Forest Lakes Metropolitan District Excavation Permit Handbook

July 2, 2020

TABLE OF CONTENTS

EXHIBITS

Forest Lakes Metropolitan District Manager's Policy Statement

As a District, we remain committed to providing information and guidance to residents, and those that wish to conduct business in the District, that is easy to understand and that makes sense. In that light, we revamped our Excavation Permit Application, created a flowchart that describes the process and have developed a Handbook where the applicable documents can all be found in one place. We believe in "one stop shopping" and we appreciate any feedback you may have so we can continue to refine this and other information packets so that they are completely user friendly.

The Excavation Permit Application is to be used whenever a resident or a contractor will be installing utilities in the District's right-of-way or when residents will install culverts (for driveways) where the work will also occur in the District's right-of-way.

For questions related to this process, feel free to contact Forest Lakes Metropolitan District at 970-884-2925. Or, come see us at 271 N. Mountain View Drive, #271, Bayfield, CO 81122.

Resources:

- FLMD's Permit Application is on our website: www.flmd.com
- La Plata County Driveway Permit Standards: https://cms9files.revize.com/laplatacounty/Road%20and%20Bridge/Driveway%20Standards.pdf
- La Plata County Driveway Permit Application: https://cms9files.revize.com/laplatacounty/Road%20and%20Bridge/Driveway%20Permit.pdf

Excavation Permit Application Process Flowchart

Forest Lakes Metropolitan District

Excavation Permit Application Process Flowchart…Applies to:

- Driveway Installation in the ROW
- Culvert Installation in the ROW
- Utility work in the ROW

Driveway and/or Culvert Installation Permit Process

Permit Application Package:

- Excavation Permit Application
- Performance & Warranty Bond
- La Plata County Driveway Permit with approval
- Certificate of Liability Insurance
- $20.00 Permit Application Fee

Applicant/Owner reviews Application Handbook and submits completed Excavation Permit Application Package to FLMD Admin

FLMD Admin date-stamps and reviews Application Package for Completeness

Excavation Permit Application Package Complete?

Complete? No

RTO

"Return to Owner for Corrections"

Complete? Yes

- FLMD Admin provides copy of Excavation Permit Application and inspection checklists to O&M Shop
- FLMD Admin updates Tracking spreadsheet accordingly

FLMD Admin provides copy of date-stamped Application and receipt to Applicant/Owner and provides O&M Shop contact info to owner

O&M Shop meets Applicant/Owner On-site and completes Preliminary On-site checklist, and signs and dates front of Excavation Permit Application

Applicant/Owner contacts O&M Shop (970)884-2111 to schedule Preliminary on-site application review to discuss requirements

Applicant/Owner completes work and calls O&M shop (970)884-2111 to schedule Final Inspection(s)

- O&M Shop inspects work and completes Final Inspection Checklist to verify work meets standards
- O&M Shop notes deficiencies on Checklist
- Applicant/Owner corrects deficiencies and O&M Shop reinspects work, if required
- O&M Shop signs and dates front of Excavation Permit Application

FLMD inspects work to determine if it meets standards

Meets Standards? No

RDTO

"Relay Deficiencies to Owner for correcting"

Meets Standards? Yes

O&M Shop Completes Tracking spreadsheet and returns copy of completed Permit Application to FLMD Admin

Excavation Permit Application

As is stated above, the Excavation Permit Application is to be used whenever a resident or a contractor will be installing utilities in the District's right-of-way or when residents will install culverts (for driveways) where the work will also occur in the District's right-of-way. The document is to be submitted to FLMD Admin via email (office@flmd.com) for those that are out of the area, or preferably by dropping it off at 271 N. Mountain View Drive, #271, Bayfield, CO 81122. It is important that all of the required documents (see the items with check boxes on the Application) are submitted with the completed Application so the process timeline will not be delayed. When you submit the Application, we will check off these items to verify they have been submitted. If they have not, the entire package will be returned to the Applicant.

Please note that by signing the Application, the Owner/Applicant/Contractor is also agreeing to all of the terms in the Application.

Once the Applicant/Owner/Contractor has submitted the Application and has paid all of the required fees, they are required to contact the O&M Shop for a Preliminary Walkthrough to discuss the requirements. The O&M Shop representative will document all of the requirements on the second page (top) of the Application. Once the work is completed, the Applicant/Owner/Contractor will again be required to contact the O&M Shop for a Final Inspection. The Final Inspection Checklist is on the bottom half of the Application and that will be used to inspect the work to ensure it complied with the District's requirements.

Exhibit A

Permit No. _____

EMERGENCY: 911
LA PLATA COUNTY DISPATCH: (970) 385-2900
UPPER PINE RIVER FIRE PROTECTION DISTRICT: (970) 884-9508
FLMD O&M SHOP: (970)884-2111 AFTER HOURS: (970) 749-5282 OFFICE: (970) 884-2925

Forest Lakes Metropolitan District
P.O. Box 440 Bayfield, CO 81122-0440
970-884-2925 (Phone) 970-884-0305 (FAX)

EXCAVATION PERMIT APPLICATION

(For Driveways and/or Culvert installation and Utility Installations in FLMD ROW)
(Valid for 180 days for Residents and One Year for Utility Companies)

1. Applicant/Owner/Contractor: _____
2. Address: _____
3. Phone Number: _____ Work Location: Forest Lakes: Unit -_____Lot - _____
4. Work being done for: _____
5. Proposed work to be done: _____
6. Specific location of cut: _____
7. Estimated Lineal foot or square feet of surface excavation: _____
   (One travel lane shall remain open at all times)
8. Estimated start date and time of completion: _____
   (Not more than 10 days nor less than 24 hours from the date cut is made)
9. Required documents Attached? (Check all that have been submitted):

- ☐ Attach evidence of current liability insurance with FLMD listed as additional insured.
- ☐ Attach properly executed performance and warranty bond unless previously submitted or expired (minimum $1,000,000.00).
- ☐ Attach a copy of La Plata County Driveway permit. Installation shall comply with County Standards and a copy of County final approval is required before FLMD will approve and sign off on FLMD Excavation permit final.
- ☐ Sketch general details of work to be done on reverse side or attach copy of your utility plan. (Attach engineered drawings for Electrical, Gas and Phone installations)
- ☐ Permit fee is attached ($20.00 per permit unless penalized)

10. Applicant is aware of all excavation and safety standards required by applicable agencies. Applicant agrees to not store items within Rights-of-Way and agrees with the attached Conditions.
11. Applicant agrees to guarantee all work for a period of one (1) year from date such work is accepted by District.
12. For culvert installations, size required (by District) :_____(See FLMD Culvert Specifications)
13. All work shall have a preliminary walk through, agreed location and utilities located prior to construction (with owner, excavator and District) and requires a final inspection by District. Minimum 24-hour prior notification of walk through and inspections are required (no weekends or holidays). It is the Applicant/Owners/Contractor's responsibility to contact the O&M Shop at 970-884-2111 for the above inspections.

Preliminary Walkthrough Date:_____By: _____
(Note Deficiencies on Back of Sheet)

Final Inspection Date:_____By: _____
(Note Deficiencies on Back of Sheet)

Final Re-Inspection Date:_____By: _____
(Note Deficiencies on Back of Sheet)

APPLICANT/OWNER/CONTRACTOR:

- Is responsible for complying with all applicable safety requirements for excavation and open trenches on the worksite. Open trenches and excavation areas should be closed as soon as possible, and the use of barricades, safety fencing, and flagging is strongly encouraged for fall protection and general safety. Forest Lakes Metropolitan District is a heavily populated residential area with constant foot travel; take this into consideration to safely plan and complete your project.
- Hereby agrees to comply with all provisions of this excavation permit system (FLMD Resolution 93-05). Also, agrees not to drive or operate steel wheeled equipment, track machines, or other non-rubber tired vehicles on any roads, rights of way, easements, greenbelts or public places within the District or in any way cause damage to roads, rights of way, easements, greenbelts or public places within the District, unless performing work at the location specified and authorized in accordance with this permit. **APPLICANT AGREES NOT TO CUT OR FILL ROADS TO ACCOMMODATE DRIVEWAYS**.
- Accepts the liability for any claims resulting from violations of this provision and agrees to indemnify and hold harmless the Forest Lakes Metropolitan District. Applicant is hereby notified that a notice of intent to file a claim on applicant's bond or other financial security will be sent immediately to their surety upon violation of this provision. Permits are only valid for 180 days from date approved unless otherwise stated.

Applicant/Owner/Signature: _____ **Date:** _____

FLMD EXCAVATION PERMIT CONDITIONS

These **Conditions** are hereby attached to and become a part of the referenced FLMD excavation permit.

1. The intent of the FLMD excavation permit system is to allow the applicant/contractor to excavate and install their equipment with minimal impact to existing facilities and return the infrastructure including the roadway and right of way to its original condition before their project began. All standards and specifications that might be encountered to accomplish this task may not be specifically listed but will be required in accordance with acceptable industry standards at applicants/contractors' expense.

2. Adequate fire protection systems shall be in place and practices followed to prevent the ignition and spread of a wildfire in the subdivision. Some provisions shall include on board fire extinguishers, adequate spark arresters on gas powered equipment, use of heated equipment and/or vehicles that could ignite tall grasses or pine needles and recognition of changing climate conditions that increase the fire danger during the construction period.

3. Applicant/contractor is responsible for complying with all applicable safety requirements for excavation and open trenches on the worksite. Open trenches and excavation areas should be closed as soon as possible, and the use of barricades, safety fencing, and flagging is strongly encouraged for fall protection and general safety. Forest lakes metropolitan district is a heavily populated residential area with constant foot travel; this should be a factor you take into consideration to safely plan and complete your project.

4. Allowable working hours are Monday through Friday; 8:00 am to 5:00 pm. FLMD O&M Department hours are Monday through Friday; 7:30 am to 4:00 pm. Services of the district after hours will be billed at overtime rates.

5. A pre-construction meeting with district, applicant/contractor shall take place before the commencement of work. Weekly/daily construction meetings are requested to coordinate work, locates, line placement, protection of existing and future underground/above ground infrastructure and review any damage repairs, inspections, etc.

6. Repairs to existing water and sewer mains and service connections shall be by contractor with approved materials and inspected by FLMD prior to cover in accordance with applicable FLMD specifications.

7. Minimum depth of bury shall be maintained throughout the service line including the crossing of drainage areas including ditches and all low-lying areas.

8. Repairs or replacement of water and sewer infrastructure shall be in accordance with FLMD water lines, sanitary sewers and storm drainage facilities standard specifications dated 1/26/2006 – Exhibit D.

9. Repairs to roads and rights of ways shall be in accordance with FLMD Minimum Road Standard Specifications, dated 10/25/2011 – Exhibit B.

10. Installation of lines/structures shall be in accordance with FLMD Minimum Road Standard Specifications, dated 10/25/2011 – Exhibit B.

11. A set of as built drawings of the final installation shall be provided to FLMD upon completion of the project and updated as the system is changed on a periodic basis.

12. All above ground structures located within the right of ways and/or within areas that could be damaged during plowing and maintenance activities shall be clearly marked with adequate snow markers to facilitate the safe removal of snow and maintenance activities.

13. Where possible, all above ground structures shall be located on the uphill slope of the row to facilitate the safe removal of snow and maintenance activities.

14. Applicant/contractor is required to restore all areas disturbed by this project to a condition equal to, or better than the condition prevailing prior to construction including reseeding if area had existing grasses. This includes but is not limited to, roads, row, easements, driveways, and yards.

15. Use of engine brake equipped vehicles by applicant/contractor is only allowed with approved mufflers.

16. Applicant/contractor shall prevent unnecessary damage to FLMD roads, adjacent land, timber, soil, water and other resources and improvements. Applicant/contractor shall ensure its operations on FLMD roads comply with applicable federal, state and county laws, regulations and standards regarding resource protection and noxious weed prevention and control. Excavated areas will require noxious weed prevention and control treatments as these areas have been found to proliferate the growth of noxious weeds.

17. Applicant/contractor shall adhere to the posted maximum speed limit of 20 mph or less.

18. Applicant/contractor will immediately report all accidents and damage to any FLMD or residential property or structures.

19. Applicant/contractor understands and agrees that FLMD is relying on, and does not waive or intend to waive by any provision of the monetary limitations or any rights, immunities and protections provided by the Colorado Governmental Immunity Act, as from time to time amended, or otherwise available to district, its officers or its employees.

20. Any road closures of more than one lane or damages to fire hydrants rendering them out of service require notification to the La Plata County dispatcher, upper pine river fire protection district and the forest lakes metropolitan district. In the case of road closures this will require prior notification to these entities.

21. Applicant/contractor shall post a construction notice sign in the mail stop with contact information for property owners who have construction related questions/issues and include this information in mailings to the property owners.

22. With any trench/pathway for buried cable, wire, or pipe that crosses FLMD infrastructure, trench must be opened to final depth and visually inspected by FLMD prior to burying any installed materials. Bores must be inspected before any boring equipment has been removed from bore hole. Please plan and schedule your work and staff accordingly to comply with this requirement.

PRELIMINARY WALK-THROUGH CHECKLIST

YES	NO	
_____	_____	Utilities Located: _____
_____	_____	Water Line Issues: _____
_____	_____	Sewer Lines Issues: _____
_____	_____	Telephone Lines Issues: _____
_____	_____	Natural Gas Line Issues: _____
_____	_____	Culvert Location Determined: _____
_____	_____	Culvert Size Required: _____
_____	_____	Culvert Material Required: _____

Other Issues/Notes: _____

_____

_____

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_____

FINAL INSPECTION(S) CHECKLIST

YES	NO	
_____	_____	Utilities Impacted: _____
_____	_____	Water Lines impacted: _____
_____	_____	Sewer Lines Impacted: _____
_____	_____	Telephone Lines Impacted: _____
_____	_____	Natural Gas Line Impacted: _____
_____	_____	Culvert Size Installed: _____
_____	_____	Culvert Installation Meet Standards
_____	_____	Ditch Width and Depth Meet Standards
_____	_____	Ditch Cleaned Out
_____	_____	Road Graded and Meets Standards
_____	_____	Culvert Installation Meet Standards
_____	_____	Road Cut Compacted

Other Issues/Notes: _____

_____

_____

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_____

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Exhibit B

Forest Lakes Metropolitan District

STANDARD SPECIFICATIONS FOR CONSTRUCTION

MINIMUM ROAD STANDARDS

GENERAL

DESCRIPTION: These specifications include material specifications and construction requirements for minimum road construction and inspection procedures so that public roads can adequately and cost effectively serve the public needs road systems installed in the District right-of-way and in other areas under District jurisdiction or ownership. Developer/Contractor/Owner should also refer to Forest Lakes Metropolitan District Excavation Permit Requirements, Standard specifications for Construction of Water lines, Sanitary Sewers, and Storm Drainage Facilities, latest revision for addition information.

