

**THE ALASKA PROJECT MANAGEMENT,
DESIGN & CONSTRUCTION MANUAL**
A Guide to Managing & Administering Municipal Public
Works and State of Alaska DOT&PF Highway Projects

VOLUME 1 – DESIGN ENGINEERING

1 STRUCTURAL ENGINEERING

- 1.1 Reinforced Concrete Design**
- 1.2 Steel Design**
- 1.3 Timber Design**
- 1.4 Bridge Design**
- 1.5 Tunnel Design**
- 1.6 Fish Passage and Box Culvert Design**
- 1.7 Underpassing and Overcrossing Design**

2 ENVIRONMENTAL ENGINEERING

- 2.1 Water Quality and Water Treatment**
- 2.2 Wastewater Treatment**
- 2.3 NEPA and Environmental Permitting**
- 2.4 Air Pollution, Solid and Hazardous Waste**

3 WATER AND WASTEWATER ENGINEERING

- 3.1 Design of Sanitary Sewers**
 - 3.1.1. Design Capacity
 - 3.1.2. Design Flow & Peak Design Flow
 - 3.1.3. Sanitary Sewer Main Slope
 - 3.1.4. Sanitary Sewer Service Connection and Extension Slope
 - 3.1.5. Minimum Pipe Size – Gravity Sewer Main
 - 3.1.6. Minimum Pipe Size – Force Sewer Main
 - 3.1.7. Minimum Pipe Size – Private Sewer Line
 - 3.1.8. Authorized Pipe Materials and Fittings
 - 3.1.9. Unauthorized Materials and Fittings
 - 3.1.10. Standard Depth of Cover & Minimum Depth of Cover
 - 3.1.11. Deep Service Risers
 - 3.1.12. Sanitary Sewer Manholes
 - 3.1.13. Sanitary Sewer Service Lines

3.1.14. Sanitary Sewer Lift Stations

3.2 Water Treatment Plants

3.3 Pipes and Pumps

3.4 Water Distribution Systems

3.1.1. Design Data

3.1.2. Existing Grid Network

3.1.3. Authorized Pipe Materials and Fittings

3.1.4. Unauthorized Materials and Fittings

3.1.5. Main Lines Minimum Sizes

3.1.6. Commercial and Industrial Service Connections and Extensions

3.1.7. Residential Service Connection and Extensions

3.1.8. Depth of Bury

3.1.9. Dead Ends

3.1.10. Fire Hydrants and Flow Requirements

3.1.11. Crossings

3.1.12. Valves

3.1.13. Mainline Live Taps

3.1.14. Thrust Restraints

3.1.15. Special Structures – Pumping Stations, Storage Tanks, Diversions Valves, Meter Vaults, etc.

3.1.16. Large Diameter Transmission Mains

3.1.17. Water Service Connections into Main

3.1.18. Water Service Extension Meters

3.1.19. Corp Stops and Curb Stops

3.1.20. Key Boxes

3.1.21. Booster Stations

3.1.22. Pressure Regulating Valve (PRV) Stations

3.5 Air Pollution, Solid and Hazardous Waste

4 WATER RESOURCES

4.1 Open Channel Flow and Drainage Channel Design

4.2 Culvert Design

4.3 Storm Drain System Design

4.4 Statistical Hydrology

4.5 Runoff and Stormwater Collection

4.6 Groundwater Hydrology

5 TRANSPORTATION ENGINEERING

5.1 Geometric Roadway Design

3.1.1. Functional Classification for Motor Vehicles

3.1.2. Content Classification for Geometric Design

3.1.3. Multimodal Considerations

3.1.4. Elements of Design

3.1.5. Design Criteria

3.1.6. Horizontal Alignment

3.1.7. Vertical Alignment

3.1.8. Cross-section Elements

3.1.9. Local Roads in Rural Areas

3.1.10. Local Streets in Urban Areas

3.1.11. Collectors in Rural Areas

3.1.12. Collectors in Urban Areas

3.1.13. Arterials in Rural Areas

3.1.14. Arterials in Urban Areas

3.1.15. Freeways in Rural Areas

3.1.16. Freeways in Urban Areas

5.2 Intersection Design

5.3 Grade Separations and Interchange Design

5.4 ADA-compliant Pedestrian Facilities

5.5 Flexible Pavement Design

5.6 Rigid Pavement Design

5.7 Highway Lighting and Lighting Design

5.8 Roadside Barrier Design

5.9 Standard Sign Design

5.10 Striping Design

5.11 Traffic & Pedestrian Control Design

5.12 Vegetation and Landscaping Design

5.13 Transportation Planning

5.14 Utility Coordination

5.15 Public Involvement

5.16 Air, Rail, and Water Transportation

6 TRAFFIC ENGINEERING

6.1 Traffic Analysis and Operations

6.2 Principles of Traffic Flow

6.3 Traffic Engineering Studies

7 GEOTECHNICAL ENGINEERING

7.1 Geology, Origins of Soils, and Soil Properties

7.2 Soil Classifications / Identification

7.3 Atterberg Limits

7.4 Seepage

7.5 Soil Compressibility

7.6 Lateral Earth Pressure

7.7 Subsurface Soil Investigations

7.8 Permafrost

7.9 Shallow Foundation Design

7.10 Deep Foundation Design

7.11 Retaining Wall Design

7.12 Slope Stability

7.13 Geosynthetics

8 PROGRESSIVE DESIGN

8.1 Phases of Design

8.2 Plan Set Development

8.3 Specifications

8.4 Cost Estimates & Engineer's Estimates

8.5 Quantity Calculations

8.6 Design Reports

8.7 Design Surveys

8.8 Design Review

8.9 Architectural Design

9 STORMWATER MANAGEMENT

9.1 Best Management Practice (BMP) Guides

9.2 2021 Alaska Construction General Permit

9.3 Erosion and Sediment Control Plan (ESCP) Preparation

9.4 Storm Water Pollution Prevention Plan (SWPPP) Preparation

9.5 Arctic Stabilization & Biotic Soil Media

10 MISC. DESIGN

10.1 Arctic Engineering

**THE ALASKA PROJECT MANAGEMENT,
DESIGN & CONSTRUCTION MANUAL**
A Guide to Managing & Administering Municipal Public
Works and State of Alaska DOT&PF Highway Projects

