



City of Northglenn

Public Right-of-Way Standards and Specifications

2021 Update





REVISION HISTORY

Revision	Date	Description
2021 Update	4/8/2021	Final updates and formatting revisions



TABLE OF CONTENTS

Revision History ii

Table of Contents iii

Tables v

Acronyms & Abbreviations..... vii

Chapter 1. General Requirements 1

 1.1 Authority & Purpose 1

 1.2 General Conditions 4

Chapter 2. Submittal Requirements for Public Improvement Construction Plans 9

 2.1 General 9

 2.2 Submittals & Content 9

 2.3 Final Plans – Public Improvement Construction Plans Only 10

 2.4 Information Required for Public Improvement Construction Plans 11

 2.5 General Formatting & Required Information 12

 2.6 Sheet Title Names & Specific Requirements 13

Chapter 3. Permits..... 21

 3.1 General 21

 3.2 Application 22

 3.3 Review & Acceptance of Submittals 22

 3.4 Issuance of a Permit 22

 3.5 Plans 22

 3.6 Warranty & Guarantee 22

 3.7 Permit Standards & Conditions 23

 3.8 Stop Work Orders 26

 3.9 Insurance Requirements 27

 3.10 Contractor License 28

 3.11 Right-of-Way Permit 28

 3.12 Grading Permit 31

 3.13 Temporary Water Service (Construction Meter) 31

Chapter 4. Public Infrastructure Acceptance Procedures & Warranty Requirements 33