SPECIFICATION MODIFICATIONS: Portions of these specifications may be modified or deleted by appropriate items in the Special Conditions or notes on the contract drawings. The District's Engineer shall approve all modifications and deletions.

REVISIONS OF STANDARDS: When reference is made to a Standard Specification (ASTM, AWWA, AASHTO, etc.), the specifications referred to shall be understood to mean the latest revision.

PUBLIC SAFETY AND TRAFFIC ACCESS: The Developer/Owner/Contractor's operations shall not cause unnecessary inconvenience. The safety and access rights of the public shall be considered at all times.

Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods. If back fill has been completed to such an extent that safe access may be provided, and the road opened to local traffic, the Contractor shall immediately clear the road and driveways, provide, and maintain access.

The Contractor shall cooperate with the various parties involved in the delivery of mail and the collection and removal of trash and garbage to maintain existing schedules for these services.

BARRICADES AND WARNING SIGNS: All signs, barricades, flagmen, lights, and other devices necessary for the protection of work and safety of the public shall be the Contractor's responsibility. A traffic control plan shall be submitted and approved by the District prior to beginning construction where any construction activity will involve the use of public right-of-way. Neither District nor District's Engineer will review the adequacy of the Contractor's traffic control measures.

DEFINITIONS AND TERMS

ABC – Aggregate Base Course, 6-inch minus (Class 3), placed and compacted on the prepared sub grade and 3-inch minus (Class 2) placed and compacted on the prepared 6-inch minus (Class 3) base course.

ADDITIONAL RIGHT OF WAY REQUIREMENTS – For all classes of streets or roads, additional right of way (R.O.W.) width may be required when the design cut or fill is greater than the R.O.W. width available. The exception to this requirement is when the cut is through rock, then the excavated slope may, as approved by the District's Engineer, be as steep as ½:1. For all types of material other than rock, the cut and fill slopes may not be steeper than shown on the appropriate drawing for the class of road.

ARTERIAL STREET OR ROAD – A road that carries a relatively high traffic volume over longer distances in a direct manner. It requires an 80-foot R.O.W., 27 foot surfaced roadway, 7-inches of compacted 6-inch minus and 3-inches of compacted 3-inch minus ABC and 3-inches of compacted ASC.

ASC – Aggregate Surface Course, 3/4-inch minus (Class 6), placed and compacted on the prepared ABC. The term "surface" indicates the top layer of aggregate, not

necessarily the actual surface of the roadway.

COLLECTOR STREET OR ROAD – A road which collects and distributes traffic from one or more residential or population concentration areas to or from an Arterial Road or major highway. It requires a 60-foot R.O.W. W., 27 foot surfaced roadway, 6-inches of compacted 6-inch minus and 3-inches of compacted 3-inch minus ABC and 3-inches of compacted ASC.

CUL-DE-SEC – A turning place at the end of a road requiring a 100-foot diameter R.O.W., with an 80-foot diameter surfaced area. Construction specifications shall match those required for the roadway leading to the cul-de-sec.

DISCONTINUOUS STREET OR ROAD – A road, which does not extend from an existing District Approved Road, Federal or State highway, or to a District approved cul-de-sec.

DISTRICT – The Forest Lakes Metropolitan District Board of Directors or their designees.

DISTRICT ACCEPTANCE – A District accepted road is one that has been accepted for future maintenance by the District.

DISTRICT APPROVAL – A District approved road is one that has been constructed in compliance with the requirements of the Forest Lakes Metropolitan District road specifications.

DISTRICT'S ENGINEER – A professional engineer, licensed in the State of Colorado, designated by the District to inspect and evaluate work on behalf of the District.

LOCAL STREET OR ROAD – A road that carries slow speed local traffic from residential areas to or from a Collector road. It requires a 60-foot R.O.W., 26-foot surfaced roadway, 6-inches of compacted 6-inch minus and 3-inches of compacted 3-inch minus ABC and 3-inches of compacted ASC.

OWNER – The subdivider, developer or any other person who is obligated or responsible to perform work which is to be District Approved or Accepted.

STREET AND ROAD – These terms are synonymous in these specifications.

STUB STREET OR ROAD – A short road used for access to a maximum of six single-family units and not over 800-feet in length. This road section may be used only when there is no possibility of lengthening the roadway in the future. It requires 60-foot R.O.W., 24-foot surfaced roadway, 6-inches of compacted 6-inch minus and 3-inches of compacted 3-inch minus ABC and 3-inches of compacted ASC. Use of this road specification shall be at the discretion of the District.

SUB GRADE – The natural or suitable fill soil of the proposed roadway to be prepared for placement of the ABC.

TECHNICIAN – A qualified material tester under the supervision of, or approved by, the District's engineer.

TEMPORARY CUL-DE-SEC – A cul-de-sec approved by the District to be used at the end of a road, which is shown on the final plat to be extended in the future.

CONTROL OF WORK

SCOPE OF WORK – All work not covered in these Specifications shall be done in accordance with the "Standard Specifications for Road and Bridge Construction", Colorado Department of Transportation, current edition.

INSPECTION OF WORK – At least 14 working days prior to the commencement of construction with the District R.O.W., the developer/contractor/owner must notify the District of intent, obtain a District Excavation Permit, along with a submittal of a proposed schedule of construction activities. The developer/contractor/owner shall notify the District of any changes in scheduling. The District, and/or the District's engineer shall inspect the work throughout the construction period to verify that work complies with District standards, specifications, rules, and regulations. Inspection requests for road

construction during inclement weather shall be postponed until acceptable weather conditions prevail. Failure to notify the District may cause removal of material, at the developer/contractor/owner's expense to allow inspection of previous work. If, in the opinion of the District, the work is not being performed in a satisfactory manner, the developer/contractor/owner will be notified of deficiencies in writing. Failure to receive such notification does not relieve any developer/contractor/owner responsibilities of compliance with these specifications. All work shall be done to the District's satisfaction.

APPROVAL OF COMPLETED WORK – The developer/contractor/owner shall notify the District in writing of the completion of roadwork and that Approval is now requested. Payment of the inspections and testing must be made before Approval is requested. The developer/contractor/owner shall provide to the District written certification by a Colorado Registered Land Surveyor that the roadway is within the platted, deeded or monumented R.O.W. It is recommended that the survey be done at the time the sub grade is ready for the aggregate base course so that problems encountered may be dealt with before further construction takes placed. The District will not consider Approval of discontinuous roads.

After review of the developer/contractor/owner's request, engineer's inspection report, the test results reports, and the surveyor's certification, the District will, within 30 days, notify the developer/contractor/owner in writing of provisional Approval or Rejection. If rejected, the District will give reasons for rejection and set forth what is required to make the work acceptable. Once the reasons for rejection have been corrected, the develop/contractor/owner may submit another request in writing to the District.

After developer/contractor/owner has been notified of a provisional approval, the developer/contractor/owner shall provide a bond or other assurance (if not previously provided), acceptable to the District in an amount to be determined by the District, warranting that any engineering or construction defects or inadequacies that show up within two years will be corrected or repaired by the developer/contractor/owner at their expense. Upon receipt of acceptable bond, or other assurance, the warranty period will begin and the work will be considered complete for purposes of Approval and, if applicable, release of any road improvements agreement.

After expiration of the warranty period and completion of any required corrections or repairs, which shall take place within 30 days of post warranty period, upon acceptable inspection by District, the bond or other assurance will be released.

CLEARING AND GRUBBING

The centerline of the proposed road shall lie on the centerline of the R.O.W. where possible. The R.O.W. shall be cleared to a width of 5-feet outside the embankment toe line or the excavation cut line. Clearing shall consist of removal of trees, brush, grass, weeds, and all organic material. In areas of embankment, stump holes, and any other excavation for root removal shall be back-filled and compacted prior to starting embankment construction.

MUD AND EARTH TRACKING ON PUBLIC STREETS: The developer/contractor/owner shall conduct their operations so as not to have the equipment tracking mud and earth onto the adjacent public roads after surface treatments have been applied. Upon notification by the District or District's Engineer, the Contractor will clean from the public roads mud and/or earth tracked by their equipment or that of their material suppliers to the project

EXCAVATION AND EMBANKMENT

Excavation and placing embankments shall be done by generally accepted methods of the industry. Benching shall be required on steep slopes and embankments shall be placed in lifts not to exceed 8-inches, and then shall be compacted as specified. In rocky areas where fill material consist predominately of rock too large to be placed in 8-inch lifts, material may be placed in maximum lifts of 24-inches, providing any boulders are scattered out within the fill and are compacted around them. Suitable fill shall comply with specifications stated herein.

Compaction of 93% of maximum dry density, as determined by AASHTO T99 or ASTM D698, shall be required for all embankment lifts and 8-inches of the sub grade surface.

The District will require compaction tests to be made by the developer/contractor/owner using a District approved engineer or technician on all lifts and sub grade surface to assure the work complies with specifications. All testing shall be at the developer/contractor/owner's expense.

CULVERTS AND STRUCTURES

Trenches for culverts and other structures shall be excavated in reasonable close tolerance to established grades. Corrugated metal pipe (CMP) culverts shall be installed with some camber in the center to assure there will be ponding in the culvert. Excavation for culverts and other structures shall be wide enough to permit taping equipment to work on all sides. When rock, either broken or solid, is encountered at the flow line, the trench shall be over excavated a minimum of 6-inches and backfill placed and compacted to provide a cushion for the pipe. This bedding shall be fine-grained material, well graded to provide uniform support for the entire length of the culvert.

Suitable material free of wood and other organic debris shall be used for backfilling and any necessary fills. Backfill material for CMP culverts shall contain no rock larger than 1-inch within 1`-foot of the culvert. The moisture content of the backfill or fill material shall be near optimum moisture before it is placed in 8-inch lifts for compaction.

Compaction requirements are 93% of maximum dry density as determined by AASHTO T99 or ASTM D698. All testing shall be at the Owner's expense.

Cross Drainage Structures may be CMP or any other District approved material. The size (diameter or box dimension) shall be determined from drainage area, runoff factor, etc. Manufactures of CMP have design criteria in their handbooks. The District may require approval of culvert sizes prior to construction. No culvert less than 18-inches in diameter will be permitted. Minimum gage of CMP is as follows:

DIAMETER	GAGE#
18 to 21-inch	16
24 to 36-inch	14
42 to 54-inch	12
60 to 72-inch	10
over 72-inch	8

Cross drainage structures shall be located at all low points to prevent ponding along the road. Maximum distance for ditch flow parallel to the roadway is 800 feet. Minimum cover over cross drainage structures shall be 1-foot for CMP's up to 36-inches in diameter, and 1.5-feet for CMP's over 36-inches.

Bridges and other structures that are not pre-fabricated shall be constructed in accordance with plans stamped by a professional Colorado engineer and approved by District.

DRAINAGE AND EROSION

Roadside ditch depth – All roads shall have a minimum roadside ditch depth of 2-feet. Ditch slopes shall be no steeper than 2:1 unless prior approval is obtained in writing from the District's Engineer. Riprap and gabions may be required in certain areas to prevent erosion.

Borrow Areas – Any borrow areas utilized for construction material shall be sloped and graded to provide adequate drainage.

Seeding of Slopes – Both excavation, embankment and borrow areas with a District approved mix at a time that will allow revegetation to occur prior to expiration of the warranty period.

AGGREGATE BASE AND SURFACE COURSES

Gravel road surfacing shall consist of a base course and a surface course, although the term "surface" does not necessarily refer to the actual finished surface of the road if the surface is to be paved. Compacted thickness of each course is given in the definitions of these specifications and in typical drawings for each type of road. The base may be either pit run river gravel or crushed stone. If river gravel is used, the oversized material must be removed. Prior to placing any gravel, the roadway sub grade shall be shaped and compacted ensuring adequate crown is in the finished roadway. Written approve by the District's engineer of the sub grade shall be acquired prior to allaying any gravel.

Gradation requirements for aggregate are as follows:

PERCENT PASSING BY WEIGHT

Base Course	Sieve Size	Surface Course

100%	4”	-
65-90%	3”	-
40-75%	¾”	100%
22-45%	#4	30-65%
16-34%	#8	25-55%
3-15%	#200	3-12%

Other requirements for ABC and ASC are:

Plasticity Index (PI) not to exceed 6 for either Base or Surface Course Aggregate.

COMPACTION - The Base Course shall be placed in two equal lifts except in the case of Stub Roads on which a single lift may be placed. The material shall be near optimum moisture when laid and compacted. Compaction shall initiate at the outer edges, progressing towards the center until the ABC is thoroughly compacted and conforms to the lines, grades, and thickness required. Written approval from the District’s engineer of base course compliance shall be acquired prior to laying any surface aggregate.

The Surface Course shall be placed and compacted in one lift when the material is near optimum moisture content. Compaction shall be accomplished with a vibratory smooth steel drum roller or other approved type weighing not less than 5 tons. The method shall be the same as specified for the ABC. Compaction of 95%, AASHTO T180 and ASTM D1557, is required.

TESTING

1. Gradation and P.I. test on aggregate shall be made by the engineer or technician as follows:
    a. An initial test will be made immediately after gravel production starts. This requirement also applies to a stockpiled material before hauling begins.
    b. A minimum of one test will be made for each 2000 cubic yards of material produced thereafter or hauled from a stockpile.
    c. Other tests may be required if the source rock appears to be too soft.
2. Proctors should be run prior to construction in order to avoid delays in the inspection process.
3. All other testing and inspection shall comply with the schedule set forth in the Colorado Department of Transportation “Field Materials Manual”, latest edition.
4. Depth checks of materials shall be made at the same rate as density testing.
5. The District may require additional test to be performed if, in the opinion of the District, the test results show the material or work not to comply with these specifications.

MISCELLANEOUS

MAXIMUM GRADE on any road shall be 8%. For Local and Stub Roads, a request for grades up to 10% for short pitches not over 300-feet in length may be considered by District. Request must include sufficient engineering data to prove that the 8% grade could not be obtained by additional cut or fill, or replacement.

