specifications for Construction, 2008, Section 280.44(d), where fibers are uniformly suspended in water, to the seeded areas using hydraulic pressure equipment. Unless otherwise specified apply at least 2,000 pounds per acre, based on dry fiber weight. On slopes steeper than 1-1/2:1, use Hydro mulch, at 1-1/2 times the specified rate with tackifier at 80 pounds per acre. If wood or grass cellulose fiber is used as a tracer for seed application, this weight may be included as part of the required 2,000 pounds per acre minimum.

840.40.00 – Plastic Sheet Covering

840.40.01 – Requirements

Cover and secure tightly in place. Overlap seams 12". For seams parallel to the slope contour, lap the uphill sheet over the downhill sheet. Control drainage from areas covered by plastic sheeting so that no discharge occurs directly onto uncontrolled disturbed areas of the construction site. Direct water away from areas above the plastic to prevent erosion and undermining beneath the plastic sheeting.

840.50.00 – Erosion Control Matting

840.50.01 – Requirements

Prepare soil for seeding. Apply matting so it is in complete contact with the soil to prevent erosion occurring beneath it. Place and securely anchor erosion matting to the slope per manufacturer's recommendations.

840.60.00 – Silt Fence

840.60.01 – Requirements

Supported (mesh) and unsupported are as follows:

1. Field-Fabricated Silt Fence
Install supported fence by fastening mesh and geo-textile securely to the up-slope side of the posts. Use stitched loops over posts for unsupported silt fence. Eliminate the mesh for unsupported fence. Only manufacturer's factory seams are acceptable; field-sewn seams are not. When using geo-textile and wire fabric, use a continuous roll of geo-textile cut to the length of the barrier to avoid joints. When joints are necessary,

splice geo-textile only at a support post and use a minimum 6' overlap. Securely fasten each end of the fence to the end post. Bury the silt fence a minimum on 6".

2. Manufactured Silt Fence System

Install in accordance with plans, special provisions, and manufacturer's recommendations.

	Requirements		
	Supported Silt Fence	Unsupported Silt Fence	
		Geo-textile Elongation > 50% (1)	Geo-textile Elongation <50% (1)
Maximum Post Spacing	4 ft	4 ft	6.5 ft

(1) As measured in accordance with ASTM D4632

850.00.00 – Construction Access and Control

850.10.01 – Requirements

Place and arrange controls as shown in the CSMP or as directed by the Engineer. Install temporary gravel construction entrance/exit structures for construction traffic moving directly onto a public road or rights of way.

Track-out of mud, dirt, debris or other undesirable materials onto streets or sidewalks is not allowed and will not be permitted. Prompt cleanup of such materials is required.

850.10.02 – Straw Bales, Bio-bags, and Sand bags

Place and arrange controls as shown in the CSMP or as directed by the Engineer.

850.10.03 – Storm Water System Inlet Protection

Construct controls as required for directing the flow of water through the filters to the inlet in such a manner as to prevent inlet bypass or blockage.

850.10.04 – Protection Fencing

Construct protection fencing as shown in the CSMP or as directed by the Engineer. The fence supports shall have a maximum spacing of ten feet.

860.00.00 – Maintenance and Removal

860.10.01 – Requirements

The Contractor shall maintain installed erosion and sedimentation controls in good working order at all times and retain the controls until the project is completed, stabilized, and final acceptance is issued. Should a control measure not function effectively, the Contractor shall perform one of the following:

1. Immediately repair the control.
2. Remove and restore the control.
3. Provide additional controls.

Remove and re-grade sediment into slopes or remove and dispose of sediment off site. Do not flush sediment-laden water into the downstream system.

860.10.02 – Maintenance

1. Catch Basins - Maintain catch basins (inlets with sumps or inverted siphons) so that no more than one-half foot sediment depth accumulates within traps or sumps.
2. Sediment Controls - Remove sediment from controls such as silt fences, straw bale barriers, check dams and sediment ponds once it has reached 1/3 of the exposed height of the control.
3. Paved Areas - Keep all paved areas and gutters clean until the notice of completion is issued.
4. Construction Access Points - Add and remove gravel, aggregate or other material specified as needed to maintain proper function of the access pad.
5. Permanent Vegetative Stabilization - At the Contractors expense, reestablish permanent stabilized areas disturbed by Contractor's operations or other activities within 7 calendar days from the time of disturbance. At the Contractor's expense, repair anchored straw displaced by wind, water, or Contractors operations within 2 days of displacement.

860.10.03 – Removal

The contractor shall remove all temporary protection measures and any sediment at the completion of the work. Immediately shape and permanently protect and stabilize the areas affected by the removal process.