VOLUME 2 – PROCUREMENT PHASE

1 STRATEGIC PLANNING

1.1 Owner’s Representation

2 TRADITIONAL PROJECT DELIVERY

2.1 Owner’s Representation

2.2 Design-Bid-Build – Competitive Bidding

3 A/E SELECTION AND CONTRACT NEGOTIATIONS

3.1 Owner’s Representation

4 PUBLIC PROCUREMENT PROCESS

4.1 Phase 1 – Solicitation Preparation

4.2 Phase 2 – Solicitation Advertisement

4.3 Phase 3 – Proposal or Bid Evaluation

4.4 Phase 4 – Contract Award

4.5 Phase 5 – Contract Management & Administration

5 ALTERNATIVE DELIVERY METHODS

5.1 Design Build (DB)

5.2 Progressive Design Build (PDB)

5.3 Best Value Procurement (Design-Bid-Build Plus Parameter)

5.4 Construction Manager General Contractor (CM/GC)

6 CONTRACT DOCUMENT PACKAGE CATEGORIES

6.1 Municipal Public Works Infrastructure Projects

6.2 EJCDC / AIA Standard Form Agreement Public Works Infrastructure Projects

6.3 DOT&PF Transportation Infrastructure Projects

7 STANDARD FORM CONTRACTS

7.1 EJCDC E-Series / Engineering Series

7.2 EJCDC C-Series / Construction Family Series

7.3 AIA A-Series / Owner-Contractor Agreements

7.4 AIA B-Series / Owner-Architect Agreements

7.5 AIA C-Series / Architect-Consultant Agreements

7.6 AIA G-Series / Construction Administration Forms

8 CONSTRUCTION SPECIFICATIONS INSTITUTE

8.1 MasterFormat Specifications

8.2 Construction Administration Documentation

9 ALASKA DOT&PF PROCUREMENT AND CONTRACTING

9.1 STIP

9.2 Tentative RFP Advertising Schedule

9.3 Request for Proposal: \$200K

9.4 Tentative Advertising Schedule (TAS)

9.5 Bid Calendar

9.6 Primary Project Delivery Models

**THE ALASKA PROJECT MANAGEMENT,
DESIGN & CONSTRUCTION MANUAL**
A Guide to Managing & Administering Municipal Public
Works and State of Alaska DOT&PF Highway Projects

VOLUME 3 – CONSTRUCTION ENGINEERING

MODULE NUMBER AND DESCRIPTION

- 1 MUNICIPAL CONSTRUCTION ADMINISTRATION TASKS**
- 2 MUNICIPAL CLOSEOUT PACKAGES**
- 3 DOT&PF CONSTRUCTION ADMINISTRATION**
- 4 DOT&PF'S FHWA PROJECT CLOSEOUT PACKAGE**
- 5 MEMO TO DOT&PF QA ENGINEER FOR MATERIAL SUBMITTAL**
- 6 CA PROJECT RECORDS DELIVERED TO DOT&PF QUALITY ASSURANCE UNIT
SATISFYING COMPLETE PROJECT CLOSEOUT**
- 7 INTERNAL DOT&PF FINAL CLOSEOUT PACKAGE**
- 8 STORMWATER MANAGEMENT**
- 9 DOT&PF STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION**
- 10 DOT&PF STANDARD CONSTRUCTION DRAWINGS**
- 11 MUNICIPAL STANDARD SPECS AND STANDARD CONSTRUCTION DRAWINGS**

1 MUNICIPAL CONSTRUCTION ADMINISTRATION TASKS

1.1 Preliminary Activities

- 4.1.1. Project Management (Scope, Schedule, Budget Mgmt.), Invoicing
- 4.1.1. Coordination With Contractor and Contract Administration
- 4.1.1. PM Software Set-Up
- 4.1.1. SWPPP Review, Approval, Management
- 4.1.1. Preconstruction Meeting
- 4.1.1. Scheduling, Logistics
- 4.1.1. Mobilization
- 4.1.1. Safety Planning, Training, And Coordination
- 4.1.1. Develop Connect Cards
- 4.1.1. Develop Submittal Register
- 4.1.1. Develop Material Summary and Special Inspection Schedule

1.2 Construction Administration

- 1.2.1. Project Management (Scope, Schedule, Budget Mgmt.), Invoicing
- 1.2.2. Submittal Reviews and Processing
- 1.2.3. On-Site Inspection and Owner's Representation
- 1.2.4. SWPPP Oversight and Management
- 1.2.5. RFIs/DCVRs
- 1.2.6. Change Orders
- 1.2.7. Pay Application Recommendations
- 1.2.8. Reoccurring Progress Meetings
- 1.2.9. Demobilization

1.3 Closeout

- 1.3.1. Develop Close-Out Documentation Summary/Checklist
- 1.3.2. Contractor As-Built Coordination
- 1.3.3. Commissioning Plan and Oversight of System Integration
- 1.3.4. Record Drawings
- 1.3.5. QA of Close-Out Documentation, Connect Cards, and Record Drawings
- 1.3.6. Coordination with DEC for Approval to Operate
- 1.3.7. Contractor Coordination for Commissioning

2 MUNICIPAL CLOSEOUT PACKAGES

- 2.1 Photo/Video Records of Pre-Construction Conditions**
- 2.2 A Complete Set of Final As-Built Drawings**
- 2.3 Construction Contract**
- 2.4 Construction Correspondence**
- 2.5 Project Permits**
- 2.6 Change Order Documentation**
- 2.7 Processed Pay Requests**
- 2.8 Owner's Representative Daily Reports and Photo Logs**
- 2.9 All Water Main Flushing and Testing Supporting Documentation**
- 2.10 Sewer Line Pressure Testing or CCTV Records**
- 2.11 Additional Pay Quantity Documentation**
- 2.12 All Material Test and Special Inspection Reports**
- 2.13 Certificate of Substantial Completion and Certificate of Completion**

3 DOT&PF CONSTRUCTION ADMINISTRATION

- 3.1 Construction Overview**
- 3.2 Project Funding & Expenditures**
- 3.3 Preliminary Activities**
- 3.4 Field Office Set-Up & Recordkeeping**
- 3.5 Field Lab Set-Up, Equipment & Recordkeeping**
- 3.6 Managing Staff**
- 3.7 Administrative Programs**
- 3.8 Contract Administration in the Office**
- 3.9 Contract Administration in the Field**
- 3.10 Documenting & Reporting the Contractor's Progress**
- 3.11 Sampling and Testing the Contractor's Work**
- 3.12 Contractor Payments**

3.13 Contract Changes

3.14 Contract Time

3.15 Final Field Construction Activities

3.16 Project Closeout

4 DOT&PF'S FHWA PROJECT CLOSEOUT PACKAGE

4.1 Final Construction Report

4.1.1. Final Estimate Assembly / Package

- * Certification of Final Estimate
- * Contractor's Release
- * Summary of Quantities
- * Materials Diploma / Materials Certificate
- * As-built plans
- * Department of Labor tax Clearance
- * Department of Revenue tax Clearance
- * Department of Labor Notice of Completion
- * Alaska Railroad Release