PAVING STANDARDS for either bituminous or concrete are not included in these specifications. “Standard Specifications for Road and Bridge Construction”, a publication of the Colorado Department of Transportation, latest edition shall be the guide. Specific plans, stamped by a Colorado registered engineer of any proposed paving shall be submitted to the District for review and approval prior to commencing of any work.

STREET SIGNS shall be installed at all intersections so that they are visible from all traffic directions. Signs and post shall be made of District approved materials, mounted, installed and conform to the Manual of Uniform Traffic Control Devices, latest edition at the developer/contractor/owner’s expense. The locations and configurations of all signs shall be District approved prior to installation.

Regulatory and Cautionary signs shall be furnished, installed and conform to the Manual of Uniform Traffic Control Devices, latest edition at developer/contract/owner’s expense. The locations and configurations of all signs shall be District approved prior to installation.

MAGNESIUM CHLORIDE shall be applied to all ASC before final compaction. Application procedures shall be as follows:

a. Apply water until the full depth of the ASC aggregate reaches optimum moisture, just so that the gravel is damp (not to the point where water is standing or the fines turn to mud).
b. Apply magnesium chloride with a sprayer at a rate of ½ gallon per square yard.
c. All magnesium chloride to penetrate the gravel.
d. Compact, preferably with a flat vibratory compactor, in accordance with the compaction section of these specifications.

PRIVATE DRIVEWAY ACCESS SPECIFICATIONS

The District is not responsible for the construction or maintenance of any private driveways. A District Excavation Permit is required for any driveway intersecting a District road. Permit forms and additional driveway specifications are available from the District offices. Driveway accesses must meet the following criteria:

1. A driveway interchange is defined as that portion of driveway located in the District right-of-way between the roadway edge and the property line, which is designed and used for the interchange of traffic between the roadway and the abutting property.

2. Paving of the driveway interchange portion is not allowed and shall **terminate at the property line**. District accepts no liability to paving damage that is located on District right-of-way and owners will be billed for damages to District equipment. Paving that impedes District maintenance operations will be removed at owner's expense.

3. All entrances and exists of the driveway shall be located and constructed so that vehicles approaching or using them will be able to obtain adequate sight in both directions along the road in order to maneuver safely and without interfering with traffic.

4. Driveway locations for ingress and egress must be reasonable from the viewpoint of the traveling public in that no unusual hazard to pedestrians or motorists shall be create, nor shall the driveway invite or compel vehicular movements in directions or locations contrary to those for which the road was designed. Driveways shall not invite or compel illegal or unsafe traffic movement.

5. No entrance or approach shall be located or constructed to interfere with, or prevent the proper location of functioning of any traffic-regulating device. No private signs, structures or display materials, either fixed or moveable shall be permitted on, or extend over any portion of the District R.O.W.

6. Generally, no more than one approach shall be allowed any lot, of which the frontage is less than 100-feet. Additional entrances or exits for lots having frontage in excess of 100-feet may be permitted only after demonstrating a necessity or hardship.

7. All driveways shall be so located that the flared portion adjacent to the traveled roadway will not encroach upon adjoining property. The flare section shall have a minimum radius of 5-feet for a non-commercial property, and 10-feet for a commercial property.

8. No commercial driveway shall have a width greater than 30-feet measured at right angles to the centerline of the driveway, except as increased by permissible radii. No non-commercial driveway shall have a width greater than 20-feet measured at right angles to the centerline of the driveway, except as increased by permissible radii.

9. The axis of an approach to the District road may be at a right angle to the centerline of the roadway and of any angle between 90° and 60° but shall not be less than 60°. Adjustments will be made according to the type of traffic to be served and other physical conditions.

10. Construction of parking or servicing areas on District R.O.W. is specifically prohibited. Off road, parking facilities shall be provided by property owners and commercial establishments on their lots for themselves and their customers.

11. All driveways and approaches shall be so constructed that they shall not interfere with the drainage system of the street or roadway. Property owners are required to provide, at their expense, drainage structures at entrances and exits which will

become an integral part of the existing drainage system. The dimensions of all drainage structures must be specified and approved by the District, prior to installation. Minimum culvert size is 12-inches in diameter. Minimum cover over culverts is 6-inches with 1.5:1 side slopes at the culvert ends. Minimum length of culvert is 20-feet.

12. The property owner assumes responsibility for the removal or clearance of snow, ice, or sleet upon any portion of the driveway approach even though it may be deposited in the course of the District snow removal operations. Removal or clearance operations by property owner shall not return snow, ice or sleet to the District roadway.

13. All driveways shall have a top grade level 8-inches lower than the District roadway shoulder at a point 15 –feet back from the roadway shoulder. Drainage from driveway shall not be allowed onto District roadway at any time.

14. Driveways shall not be constructed so that resulting drainage presents any type of hazard to adjacent property or improvements on that property.

15. Cutting or filling of roadway to match driveway interchange portion is prohibited.

16. The District reserves the right to discontinue water service to the property until an excavation permit is issued, approved and installation is accepted.

UTILITY INSTALLATION IN DISTRICT R.O.W. OR EASEMENTS

These standards will serve as a guide to all utility work within road right-if-way or easements of the District. The coordination and enforcement of these installations will be exercised by the District under an excavation permit process. Permits are available from the District. These standards will apply to all new utility installations and will be adhered to wherever practical for repair or replacement of existing facilities. District's excavation permit system is an integral part of this standard and should be referred to for additional information.

The locations of existing utilities if shown on the construction drawings are approximate only. The Permitee shall be responsible for the exact locations, damage to and protection of all utilities encountered.

In the event of a break in an existing water main, gas main, sewer, or underground cable, the Permitee shall immediately notify the responsible official of the organization operating the utility interrupted and shall lend all possible assistance in restoring services as quickly as possible.

1. All underground installations shall be initially installed beneath the surface of the right-of-way at a minimum depth of 6' (six feet) except telephone and TV lines, which shall be at a minimum depth of 18" (eighteen inches) and gas, and power lines, which shall be at a minimum depth of 30" (thirty inches). Any disturbed portion of the roadway shall be restored to its original condition. Backfilling shall be made in 6" (six inch) lifts, mechanically tamped, and packed and the last 12" (twelve inches) of backfill shall be of crushed rock or gravel. In those areas where it is necessary to cut bituminous pavement, the backfilling must be squared with an asphalt spade and tacked with a bituminous material. A hot mix bituminous compound shall be applied to the patch area to a depth of al least the thickness of the original mat, but in all cases no less than two inches. The material shall be placed so that before compaction it is approximately ½ inch above the adjacent mat and then rolled with a steel wheel or rubber-tired roller until a smooth uniform surface is achieved.

2. Where the installation crosses the roadway, the crossing shall be nearly perpendicular to the roadway as physically possible.

3. At the discretion of the District, where the installation crosses any ditches, canals, or water carrying structures, wherever possible it shall be pushed through and beneath in a pipe or large diameter. In no case shall the flow of water ever be impaired or interrupted.

4. If the District so requires, the installation shall be marked with marker acceptable to the District at locations designated by the District.

5. No cleated or tracked equipment will be allowed to work on or over asphalt or magnesium chloride treated surfaces without mats, no pads on excavating equipment

will rest directly on asphalt surfaces but shall be padded to protect the roadway surfaces.

6. The backfilling and surface treatment including asphalt/magnesium chloride procedures shall be guaranteed for one year after completion by the permitee.

7. At the discretion of the District, an as built plan may be required.

8. Inspections by the District Superintendent shall be at any time during the construction. The Contractor shall notify the District Superintendent before and at the time backfilling, procedures are to begin.

9. Surety bonds are required on all work performed in District right-of-ways or easements. Requirements are those stated in the District Excavation Permit system, latest revision.

10. All utilities are to be installed before any surfacing is placed.

11. All water and sewer lines to be separated by a minimum of 10’ (ten foot), horizontal.

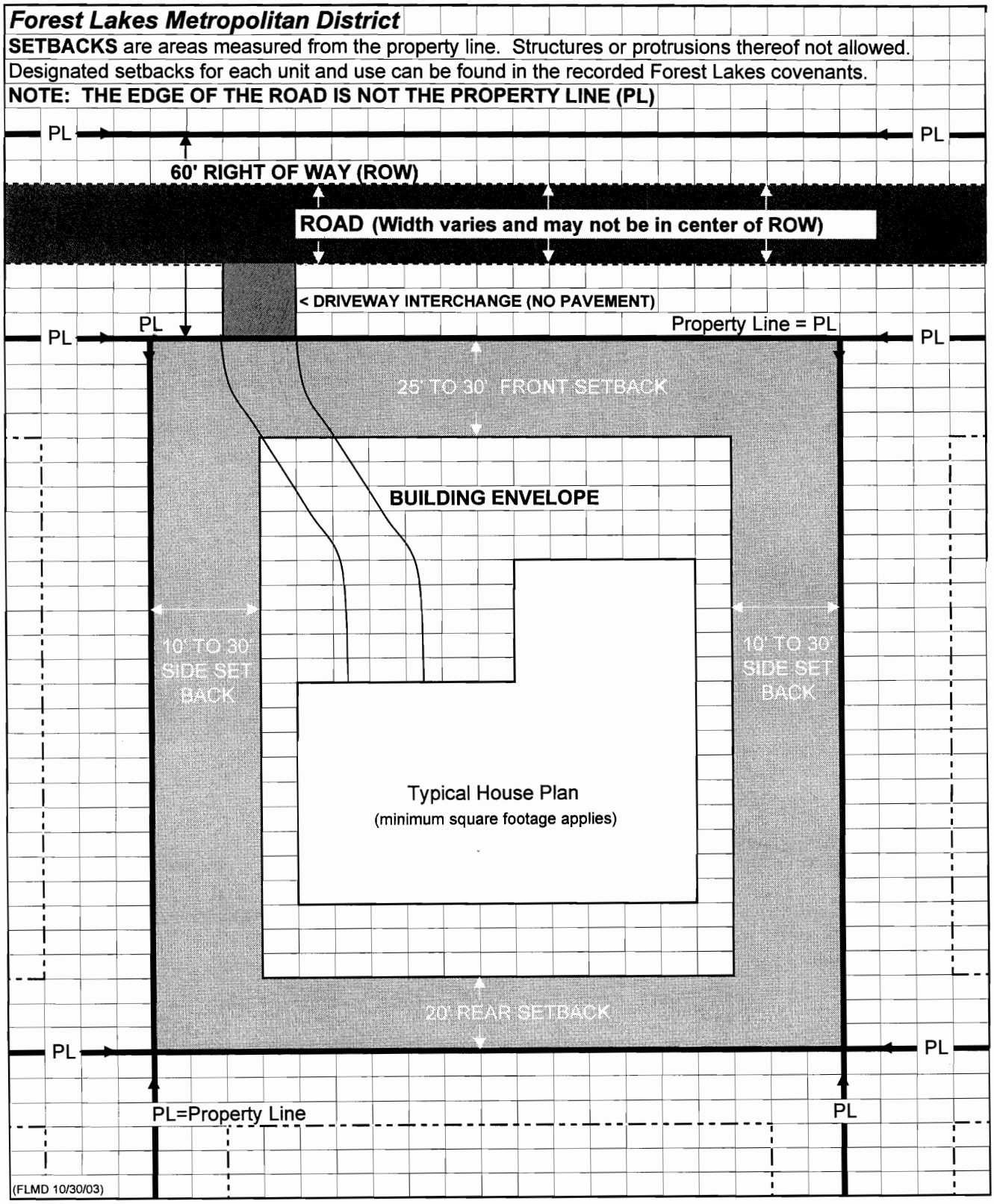
12. A minimum of 3’ (three foot) separation must be maintained horizontally for any utility in any road right-of-way.

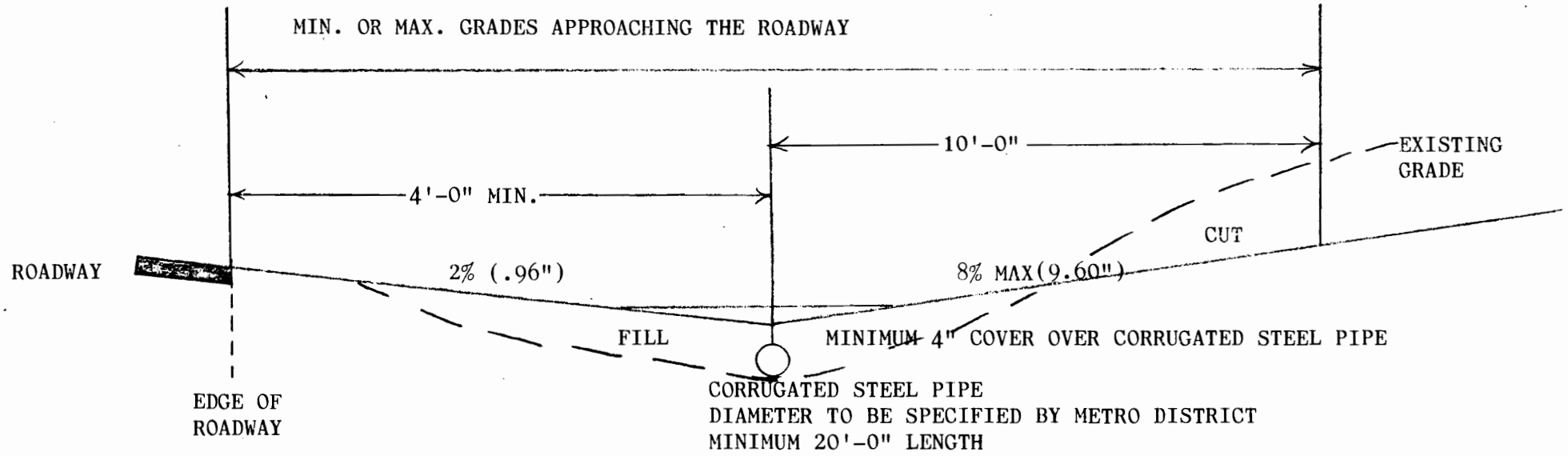
13. Minimum depths of utilities in borrow areas or ditches shall be 36” (thirty six inches).

14. All power lines shall be encased in an approved conduit. Primary power lines perpendicular to the roadway shall be further encased in a steel pipe sleeve.

15. Fiber optic lines shall be installed in accordance with Exhibit E - Minimum Construction Requirements for the Installation of Fiber Optic Cable of the Forest Lakes Metropolitan District Rules and Regulations, latest edition.