 4.1 Applicability 33

 4.2 Acceptance/Warranty Inspection Criteria 37

Chapter 5. Design Report Requirements 40

 5.1 General 40

 5.2 Geotechnical Report 40

 5.3 Drainage Report 46

 5.4 Utility Study – Sanitary Sewer & Water 48

 5.5 Responsibilities for Traffic Studies 49

 5.6 Pavement Design Report 57

 5.7 Pavement Evaluation Report 57

 5.8 Pavement Design & Technical Criteria 58

 5.9 Pavement Design Procedure 61

Chapter 6. Earthwork & Erosion Control 63

 6.1 Introduction 63

 6.2 Soils Investigations 63

 6.3 Earthwork & Grading 63

 6.4 Erosion & Sediment Control Plans 64



6.5 Erosion Control 67

Chapter 7. Sanitary Sewer System 68

7.1 Introduction 68

7.2 Design Criteria - Planning 68

7.3 Materials & Facilities Requirements 71

7.4 Tests 77

7.5 Materials 80

7.6 Industrial Pre-Treatment Devices 84

7.7 Lift Stations Specifications 92

Chapter 8. Water System 94

8.1 Introduction 94

8.2 Design Criteria 94

8.3 Construction Specifications 103

8.4 Materials 111

Chapter 9. Storm Drainage & Other Concrete Facilities 123

9.1 Planning 123

9.2 Design 124

9.3 Construction Specifications 131

Chapter 10. Concrete Sidewalks & Other Concrete Facilities 136

10.1 General 136

10.2 General Layout & Design Criteria 136

Chapter 11. Roadways & Pavements 140

11.1 Introduction 140

11.2 Roadway Design & Technical Criteria 140

Chapter 12. Traffic Operation Devices 147

12.1 Introduction 147

12.2 Design Standards 147

12.3 Traffic Signal Specifications 152

12.4 Construction Standards 175

12.5 Traffic Signing & Pavement Markings 175

12.6 Traffic Signs 176

12.7 Pavement Marking & Striping 178

Chapter 13. Right-of-Way Grading & Erosion Control 181

13.1 Right of Way Grading & Erosion Control 181

Chapter 14. Trenching, Backfilling, & Compacting - Utilities 190

14.1 General 190

14.2 Equipment 190

14.3 Trenching for Utilities 190

Chapter 15. Street Construction Standards 196

15.1 General 196

15.2 Compaction in Utility Trenches 196

15.3 Excavation & Embankment 196

15.4 Subgrade Preparation & Grading 197

15.5 Subbase Construction 197

15.6 Base Construction 198

15.7 Bituminous Construction 198

15.8 Portland Cement Concrete Pavement 216

15.9 Materials & Construction Practices 218

15.10 Utility Pothole Repair 220

15.11 Bridges & Major Drainage Structures 220

15.12 Material Specifications 221



15.13 Bituminous Materials & Pavements221

15.14 Portland Cement Concrete Pavement -- Materials222

15.15 Portland Cement Concrete Pavement -- Equipment223

15.16 Portland Cement Concrete Paving -- Mixing225

15.17 Concrete for Sidewalk & Crosspans.....227

15.18 Underground Facilities for Traffic Signals.....232

Chapter 16. Temporary Traffic Control 237

16.1 Construction Traffic Control237

Chapter 17. Revegetation & Seeding 239

17.1 General239

17.2 Erosion Control - General.....241

17.3 Topsoil241

17.4 Seed242

17.5 Fertilizer.....242

17.6 Straw Mulch.....242

17.7 Straw Bales.....242

17.8 Temporary & Permanent Planting of Exposed Soils.....242

Glossary 244

Resource Standards for References 249

Appendix A Plan Development Checklist A-1

Appendix B General Notes..... B-1

Appendix C Construction Notes C-1

C.1 Standard Grading and Erosion and Sediment Control Construction Plan Notes C-1

C.2 Sanitary Sewer Construction Notes..... C-2

C.3 Additional general sewer notes; any of the following notes may be omitted when not applicable: C-3

C.4 Water Construction Notes..... C-4

C.5 Storm Drainage Construction Notes..... C-5

C.6 Street Improvements Construction Notes C-5

C.7 Traffic Signing and Pavement Marking Construction Notes..... C-6

Appendix D Certification of As-Builts C-1

Appendix E Checklist for Right-of-Way Permits..... E-1

Appendix F Design Forms F-1

Appendix G Standard Drawings G-1

G.1 Erosion Control Standard Drawings..... G-1

G.2 Sanitary Sewer Standard Drawings..... G-1

G.3 Storm Drainage Standard Drawings..... G-1

G.4 Street Standard Drawings..... G-2

G.5 Traffic Standard Drawings G-3

G.6 Water Standard Drawings G-3

TABLES

Table 2.1: Submittals & Content 10

Table 2.2: General Formatting & Required Information 12

Table 2.3: Cover Sheet Requirements..... 14

Table 3.1: Submittal Requirements 29

Table 5.1: Required Test 42

Table 5.2: Minimum Pavement Thickness 60

Table 7.1: Service Line Size and Slope 69

Table 7.2: Cast-in-Place Manhole Details..... 73

Table 7.3: Manhole Grouting 74



Table 7.4: Squeegee Sand Grading 76

Table 7.5: Sanitary Sewer Appurtenances 77

Table 7.6: Air Test Specs 78

Table 7.7: Minimum Pipe Wall Thickness for Gravity PVC Pipe 82

Table 7.8: Minimum Pipe Wall Thickness for Pressure PVC Pipe 82

Table 7.9: General Manhole Design Requirements..... 83

Table 7.10: Mortar Guidelines 84

Table 7.11: Manning’s Roughness Coefficient 86

Table 7.12: Minimum Slope 87

Table 7.13: Grease Factor 88

Table 7.14: Grease Storage 89

Table 8.1: Water System Analyses Criteria 95

Table 8.2: Fire Flow 95

Table 8.3: Main Crossing Scenarios 97

Table 8.4: Pipe Sizing Suppliers 99

Table 8.5: Required Service Tab Sizes Based on the Diameter & Type of Pipe..... 107