4.1.2. Final Construction Report Summary Sheet

4.1.3 Report on Design Recommendations

4.1.4. Report on Claims

4.1.5. Explanation of Overruns and Underruns

4.1.6. Summary of Change Documents

4.1.7. ROW Clearance Forms

5 MEMO TO DOT&PF QA ENGINEER FOR MATERIAL SUBMITTAL

5.1 Materials Closeout Includes

5.1.1 Final Progress Estimate – Summary of Quantities

5.1.2. Copy of All Executed / Signed Change Orders

5.1.3. Completed Material Summary / Materials Testing Summary

5.1.4. All Field Test Results

5.1.5. All Lab Test Results

5.1.6. Project Materials Report (PMR) for Minor Quantity Items

5.1.7. All Correspondence Related to Failing Materials

5.1.8. Completed Materials Certification List (MCL) – Signed

- 5.1.9 Materials Certificates
- 5.1.10 Memorandum of Exceptions

6 CA PROJECT RECORDS DELIVERED TO DOT&PF QUALITY ASSURANCE UNIT SATISFYING COMPLETE PROJECT CLOSEOUT

6.1 Contract Document Files

- 6.1.1. Conformed Contract
- 6.1.2. Letter of Award and Notice to Proceed (NTP)
- 6.1.3. Approved Subcontracts
- 6.1.4. Project Funding Agreement and Bid Tab
- 6.1.5. Progress Schedules
- 6.1.6. Directives
- 6.1.7. Permits
- 6.1.8. Change Orders & Supplemental Agreements – Complete
- 6.1.9. Change Orders & Supplemental Agreements – Backup
- 6.1.10. Requests for Proposals (RFPs)
- 6.1.11. Interim Work Authorizations (IWAs)
- 6.1.12. Utility Agreements
- 6.1.13. Professional Service Agreements
- 6.1.14. Approved Traffic Control Plans (TCPs)
- 6.1.15. TCS and Flagger Certifications
- 6.1.16. Truck MAVW & Scale Certification
- 6.1.17. Preconstruction Conference

6.2 Correspondence and Report Files

- 6.2.1. Correspondence – State to Contractor
- 6.2.2. Correspondence – Contractor to State
- 6.2.3. Requests for Information (RFIs)
- 6.2.4. Claims
- 6.2.5. Correspondence with District
- 6.2.6. Correspondence with Government Agency
- 6.2.7. Correspondence with Local Utilities
- 6.2.8. Progress Meetings
- 6.2.9. Safety Meetings
- 6.2.10. Inspector Daily Reports
- 6.2.11. Project Engineer's Diary

- 6.2.12. Regional QA Review Memo/Responses
- 6.2.13. Labor Compliance Interview
- 6.2.14. Commercially Useful Function (CUF)
- 6.2.15. EEO Utilization
- 6.2.16. Non-Material Submittals
- 6.2.17. Certified Payroll
- 6.2.18. SWPPP
- 6.2.19. Final Closeout Package

6.3 Pay Estimate, Quantity, and Pay Item Files

- 6.3.1. Pay Item Files
- 6.3.2. Lump Sum Agreements
- 6.3.3. Stockpiled Materials
- 6.3.4. Progress Estimates
- 6.3.5. Time and Materials Work

6.4 Material Files

- 6.4.1. Submittals
- 6.4.2. Materials Certifications
- 6.4.3. Materials Testing
- 6.4.4. Fabrication Testing

6.5 Administrative Files

- 6.5.1. Master Index
- 6.5.2. State Funding Information
- 6.5.3. Federal Funding Agreements
- 6.5.4. Letters of Assignment
- 6.5.5. Personnel Certifications
- 6.5.6. Overtime Requests
- 6.5.7. Personal
- 6.5.8. Stock Requests
- 6.5.9. Misc. Bills & Vouchers
- 6.5.10. Equipment Inventory
- 6.5.11. Photographic Records
- 6.5.12. Safety

6.6 Design and Project Development Data Files

6.1.1. Material Sites, Mining Plans, Blasting

6.1.2. Design Files, Pre-Award Information, and Computations

6.1.3. Right of Way Information

6.1.4. Project Survey Data

7 INTERNAL DOT&PF FINAL CLOSEOUT PACKAGE

7.1 Final Construction Report Routing and Distribution Sheet

7.2 Final Acceptance Letter

7.3 Transmittal of Final Documents Letter – Certified Mail

7.4 FHWA Project Closeout Package Checklist

7.5 Final Estimate Review Report

7.6 Certification of Final Estimate

7.7 Final Progress Estimate – Summary of Quantities

7.8 Estimate Summary by Funding Report

7.9 Contractor’s Release

7.10 Final Construction Report Summary Sheet

7.11 Letter of Project Completion

7.12 Division 670 Manufacturer Warranty for Inlaid MMA Pavement Markings (if applicable)

7.13 Explanation of Overruns and Underruns

7.14 Summary of Change Documents

7.15 Project Records Index

7.16 DBE Clearance

7.17 Project Materials Certification / Materials Diploma

7.18 Materials Testing Summary / Materials Acceptance Summary

7.19 Materials Certification List

7.20 Department of Revenue Tax Clearance

7.21 Department of Labor Tax Clearance Request Form for Contractors

7.22 Department of Labor Tax Clearance – Notice of Completion

7.23 As-Built Memorandum to Quality Assurance Engineer

7.24 Right-of-Way Clearance (if applicable)

7.25 Land Survey Monument Record (if applicable)

7.26 Environmental Clearance Forms

7.27 Catalog Cuts and/or M&O Manuals Transmittal Letter (if applicable)

7.28 FHWA – Final Inspection of Federal-aid Project

7.29 Project History

7.30 Lessons Learned / Report on Design Recommendations

7.31 Report on Claims (if applicable)

7.32 Alaska Railroad Release (if applicable)

7.33 Copy of Piledriving Records (if applicable)

8 STORMWATER MANAGEMENT

8.1 SWPPP Review and Approval

8.2 DOT&PF SWPPP Inspections

8.3 Municipal SWPPP Inspections

8.4 SWPPP Administration

8.5 SWPPP Closeout

9 DOT&PF STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION

9.1 General Provision Division

9.1.1. Bidding Requirements and Conditions

9.1.2. Award and Execution of Contract

9.1.3. Scope of Work

9.1.4. Control of Work

9.1.5. Control of Materials

9.1.6. Legal Relations and Responsibility to Public

9.1.7. Prosecution and Progress

9.1.8. Measurement and Payment

9.1.9. Disadvantaged Business Enterprise (Dbe) Program

9.2 Earthwork Division

- 9.2.1. Clearing and Grubbing
- 9.2.2. Removal of Structures and Obstructions
- 9.2.3. Excavation and Embankment
- 9.2.4. Structure Excavation for Conduits and Minor Structures
- 9.2.5. Excavation and Fill for Major Structures
- 9.2.6. Filter Blanket

9.3 Bases Division

- 9.3.1. Aggregate Base and Surface Course
- 9.3.2. Subgrade Modification
- 9.3.3. Reconditioning
- 9.3.4. Subbase
- 9.3.5. Stockpiled Material
- 9.3.6. Asphalt Treated Base Course
- 9.3.7. Emulsified Asphalt Treated Base Course
- 9.3.8. Crushed Asphalt Base Course

9.4 Asphalt Pavement and Surface Treatments Division

- 9.4.1. Hot Mix Asphalt Pavement
- 9.4.2. Tack Coat
- 9.4.3. Prime Coat
- 9.4.4. Seal Coat
- 9.4.5. Surface Treatment
- 9.4.6. Rumble Strips

9.5 Structures Division

- 9.5.1. Concrete for Structures
- 9.5.2. Prestressing Concrete
- 9.5.3. Reinforcing Steel
- 9.5.4. Steel Structures
- 9.5.5. Piling
- 9.5.6. Timber Structures
- 9.5.7. Bridge Barriers and Railing
- 9.5.8. Waterproofing Membrane
- 9.5.9. Removal of Concrete Bridge Deck