Exhibit C


Forest Lakes Metropolitan District
SETBACKS are areas measured from the property line. Structures or protrusions thereof not allowed.
Designated setbacks for each unit and use can be found in the recorded Forest Lakes covenants.
NOTE: THE EDGE OF THE ROAD IS NOT THE PROPERTY LINE (PL)
PL
PL
60' RIGHT OF WAY (ROW)
ROAD (Width varies and may not be in center of ROW)
< DRIVEWAY INTERCHANGE (NO PAVEMENT)
PL
PL
Property Line = PL
PL
25' TO 30' FRONT SETBACK
BUILDING ENVELOPE
10' TO 30' SIDE SET BACK
10' TO 30' SIDE SET BACK
Typical House Plan
(minimum square footage applies)
20' REAR SETBACK
PL
PL
PL=Property Line
PL
(FLMD 10/30/03)



NOTE-FILLING/CUTTING ROADWAY FOR DRIVEWAY ACCESS IS PROHIBITED

MINIMUM/MAXIMUM GRADES FOR DRIVEWAYS APPROACHING THE ROADWAY

SCALE NONE	APPROVED BY DEK	DRAWN BY
DATE 6/13/90		REVISED

FOREST LAKES METROPOLITAN DISTRICT

DRAWING NUMBER

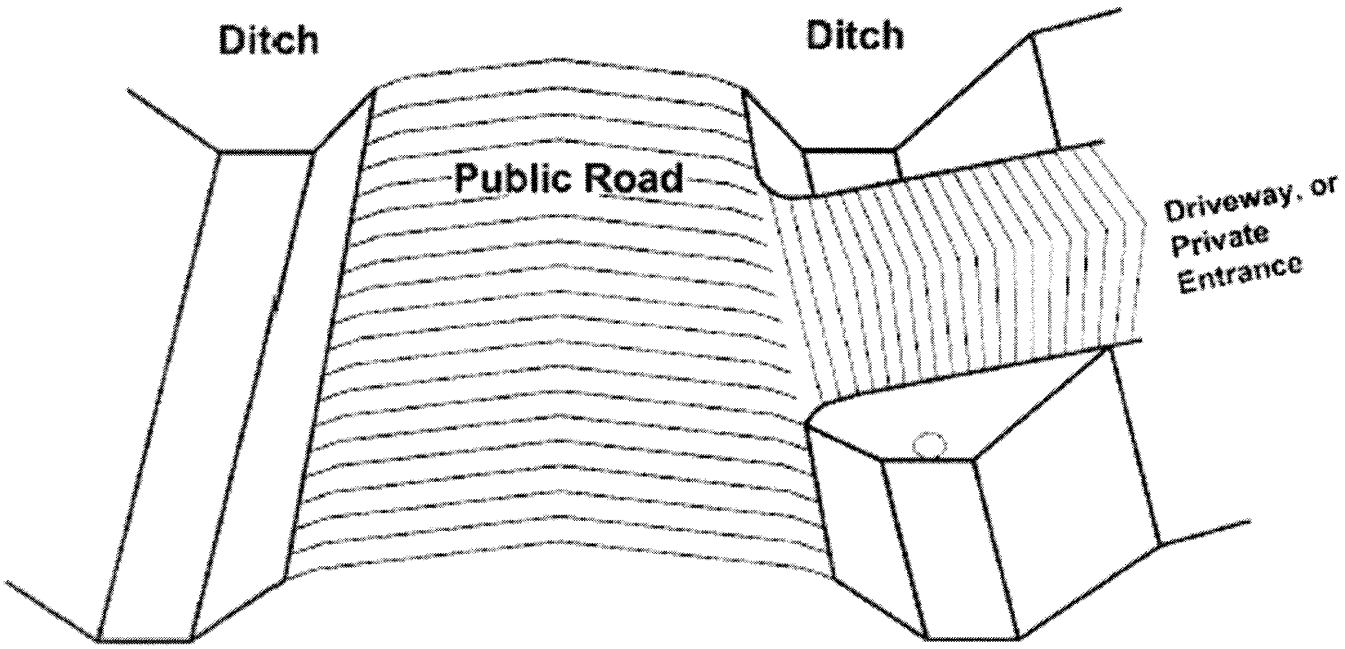


Figure 8: Proper matching of driveway and road edge

Forest Lakes Metropolitan District

STANDARD SPECIFICATIONS FOR CONSTRUCTION

WATER LINES, SANITARY SEWERS, AND STORM DRAINAGE FACILITIES

1.0 GENERAL

1.1 DESCRIPTION: These specifications include material specifications and construction requirements for underground water, sewer and drainage systems installed in the District right-of-way and in other areas under District jurisdiction or ownership.

1.2 SPECIFICATION MODIFICATIONS: Portions of these specifications may be modified or deleted by appropriate items in the Special Conditions or notes on the contract drawings. The District's Engineer shall approve all modifications and deletions.

1.3 REVISIONS OF STANDARDS: When reference is made to a Standard Specification (ASTM, AWWA, AASHTO, etc.), the specifications referred to shall be understood to mean the latest revision.

1.4 PUBLIC SAFETY AND TRAFFIC ACCESS: The Contractor's operations shall cause no unnecessary inconvenience. The safety and access rights of the public shall be considered at all times.

Vehicular access to residential driveways shall be maintained to the property line except when necessary construction precludes such access for reasonable periods of time. If back fill has been completed to such an extent that safe access may be provided, and the road opened to local traffic, the Contractor shall immediately clear the road and driveways and provide and maintain access.

The Contractor shall cooperate with the various parties involved in the delivery of mail and the collection and removal of trash and garbage to maintain existing schedules for these services.

1.5 BARRICADES AND WARNING SIGNS: All signs, barricades, flagmen, lights and other devices necessary for the protection of work and safety of the public shall be the Contractor's responsibility. A traffic control plan shall be submitted and approved by the District prior to beginning construction where any construction activity will involve the use of public right-of-way.

1.6 LOCATION AND PROTECTION OF UTILITIES: The locations of existing utilities if shown on the construction drawings are approximate only. The Contractor shall be responsible for the exact locations, damage to and protection of all utilities encountered.

In the event of a break in an existing water main, gas main, sewer or underground cable, the Contractor shall immediately notify the responsible official of the organization operating the utility interrupted and shall lend all possible assistance in restoring services as quickly as possible.

1.7 INTERRUPTION OF WATER SERVICE: The Contractor shall not discontinue water service to any residence, business or other occupied dwelling without notifying the organization operating the water line at least 24 hours in advance. The Contractor shall notify the residents of all dwellings to which water service is temporarily discontinued not less than thirty (30) minutes before the water is shut off. Water service shall not be discontinued for more than two (2) consecutive hours without special written permission from the District.

1.8 REMOVAL OF PLANTINGS: Where trees, hedges, shrubs or other ornamental plantings within the construction limits are not designated to be protected or saved, the Contractor shall notify in writing the owner of the property fronting the plantings in question not less than ten (10) days prior to removing the plantings. This notification shall include allowing the property owner the option to transplant the plantings fronting their property onto their property instead of having the Contractor remove them.

1.9 MUD AND EARTH TRACKING ON PUBLIC STREETS: The Contractor shall conduct their operations so as not to have the equipment tracking mud and earth onto the adjacent public roads. Upon notification by the District or District's Engineer, the Contractor will clean from the public roads mud and/or earth tracked by their equipment or that of their material suppliers to the project.

2.0 MATERIALS

2.1 GENERAL: This section covers pipe and other materials to be used in the construction of the various types of underground utilities.

All materials used shall be new and in conformance with the applicable standards.

2.2 CONTRACTOR REQUIREMENTS: All materials to be furnished by the Contractor shall conform to the requirements of these specifications. The type, size and strength class of pipe, fittings and other materials shall be as shown on the plans or otherwise specified in the Contract Documents.

2.3 HANDLING: All materials shall be handled with equipment and methods adequate to prevent shock or damage. Under no circumstances shall materials be dropped. Pipe handled on skidways shall not be skidded or rolled against pipe already on the ground. If any part of the coating or lining is damaged, the Contractor shall repair or replace the material at his expense as directed by the District or District's Engineer. All pipe and appurtenances shall be handled in accordance with the appropriate AWWA and ASTM Standards.

2.4 STORAGE: The Contractor will be held responsible for the safe storage and protection of all pipe and other materials delivered to the work site. The interiors of all pipe and pipefittings shall be kept free from dirt and foreign matter at all times. Gaskets for pipe joints shall be stored in a cool location out of direct sunlight.

Any material that has been damaged before actual incorporation in the work shall be repaired or replaced at the Contractor's expense. Any material, which does not meet these material specifications, shall be removed from the construction site.

2.5 **PIPE AND FITTINGS FOR SANITARY SEWER CONSTRUCTION**: Pipe used in construction of gravity sanitary sewer mains and service lines shall be polyvinyl chloride (PVC), or ductile iron.

The minimum pipe size for gravity sewers shall be eight- (8) inch diameter for mains and laterals, and four (4) inch diameter for service lines. Sanitary sewers under pressure shall be of ductile iron or PVC pressure pipe.

2.5a POLYVINYL CHLORIDE PIPE: Polyvinyl Chloride (PVC) gravity sewer pipe and fittings shall conform to ASTM D 3034, Type PSM. The minimum wall thickness for PVC pipe shall conform to Standard Dimension Ratio (SDR) 35. Standard laying lengths shall be twenty (20) feet per section.

JOINTS: PVC sewer pipe shall have integral bell and spigot joints. PVC sewer pipe shall be connected with flexible elastomeric seals per ASTM D 3212. Gaskets shall be neoprene or other synthetic rubber material conforming to ASTM D 1869.

FITTINGS: All fittings and accessories shall be gasketed bell and spigot type as manufactured by the supplier for ASTM D3034 pipe. Tees for 4" or 6" service connections to sewer mains shall be saddle-type fittings manufactured by Fast T Model 4-40 for the applicable type/size main to be installed on. No substitutes.

2.5b DUCTILE IRON PIPE: Ductile iron pipe for sanitary sewers under pressure shall conform to AWWA C151/A21.51-91. Pipe thickness shall be AWWA C150/A21.50-91, Class 52 unless otherwise specified in construction drawings. Pipe is to be furnished in 18 or 20 foot laying lengths.

JOINTS: Unless otherwise specified in the Construction Plans or Special Conditions, ductile iron pipe joints shall be mechanical conforming to AWWA C111/A21.11-95. Gaskets shall be neoprene or other synthetic rubber material.

FITTINGS: Fittings for ductile iron pipe shall be ductile iron or cast iron in accordance with AWWA C110/A21.10-93 and shall have a pressure rating of not less than that specified for the pipe. Fitting joints shall be mechanical conforming to AWWA C111/A21.11-95. Gaskets shall be neoprene or other synthetic rubber material.

2.5c PVC PRESSURE PIPE: PVC pipe used for sanitary sewers under pressure shall meet the requirements of AWWA C900-89 and shall be Class 150 unless pressure class is shown on the plans or other wise specified.

JOINTS: Joints shall be bell and spigot type sealed with an elastomeric gasket conforming to ASTM D-1869 and E-477. The bell section shall be at least as strong as the pipe wall.

FITTINGS: Fittings for PVC pressure pipe shall be of cast iron or ductile iron in accordance with Section 2.5b of these specifications.

2.6 **PIPE AND FITTINGS FOR STORM SEWERS CULVERTS AND SIPHONS**: Pipe shall be galvanized corrugated steel, corrugated aluminum non-reinforced concrete or reinforced concrete.

2.6a CORRUGATED STEEL PIPE: (CSP) Corrugated steel pipe and coupling bands shall conform to the applicable requirements of AASHTO M 36. The pipe shall be made from zinc-coated (galvanized) iron or steel sheets per AASHTO M 218. Unless otherwise specified or approved by the District or District's Engineer, all round C.S.P. shall be fabricated with helical corrugations and a continuous lock or welded seam. If not specified, the wall thickness of C.S.P. shall be per Colorado Division of Highways Standard M-603-MB.

JOINTS: Corrugated steel pipe shall be jointed with gasketed coupling band corrugated to match the ends of the pipe and form a watertight seal. Dimple bands are not permitted. Coupling bands shall be of the same material and have the same coating as the pipe. Gasket material shall be of neoprene or other approved synthetic rubber.

COATING: The inside and outside of all corrugated steel pipe shall be coated with bituminous, polymeric or aluminum material if so specified on the plans.

Bituminous coated CSP shall conform to the requirements of AASHTO M 190, Type A (fully bituminous coated).

Corrugated steel pipe and coupling bands with polymeric coating shall be fabricated from precoated sheets and shall conform to the requirements of AASHTO M 245 and M 246, Type B.

Corrugated steel pipe and coupling bands coated with aluminum shall be fabricated from sheet that has been hot-dipped in commercially pure aluminum or approved aluminum alloy. The minimum coating weight on both sides of the sheet shall be 1.0 oz./sq. ft.

2.6b CORRUGATED ALUMINUM PIPE (CAP) : Corrugated aluminum pipe and coupling bands shall conform to AASHTO M 196. Unless otherwise specified or approved by the District or District's Engineer, all round corrugated aluminum pipe shall be fabricated with helical corrugations and a continuous lock seam. Unless otherwise specified, the thickness gauge of CAP shall be per Colorado Division of Highways Standard M-603-MB.

JOINTS: Corrugated aluminum pipe shall be joined with gasketed coupling bands of the same alloy as the pipe. Bands shall be corrugated to match the ends of the pipe and form a watertight seal. Dimple bands are not permitted. Gasket material shall be of neoprene or other approved synthetic rubber.

2.6c CONCRETE PIPE: Nonreinforced concrete pipe (NCP) shall conform to the requirements of AASHTO M 86. Reinforced concrete pipe (RCP) shall meet the requirements of AASHTO M 170. The wall thickness and strength class of reinforced

and nonreinforced concrete pipe shall be determined in accordance with Colorado Division of Highways Standard M-603 RC unless otherwise specified.

JOINTS: Gasketed bell and spigot joints for watertight concrete pipe shall conform to the requirements of AASHTO M 198.

Concrete pipe with tongue and groove joints may be used for storm drainage only. Tongue and groove joints will not be allowed under paved surfaces.

2.7 **PIPE AND FITTINGS FOR WATER MAINS AND SERVICE CONNECTIONS** Pipe for water mains shall be ductile iron. Service pipe shall be polyethylene (PE).