All materials associated with temporary erosion and sedimentation control that are not incorporated into the permanent work become the property of the Contractor.

Remove the materials from the area and dispose of materials in accordance with local, State, and Federal laws and to a suitable offsite location.

SECTION - 900

CONSTRUCTION MATERIALS

900 – CONSTRUCTION MATERIALS

900.00.00 – Scope

This section describes and specifies the materials commonly used in all City of Central Point, Department of public works projects. Materials specific only to particular phase of construction, such as paving, water or storm sewer shall be included in that materials section.

900.01.00 – Materials Testing and Quality Assurance

The standard materials test methods for the materials contained in these standards and specifications shall be conducted by a materials testing laboratory certified to perform the tests as required by the qualifying agency or institution. The tests shall include all tests requested by the City, or a consulting engineer acting in agency for the City to determine the initial design elements as well as quality assurance testing in the field.

City, state, county or a combination of such funding may fund City projects. Public Works facilities may also be constructed in conjunction with private development and accepted by the City of Central Point. In these cases specific or specialized materials may be approved by the Public Works Department on a particular project. These materials and conditions will be specified on the approved drawings.

910.00.00 – Aggregate

Aggregate shall include all classes of crushed rock to be used in construction of Public Works facilities that as been mechanically plant produced by a certified source described and specified as follows.

910.00.01 – Aggregate Source Certification

The certifying laboratory shall be qualified to conduct all materials tests normally required by the ODOT or APWA to determine the strength and quality of soil, aggregates, asphalt and Portland cement products used in public works construction.

The Public Works Department requires that Aggregate Certifications be submitted on a semi-annual basis. These are due on January 1 and July 1. Only Certifications performed with the two months prior to the due date will be accepted for review. The certification will be considered valid for the six-month period unless visual or performance evaluations indicate that the product has changed. In such cases, the PWD may then require additional certifications to assure quality and compliance with specifications.

The certification shall identify the source by its state designated source number and

situs. The certifying laboratory shall be qualified to conduct all materials tests normally required by the ODOT or APWA to determine the strength and quality of aggregate, asphalt or Portland cement products used in public works construction. An employee of the certifying laboratory must obtain the samples. A registered professional engineer must certify the required tests.

Individual material types as noted below shall require separate certifications for each material.

910.10.00 – Crushed Rock

910.10.02 – Base Aggregate

Certifications required for sieve sizes ¾"-0 through 2-½" - 0 crushed rock base materials shall conform to all the requirements as set forth in Oregon Standard Specifications for Construction, 2008, Section 02630, Base Aggregate.

Crushed aggregate base and sub-base shall meet the following gradation and quality specifications:

Table 910-1 Base Aggregate Sieve

Separated Sizes	2-½"-0	2"-0	1-½"-0	1"-0	¾"-0
<u>Sieve Size</u>					
					<u>Percentages Passing (by weight)</u>
3"	100				
2-½"	95 – 100	100			
2"	-	95 – 100	100		
1 ½"	-	-	95 – 100	100	
1-¼"	55 – 75	-	-	-	
1"	-	55 – 75	-	90 – 100	100
¾"	-	-	55 – 75	-	90 – 100
½"	-	-	-	55 – 75	-
3/8"	-	-	-	-	55 – 75
¼"	30 – 45	30 – 45	35 – 50	40 – 55	40 – 60
No. 10	(1)	(1)	(1)	(1)	(1)

(1) Of the fraction passing the ¼" sieve, 40% to 60% shall pass the No. 10 sieve.

910.10.03 – Sub-base Aggregate

This term is used to describe durable, natural pit-run shale, coarse gravel, cobbles, and boulders mixed with natural fractions of sand, and cemented sand and gravel that has

been reduced to a 4" minus size by processing through a crusher, that would not be acceptable as a crushed rock base course material because of contamination by cementitious materials or poor gradation. The material shall be certified to meet the following requirements:

Gradation	Screen/Sieve Size	Percent Passing
4"	4"	100
	3"	-
	2"	55 - 75
	1"	-
	1/2 "	25 - 45

910.10.04 – Clean Drain Rock

This material shall be clean washed 1" drain rock produced from screened creek gravels. The primary use of this rock will be for bedding under storm sewer pipes to allow the flow of ground water beneath the pipe. Clean Drain Rock shall only be used in situations where there is excessive ground water and the City Engineer directs its use. The Public Works inspector at the project site shall visually accept the material.