- 9.5.10. Mechanically Stabilized Earth Wall
- 9.5.11. Forms and Falsework
- 9.5.12. Field Painting of Steel Structures
- 9.5.13. Concrete Surface Treatments
- 9.5.14. Drilled Shafts
- 9.5.15. Expansion Joints, Bearings, and Waterstops
- 9.5.16. Temporary Crossings
- 9.5.17. Commercial Concrete

9.6 Miscellaneous Construction Division

- 9.6.1. Metal Flume Downdrains
- 9.6.2. Structural Plate Pipe
- 9.6.3. Culverts and Storm Drains
- 9.6.4. Manholes and Inlets
- 9.6.5. Underdrains
- 9.6.6. Guardrail
- 9.6.7. Fences
- 9.6.8. Sidewalks
- 9.6.9. Curbing
- 9.6.10. Ditch Lining
- 9.6.11. Riprap
- 9.6.12. Sacked Concrete Slope Protection
- 9.6.13. Monuments and Markers
- 9.6.14. Concrete Barrier
- 9.6.15. Standard Signs
- 9.6.16. Thaw Pipe and Thaw Wires
- 9.6.17. Railroad Crossings
- 9.6.18. Seeding
- 9.6.19. Soil Stabilization
- 9.6.20. Topsoil
- 9.6.21. Planting Trees and Shrubs
- 9.6.22. Rest Area Facilities
- 9.6.23. Block Sodding
- 9.6.24. Calcium Chloride for Dust Control
- 9.6.25. Pipe Hand Rail

- 9.6.26. Sanitary Sewer System
- 9.6.27. Water System
- 9.6.28. Geotextile for Embankment and Roadway Separation, Stabilization and Reinforcement
- 9.6.29. Geotextile for Subsurface Drainage and Erosion Control
- 9.6.30. Paving Fabric
- 9.6.31. Silt Fence
- 9.6.32. Geogrid for Embankment and Roadway Stabilization and Reinforcement
- 9.6.33. Insulation Board
- 9.6.34. Gabions
- 9.6.35. Driveways
- 9.6.36. Mobilization and Demobilization
- 9.6.37. Erosion, Sediment, and Pollution Control
- 9.6.38. Construction Surveying and Monuments
- 9.6.39. Traffic Maintenance
- 9.6.40. Services to be Furnished by the Contractor
- 9.6.41. CPM Scheduling
- 9.6.42. Signals and Lighting
- 9.6.43. Electric Load Centers
- 9.6.44. Traffic Markings

9.7 Materials Division

- 9.7.1. Hydraulic Cement and Supplementary Cementitious Materials
- 9.7.2. Asphalt Materials
- 9.7.3. Aggregates
- 9.7.4. Masonry Units
- 9.7.5. Joint Materials
- 9.7.6. Concrete and Plastic Pipe
- 9.7.7. Metal Pipe
- 9.7.8. Paints
- 9.7.9. Reinforcing Steel and Wire Rope
- 9.7.10. Fence and Guardrail
- 9.7.11. Concrete Curing Materials and Admixtures
- 9.7.12. Miscellaneous
- 9.7.13. Structural Timber, Lumber, and Piling

- 9.7.14. Preservatives for Timber
- 9.7.15. Steel for Piles
- 9.7.16. Structural Steel
- 9.7.17. Steel Forgings
- 9.7.18. Steel, Gray-Iron and Malleable-Iron Castings
- 9.7.19. Bearings
- 9.7.20. Prestressing Steel and Fittings
- 9.7.21. Bridge Railing
- 9.7.22. Waterstops
- 9.7.23. Seed
- 9.7.24. Fertilizer
- 9.7.25. Topsoil
- 9.7.26. Soil Stabilization Material
- 9.7.27. Geosynthetics
- 9.7.28. Sign Materials
- 9.7.29. Waterproofing Membrane
- 9.7.30. Signals and Lighting Materials

10 DOT&PF STANDARD CONSTRUCTION DRAWINGS

10.1 Bridges and Structures

- 10.1.1. Cantilevered Retaining Wall Type I
- 10.1.2. Cantilevered Retaining Wall Type I – High Seismic Cantilevered Retaining Wall Type II
- 10.1.3. Cantilevered Retaining Wall Type II – High Seismic Cantilevered Retaining Wall Type III
- 10.1.4. Cantilevered Retaining Wall Type III – High Seismic Cantilevered Retaining Wall Details
- 10.1.5. Bin Walls

10.2 Construction Barricades and Signing

- 10.2.1. Location of Double Traffic Fine Signs
- 10.2.2. Interim Pavement Markings

10.3 Drainage Culverts and Sewers

- 10.3.1. Culvert Pipe & Arch Installation Details
- 10.3.2. Pipe And Arch Tables

- 10.3.3. Pipe and Arch Tables (Steel Pipe)
- 10.3.4. Pipe and Arch Tables (Plastic Pipe)
- 10.3.5. Pipe and Arch Tables (Spiral Rib Pipe)
- 10.3.6. Culvert End Sections
- 10.3.7. Culvert Bevels
- 10.3.8. Culvert Marker Post
- 10.3.9. Culvert Circulating Thaw Pipe
- 10.3.10. Culvert Thaw Wire Installation
- 10.3.11. Remote Thaw Wire Installation
- 10.3.12. Manholes, Frame and Cover
- 10.3.13. Stormdrain Manhole Frame and Grate Details
- 10.3.14. Curb Inlet Box, Frame & Grate
- 10.3.15. Inlet Frames and Grates
- 10.3.16. High-Capacity Curb Inlet Box Frame and Grate
- 10.3.17. High-Capacity Inlet Frames and Grate (Field and Gutter Inlets) Type “A” Inlet Boxes
- 10.3.18. Headwalls – Cast-in-Place – Type I
- 10.3.19. Headwalls – Cast-in-Place – Type II
- 10.3.20. Headwalls – Precast – Type I
- 10.3.21. Headwalls – Precast – Type II
- 10.3.22. Type “C” Inlet Box, 18 Inch Pipe on 4:1 Slope
- 10.3.23. Type “D” Outlet Box, 18 Inch Pipe on 4:1 Slope
- 10.3.24. Type “C” Inlet Box, 24 Inch Pipe on 4:1 Slope
- 10.3.25. Type “D” Outlet Box, 24 Inch Pipe on 4:1 Slope

10.4 Erosion and Landscaping

- 10.4.1.1 Slope Rounding and Warping

10.5 Fences and Gates

- 10.5.1. Chain Link Fence
- 10.5.2. Chain Link Fence Gate
- 10.5.3. Woven Wire Fence
- 10.5.4. Woven Wire Fence with Barbed Wire

10.6 Guardrail, Median Barriers and Crash Cushions

- 10.6.1. Standard Guardrail Hardware (Nuts, Bolts, and Washers)