2.7a DUCTILE IRON PIPE: Ductile iron pipe for water mains shall conform to AWWA C151/A21.51-91 and C150/A21.50-91, thickness-classes. Pipe thickness shall be AWWA Class 52 unless otherwise specified in the construction drawings.

JOINTS: Unless otherwise specified in the Construction Plans or Special Conditions, ductile iron pipe joints shall be mechanical joints conforming to AWWA C111/A21.11-95. Gaskets shall be of neoprene or other synthetic rubber material. Bolt through positive restraint mechanism for mechanical joints shall be used to connect valves and fittings manufactured of ductile iron conforming to ASTM A 80-55-06 except for use directly on fire hydrant shoes due to bolting problems. Foster Adaptor or equal.

FITTINGS: Fittings for ductile iron pipe shall be ductile iron or cast iron in accordance with AWWA C110/A21.10-93 and shall have a pressure rating of not less than that specified for the pipe. Fitting joints shall be mechanical conforming to AWWA C111/A21.11-95. Gaskets shall be neoprene or other synthetic rubber material.

2.7b POLYETHYLENE PIPE: Polyethylene pipe for water service lines shall conform to ASTM D 2239 PE, NBS-PS11-69 (SDR 7), AWWA C901-88, NSF approved, 200 psi, and iron pipe size.

JOINTS: Unless otherwise specified in the Construction Plans or Special Conditions, iron pipe size polyethylene pipe shall be joined with brass, Mueller Insta-Tite couplers #H15408. No substitutes.

FITTINGS: Fittings for polyethylene pipe shall be 200 psi, iron pipe size, brass, Mueller Insta-Tite. No substitutes.

2.7c CURB STOPS, CURB STOP BOXES, and CORPORATION STOPS: Curb stops shall be brass, Mueller Insta-Tite #H15213 for IPS PE. Curb Stop Boxes shall be cast iron, Mueller H-10314 with 5'-6" bury w/rods. Corporation Stops shall be brass, Mueller Insta-Tite #H15005, CC X Insta-Tite for IPS PE. No substitutes.

2.8 **MANHOLES FOR SANITARY AND STORM SEWERS**: All manholes shall be precast concrete constructed in accordance with District approved project plans. Unless otherwise stated all manholes shall be pre-engineered with Z-LOK flexible boot connectors, conforming to ASTM C-923 for type and size of pipe stated in construction drawings, a minimum of 48" inside diameter, all drops are standard straight through (1" slope) with prepoured ¾ depth invert channeling (4 Corners Precast Durango Style).

2.8a CEMENT: All cement mortar used in precast concrete bases, manhole riser sections, cones and flat tops, for sanitary sewer manholes, shall be Type V or modified Type II Portland cement having less than five (5) percent tricalcium aluminate. Type II Portland cement may be used in the various concrete elements of storm sewer manholes.

2.8b PRECAST CONCRETE MANHOLE SECTIONS: Manhole risers, cones, flat tops, manhole bases and grade rings shall be precast reinforced concrete sections conforming to ASTM C-478 or AASHTO M 199. Manholes, which are 5 feet or less in depth as measured from the invert to the top of rim, shall have a flat reinforced concrete top. Manholes greater than 5 feet deep as measured from the invert to the top of rim shall use eccentric conical top sections.

Manhole risers and conical sections shall be made with tongue and groove ends for continuous and uniform joints between sections. Such joints and grade rings shall be sealed with preformed bitumatic material or other approved flexible joint sealant comparable to Conseal.

2.8c MANHOLE STEPS: Manhole steps shall be of plastic coated steel or other approved materials. The rungs shall be 10 inches wide with non-slip surface free from splinters, burrs or sharp edges that may be a hazard. The legs shall be long enough to provide a 3-½ inch minimum embedment length and 6-inch projection from the wall.

The steps shall be fabricated with tapered legs that lock into specially formed holes in cured concrete walls or with lugs for embedment in wet concrete.

2.8d RINGS AND COVERS: Manhole rings and covers shall be cast iron, with a minimum 32-inch diameter overall base, minimum 22" clear opening, maximum 6-inch frame height, cover with letter designation "SEWER", traffic strength. The standard manhole ring and covers shall be Castings Inc., MH-250-24 C.I., Deeter 1256/1258, or approved substitute. The bearing surfaces between the ring and cover shall be machine finished or ground to assure non-rocking fit in any position. Rings shall be sealed to manholes or grade rings with preformed bitumatic material or other approved flexible joint sealant comparable to Conseal or Rub-R-Nek meeting Federal specification SS-S-210A.

2.8e MANHOLE ADJUSTING RINGS: To raise grades of manhole rims by 1" to 3", cast iron manhole adjusting rings may be used. The bearing surfaces between the ring and cover shall be machine finished to assure non-rocking fit. Set screw fasteners shall be included in each adjusting ring. Adjusting rings shall be Neenah R-1979 Series or equal approved by District's Engineer. Adjusting rings shall be dimensioned to fit existing rings snugly.

2.9 **STORM DRAIN INLET BOXES GRATES AND FRAMES**: Storm drain inlets shall be constructed in accordance with District approved project plans. All inlet grates, frames and curb opening sections shall be of cast iron and all grates shall be bicycle safe.

2.10 **APPURTENANCES FOR WATER DISTRIBUTION**

2.10a FIRE HYDRANTS: Fire hydrants shall be the dry barrel type and shall conform to the requirements of AWWA C502-94(C502a-95). Hydrants shall be Mueller Centurion A423 (National Standard Thread). No substitutes will be accepted.

The standard hydrant shall have a six-inch mechanical joint inlet conforming to AWWA C111/A21.11-95 with gaskets of neoprene or other synthetic rubber, a 5¼ inch main valve opening, two (2) 2½ inch hose nozzles (National Standard – 7½ threads per inch) and one (1) 4½ inch pumper nozzle with 6.055" OD male thread (National Standard - 7½ threads per inch). The hydrant barrel shall be marked with a circumferential rib to denote the interceded ground line. The center of the hose nozzles and pumper nozzle shall be at least 14 inches above the ground line mark.

Hydrants shall be of the "traffic" or "breakaway" design, having easily replaceable breaking devices for the grade line flange and operating stem that prevents damage to the barrel sections upon impact. The hydrant base must be 5'-0" below the breakaway base. The breakaway base shall be set at the ground level.

The operating nut and nozzle cap wrench nuts shall be 1½ inch pentagon, measuring from point to opposite flat side at the base and tapering uniformly to 1-7/16 inches at the top. The height of the nut shall not be less than one inch.
The nozzle caps shall be removable and the operating nut opened by turning to the left (counter-clockwise). Nozzle caps shall be securely chained to the upper barrel section.

PAINTING: Fire hydrants shall be painted red.

2.10b GATE VALVES: The minimum requirements for all gate valves shall conform to AWWA C500-93 or AWWA C509-94 standards.

All gate valves shall be Mueller A2370-20 resilient wedge, cast or ductile iron body, fully bronze mounted with non-rising stem and Mueller HP coated AWWA C550-90. The stem and all wearing surfaces shall be bronze or other approved non-corrosive material. Contact surfaces shall be machine finished and all wearing surfaces shall be easily renewable. Nonferrous bushings shall be of substantial thickness tightly fitted and pressed into machined seats. A clockwise turn of the stem shall close the valve. No substitutes.

END CONNECTIONS: End connections of gate valves shall consist of mechanical joints conforming to AWWA C111/A21.11-95 and ANSI A21.11. Gaskets shall be of neoprene or other synthetic rubber material.

WRENCH NUTS: Wrench nuts shall be made of cast iron and shall be 1 5/16 inches square at the top, 2 inches square at the base, and 1¾ inches high.

2.10c VALVE BOXES: A cast iron valve box and lid shall be provided for each underground valve. Valve boxes shall be 5¼ inch diameter adjustable slip type, sized for the type of valve and minimum depth of 5'-10" bury. The lid shall have the word WATER permanently cast in the top.

2.10d AIR AND VACUUM VALVES: Air and vacuum valves shall be of the type and size specified. They shall be designed for 200 psi working pressure conforming to AWWA C512-92 and shall be Crispen Type RN or equal approved by District's Engineer. A separate isolation valve of the same size and pressure rating as the air valve shall be installed between the water main and the air and vacuum valve. The air and vacuum valve shall be housed in a vault made of 18" ADS culvert with aluminum frost proof meter dome. The vault shall be drained to day light with 4" PVC, SDR 35 piping and washed gravel placed inside to insure proper drainage of vault. The vault shall be insulated in a manner acceptable to District's Engineer.

2.10e BONDING STRAPS: A bonding strap shall be installed across each joint in the water line to provide metal to metal continuity for tracing purposes. The Contractor shall be responsible for installation. Bonding strap shall be a minimum #9 copper wire properly attached at each end by means of magnesium weld or other approved method.

2.10f FLANGED ADAPTERS: The flanged adapters shall be Smith-Blair 912 or Baker Series 601 cast flanged coupling adapters with anchor studs or equal approved by District's Engineer.

2.10g FLEXIBLE COUPLERS: Flexible couplings shall have cast iron or steel sleeves the same as pipe type furnished; ductile iron flanges, bronze bolts and nuts; and wedge-type rubber gaskets. The couplings shall be designed for a 200-psi working pressure except as noted and each shall be sized to properly fit the ends of the two pieces of pipe being joined. The couplings shall be Smith-Blair Type 433, Baker Series 236 Cast Transition Couplings, or equal approved by District's Engineer.

2.10h MAIN TAPPING SADDLES: Saddles shall have cc threads and made of brass or stainless steel water works construction with double flat straps and brass or stainless steel bolts and nuts. Mueller or equal approved by District's Engineer.

2.10i MISCELLANEOUS APPURTENANCES: Including check valves, service materials, saddles, regulator valves, insulators, pumps, pressure tanks, valve boxes and miscellaneous hardware shall be of a quality acceptable to the District or the District's Engineer for examination and testing. The acceptance of any appurtenance by the District or the District's Engineer shall not be a bar to their subsequent rejection if found defective.

2.10j CONCRETE AND MORTAR: All concrete used in construction of manholes, inlet boxes, vaults, concrete encasement, thrust blocks, etc., shall be Colorado Division of Highways "Class B". Unless otherwise specified, all concrete shall be made with Type II Portland Cement.

Cement mortar used in construction of manholes, inlets, vaults, etc., shall be mixed at a ratio of one part Portland Cement to three parts sand. The amount of water used in the mortar shall be the minimum amount required for workability of the mix. Mortar

shall be made with Type II Portland Cement unless otherwise specified. Mortar used for the patching of existing manholes shall be non-shrink type approved by the District's Engineer.

3.0 TRENCH EXCAVATION

3.1 GENERAL: Following are the specifications that shall govern excavations and trenching for pipelines or other underground conduits and appurtenances within the road right-of-ways and in other areas under District jurisdiction or ownership. In addition to these specifications, District's excavation permit system standards and specifications shall apply as stated in the excavation permit secured from the District.

3.2 RESPONSIBILITY: The Contractor shall notify all utility companies and interested parties prior to commencement of work in order to insure that there will not be interruptions of services during construction. The Contractor shall notify all utility users in advance of any interruption to service. No interruption in service shall exceed 8 hours in duration. The Contractor shall be liable for all damages.

Should any utility be damaged in the construction operations, the Contractor shall immediately notify the owner of such utility and unless authorized by the owner of the utility, the Contractor shall not attempt to make repairs.

In the event that during construction it is determined that any underground utility conduit or any aboveground utility will be encountered, the Contractor shall notify the affected utility company 48 hours in advance so that any anticipated problems can be addressed and utilities located.

3.3 SURFACE REMOVALS AND TOPSOIL PRESERVATION: The Contractor shall remove surface materials and obstructions only to the widths necessary for excavation of the trench. All fences, landscaping and structures not designated for removal shall be protected or, if moved, restored to their original condition after construction is complete.

No more than one-half of the width of a road shall have an open trench at any time.

Removal of concrete curbs, gutters, sidewalks and driveways shall be along existing joints or neatly sawed lines.

Where excavation is required under paved areas, the pavement shall be cut in such a manner as to effect a smooth, straight cut edge and as a vertical face six (6) inches minimum beyond the trench wall. Trench width shall be no wider than 12" wider than the conduit to be installed. All vegetation, concrete, asphalt and other refuse removed from the construction limits shall be separated from suitable topsoil and backfill material, and hauled to a disposal site secured by the Contractor.

Where the trench is in an unpaved area, clean topsoil suitable for final grading shall be stripped, stockpiled separately in approved locations, and restored to the surface after the trench is backfilled evenly. Where excavation is in a lawn-covered area, the sod shall be cut and removed and replaced after trench filling so as to promote regrowth. Where sod is disturbed, the Contractor shall resod with like grass at his own expense.

3.4 STOCKPILING EXCAVATED MATERIAL: Excavated material shall be piled in locations that will not endanger the work, create traffic hazards or obstructed sidewalks and driveways. Fire hydrants, valve boxes, manholes and other utility access points shall be left unobstructed until the work is complete. Gutters and other watercourses shall not be obstructed unless other provisions are made for runoff and road drainage.

All surplus material and excavated material unsuitable for backfilling shall be removed from the site and disposed of in areas secured by the Contractor.

3.5 TRENCHING WIDTHS: Trenches shall be excavated to the width necessary to permit the pipe to be laid and jointed properly and backfill materials placed and compacted as required. Where conduit is to be installed outside of existing pavement and pipes have an inside diameter of 33 inches or less, the trench shall be excavated at pipe level a minimum of 16 inches wider than the outside diameter of the pipe so that a clear space of not less than 8 inches is provided on each side of the pipe.

For pipes having an inside diameter of 36 inches or greater, the trench shall be excavated at pipe level a minimum of 24 inches wider than the outside diameter of the pipe so that a clear space of not less than 12 inches is provided on each side of the pipe. Wherever it is necessary to exceed these limits, approval of the District's Engineer shall be obtained and provision shall be made for the additional load imposed on the pipe. When sheeting is used, the widths indicated above shall be measured to the inside dimension between the sheeting.

3.6 TRENCHES WITH SLOPING SIDES: The banks of trenches shall be kept as nearly vertical as possible, however, where working conditions and easement or right-of-way permit (as determined by the District's Engineer), trenches may be excavated with sloping sides with the following limitations:

(1) In traveled roads, alleys or narrow easements, only vertical trenches with proper bracing will be allowed.

(2) Where trenches with sloping sides are permitted, the slopes shall not extend below a point 12 inches above the top of pipe. The trench shall be excavated with vertical sides below this point with widths not exceeding those specified.