Table 8.6: Acceptable Corporation Stops 118

Table 8.7: Compression Couplings 119

Table 8.8: Acceptable Setters 120

Table 9.1: Minor Storm Allowable Pavement Spread 125

Table 9.2: Major Storm Allowable Pavement Spread 125

Table 9.3: Limits of Cross Street Flow 126

Table 11.1: Curb Radii Criteria 141

Table 11.2: Street Design Criteria 141

Table 11.3: Stopping Sight Distance 144

Table 12.1: Conduit Schedule 154

Table 12.2: Conductor Schedule 156

Table 14.1: Flowable Fill Mixtures 192

Table 14.2: Pipe Bedding Gradation 194

Table 14.3: Crushed Rock Gradation..... 194

Table 14.4: Backfill Gradation 194

Table 15.1: Aggregate Properties 200

Table 15.2: Dense Graded HMA Gradation Range..... 201

Table 15.3: SMA Aggregate Gradation Range Properties 201

Table 15.4: Properties of Performance Graded Binders..... 202

Table 15.5: Rap Aggregate Uniformity Tolerance 203

Table 15.6: Superpave Mixture Properties for Dense Graded HMA..... 205

Table 15.7: Superpave Mixture Properties for Open Graded SMA 207

Table 15.8: Minimum Voids in Mineral Aggregate (VMA) for Dense Graded HMA & Open Graded SMA, % 207

Table 15.9: Mix Design Verification Tolerances 208

Table 15.10: Mixture Discharge Temperatures 210

Table 15.11: Minimum Air & Surface Temperatures Limitations or Mix Placement(HMA) 211

Table 15.12: Job Mix Formula Tolerances 215

Table 15.13: Aggregate Base Course Materials & CDOT Specification 218

Table 15.14: Classification Table for Subbase 221

Table 15.15: Classification Table for Aggregate Base Course 221

Table 15.16: Concrete Cylinder Test Requirements 223

Table 15.17: Concrete Placement Temperature Protection Requirements 229

Table 15.18: Concrete Cylinder Test Requirement..... 231

Table 17.1: Classification Table for Amended Soil 239

Table 17.2: Classification Table for Topsoil 240

ACRONYMS & ABBREVIATIONS

AASHTO American Association of State Highway and Transportation Officials

AASHTO "Green" A Policy on Geometric Design of Highways and Streets, Latest Edition. American Association of State Highway and Transportation Officials

ACI American Concrete Institute

AISC American Institute of Steel Construction

ANSI American National Standards Institute

APWA American Public Works Association

ASA American Standards Association

ASTM American Society for Testing and Materials

ATSSA American Traffic Safety Services Association

AWWA American Water Works Association

CDOT Colorado Department of Transportation

CMP Corrugated Metal Pipe

CMPA Corrugated Metal Pipe Arch

CUHP Colorado Urban Hydrograph Procedure

CWCB Colorado Water Conservation Board

DIP Ductile Iron Pipe

DRCOG Denver Regional Council of Governments

FEMA Federal Emergency Management Agency

FHWA Federal Highway Administration

FIRM Flood Insurance Rate Map

HERCP Horizontal Elliptical Reinforced Concrete Pipe

IMSA International Municipal Signal Association

ITE Institute of Transportation Engineers

MHFD Mile High Flood District

MUTCD Manual on Uniform Traffic Control Devices

NEC National Electric Code

NEMA National Electric Manufacturers Association

NFIP National Flood Insurance Program

NPDES National Pollution Discharge Elimination System

NRCS National Resources Conservation Service

ODP Official Development Plan

OSHA Occupational Safety and Health Association

PDP Preliminary Development Plan

PUD Planned Unit Development

PVC Polyvinyl Chloride

RCBC Reinforced Concrete Box Culvert

RCP Reinforced Concrete Pipe

ROW Right-of-Way

SCS Soil Conservation Service

SPP Structural Plate Pipe



SPPA	Structural Plate Pipe Arch	USDCM	Urban Storm Drainage Criteria Manual (MANUAL)
UDFCD District	Urban Drainage and Flood Control	USGS	United States Geological Survey
UNCC	Utility Notification Center of Colorado		