- 10.6.2. Standard Guardrail Hardware (Rail and Splices)
- 10.6.3. Standard Guardrail Hardware (Terminal Connectors)
- 10.6.4. Standard Guardrail Hardware (Miscellaneous)
- 10.6.5. Standard Guardrail Hardware (Flexible Delineators)
- 10.6.6. MASH Box Beam Guardrail
- 10.6.7. Steel Post W31 Guardrail
- 10.6.8. Wood Post W31 Guardrail
- 10.6.9. Steel Post Modified Thrie-Beam Guardrail
- 10.6.10. Guardrail Post Installation
- 10.6.11. W31 Guardrail Transition Details
- 10.6.12. W31 Downstream End Anchor
- 10.6.13. W31 Guardrail Buried-In-Backslope Terminal
- 10.6.14. Widening for Guardrail End Terminals
- 10.6.15. W31 Short Radius Guardrail
- 10.6.16. Long Span W31 Guardrail
- 10.6.17. MASH Bridge Rail Thrie Beam Transition
- 10.6.18. MASH “F” Shape Concrete Barrier

10.7 Intersections, Approaches and Pavement Design

- 10.7.1. Curb Cut, Curb and Gutter and Curb Ramp Details
- 10.7.2. Parallel Curb Ramp
- 10.7.3. Perpendicular Curb Ramp
- 10.7.4. Accessible Parking
- 10.7.5. Superelevation Transition

10.8 Luminaires and Lighting Standards

- 10.8.1. Lighting Standards
- 10.8.2. Junction Boxes for Electroliers and Traffic Signals
- 10.8.3. Type 1 Load Center

10.9 Miscellaneous

- 10.9.1. Survey Monument
- 10.9.2. Brass Cap Monument and Monument Case
- 10.9.3. Mailbox Location
- 10.9.4. Mailbox Installation
- 10.9.5. Mailbox Mounting and Anchoring Details

10.9.6. Cable Safety Rail

10.10 Sign and Sign Supports

10.10.1 Sign Framing

10.10.2 Bracing for Signs Mounted on Single Post

10.10.3 Post Mounted Sign Offset and Height

10.10.4 Sign to Sign Post Connections

10.10.5 Pole and Mastarm Sign Mounting

10.10.6 Light Sign Structure Post Embedment

10.10.7 Sign Framing

10.10.8 Bracing for Signs Mounted on Single Post

10.10.9 Post Mounted Sign Offset and Height

10.10.10 Sign to Sign Post Connections

10.10.11 Pole and Mastarm Sign Mounting

10.10.12 Light Sign Structure Post Embedment

10.10.13 Sign Post Base and Foundation

10.10.14 Sign Post Base and Foundation Behind Barrier

10.10.15 Overhead Sign Mounting

10.11 Traffic Control

10.11.1. Guide Marker Placement

10.11.2. Recessed Pavement Markers

10.11.3. Pavement Marking Applications

10.11.4. Pavement Marking Applications

10.11.5. Pavement Marking Symbol Dimensions

10.11.6. Crosswalk Location at Signalized Intersections

10.11.7. Milled Rumble Strips

10.11.8. Traffic Signal Hardware

10.11.9. Traffic Signal and Accessories Foundation

10.11.10. Loop Detector Installation

10.11.11. Controller Cabinet Foundation

10.11.12. Concrete 42-inch Dia. Signal Pole Foundation

10.11.13. Concrete 48-inch Dia. Signal Pole Foundation

10.11.14. Signal Pole with 15 to 35' Mastarm

10.11.15. Signal Pole with 40 to 50' Mastarm

10.11.16. Signal Pole with 55 to 65' Mastarm

10.11.17. Signal Pole with 70 to 75' Mastarm

10.12 Utilities

10.12.1. Thrust Blocks

11 MUNICIPAL STANDARD SPECS AND STANDARD CONSTRUCTION DRAWINGS

11.1 Municipal Standard Specifications – General Provisions Division

11.1.1. Bidding Requirements and Conditions

11.1.2. Award and Execution of Contract

11.1.3. Scope of Work

11.1.4. Control of Work

11.1.5. Legal Relations and Responsibilities

11.1.6. Measurement and Payment

11.1.7. Forms

11.2 Municipal Standard Specifications – Earthwork Division

11.2.1. Exploratory Test Pits

11.2.2. Clearing and Grubbing

11.2.3. Removal of Trees

11.2.4. Removal of Sidewalk

11.2.5. Removal of Curb and Gutter

11.2.6. Removal of Pavement

11.2.7. Grading Existing Surfaces

11.2.8. Dewatering

11.2.9. Trench Excavation and Backfill

11.2.10. Trench Excavation, Backfill and Compaction for Service Connections

11.2.11. Furnish Trench Backfill

11.2.12. Furnish Bedding Material

11.2.13. Furnish Filter Material

11.2.14. Drain/Filter Rock

11.2.15. Furnish Foundation Backfill

11.2.16. Unclassified Fill and Backfill

11.2.17. Classified Fill and Backfill

11.2.18. Leveling Course

11.2.19. Cobbles

11.2.20. Riprap

- 11.2.21. Geotextile Fabric
- 11.2.22. Insulation
- 11.2.23. Disposal of Unusable or Surplus Material
- 11.2.24. Reconstruct Driveway
- 11.2.25. Pipe Casing
- 11.2.26. Shoring, Sheeting and Bracing/Shoring

11.3 Municipal Standard Construction Drawings – Earthwork Division

- 11.3.1. Typical Sections – 20’/24’ Strip Paved and RAP Streets
- 11.3.2. Typical Sections – Secondary Streets
- 11.3.3. Typical Sections – Primary Streets
- 11.3.4. Typical Section – Deep Excavation
- 11.3.5. Typical Section – Alley
- 11.3.6. Typical Section – Pathway
- 11.3.7. Driveway Connection Detail
- 11.3.8. Trench Backfill and Bedding Layout
- 11.3.9. Pipe Insulation
- 11.3.10. Class B Bedding Material
- 11.3.11. Class C Bedding Material
- 11.3.12. Class D Bedding Material
- 11.3.13. Foundation Materials
- 11.3.14. Type II Classified Fill and Backfill
- 11.3.15. Type II-A Classified Fill and Backfill
- 11.3.16. Type V Classified Fill and Backfill
- 11.3.17. Type VI Classified Fill and Backfill
- 11.3.18. Leveling Course
- 11.3.19. Pipe Encasement
- 11.3.20. Compaction of Backfill within the Right-of-Way

11.4 Municipal Standard Specifications – Portland Cement Concrete Division

- 11.4.1. PCC Curb and Gutter & PCC Valley Gutter
- 11.4.2. PCC Sidewalk
- 11.4.3. PCC Curb Ramps
- 11.4.4. Structures and Retaining Walls
- 11.4.5. Concrete Masonry Retaining Walls
- 11.4.6. Concrete – Building Structures

- 11.4.7. PCC Cluster Mailbox Base
- 11.4.8. Concrete Parking Bumpers
- 11.4.9. Colored Concrete
- 11.4.10. Sidewalk Joint Sealant