910.11.00 – Trench Backfill and Bedding Aggregate

910.11.01 – Requirements

Trench backfill and bedding shall conform to the following requirements:

- a) *Bedding for Water Mains* – Material for bedding shall consist of 3/4"-0 minus crushed rock meeting the grading requirements in Section 910.10.02, Base Aggregate above, unless otherwise directed by the Public Works Department.
- b) *Bedding for Storm Sewers* - Material for bedding shall consist of 3/4"-0 crushed rock meeting the grading requirements in Section 910.10.02, Base Aggregate above, unless otherwise directed by the Public Works Department.
- c) *Bedding for Water Service lines and Utilities* – This bedding material shall consist of clean uniformly graded course sand produced from crushed gravels with a maximum particle size of 1/4". At least 90 to 100 percent shall pass the No. 4 sieve and not more than 5 percent shall pass the No. 200 sieve. Decomposed Granite and Pea Gravel are not approved.
- d) *Pipe Zone* – Pipe zone material shall consist of 3/4"-0 crushed rock meeting the grading requirements in Section 910.10.02, Base Aggregate unless otherwise directed by the Public Works Department.

In certain cases where the depth of trench exceeds 8' in depth, is a safety hazard, and where the pipe diameter is too large to adequately compact material beneath the haunches of the pipe, the Public Works Department may authorize the use of clean

washed and screened 1" clean drain rock conforming to Section 910.10.04, Clean Drain Rock from the bedding to the spring line of the pipe. The quality of the clean rock shall be visually determined and approved by the Public Works Department.

- e) *Variable Zone Trench Backfill* - Backfill, from 6" above the pipe to the top of newly compacted sub-grade (varying depth), within the City street section right-of-way the material shall consist of ¾"-0 crushed rock meeting the grading requirements in Section 910.10.02, Base Aggregate **or**:

Under existing pavement, a 1 sack mix, cement and sand slurry otherwise meeting the requirements of Section 945.00.00, Cement-Sand Slurry may be substituted for ¾"-0 crushed rock noted above.

- f) *Upper Zone Trench Backfill* - Under existing pavement, backfill from the bottom of the pavement section to 36" below finished grade (top of the variable zone), a 1 sack cement and sand slurry mix meeting the requirements of described in Section 945.00.00, Cement-Sand Slurry shall be installed.

In newly constructed streets, within the City street section right-of-way, from the top of sub-grade to the top of the pipe zone (or top of the variable zone), the backfill material shall consist of ¾"-0 crushed rock meeting the grading requirements in Section 910.10.02, Base Aggregate.

- g) *Trench Backfill Outside of Street R/W* - Backfill over natural ground, outside the City street section Right-of-Way, from a minimum of 6" above the pipe (top of pipe zone) to finished grade. Unless other wise specified, material consisting of 4" crushed rock conforming to Section 910.10.03; or of ¾"-0 crushed rock meeting the grading requirements in Section 910.10.02, Base Aggregate; or decomposed granite or selected material approved by the Public Works Department may be used.

911.00.00 – Aggregate Material Tests

The following tests shall be conducted as a minimum to determine the quality and strength characteristics of aggregate materials:

- a) Maximum density shall be determined using AASHTO T-180-D as corrected for oversize (AASHTO T-224)
- b) Sand Equivalency conforming to AASHTO T-176. **Not less than 30**
- c) Sieve Analysis conforming to AASHTO T-27
- d) Fracture conforming to ODOT TM-213:
When crushed gravel is furnished, it shall have at least one mechanically fractured face on 50 percent of the material retained on each sieve size 1-½" and above and 70 percent for the material passing the 1-½" and retained on each of the sieves down to ¼".
- e) Liquid Limit (maximum) conforming to AASHTO T-89. **N.P. or 33 Max., as tested below.**

f) Plasticity index (maximum) conforming to AASHTO T-90. ***N.P. or 6 Max., as tested below.***

Durability:

Degradation Tests:

Passing No. 20 Sieve (ODOT TM 208) – ***30% maximum***

Sediment Height (ODOT TM 208) – ***3” Maximum***

Abrasion: AASHTO T 96 – ***35% Maximum***

Percent of Material Passing the No. 40 Sieve	Liquid Limit (Maximum) AASHTO T 89	Plasticity Index (Minimum) AASHTO T 90
0.0 to 5.05, inclusive	33	6
5.1 to 10.0, inclusive	30	5
10.1 to 15.0, inclusive	27	4
15.1 to 20.0, inclusive	24	3
20.0 to 25.0, inclusive	21	2
Over 25.0	21	0 or N.P.

915.00.00 – Sub-grade and Trench Reinforcement Rock

This section describes rock material that is acceptable for reinforcing soft areas of trench or street sub-grades. These areas are typically over excavated and then are brought to the designed sub-grade elevation with reinforcement material. These materials may be also incorporated into the approved design where the cost of additional crushed sub-base above the minimum required thickness is required to meet equivalent pavement thickness design criteria.