3.7 TRENCH LENGTH: No more than 200 feet of unbackfilled trench may be left open overnight. During the months of November through April no uncovered trench shall be left overnight if installations permitted. Trenches should be backfilled as soon as possible to eliminate hazards and traffic congestion, but in no case shall the open trench length exceed 400 feet without the consent of the District's Engineer.

Trenches across existing roads are to be made so that traffic is not closed. The District's Engineer may allow short duration closures. In such instances, the Contractor shall notify the applicable emergency services.

3.8 TUNNELING: No tunneling under sidewalks, curb and gutter or other structures will be permitted, except when line can be pulled or jacked, in which case such line shall be left in place.

3.9 BRACING AND SHEETING OF TRENCHES: All trenches shall be properly braced, sheeted or otherwise supported to provide safe working conditions and protection of the work and adjacent property.

Bracing and sheeting shall conform to the recommendations in the Occupational Safety and Health Standards for Construction (OSHA). A sand box or trench shield may be used in lieu of sheeting and bracing as permitted by OSHA. Unless otherwise approved, all trench support materials shall be removed in a manner that will prevent caving of the sides and movement or other damage to the pipe.

3.10 **EXCAVATION BELOW GRADE**: Where the excavation is carried beyond or below the lines and grades shown on the plans or staked, the Contractor shall, at his own expense, refill all such excavated space with suitable granular material.

3.l0a OVEREXCAVATING FOR ROCK: When bedrock or boulders are encountered in the trench bottom, or loose, stony soil where there is the possibility of pipe being subjected to "point" contacts, the trench shall be over excavated a minimum of six (6) inches. The over excavated material shall be replaced with District's Engineer-approved material and compacted. If blasting is required for rock excavation, all work with explosives shall conform to Federal and State Laws, and OSHA rules and regulations. The Contractor at their expense shall repair any damage caused by blasting.

3.l0b UNSTABLE TRENCH BOTTOM: Where the trench bottom is found to consist of soft, spongy or unstable soil, frozen material, organic matter or any other material that the District's Engineer determines to be unsuitable for supporting the pipe, an additional depth equal to the outside diameter of the pipe shall be removed and replaced with suitable granular materials, properly compacted to provide adequate support.

3.11 REMOVAL OF WATER: Trenches shall be kept free of water during pipe laying operations by draining, pumping or other approved methods. The water level shall be maintained below the trench bottom throughout the placement of bedding, pipe laying, joining and backfilling operations. The dewatering shall be carried out so that it does not destroy or weaken the strength of the soil under or alongside the trench. Water shall be disposed of in a suitable manner without damage to adjacent property

or without being a menace to public health and convenience. Under no circumstances shall trench water be discharged into sanitary sewers. The District's Engineer shall approve the method of disposal of trench water.

3.12 PREPARING THE TRENCH BOTTOM: If soil conditions are stable, and the trench bottom is of a material that can be cut true and straight, pipe can be installed using the uniform trench bottom for support. The trench bottom must be straight, free of bumps or hollows, and at the correct grade. As the pipe is laid, any irregularities in the trench bottom must be leveled off or filled in with tamped soil. The trench bottom may also be prepared by digging at least 4" deeper than pipe grade and then bringing the trench bottom up to grade with selected refill material tamped to provide the proper cushion for the pipe. A coupling or bell hole shall be dug at each pipe joint so that the pipe is uniformly supported along its length. The hole shall have sufficient length, width and depth to permit assembly of the joint and provide a minimum clearance of two (2) inches between the coupling and the trench bottom.

3.13 **BEDDING CLASSES**: Herein contained are the various classes of Bedding and Cradles.

3.13a Class A Bedding: Class A bedding shall be defined as that method of bedding in which the lower half of the pipe is set in reinforced concrete (2000 psi min.). The minimum thickness of concrete under the lowest part of the conduit shall be ¼ of the outside pipe diameter but not less than 4 inches.

The trench shall be maintained free of water during placing of the concrete cushion before the concrete has taken its initial set. The concrete shall extend upward around the pipe to the spring line of the pipe barrel. The width of the concrete cradle shall be at least equal to the outside pipe diameter plus 8 inches.

3.13b Class B Bedding: Class B bedding shall be defined as that method of bedding in which the pipe is set on compacted granular material. The trench shall be excavated to a depth below the established grade equal to ¼ of the outside pipe diameter, but not less than 4 inches. In rock excavation, the minimum depth shall be 6 inches. Compacted granular material shall be placed under the pipe and around the sides of the pipe up to the spring line of the pipe barrel. The placing shall be done in a manner, which will assure no separation or change in uniform gradation. The granular material shall be a consolidated and compacted by hand operated mechanical vibrator to at least 90% of maximum dry density as determined by AASHTO T 180. Granular material shall be placed to one (1) foot above the top of the pipe.

3.13c Class C Bedding (Hand Shaped Bottom): Class C bedding shall be defined as that method of bedding in which the pipe is placed on a native, stable soil foundation shaped to fit and uniformly support the lower quadrant of the pipe barrel for a width of at least 50% of the outside pipe diameter. Bell holes shall be excavated and kept free of foreign material.

The barrel of the pipe shall be bedded throughout its entire length. Native soil shall be hand compacted to spring line and then placed to one foot above the top of the pipe and compacted to at least 90% maximum dry density. The remainder of the backfill shall be placed in compliance with the section on trench and excavation backfill.

3.14 GRANULAR BEDDING AND HAUNCHING MATERIALS:

Granular materials required for bedding of pipe and structures, and haunching around pipe shall meet the following gradation requirements:

Sieve Size	Total Passing by Sizes (% by Weight)
3/4"	100 to 90
1/2"	------
3/8"	20 to 55
No.4	0 to 10
No.8	0 to 5

The aggregate used shall contain not more than a total of 8% by weight of deleterious substances such as clay, shale or organic matter. The plasticity index shall not be over 6.

3.15 STABILIZING MATERIAL: In the event unstable trench conditions are found at pipe line grade, or in the case of over-excavation for rock, (dry) uniformly graded (class I, 4, or 5) rock shall be used for trench stabilization. Nothing in this bedding material classification is intended to preclude the use of sand bedding provided the sand has a plasticity index of 6 or less, and having no more than 15% passing 100 sieve.

3.16 **BACKFILL MATERIAL**: In general, backfill shall be that material excavated from pipeline trenches on the site that is free from frozen materials, large amount of organic material, concrete, asphalt, dry clods, muck, debris and rock over three (3) inches in diameter. When, in the opinion of the District's Engineer, the excavated material is not satisfactory for use as backfill, suitable backfill material shall be furnished by the Contractor and condemned material removed from the site.

Backfill material consisting of earth and rock shall contain a sufficient amount of earth to completely fill all voids between the rocks.

3.16a SPECIAL BACKFILL MATERIAL: Where required on the plans or in the Special Provisions, backfill shall consist of a flowable fill consisting of a plant mixed aggregate cement combination meeting the following specification: 94 pounds Portland cement, 200 pounds fly ash, 2,990 pounds fine aggregate, and 49 to 57 gallons of water per cubic yard.

3.17 COMPACTING BACKFILL MATERIAL: Backfill material in trenches shall be compacted to at least ninety (90%) percent of maximum density except for the top three (3) feet of the trench under existing or proposed roads which shall be compacted to at least ninety-five (95%) percent of maximum density. Maximum density shall be defined by AASHTO T 180. All approved backfill material shall be adjusted to within three (3) percent of the optimum moisture content prior to its placement in the trench. When sand is placed as backfill it must have minimum moisture content of 5%.

3.18 INITIAL BEDDING AND TAMPING: Backfilling should follow pipe assembly as closely as possible. During initial bedding and backfilling, the Contractor shall take all necessary precautions to prevent movement or distortion of the pipe or structure being backfilled. The first step in providing firm, continuous support for the pipeline is to tamp soil solidly under the pipe and couplings. The next step is providing effective support of the pipe in the haunching area. This is accomplished by placing bedding material equally along both sides of the pipe and thoroughly compacting it by hand under the haunches and around the pipe. Tamping should be done in 4" layers. Side support is accomplished by tamping the soil firmly under the haunches of the pipe to the spring line and compacting it out to the undisturbed trench walls.

Backfilling of the trench with bedding material shall continue to a point that is at least one foot above the top of the pipe. The balance of the backfill may be machine placed in lifts not to exceed 24". Compaction between lifts is required by mechanical or other approved means. Trenches outside of proposed roads shall be backfilled to provide for mounding between 6" and 12" over existing natural ground.

3.19 FLOODING OR JETTING OF TRENCHES: Flooding or jetting of trenches shall not be permitted unless approved by the District's Engineer.

3.20 **TESTING:** All backfill shall be frequently tested to insure that the required density is being attained. When required by the District's Engineer, the minimum requirements for compaction testing shall be as follows:

For every 400 lineal feet of trench and each branch or section of trench less than 400 feet in length, at least one compaction test shall be performed at the surface and at mid-trench for excavations greater than 6 feet. Compaction tests shall be taken at random locations along the trench and wherever the District's Engineer suspects poor compaction. If any portion of the backfill placed fails to meet the minimum density specified, the area shall be defined by additional tests if necessary and the material in the designated area shall be removed and replaced to the required density at the Contractor's expense.

An approved material-testing laboratory at the Contractor's expense shall perform all compaction testing. It shall be Contractor's responsibility to make necessary excavations in order to accommodate compaction tests at all locations designated.

A summary report of all compaction test results shall be submitted to the office of the District's Engineer. These test results are required as a basis of acceptance of

facilities by the District as required by District's Engineer.

3.21 RESTORATION OF GROUNDS: The cleanup and restoration of grounds shall be a continuous process from the beginning of construction to final completion of the work. The Contractor shall keep the work site free from the accumulation of debris and waste material caused by his operation.

Immediately after the pipeline is backfilled, the area shall be cleaned and restored to the original grade and condition. See Section 3.3 for grass removal and replacement requirements. All fences shall be replaced to the same elevation and alignment and restored to a condition equal to or better than that at the beginning of construction.

3.22 RESTORATION OF PAVED AND CONCRETE SURFACES: Immediately after any section of a completed pipeline has been tested and accepted by the District's Engineer, the Contractor shall replace all paved surfaces removed or damaged by their operation. All asphalt pavement and areas of curb removed shall be replaced with hot mixed bituminous pavement. Paved surfaces shall be restored to their original line and grade and finished to match adjacent undisturbed surfaces. The excavation contractor shall be responsible for the maintenance of the patch for a period of one (1) year or until it is removed and replaced by the District or their contractor. The equipment used for excavation must be equipped with pads for the stabilizers so as not to damage the street. Also, the front-end loader bucket should have a plank or buffer between the bucket and the street.

3.23 RESTORATION OF SURFACE TREATED GRAVEL ROADS: Immediately after any section of a completed pipeline has been tested and accepted by the District's Engineer, the Contractor shall replace all surface treatment (magnesium chloride) of surfaces removed or damaged by their operation. Surfaces shall be restored to their original line and grade and finished to match adjacent undisturbed surfaces. The excavation contractor shall be responsible for the maintenance of the patch for a period of one (1) year or until it is removed and replaced by the District or their contractor.

4.0 **INSTALLATION OF PIPE AND APPURTENANCES**: All pipe, valves, hydrants, manholes and other pipeline appurtenances shall be installed and tested in accordance with the construction plans and specifications, applicable AWWA, ASTM or AASHTO Standards and Manufacturer's instructions. When installation instructions or procedures differ, the District's Engineer will determine which will take precedence over the others.

4.1 **INSTALLATION OF SANITARY SEWERS, STORM SEWERS AND CULVERTS**: All sanitary sewer facilities shall be in compliance with design criteria of the Colorado State Department of Health. All plastic sewer pipe installed shall be installed in accordance with ASTM-D 2321-89.

4.1a PIPE LAYING: After the trench has been dewatered and the bedding prepared, the pipe shall be laid to the line and grade shown on the plans or staked. Variance from established line and grade shall not be greater than three (3) inches horizontally and one-half (½) inch vertically, provided that such variation does not result in a level or reverse sloping invert.

The Contractor shall constantly check line and grade of the pipe with laser beam or batter boards. Whenever the pipe is found to be outside the specified limits, the misaligned sections shall be removed and relayed to the correct line and grade at the Contractor's expense.

Pipe shall be laid upgrade from the point of connection to the existing sewer or from a designated starting point. Pipe with bell and spigot joints shall be laid with the bell end forward or upgrade.

The inside of the pipe and jointing surfaces shall be kept clean and free from mud, soil, gravel, ground water and other foreign material. When pipe laying is not in progress, the forward end of the pipe shall be kept tightly closed with a temporary plug.

4.1b INSTALLATION OF SEWER SERVICE LINES: Service pipe shall be laid at a minimum grade of one-eighth (1/8) inch per linear foot. The District's Engineer shall establish the alignment of service lines.

The maximum deflection permissible at any one fitting or any combination of adjacent fittings shall not exceed 45 degrees, unless otherwise approved.

The service line shall be joined to the sewer main with a wye fitting or Fast T Model 4-40 saddle permanently connected above the spring line of the sewer pipe. The District's Engineer shall approve the method of tapping the main. The service line or wye shall not extend beyond the inside wall of the sewer main.

Where service lines are stubbed out to the right-of-way line and ended for future connection, the end of the pipe shall be plugged and marked with a 2" x 4" x 4' board buried vertically above the end of the pipe and extending to the ground surface or with a 4" wide plastic tape with metal backing and the words, "WARNING SEWER LINE" marked on the tape extending from the sewer line to the surface. The ends of the service lines shall include a sewer two way tee with clean out at surface and be capped with water-tight plugs braced to withstand test pressures.

4.1c INSTALLATION OF MANHOLES: No cast in place manhole bases shall be permitted without the express written approval of the District or District's Engineer.

Precast manholes shall be laid on a firm unyielding sub grade as determined by the District's Engineer. Prior to placement of manhole base, the ground surface shall be compacted to a smooth and level-supporting surface. Any unevenness or over excavation shall be brought to final grade using gravel backfill material.

All pre-cast barrel sections shall be placed and aligned to provide vertical sides and alignment of the ladder rungs. Approved bitumatic sealer shall be placed between pre-cast sections so that the completed manhole is rigid and watertight. Horizontal joints and any holes or possible leak spots shall be plastered with non-shrink grout to a smooth finish inside and out.