11.5 Municipal Standard Construction Drawings – Portland Cement Concrete Division

- 11.5.1. Curb and Gutter Cross Sections
- 11.5.2. Curb and Gutter Termination Transition
- 11.5.3. Typical Section – Valley Gutter
- 11.5.4. Typical Section – Median/Curb Nose
- 11.5.5. Steel Curb Facing
- 11.5.6. Driveway Curb-cut with Attached Sidewalk
- 11.5.7. Driveway Curb Return with Attached Sidewalk
- 11.5.8. Perpendicular Curb Ramp
- 11.5.9. Parallel Curb Ramp
- 11.5.10. Accessible (Type 1A/2A) Curb and Gutter Sections
- 11.5.11. Curb Ramp Clearances
- 11.5.12. Pedestrian Push Button Access
- 11.5.13. Curb Type Retaining Wall – 2’ to 3’
- 11.5.14. Sidewalk Retaining Wall – 6” to 24”
- 11.5.15. Sidewalk Retaining Wall – 2’ to 5’

11.6 Municipal Standard Specifications – Asphalt Surfacing Division

- 11.6.1. Seal Coat
- 11.6.2. Prime Coat
- 11.6.3. Tack Coat
- 11.6.4. Crack and Joint Sealant
- 11.6.5. Asphalt Concrete Pavement / Hot Mix Asphalt
- 11.6.6. Permanent Asphalt Speed Humps
- 11.6.7. Recycled Asphalt Pavement (RAP)
- 11.6.8. Bituminous Surface Treatment
- 11.6.9. Pavement Rotomilling
- 11.6.10. Remove and Replace Asphalt Surfacing
- 11.6.11. In-Place Full Depth AC Pavement Reclamation and Leveling Course
- 11.6.12. Pavement Seam Repair Infrared Method

11.7 Municipal Standard Construction Drawings – Asphalt Surfacing Division

- 11.7.1. Typical Resurfacing Detail – Gravel
- 11.7.2. Typical Resurfacing Detail – Non-Gravel Surfaces
- 11.7.3. Standard Speed Hump

11.8 Municipal Standard Specifications – Sanitary Sewers Division

- 11.8.1. Furnish and Install Pipe
- 11.8.2. Sanitary Sewer Concrete Structures
- 11.8.3. Sanitary Sewer Pipe Connections and Extensions
- 11.8.4. Sanitary Sewer Flow Control
- 11.8.5. Existing Manhole Modifications
- 11.8.6. Sewer Closed Circuit Television Inspections
- 11.8.7. Remove and Dispose of Existing Cesspools or Septic Tanks

11.9 Municipal Standard Construction Drawings – Sanitary Sewers Division

- 11.9.1. Sanitary Manhole - Type A - Pipe 8” to 24”
- 11.9.2. Sanitary Manhole - Type B - Pipe D_{ia} 30” to 36”
- 11.9.3. Sanitary Manhole - Type C - Pipe D_{ia} 40” to 48”
- 11.9.4. Type A and B Manhole Base Plan
- 11.9.5. Manhole Heights
- 11.9.6. Copolymer Polypropylene Manhole Step
- 11.9.7. Sewer Service Connect for On-Site Lift Station 1-1/2” and 2”
- 11.9.8. Manhole Cover
- 11.9.9. Manhole Frame
- 11.9.10. Watertight Manhole Ring
- 11.9.11. External Drop Connection
- 11.9.12. Internal Drop Connect
- 11.9.13. Typical Beaver Slide Manhole
- 11.9.14. Sanitary Sewer Service (Complete)
- 11.9.15. Large Diameter Lateral Connection to Concrete Pipe
- 11.9.16. New Construction of Sewer Lines Service Riser/Top Entry for Deep Sewer –
Ductile Iron
- 11.9.17. Sanitary Sewer Service Connection (R.O.W. Only)
- 11.9.18. Sanitary Sewer Cleanout Cover
- 11.9.19. Sanitary Cleanout
- 11.9.20. Special Manhole and Cleanout Details (inside protective well radius)

- 11.9.21. Horse Shoe Sanitary Sewer Manhole Detail
- 11.9.22. Contractor Field Installation Notes Sanitary Example
- 11.9.23. Manhole Cone Adjustment
- 11.9.24. Manhole Ring Adjustment

11.10 Municipal Standard Specifications – Storm Drain Systems Division

- 11.10.1. Furnish and Install Pipe
- 11.10.2. Subdrains
- 11.10.3. Connections to Existing Manholes or Catch Basins
- 11.10.4. Manholes and Catch Basin Manholes
- 11.10.5. Watertight Manhole Frames and Cover
- 11.10.6. Adjust Storm Drain Manhole Cone to Finish Grade
- 11.10.7. Adjust Storm Drain Manhole Ring to Finish Grade
- 11.10.8. Construct Catch Basin
- 11.10.9. Relocate Catch Basin or Catch Basin Manhole
- 11.10.10. Remove Manhole or Catch Basin
- 11.10.11. Adjust Catch Basin to Finish Grade
- 11.10.12. Abandon Catch Basin Lead
- 11.10.13. Construct Storm Cleanout
- 11.10.14. Adjust Storm Cleanout to Finish Grade
- 11.10.15. Construct Drop Connection
- 11.10.16. Flume Downdrain
- 11.10.17. Footing Drain Services
- 11.10.18. Construct Open Ditch
- 11.10.19. Culvert
- 11.10.20. Fin Drain
- 11.10.21. Oil and Grit Separator
- 11.10.22. Heat Trace System
- 11.10.23. Prepare Pipe for Lining
- 11.10.24. Storm Drain Closed Circuit Television Inspections
- 11.10.25. Cured in Place Pipe Lining

11.11 Municipal Standard Construction Drawings – Storm Drain Systems Division

- 11.11.1. CPEP Storm Pipe Connection
- 11.11.2. Corrugated Metal Pipe Band Detail
- 11.11.3. Subdrain

- 11.11.4. Storm Drain Manhole Type I - Pipe ~ 24"
- 11.11.5. Storm Drain Manhole Type II - 24" to 36"
- 11.11.6. Storm Drain Manhole Type III
- 11.11.7. Storm Drain Manhole Cover
- 11.11.8. Storm Drain Top Intake Cover
- 11.11.9. Storm Drain Beehive Intake Cover
- 11.11.10. Manhole Heights
- 11.11.11. Precast Concrete Reducing Slab (72" or 48" to 26")
- 11.11.12. Precast Concrete Reducing Slab (72" to 48")
- 11.11.13. Precast Concrete Two Hole Reducing Slab (72" to two 25 1/2") 55-14
- 11.11.14. Precast Concrete Reducing Slab (112" to 72")
- 11.11.15. Precast Concrete Reducing Slab (140" to 72")
- 11.11.16. Precast Concrete Reducing Slab (168" to 72")
- 11.11.17. Manhole Cone Adjustment
- 11.11.18. Manhole Ring Adjustment
- 11.11.19. Catch Basin Inlet Frame and Hood for Type 1 Curb and Gutter
- 11.11.20. Catch Basin Inlet Grates for Type 1 Curb and Gutter
- 11.11.21. Catch Basin Inlet for Type 2 Curb and Gutter
- 11.11.22. Precast Catch Basin
- 11.11.23. Storm Drain Cleanout
- 11.11.24. Storm Drain Drop Connection (2' Min Drop)
- 11.11.25. Storm Drain Drop Connection (4' Min Drop)
- 11.11.26. Footing Drain Service Detail
- 11.11.27. Driveway Culvert Details