915.01.01 – Material Requirements

The material shall meet all of the requirements for grading as follows:

Pit – Run basalt shale material shall be selected from the quarry site that is fractured, of durable quality, and that can be further broken down to individual pieces by towed, self-propelled grid or vibratory grid rollers.

Decomposed Granite and un-fractured Creek Run Gravels are not approved!

Gradation - The grading shall be such that the maximum size shall not exceed 75% of the compacted thickness of the layer, in which, it is to be incorporated. The aggregate fraction passing a ¼” sieve shall constitute not less than 10% or more than 50% of the whole, by weight. Not more than 8% of the total aggregate shall pass a No. 200 sieve. Within the above limits, the aggregate shall be uniformly graded so that the materials will be dense and firm when watered and compacted.

Abrasion - The source material from which aggregate materials are obtained, Produced or manufactured when tested in accordance with AASHTO T 96, shall have a percentage of wear of not more than 45.

Sand Equivalent – Aggregates to be incorporated in the work shall have a Sand Equivalent value of not less than 30.

Determination – Determination of designated sizes and grading shall be by percentages of weight for each screen in conformance with AASHTO T 27.

Liquid Limit and Plasticity - Liquid limits of the material used shall not exceed 30 and plasticity index shall not exceed 5.

920.00.00 – Rip-rap

920.10.01 – General Requirements

Loose riprap of the required sizes or classes shall conform to the requirements of Oregon Standard Specifications for Construction, 2008, Section 00390, Rip-Rap Protection.

925.00.00 – Hot Mix Asphalt Concrete Paving (HMAC)

925.10.01 – General Requirements

Plant produced HMAC shall be supplied by an approved company regularly engaged in the production of plant-mix asphaltic concrete for use in public works projects, using aggregates, asphaltic cement, plant, and equipment conforming to the standards of the Asphalt Institute. Asphalt and aggregate materials shall be subject to approval by the Public Works Department preceding mixing as stated below in Section 925.10.02, Mix Design.

Plant mixed HMAC shall be subject to final approval after blending and mixing at the plant or the place of delivery prior to final rolling. Approval will be based on periodic sampling of the materials at the plant or work site. Certified copies of the Suppliers plant test results shall be delivered upon request to the PWD to confirm field test results.

925.10.02 – Mix Design

Each local supplier of HMAC shall establish current mix design(s) with the Public Works Department as of January 1st of the year preceding construction for the standard classes of asphaltic concrete it intends to supply for public works projects or street construction to be dedicated to the City.

The mix design shall be prepared by an ODOT certified laboratory and shall conform to all of the requirements and standards of the Oregon Standard Specifications for

Construction, 2008 for Level 3 and Level 4 duty pavements, 1" (Class "B"), ¾" (Class "C"), and ½" (Class "D") dense graded mixes, as defined by Section 00745, unless otherwise approved by the Public Works Department.

Where a supplier has not supplied the annual mix design for asphaltic concrete to the PWD, or a special mix design is required, the supplier shall be required to submit the mix design prepared by an ODOT Certified laboratory to the Public Works Department for approval by the at least 10 days prior to incorporation of the mix into the project.

The mix designs shall be prepared using the Suppliers aggregates, and shall include gradation, percentage of asphaltic cement, and maximum density, according to the ODOT method (RICE) or the Marshall method.

The asphaltic concrete mix shall conform as applicable to the requirements for mixing temperatures, hauling, and placing temperatures of the Oregon Standard Specifications for Construction, 2008, Section 00745.

930.00.00 – Portland Cement Concrete (PCC)

930.10.01 – General

Plant mixed Portland Cement Concrete (PCC) for use in all Public Works facilities construction shall be produced by a company regularly engaged in the production of ready-mix concrete, using aggregates, cement, additives, plant and equipment that conforms to the applicable requirements of Oregon Standard Specifications for Construction, 2008, Section 02001, Concrete, and applicable requirements of the American Concrete Institute (ACI).