The manhole ring and cover shall be adjusted to grade with pre-cast grade rings. The total height of grade rings shall not be more than eight (8) inches, fourteen (14) inches including six (6) inch ring and cover. Rings shall be sealed to manholes or grade rings with preformed bitumatic material or other approved flexible joint sealant comparable to Conseal or Rub-R-Nek meeting Federal specification SS-S-210A.

All newly constructed manholes shall be cleaned of any accumulation of silt, debris, or foreign matter of any kind, and shall be free from such accumulations at the time of final inspection.

4.1d INSTALLATION OF STORM SEWER INLETS AND VAULTS: Pre-cast or formed concrete boxes for storm inlets and vaults shall be placed on prepared granular bedding, uniformly supported, in correct alignment and at proper grade.

When the box is furnished in more than one section, the sections shall be joined and sealed with an approved bitumatic material so that the completed box is rigid and watertight.

Pipe connections to concrete structures shall be made by approved methods and shall result in a smoothly finished, watertight connection. Pipe ends shall not extend more than one inch beyond the inside face of the structure.

All inlet boxes, vaults and irrigation structures shall be cleaned of any accumulation of silt, debris or other foreign matter and shall be free from such accumulations at the time of final inspection.

4.2 **INSTALLATION OF WATER LINES FORCE MAINS SIPHONS AND OTHER PRESSURE PIPELINES:**

4.2a PIPE LAYING: Pipe shall be laid on the alignment shown on the plans or staked. Unless otherwise specified or approved, all pressure pipelines shall be laid to a minimum depth of sixty (60) inches measured from the proposed final ground surface or of the proposed road surface to top of pipe.

The inside of the pipe and jointing surfaces shall be kept clean and free from mud, dirt, gravel, ground water and other foreign material. When pipe laying is not in progress, the open ends of the pipeline shall be kept closed with water-tight plugs. All pipe lengths shall be squarely cut.

Long radius horizontal or vertical curves may be laid with standard pipe by deflections at the joints of rigid pipe. Maximum deflections at pipe joints shall be per the Manufacturer's recommendations or applicable AWWA Standard.

Ductile-Iron water mains and their appurtenances shall be installed in accordance with AWWA C600-93. Polyvinyl chloride (PVC) pressure pipe and fittings for water shall be installed in accordance with AWWA C605-94.

4.2b CONCRETE BLOCKING: Concrete support or thrust blocks shall be poured at all pipe bends, tees, caps, valves, hydrants and other locations shown on the plans. The size and location of blocking shall be as shown on the plans. Thrust blocks shall be poured on firm, stable foundation material and all bearing surfaces shall be against undisturbed earth.

Concrete for support and thrust blocks shall be made with Type II Portland Cement and shall reach a minimum compressive strength of 3000 psi in 28 days.

Reinforcing steel and bolts used to anchor valves, fittings, etc., to thrust blocks shall meet tensile requirement of ASTM Grade 40. All anchorage steel not embedded in concrete shall be coated with coal tar or other approved coating material.

4.2c INSTALLATION OF VALVES AND VALVE BOXES: Each valve shall be installed in a vertical position. An adjustable slip type valve box shall be set into position during backfilling operations. The lower section of the valve box shall be cushioned with backfill material so that it does not rest directly upon the body of the valves or upon the water main. The upper section of the unit shall be placed in proper alignment and adjusted so that its top will be at final grade. The completed valve box shall be vertically centered over the valve-operating nut and each valve shall be tested for proper access and operation.

4.2d INSTALLATION OF FIRE HYDRANTS: Hydrants shall be placed on the uphill side of roads and installed at the locations shown on the plans unless otherwise specified by District's Engineer. They shall be plumb and set so that the bottom of the pumper nozzle is no less than fourteen (14) inches above finished grade.

A minimum of ¼ cubic yard of washed gravel shall be placed around the base of the hydrant to insure proper drainage of the hydrant after use. Blocking of the hydrant shall consist of pouring a solid concrete base of not less than ¼ cubic yard extending from the hydrant base to the undisturbed soil on the bottom and sides of the trench. Weep holes, which drain the hydrant, shall not be covered with concrete.

4.2e INSTALLATION OF WATER SERVICE PIPE: Underground water service pipe shall be laid not less than ten (10) feet horizontally from the building sewer service line. Where this separation is not possible, the water service line shall be at least eighteen (18) inches above the top of the building sewer service line and still meet minimum depths specified in 4.2a.

Each water service line shall be machine drilled and connected to the water main with a tapping saddle through a brass corporation stop. The main shall be tapped at an angle of forty-five degrees (45°) from the vertical, and the corporation stop must be turned so that the T-handle will be on top. Service lines extended to property lines shall terminate with a curb stop with box, plugged and marked.

4.2f CONNECTION TO EXISTING MAINS: New water main lines shall not be connected to existing mains in service until the new lines have been tested, disinfected at least 25 ppm residual of Cl_z after twenty-four (24) hours in accordance with AWWA C651-92 and accepted by the District, unless an exception is approved by the District's Engineer.

Where the connection of the new work to old requires interruption of service, the District's Engineer and the Contractor shall mutually agree upon a date and time for connections which will allow ample time to assemble labor and materials and allow adequate notification to affected existing users.

5.0 **TESTING PIPELINES**: All pressure and the Contractor under direct control of the District's Engineer shall perform leakage testing.

5.1 TESTING SANITARY SEWERS: Testing sanitary sewers for acceptability shall include the following tests:

a. Exfiltration of water or exfiltration of air under pressure…by Contractor
b. Deflection of thermoplastic pipe……by District's Engineer
c. Lamping……by District's Engineer

5.1a EXFILTRATION TESTS: An exfiltration or leakage test shall be performed on all newly constructed sanitary sewer mains as directed by District's Engineer. The Contractor will determine whether the test will be made with water or air pressure and shall furnish all labor, tools and equipment necessary to conduct the test.

The exfiltration test will not be considered valid without the presence of the District's Engineer or his designated representative throughout the test.

EXFILTRATION OF WATER TEST: The test section shall be sealed off from the remaining pipeline with watertight plugs inserted in the pipes at the end manholes. The Contractor shall fill the pipe to the test level with potable water at least 24 hours prior to conducting the test. The test level shall be at least eighteen (18) inches above the top of the pipe opening in the upper manhole or eighteen (18) inches above the ground water table, whichever is higher.

Throughout the test period of at least one (1) hour, the water level shall be maintained at the test level and all water added shall be accurately measured. If the exfiltration rate exceeds 0.15 gallons per inch of inside pipe diameter per hour per 100 feet of pipe length, the leaks shall be located and repaired at the Contractor's expense, and the pipeline retested until the leakage is within the allowable limits.

AIR LEAKAGE TEST: If the Contractor chooses to test for exfiltration with air pressure, the testing shall be in accordance with ASTM Standard C-828. The ends of the test section shall be sealed at the manholes with pneumatic plugs. One of the plugs provided shall have two taps. One tap will be used for introducing air into the pipeline through suitable valves and fittings so that the input air may be regulated. The second tap shall be fitted with valves and fittings to accept a pressure gauge to monitor the internal pressure of the sewer pipe.

The pressure gauge shall meet the following minimum specifications:

Size	4½ inches diameter
Pressure range	0-15 psi
Figure intervals	1 psi increments
Minor Subdivisions	0.05 psi
Pressure tube	Bourdon tube or diaphragm

PROCEDURE: Connect the pressure gauge and air control equipment to the proper fittings and slowly apply air pressure. Pressurize the pipe line to 4.0 psig and throttle the air supply to maintain between 4.0 and 3.5 psig for at least two (2) minutes in order to allow equilibrium between air temperature and pipe walls. During this time check all plugs for leakage. If plugs are found to leak, bleed off air, tighten plugs and repressurize the pipeline. After the temperature has stabilized, allow the pressure to decrease to 3.5 psig. At 3.5 psig begin timing to determine the time required for pressure to drop to 2.5 psig. The time, in seconds, for the air pressure to decrease from 3.5 psig to 2.5 psig should be greater than the minimum test time shown in the following table:

MINIMUM TEST TIME FOR VARIOUS PIPE SIZES

Nominal Pipe Size, in.	T(time) Min/100 ft.	Nominal Pipe Size, in.	T(time) Min/100 ft.
4	0.3	24	3.6
6	0.7	27	4.2
8	1.2	30	4.8
10	1.5	33	5.4
12	1.8	36	6.0
15	2.1	39	6.6
18	2.4	42	7.3
21	3.0		

If the air test fails to meet the above requirements, the leaks shall be located and repaired at the Contractor's expense, and the pipeline retested until the leakage is within the allowable limits.

In areas where the ground water level is above the pipe, the hydrostatic pressure of the ground water above bottom of the pipeline shall be determined and added to all test pressures.

5.1b DEFLECTING TESTING FOR PLASTIC PIPE: All PVC and ABS composite sewer lines will be tested for excess deflection by the District's Engineer. The maximum allowable deflection of flexible pipe shall not exceed seven and one-half percent (7 ½%) of the Base Inside Diameter as established in ASTM D3034-81. The following values from ASTM D3034-81 shall apply:

Nominal Pipe Size, in.	Base Inside Diam., in.	7½% Deflection Mandrell Diam., in.
6	5.742	5.31
8	7.665	7.09
10	9.563	8.84
12	11.361	10.51
15	13.898	12.86

The deflection test will be performed by pulling a "go-no-go" mandrel up-grade through the pipe from manhole to manhole. Where deflection is found to be in excess of allowable testing limits, the Contractor shall excavate to the point of excess deflection and remove the deflection by recompacting around the pipe or other approved method. After backfilling, the line shall then be retested for deflection. If the line has failed to return to its original size (inside diameter) the Contractor at their expense shall replace the deflected pipe.

5.1c LAMPING TEST: Lamping will be performed on all sanitary sewer pipe by the District's Engineer. In order to pass the lamping test, three-fourths (¾) of the pipe circle shall be observed both vertically and horizontally between manholes.

5.2 TESTING STORM SEWERS AND CULVERTS: Testing of all gravity flow pipeline, other than sanitary sewers, shall consist of a physical inspection by the District's Engineer. All pipelines and sewer lines will be lamped to check for proper alignment and uniformity of grade.

All plastic pipe will be subject to deflection testing by the District's Engineer. The maximum allowable deflection of any flexible pipe shall be seven and one-half percent (7½ %) of the base inside diameter of the pipe as defined above.

5.3 TESTING PRESSURE PIPELINES: Water main, force mains, siphons and all other pipelines that will operate under pressure shall be tested for pressure and leakage in

accordance with these specifications and AWWA Standard C-603, Section 4.

The Contractor shall furnish all labor, equipment, tools, water and other incidental items required to conduct the tests. Test results will not be considered valid without the presence of the District's Engineer or his representative throughout the test.

No pressure testing shall be performed until all thrust blocks have been placed and cured for at least two (2) days, and the pipeline backfilled adequately to prevent any movement or lifting of the pipe. Pavement or other permanent surfaces shall not be placed until all pressure and leakage tests are satisfactorily completed.

5.3a TEST PRESSURE: Unless otherwise specified, the test pressure for all pipes shall be double the operating pressure at the lowest elevation of the test section or the class designation of the pipe plus fifty (50) psi, whichever is less, except that the minimum test pressure for water distribution lines shall be one hundred fifty (150) psi.

5.3b FILLING:The pipeline shall be filled with potable water at least twenty-four (24) hours before being subjected to the hydrostatic pressure test. Each section of pipeline shall be filled slowly and all air expelled by means of taps at points of highest elevation. Tapping to remove air shall be the responsibility of the Contractor with location of taps approved by the District's Engineer.

5.3c PROCEDURE: The pressure and leakage tests may be performed simultaneously or separately. The total time for the combined pressure and leakage tests shall be a minimum of two (2) hours for each section of pipeline. If separate tests are made, the pressure test shall be made first. The duration of the pressure test shall be a minimum of one (1) hour and the duration of the leakage test shall be a minimum of four (4) hours. The pressure of the leakage test may be reduced to one hundred and fifty percent (150%) of the maximum working pressure that will occur on that portion of the line.

The specified test pressure shall be applied by means of a pump connected to the pipe in a manner satisfactory to the District's Engineer. No pipe installation will be accepted if the leakage for the section of line being tested is more than the rate calculated using the following formula, except that leakage for Asbestos-Cement pipe shall conform to provisions of AWWA C603.

$$L = \frac{ND\sqrt{P}}{7{,}400}$$

L = allowable leakage in gallons per hour
N = number of joints in length of pipeline tested
D = nominal diameter of pipe in inches
P = average test pressure in psi gauge

Leakage is defined as the quantity of water to be supplied to the section of pipeline being tested, which is necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

5.4 TESTING MANHOLES: Initial inspection of manholes shall be visual by the District's Engineer. Acceptance will require a completely assembled, backfilled manhole with invert poured and all grouting completed. Any manhole suspected of being non-watertight or any manhole in a high groundwater area or any manhole not otherwise meeting the intent of the specifications may have to be water tested at the prerogative of the District's Engineer. The manhole shall be either tested visually for infiltration or shall have inlet and outlet plugged and be filled with water above all seams. Loss or gain due to leakage shall not exceed 1.0 foot per 24 hours, as measured vertically from the top of the ring.

6.0 **DISINFECTION OF WATER LINES:** After completion of pressure and leakage testing and prior to being placed into service, all new water mains and repaired portions of or extensions of existing mains shall be chlorinated by the Contractor in accordance with AWWA Standard C651-92, storage tanks in accordance with AWWA C652-92.

6.1 PREVENTING REVERSE FLOW: Valves shall be manipulated so that the strong chlorine solution in the line being treated will not flow back into the line supplying the water.

6.2 CHLORINATING VALVES AND HYDRANTS: In the process of chlorinating newly

laid pipe, all valves or other appurtenances shall be operated while the pipeline is filled with the chlorinating agent and under normal operating pressure.

6.3 FINAL FLUSHING AND TESTING: Following chlorination, all treated water shall be thoroughly flushed from the newly laid pipe at its extremity until the replacement water throughout its length shows upon test a chlorine residual of less than 2 mg/l.

6.4 BACTERIOLOGICAL TESTING: Following flushing samples shall be collected by the Contractor for testing for bacteriological quality. Each 1,000 feet of water main shall be sampled and tested and results of the test supplied to the District or District's Engineer before acceptance of any portions of the line.