11.12 Municipal Standard Specifications – Water Systems Division

- 11.12.1. Furnish and Install Pipe
- 11.12.2. Furnish and Install Valves
- 11.12.3. Furnish and Install Fire Hydrants
- 11.12.4. Water Service Lines
- 11.12.5. Furnish and Install Galvanic Anodes
- 11.12.6. Temporary Water Systems
- 11.12.7. Decommission Water System and Components

11.13 Municipal Standard Construction Drawings – Water Systems Division

- 11.13.1. MJ Cap and Plug

- 11.13.2. Relocate Water Main (Sewer/Storm Drain)
- 11.13.3. Tracer Wire
- 11.13.4. Joint Bonding
- 11.13.5. Typical Pipe Angle Marker
- 11.13.6. Thrust Block
- 11.13.7. Mid-Span Thrust Block
- 11.13.8. Typical Valve Box (VB)
- 11.13.9. Dust Pan with Thaw Wires
- 11.13.10. Single Pumper “L” Base Fire Hydrant Assembly
- 11.13.11. Double Pumper “L” Base Fire Hydrant Assembly
- 11.13.12. Fire Hydrant Guard Posts
- 11.13.13. 1” Water Service Connect
- 11.13.14. Water Service Connect - 1-1/2” and 2”
- 11.13.15. Irrigation System
- 11.13.16. Adjust Service Key Box
- 11.13.17. Small Diameter Water Service Under Foundation
- 11.13.18. Large Diameter Water Service Under Foundation
- 11.13.19. Water Service Extension Stub
- 11.13.20. Anode Detail
- 11.13.21. Anode Wire Connection

11.14 Municipal Standard Specifications – Construction Surveying Division

- 11.14.1. Project Control
- 11.14.2. Field Notes
- 11.14.3. Party Chief’s Daily Diary
- 11.14.4. Clearing and Grubbing Stakes
- 11.14.5. Cross Sections
- 11.14.6. Slope Stakes
- 11.14.7. Grade Stakes
- 11.14.8. Drainage Facilities
- 11.14.9. Water Systems
- 11.14.10. Sanitary Sewer Systems
- 11.14.11. Major Structures
- 11.14.12. Miscellaneous Construction
- 11.14.13. Electronic Data Collection, Radial Surveys and Global Positioning Systems

11.15 Municipal Standard Construction Drawings – Construction Surveying Division

- 11.15.1. Field Book Index
- 11.15.2. Control Reference Points
- 11.15.3. Monument Recovery and Horizontal Control
- 11.15.4. Vertical Control
- 11.15.5. Clearing Limits
- 11.15.6. X-Sections/Slope Stakes
- 11.15.7. Grade Stakes/Blue Tops
- 11.15.8. Drainage Structures
- 11.15.9. Retaining Wall Structures
- 11.15.10. Storm Sewer Layout
- 11.15.11. Drainage Stakes
- 11.15.12. Curb and Gutter Stakes
- 11.15.13. Water Line Layout

11.16 Municipal Standard Specifications – Miscellaneous Division

- 11.16.1. Adjust Gas Valve Key Box to Finish Grade
- 11.16.2. Adjust Gas Valve Manhole to Finish Grade
- 11.16.3. Adjust Electric/Telephone Manhole
- 11.16.4. Adjust Electrical Vault
- 11.16.5. Adjust Utiliduct Lid
- 11.16.6. Remove Pipe
- 11.16.7. Reset Fence
- 11.16.8. Reset Parking Meters
- 11.16.9. Traffic Markings
- 11.16.10. Standard Signs
- 11.16.11. Traffic Maintenance
- 11.16.12. Bollards
- 11.16.13. Remove Guardrail
- 11.16.14. Guardrail
- 11.16.15. Temporary Group Mailboxes
- 11.16.16. Relocate Mailbox
- 11.16.17. Chain Link Fence
- 11.16.18. Silt Fence
- 11.16.19. Soil Stabilization

11.16.20. Flexible Delineators

11.17 Municipal Standard Construction Drawings – Miscellaneous Division

- 11.17.1. Standard Location for New Utilities
- 11.17.2. Locations for Existing Utilities (Approval Required for New Utilities)
- 11.17.3. Typical Water and Sewer Locations
- 11.17.4. Adjustment for Gas Valve Key Box (1/4” thru 4”)
- 11.17.5. Adjustment for Gas Valve Manhole
- 11.17.6. Standard Method for Shoring Phone/Conduit ACS Approved Method and Procedure #86-1
- 11.17.7. Striping Notes
- 11.17.8. Intersection Approach Striping
- 11.17.9. Left-Turn Pocket Approach Striping
- 11.17.10. Raised Median Approach and Two Lanes Drive to Right Striping
- 11.17.11. Left-Turn Pocket Approach from Two Way Center Left-Turn Lane Striping
- 11.17.12. Two Way Center Left Turn Lane Striping
- 11.17.13. Passing on Both Sides of an Obstruction
- 11.17.14. Layout Templates for Stencils
- 11.17.15. Approach to Railroad Crossing on Two-Lane Two-Way Highway
- 11.17.16. Typical Uncurbed Return with Pathway
- 11.17.17. Typical Uncurbed Return without Pathway
- 11.17.18. Typical Curb Return with Sidewalk
- 11.17.19. Typical Curb Return without Sidewalk
- 11.17.20. Post Mounted Sign with Shoulder
- 11.17.21. Post Mounted Sign with No Shoulder
- 11.17.22. Post Mounted Sign with Guardrail
- 11.17.23. Post Mounted Sign Curb without Sidewalk
- 11.17.24. Post Mounted Sign Curb with Parkway and Sidewalk
- 11.17.25. Post Mounted Sign Curb with Sidewalk without Parkway
- 11.17.26. Post Mounted Sign Raised Medians
- 11.17.27. Post Mounted Sign Secondary Panel Height and Sign Positioning
- 11.17.28. Street Name Signs
- 11.17.29. Sign on Round Post
- 11.17.30. Street Name on Round Post
- 11.17.31. Concrete Foundation for Sign Post

- 11.17.32. 12” Plate Installation Detail with Supplemental 8” D3-D1
- 11.17.33. Signs Signal Pole Mast Arm Sign Mounting
- 11.17.34. Wood Bollard
- 11.17.35. Removable Wood Bollard
- 11.17.36. Removable Steel Rectangular Bollard
- 11.17.37. Removal Circular Bollard
- 11.17.38. Guard Rail Detail
- 11.17.39. Cluster Mailbox Location
- 11.17.40. Fence Details

11.18 Municipal Standard Specifications – Landscaping Improvements Division

- 11.18.1. Landscaping
- 11.18.2. Topsoil
- 11.18.3. Seeding
- 11.18.4. Sod
- 11.18.5. Landscape Edging
- 11.18.6. Landscape Fabric
- 11.18.7. Willow Staking
- 11.18.8. Site Furnishings
- 11.18.9. Modular Concrete Block Wall
- 11.18.10. Boulders