930.10.02 – Requirements

- a) Compressive Strength – Unless otherwise specified herein or shown on the plans or details, or as directed by the City Engineer, all PCC shall have a minimum compressive strength of 3300 psi after 28 days.
- b) Aggregate –
 1. Miscellaneous Concrete Structures - Unless otherwise specified, the maximum size aggregate shall be ¾".
 2. Major Concrete Structures – The aggregate gradation shall be selected and designed in accordance with the type of structure and applicable sections of Oregon Standard Specifications for Construction, 2008, Section 02001 Concrete and Section 02690, PCC Aggregates.
- c) Unless otherwise specified or approved, maximum slumps for concrete shall be required as follows:
1" - Machine-placed curbs, or curb and gutter
3" - Thrust blocking, concrete encasement for pipes, and manhole bases

3"- Formed and poured curbs, or curb and gutter

4"- Formed, reinforced concrete structures, sidewalks, driveway aprons, wheelchair ramps, catch basins and curb inlets

- d) Air Entrainment: Concrete which will be subject to freezing and thawing, Such as curb and gutter sections, sidewalks, driveway aprons, and wheelchair ramps, shall have 3% to 5% entrained air.
- e) Certification: Upon request, the concrete supplier shall provide the Public Works Department with copies of the load ticket showing the batch date, type of material, quantity, delivery date and time; mix or yield design and any other reasonable information to substantiate the quality or type of material placed.

930.10.03 – Joint Materials

Generally, joint materials shall conform to Oregon Standard Specifications for Construction, 2008, Section 02440, Joint Materials. Joint materials for residential sidewalks may be a high quality asphalt impregnated fiberboard.

935.00.00 – Topsoil

935.10.01 – General

Topsoil material(s) shall conform to the Oregon Standard Specifications for Construction, 2008, Section 01040.14, Topsoil. Material shall be fertile, loamy, natural surface soil consisting of sands, silts, clays and organic matter in combination. Such topsoil material shall be free from substances toxic to plant growth and noxious weeds as defined by the Oregon Department of Agriculture as Type "A" or Type "B"; and from roots, refuse, sticks and lumps when tested according to AASHTO T 88.

Projects that include Low Impact Development in the design of stormwater control, shall refer to Oregon Standard Specifications for Construction 2008, Section 01012 – Stormwater Control, Water Quality Biofiltration Swale. For plantings in Low Impact Development projects, refer to Oregon Standard Specifications for Construction 2008, Section 01040 – Planting.

935.10.02 – Quality Control of Source

Each source shall be well drained and, before stripping, shall have healthy crops of grass or other vegetative growth, free from noxious weeds as defined above including Canadian Thistle, Morning-Glory, Blackberry, Horsetail, Tansy Ragwort or other plants designated as a noxious weed by State or County officials.

940.00.00 – Geo-textile Construction Fabric

940.10.01 – General

Unless otherwise specified, all woven and non-woven geo-textile materials shall conform to the Oregon Standard Specifications for Construction, 2008, Section 02320, Geosynthetics as applicable.

940.10.02 – Requirements

- a) Sub-grade Geo-textile – Only woven fabric is acceptable and shall meet the above requirements. Application and installation shall meet the requirements set forth in the requirements set forth in the plans or as described further herein and Oregon Standard Specifications for Construction, 2008, Section 00350, Geosynthetic Installation.
- b) Pavement Overlay Geo-textile – **Contact the Public Works Department.**
- c) Embankment Geo-textile – Both woven and non-woven fabric is acceptable shall meet the above Materials requirements. Application and installation shall meet the requirements set forth in the plans or as described further herein and Oregon Standard Specifications for Construction, 2008, Section 00350, Geosynthetic Installation.
- d) Drainage Geo-textile – Both woven and non-woven fabric is acceptable within the range of application and shall meet the above Materials requirements. Application and installation shall meet the requirements set forth in the plans or as described further herein and Oregon Standard Specifications for Construction, 2008, Section 00350, Geosynthetic Installation.

945.00.00 – Cement-Sand Slurry

945.10.01 – Requirements

As described in Oregon Standard Specifications for Construction, 2008, Section 02010, except that the cement and sand slurry mix shall consist 1 standard sack Type II cement having a 7" slump, plus or minus 1-1/2" when tested according to AASHTO T 119. This mix shall be used in all applications requiring the use of cement-sand slurry unless otherwise specified or directed.

Sand shall meet the requirements Oregon Standard Specifications for Construction, 2008, Section 02690.30, Fine Aggregates except that 100 percent shall pass the No. 4 (3/16") sieve.

960.00.00 – Miscellaneous Materials

960.10.01 – Locating Tape for Marking Discovered Utilities

Marking tape meeting ODOT or APWA requirements shall be minimum, 2” wide, heavy duty, non-fading, metallic/plastic material(s) that bear a repeated warning with the name or type of utility being marked, and shall be supplied in the following colors:

Example: “CAUTION: BURIED ELECTRIC LINE” (Red)

1. Water – Blue
2. Storm Drain – Green
3. Sanitary Sewer – Green
4. Gas – Yellow
5. Electrical – Red
6. TV Cable – Orange
7. Phone – Orange