Exhibit E

Revised: 5/31/2018

APPLICATION FOR DRIVEWAY PERMIT

La Plata County Colorado

PUBLIC WORKS - ENGINEERING DEPARTMENT
1365 S. Camino del Rio
Durango, CO 81303
970-382-6363

engineering@co.laplata.co.us

Upon completion of driveway, call for final inspection 970-382-6378

County Inspector has seven (7) working days to process application.

Applicant Name, Mailing Address, Telephone & Email: PARCEL NUMBER _____

In signing below and accepting this Driveway Permit, the undersigned (or representative of - attach form) Permittee, vertifies that he/she had read and understands the foregoing provisions; that he/she has the authority to sign for and bind Permittee to all conditions set forth herein. The Permittee furhter verifies, by virtue of signature, that the appropriate specifications and standards, driveway checklist and special conditions has been received.

Applicant Signature: _____ Date: _____

Contractor Name, Mailing Address, Telephone & Email:

Type of Road: ◯ Subdivision ◯ County* ◯ State Highway ◯ Other

*Bond on File? ◯ Y ◯ N

*Work within the County Road ROW requires a $5000 License & Permit Bond and a License Agreement for Construction of a Driveway.

Address of Driveway assigned by County GIS: _____

Is there a gate code? List it here please: _____

IMPORTANT!!! Read below.

1	A site plan is required with this application. Show the layout and length of drive. Show turnouts and turnarounds when applicable. Show radii when applicable and also location of structures/dwellings.
2	Mark or flag the proposed driveway location to adjacent road so our inspector can find it, or make an appointment with inspector. Place flagging at road and at dwelling location and along drive if needed.
3	This permit must be available on site during construction. Once complete, schedule a FINAL INSPECTION by calling 970-382-6378 or 970-382-6363.
4	Your driveway is not considered COMPLETE until FINAL INSPECTION is complete.
5	The issuance of a Certificate of Occupancy (CO) can be delayed if a driveway has not been inspected as complete.
6	We require legal access documentation (easement agreement/plat) if driveway access crosses other parcels/property or is not accessed directly off a public road.

Approved Location of Driveway Access by County Inspector: _____

Driveway Permit granted and approved for construction: Date _____

Granted and Approved By: _____ Title: _____

FIRE DISTRICT CONTACTS

Durango Fire:	Upper Pine River:	Los Pinos Fire:	Ft. Lewis Mesa:
970-382-6023	970-884-9508	970-563-9501	970-588-3400
karolahanks@durangofire.org	firemarshal@upperpinefpd.org	tom.aurnhammer@lospinosfire.com	office@flmfire.org

FINAL INSPECTION

Permit Completed and Approved Date: _____

Authorized Signature for County: _____

DO NOT WRITE BELOW - FOR OFFICE USE ONLY

Plans Approved By:	Driveway Permit Fee	License & Permit Bond on file?	License Agreement	Driveway Permit Number:	Date Permit Issued
	Visa /MC /Discover /AE or eCheck	Y ◯ N ◯	Y ◯ N ◯		

UPON COMPLETION OF PROJECT, CALL FOR FINAL INSPECTION 970-382-6378

1365 S. Camino del Rio
Durango, CO 81303
970-382-6363

"DRIVEWAY STANDARDS"

Resolution 2014-40

~~EXHIBIT A~~

The following definition shall replace the definition of "driveway" in Section 62:

Driveway means a roadway, from the intersection with the adjacent public or private road, Measured from the shoulder or surface edge to the furthest dwelling unit or accessory structure that provides access to a maximum of two (2) lots or three (3) dwelling units with twenty-four (24) or less ADT.

The following section shall replace the current version of Section 74-97:

La Plata County Code Sec. 74-97. Driveways.

(a) *Purpose.* The intent of this section is to provide safe ingress and egress for driveways and adequate access for emergency responders to protect the health, safety and welfare of the community, while recognizing the need for flexibility in driveway development.

(b) *Permits for new development; exceptions.*

(1) A driveway permit that complies with this section shall be obtained from the department of public works prior to issuance of the following:

a. A final building permit or certificate of occupancy for a new dwelling unit; and

b. An Administrative, Class I or Class II permit that serves twenty-four (24) or less ADT.

(2) A driveway permit is not required for and all standards in this section shall not apply to the following:

a. Development of additional dwelling units that are subject to administrative review pursuant to section 82-37(b);

b. Redevelopment or reconstruction of an existing dwelling unit. For the purpose of this section, a manufactured home shall be considered a dwelling unit;

c. Development of a dwelling unit that was issued a valid building permit prior to April 1, 2015;

d. Development of a primary dwelling unit on a parcel that duly obtained a driveway permit from the County and constructed such driveway prior to April 1, 2015; and

e. Development of a dwelling unit that utilizes a driveway that is less than 125 feet in length and intersects with a private road or public non-County road.

(3) Reserved.

(4) A driveway or access that intersects with a County road and serves a vacant lot or an agricultural use shall be exempt from the requirements of this section but shall be required to obtain a permit prior to commencing work within the right-of-way.

(5) Development of a primary dwelling unit on a parcel that intersects with County Road 124 at a point north of where the County's winter maintenance terminates shall not be required to obtain a driveway permit; however, such driveway shall be required to obtain a permit prior to commencing work within the right-of-way.

(c) *General standards.* Driveways shall meet the following requirements:

(1) Surface width. For horizontal tangent (straight) sections of driveway, the surface width shall be twelve (12) feet, with two (2) foot clear zones on each side that are free from unmovable obstructions. For curved sections with a centerline radius of 150 feet or less, the surface width shall be sixteen (16) feet with two (2) foot clear zones that are free from unmovable obstructions with appropriate tapering from tangent sections. Curved sections that are less than 100 feet in length, as measured along the centerline, and that do not exceed a 90 degree change in direction, shall be permitted to maintain a surface width of twelve (12) feet.

(2) Surface. To ensure that a driveway can support a 60,000lb vehicle, the driveway surface, including turnouts and turnarounds, shall be constructed of a minimum 4" Class 6 (3/4" minus) aggregate surface placed on a compacted subgrade material, from the intersection of the roadway to the primary structure(s). The subgrade shall be scarified and compacted to a minimum depth of 12 inches below finished grade and shall be free of roots, sod, weeds, wood, construction debris, ice, snow, or other frozen materials, and deleterious matter. The clear zones are not required to meet a surfacing requirement, but shall not exceed a four (4) foot horizontal to one (1) foot vertical grade. The surfacing requirements are minimum standards and an applicant may choose to exceed these standards.

(3) Cut and fill slopes. Cut slopes shall not be greater (steeper) than one (1) foot horizontal to one (1) foot vertical and four (4) feet high. Fill slopes shall not be greater (steeper) than two (2) feet horizontal to one (1) foot vertical and four (4) feet high. A slope that exceeds the minimum cut or fill requirements of this paragraph shall either be certified as stable in its current finished state by a Colorado-licensed engineer or shall be designed by a Colorado-licensed engineer.

(4) Maximum grade. The maximum grade shall not exceed twelve (12) percent for horizontal tangent (straight) sections. For curved sections with a centerline radius of 150 feet or less, the grade shall not exceed ten (10) percent. Curved sections that are less than 100 feet in length, as measured along the centerline, and that do not exceed a 90 degree change in direction, shall be permitted to maintain a maximum grade of twelve (12) present.

(5) Overhead clearance. The minimum overhead clearance shall be thirteen (13) feet, six (6) inches for the width of the entire surface and clear zone. All overhead impediments, including but not limited to wires, trees, and gates, shall remain clear from the intersection of the access road to the termination of the driveway.

(6) Access to legal property. A driveway shall provide access to a lot that was legally created and has obtained all required land use permits under subpart B.

(7) Legal access. Evidence of legal access across adjoining properties shall be provided through an express grant or a written description of the prescriptive use.

(8) Interior curves. Minimum thirty (30) foot radius inside curves shall be provided.

(9) Turnarounds. Driveways that are longer than 400 feet shall provide a turnaround within 150 feet of the nearest point of the primary dwelling unit. The turnaround shall be designed and constructed to allow a thirty-five (35) foot long emergency vehicle to turn around. Where topography or the length of the driveway influences the location of the turnaround, the public works director is encouraged to contact the applicable fire district for comment on the proposed location. After receipt of comment from the applicable fire district, the public works director may waive or reduce the requirement for a turnaround.

(10) Turnouts. Driveways that are longer than 800 feet shall provide a turnout every 400 feet as measured from the access road. Turnouts shall meet the surface requirements of this section, shall be sixty (60) feet in length and shall provide twenty (20) feet in surface width with reasonable tapering and two (2) foot clear zones on each side. Driveways that are 1000 feet or less in length and allow an unobstructed line of sight from the adjacent road to the structure shall not be required to construct turnouts. Where topography or the length of the driveway influences the location(s) of the turnout, the public works director is encouraged to contact the applicable fire district for comment on the proposed location(s). After receipt of comment from the applicable fire district, the public works director may reduce the number of required turnouts or vary the locations of the turnouts.

(11) Drainage. Driveway design and construction shall not adversely affect the drainage on a roadway or any adjacent properties.

(12) Flood hazard areas. Driveways within flood areas shall comply with the requirements in chapter 78 of subpart b.

(13) Bridges. Driveways that utilize bridges shall comply with the standards for low ADT roads as identified in section 74-92 of subpart b and the flood hazard area requirements as identified in chapter 78 of subpart b.

(14) Costs. The cost of all driveway construction, reconstruction and maintenance, including any portion in a public or private right-of-way, including but not limited to culvert design, installation, and replacement, shall be the responsibility of the property owner, unless provided otherwise in a separate written agreement.

(15) Intersection of a driveway and roadway.

a. Driveways that intersect with a county road shall slope away from the shoulder of the road surface at a minimum grade of at least two (2) percent for the first ten (10) feet. All other driveways shall not exceed five (5) percent for the first fifteen (15) feet from the intersection with the shoulder of the road.

b. The axis of the driveway at the intersection with the roadway shall be no less than a sixty (60) degree angle to the centerline.

c. The intersection of the driveway and the roadway shall be at least fifty (50) feet from the intersection of any roadways. The public works director may allow a driveway within fifty (50) feet of an intersection if the driveway is located on a local or low ADT road and there is a determination that the location would not adversely impact the safety of the traveling public.

d. The public works director shall determine if a culvert is required at the intersection of a driveway and a county road. If a culvert is required, the minimum culvert size shall be fifteen (15) inches along a County road and twelve (12) inches along all other roads and the minimum culvert cover shall be eight (8) inches. Culverts along County roads shall be constructed of metal or concrete and shall maintain a slope consistent with the roadside drainage. The public works director may require that a larger culvert and culvert cover is required based on the location of the proposed driveway.

e. Sight distance along a county or state access road at the intersection of the driveway shall meet the Colorado State Highway Access Code minimum standards. Sight distance along all other roads at the intersection of the driveway shall provide adequate sight distance in both directions along the roadway in order to maneuver safely and without interfering with roadway traffic. The public works director may require a Colorado-licensed engineer to certify that there is adequate sight distance in both directions along the roadway.

f. House addressing signs shall be visible form the intersection of the roadway and driveway. Such signs shall be made of a non-combustible and reflective material that contrasts in color with the background. Numbers shall be a minimum of four (4) inches high and shall have a minimum stroke width of .5 inches.

g. A maximum of one driveway shall be permitted for a lot with less than 100 feet of frontage. The public works director may allow for more than one driveway for lot with 100 or more feet of frontage after making a determination that an additional driveway does not adversely impact the safety of the traveling public.

(d) *Process.* An application for a driveway permit shall be obtained from the public works department or building department. After review of the design of the driveway and determination of compliance with the provisions of this section, the public works director shall issue a conditional approval of a driveway permit. A conditional approval shall be valid for one (1) year from the date of approval. Upon completion of construction of the driveway, the property owner shall contact the public works department for a final inspection. The public works director shall issue a final approval of a driveway permit if the inspection demonstrates that the driveway construction complies with the provisions of this section. A final building permit or certificate of occupancy (CO) may be issued prior to final approval of a driveway permit if the public works director determines that seasonal conditions prevent the immediate surfacing or completion of the driveway; in such case, a final approval shall be obtained when the seasonal conditions would allow the surfacing to be completed, which shall not be more than six (6) months after issuance of the final building permit or CO.

(e) *Waivers.*

(1) Process. An applicant may submit a written request for a waiver of any general standard in this section to the public works director. The applicant shall provide to the director a postage-paid, addressed envelope and form the seeks comment from the applicable fire district on the waiver request. In addition, the applicant is encouraged to meet with the applicable fire district to discuss the waiver request. The applicable fire district shall be the fire district that provides emergency response to the property served by the proposed driveway. The fire district shall have ten (10) working days from the date of receipt of the comment request to provide the director with comments.
Comments received from the fire district shall be placed in the file. The director may grant a waiver from the application of the general standard no earlier than twenty-one (21) days after submittal of the request to the applicable fire district. The applicable fire district shall be treated as a commenting agency and the director shall consider any and all timely comments

submitted prior to issuing a final decision. Any waiver granted by public work will be provided in writing and notice shall be provided to the applicable fire protection district.

(2) Mitigating factors to consider. If the public works director receives comment from the fire district that granting the waiver request would present health, safety, and welfare concerns, the director may consider, but is not limited to, the following factors when determining whether to grant the waiver request.

a. Plans for and implementation of substantial defensible space measures, as identified in the State of Colorado Forest Service, Creating Wildfire-Defensible Zones Guide;

b. Provision of adequate on-site water supply capable of supplying fire flow for fire protection, as set forth in Chapter 34 of the La Plata County Code;

c. Design and construction of internal automatic fire sprinkler systems designed and installed in compliance with Chapter 34 of the La Plata County Code for all properties served;

d. Paving of the driveway; and

e. Use of a substantial amount of fire-resistant building construction types and designs recognized for fire adapted communities for all properties served.

(3) Criteria for director determination. The public works director may grant a request for a waiver if he or she determines that the following elements have been satisfied:

a. Topography challenges or other site-specific constraints make it extremely difficult to comply with the standards; and

b. The granting of a waiver will not be detrimental to the health, safety, and welfare of the public, including the occupants of the residential structure(s) served by the driveway.

(4) Limitation of extent of waiver and conditions. The public works director may limit the extent of the waiver to the degree necessary to comply with subparagraph (2). In addition, the director may condition the waiver on the implementation of measures that mitigate health, safety, and welfare concerns. The director's final determination shall be in writing and a copy shall be provided to the applicable fire district.