11.19 Municipal Standard Construction Drawings – Landscape Improvements Division

- 11.19.1. Shrub Planting Detail
- 11.19.2. Conifer Planting Detail
- 11.19.3. Deciduous Tree Planting Detail
- 11.19.4. Boulder

11.20 Municipal Standard Specifications – Traffic Signals and Illumination Division

- 11.20.1. Excavation and Backfilling
- 11.20.2. Removing and Replacing Improvements
- 11.20.3. Foundations
- 11.20.4. Mast Arms, Poles, and Steel Pedestals and Posts
- 11.20.5. Conduit
- 11.20.6. Junction Boxes
- 11.20.7. Expansion Fittings

- 11.20.8. Conductors
- 11.20.9. Wiring
- 11.20.10. Fused Splice Connections
- 11.20.11. Bonding and Grounding
- 11.20.12. Load Centers
- 11.20.13. Wood Poles
- 11.20.14. Miscellaneous
- 11.20.15. Controller Assemblies
- 11.20.16. Vehicle Detectors
- 11.20.17. Vehicle Signal Heads
- 11.20.18. Pedestrian Signals
- 11.20.19. Pedestrian Pushbuttons
- 11.20.20. Flashing Beacons
- 11.20.21. Luminaires
- 11.20.22. Ballasts
- 11.20.23. Falsework Lighting
- 11.20.24. Interconnect Cabinet
- 11.20.25. Protective Post Assembly
- 11.20.26. Salvaging Electrical Equipment

11.21 Municipal Standard Construction Drawings – Traffic Signals and Illumination Division

- 11.21.1. Saw Cut Trench
- 11.21.2. Concrete Foundation Load Center Type 1A
- 11.21.3. Concrete Foundation Load Center Type 1
- 11.21.4. Concrete Foundation Type 1 Load Center Section AA
- 11.21.5. TS2 Controller Cabinet Foundation
- 11.21.6. Concrete Foundation TS2 Controller Section AA
- 11.21.7. Concrete Foundation TS2 Controller Section BB
- 11.21.8. Vault Type “M” Controller Cabinet Foundation
- 11.21.9. Poured Concrete Luminaire Pole Foundation
- 11.21.10. Signal Pole Foundation Details Concrete 42” Diameter
- 11.21.11. Signal Pole Foundation Notes Concrete 42” Diameter
- 11.21.12. Concrete Foundations for Signal Pedestal Pole and Pedestrian Push Button Pole

- 11.21.13. Driven Steel Pole Light Pole Foundation
- 11.21.14. Luminaire Pole Handhole Details
- 11.21.15. Pedestrian Push Button Pole
- 11.21.16. Signal Pedestal Pole
- 11.21.17. Pedestal Signal Pole Slip-Base and Adapter Detail
- 11.21.18. Luminaire Clearances
- 11.21.19. Flange-Mounted Luminaire Pole
- 11.21.20. Luminaire Arm Detail
- 11.21.21. Driven Steel Pipe Pole Assemblies
- 11.21.22. Flange-Mounted Detail for Concrete Luminaire Base
- 11.21.23. Concrete Luminaire Base Slip-Base Detail
- 11.21.24. Signal Pole Details
- 11.21.25. Signal Pole Notes
- 11.21.26. Signal Pole 15' to 35' MastArm Elevation View
- 11.21.27. Signal Pole 40' to 50' Mastarm Elevation View
- 11.21.28. Signal Pole 55' to 65' Mastarm Elevation View
- 11.21.29. Signal Pole Upper Section Options Part 1
- 11.21.30. Signal Pole Upper Section Options Part 2
- 11.21.31. Side-Mounted Signal Details
- 11.21.32. Pedestrian Push Button Assembly
- 11.21.33. Post Top and Mast Arm Mounted Signal Details
- 11.21.34. HDPE/PVC Transition Detail
- 11.21.35. Type IA Junction Box
- 11.21.36. Type II Junction Box
- 11.21.37. Type III Junction Box
- 11.21.38. Post Mounted Load Center - Type 3
- 11.21.39. Post Mounted Load Center - Type 2
- 11.21.40. Pad Mounted Load Center - Type 1A
- 11.21.41. Pad Mounted Load Center - Type 1
- 11.21.42. Load Center Wiring Diagram "A"
- 11.21.43. Panel Schedule for Wiring Diagram "A"
- 11.21.44. Load Center Wiring Diagram "B"
- 11.21.45. Panel Schedule for Wiring Diagram "B"
- 11.21.46. Load Center Wiring Diagram "C"

- 11.21.47. Panel Schedule for Wiring Diagram “C”
- 11.21.48. Load Center Wiring Diagram “D”
- 11.21.49. Panel Schedule for Wiring Diagram “D”
- 11.21.50. Load Center Wiring Diagram “E”
- 11.21.51. Panel Schedule for Wiring Diagram “E”
- 11.21.52. Load Center Wiring Diagram “F”
- 11.21.53. Panel Schedule for Wiring Diagram “F”
- 11.21.54. Load Center Wiring Diagram “G”
- 11.21.55. Panel Schedule for Wiring Diagram “G”
- 11.21.56. Conduit Encased Loop Detector
- 11.21.57. Loop Detector Home Run
- 11.21.58. Opticom Detector Installation Details
- 11.21.59. Signal Heads
- 11.21.60. Speed Limit Sign Beacon
- 11.21.61. Mast Arm Mounted Sign Beacons
- 11.21.62. Warning Sign Beacon
- 11.21.63. Splice Detail Loop Detector Leads
- 11.21.64. Signal Head Wiring Details
- 11.21.65. Interconnect Cable Termination Cabinet
- 11.21.66. Protective Post Assembly

**THE ALASKA PROJECT MANAGEMENT,
DESIGN & CONSTRUCTION MANUAL**
A Guide to Managing & Administering Municipal Public
Works and State of Alaska DOT&PF Highway Projects

VOLUME 4 – PROJECT MANAGEMENT

1 CLIENT, SUBCONSULTANT & CONTRACT MANAGEMENT

1.1 Owner’s Representation

2 SCOPE MANAGEMENT

2.1 Owner’s Representation

3 SCHEDULE MANAGEMENT

3.1 Owner’s Representation

4 QUALITY MANAGEMENT

4.1 Owner’s Representation

5 RISK MANAGEMENT

5.1 Owner’s Representation

6 COST & EARNED VALUE MANAGEMENT

6.1 Owner’s Representation

7 STAKEHOLDER & RESOURCE MANAGEMENT

7.1 Owner’s Representation

8 PROJECT INITIATION

8.1 Owner’s Representation

9 PROJECT PLANNING

9.1 Owner’s Representation

10 PROJECT EXECUTION

10.1 Owner’s Representation

11 PROJECT MONITORING & CONTROLLING

11.1 Owner’s Representation

12 PROJECT CLOSEOUT

12.1 Owner’s Representation