



**AGENDA for a Regular Meeting
of the Board of Trustees of the Town of Fairplay, Colorado
Monday, April 15, 2024, at 6:00 P.M in the
Fairplay Town Hall Board Room, 901 Main Street, Fairplay, CO**
[Join the TEAMS Meeting](#) (Meeting ID: 225 217 433 79 / Passcode: Y6Z2h7)

- I. **CALL TO ORDER & PLEDGE OF ALLEGIANCE**
- II. **APPROVAL OF AGENDA**
- III. **CONSENT AGENDA** *(This item is intended to streamline the Board Meeting grouping routine, non-controversial business. The public or the Board Members may ask that an item be removed from the Consent Agenda for individual consideration.)*
 - A. **APPROVAL OF MINUTES OF REGULAR MEETING** – January 22, 2024.
 - B. **APPROVAL OF EXPENDITURES** – Paid bills for all Town funds from March 28, 2024 through April 11, 2024 in the amount of **\$237,345.01** and 1st Quarter 2024 Financial Statements.
- IV. **CITIZEN COMMENTS** *(This item allows for the public to sign up to address the Board on matters that are not on the agenda. Sign-up can be done prior to, or at the start of a meeting, on the required form.*
- V. **NEW BUSINESS**
 - A. Administration of Oaths of Office to and seating of Trustees Raymond Douglas and Erik Baum.
 - B. Comments from and presentation to outgoing Trustee Scott Dodge.
 - C. Selection of Mayor Pro Tem.
 - D. **FIRST READING:** Should the Board Approve the adoption of Resolution No. 16, Series of 2024, entitled, **“A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, APPOINTING JANEL SCIACCA AS TOWN CLERK AND TOWN ADMINISTRATOR.”**?
 - E. **FIRST READING:** Should the Board Approve the adoption of Resolution No. 17, Series of 2024, entitled, **“A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, APPOINTING JENNIFER DANNER AS TOWN TREASURER.”**?
 - F. **FIRST READING:** Should the Board Approve the adoption of Resolution No. 18, Series of 2024, entitled, **“A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, APPOINTING BRIAN GREEN AS MUNICIPAL COURT JUDGE.”**?
 - G. **FIRST READING:** Should the Board Approve the adoption of Resolution No. 19, Series of 2024, entitled, **“A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, APPOINTING THE FIRM OF WILSON WILLIAMS FELLMAN & DITTMAN AS TOWN ATTORNEY.”**?
 - H. **FIRST READING:** Should the Board Approve the adoption of Resolution No. 20, Series of 2024, entitled, **“A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, DESIGNATING THOSE PERSONS AUTHORIZED TO SIGN ON TOWN BANK ACCOUNTS.”**?
 - I. **FIRST READING:** Should the Board Approve the adoption of Resolution No. 21, Series of 2024, entitled, **“A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, APPROVING A PROPOSAL FROM AMERICAN CIVIL CONSTRUCTORS MOUNTAIN WEST FOR COMPLETION OF A PORTION OF SIDEWALK ALONG THE WEST SIDE OF US HIGHWAY 285.”**?
- VI. **PUBLIC HEARINGS**
 - A. **TO BE CONTINUED** - Ordinance No. 2, Series of 2024, entitled, **“AN ORDINANCE OF THE BOARD OF TRUSTEES FOR THE TOWN OF FAIRPLAY, COLORADO, AMENDING CHAPTER 18 BUILDING REGULATIONS TO INCREASE THE DESIGN SNOW LOADS FOR STRUCTURES?”**.
 - B. **TO BE CONTINUED** - Ordinance No. 3, Series of 2024, entitled, **“AN ORDINANCE OF THE BOARD OF TRUSTEES FOR THE TOWN OF FAIRPLAY, COLORADO AMENDING CHAPTER 10 – GENERAL OFFENSES OF THE FAIRPLAY MUNICIPAL CODE REGARDING NOISE AND NOISE PERMITS, AND CHAPTER 11 – STREETS, SIDEWALKS AND PUBLIC PROPERTY REGARDING PARKING AND PARKING PERMITS?”**.
- VII. **STAFF AND BOARD OF TRUSTEE REPORTS**
 - A. Presentation of DRAFT updated Fairplay Public Works Manual; Wastewater Design Criteria, Technical Specifications Construction Details; and Wastewater Rules & Regulations for review and public input.
- VIII. **ADJOURNMENT AND BOARD OF TRUSTEE RECEPTION.**

Upcoming Meetings/Important Dates

The Flume’s People Choice Awards	Monday, April 24, 2024
Park County Intergovernmental Meeting	Thursday, April 25, 2024

*Posted at Fairplay Town Hall, Fairplay Public Library, Fairplay Post Office, and on The Town of Fairplay Website (www.fairplayco.us) on Thursday, April 11, 2024. **THIS AGENDA MAY BE AMENDED.***

**MINUTES OF THE REGULAR MEETING OF THE
FAIRPLAY BOARD OF TRUSTEES
January 22, 2024**

CALL TO ORDER

A Regular Meeting of the Board of Trustees for the Town of Fairplay was called to order by Mayor Frank Just on Monday, January 22, 2024, at 6:00 p.m. in the Board Room located in the Fairplay Town Hall at 901 Main Street, having previously been posted in accordance with Colorado Open Meetings law.

PLEDGE OF ALLEGIANCE AND ROLL CALL

Mayor Just proceeded with the pledge of allegiance, followed by the roll call, which was answered by Mayor Frank Just, Mayor Pro Tem Dodge, and Trustees Ray Douglas, Josh Voorhis and Pete Lynn.

Staff in attendance were Town Administrator Janell Sciacca, Town Treasurer Jennie Danner, Chief of Police Jeff Worley, Town Engineers Deron Dirksen and Matt Hutson, Town Planner Scot Hunn, and Operators in Responsible Charge Marty Deline and Keith Chisholm.

APPROVAL OF AGENDA

Motion #1 by Trustee Voorhis, seconded by Trustee Douglas, that the agenda be adopted as written. A roll call vote was taken: Douglas – aye, Dodge – aye, Just – aye, Voorhis – aye, Lynn – aye. Motion carried unanimously.

CONSENT AGENDA

- A. APPROVAL OF MINUTES** – November 6, 2023 Regular Meeting.
- B. APPROVAL OF EXPENDITURES** – Approval of paid bills for all Town Funds from January 5, 2024 to January 18, 2024 in the amount of \$288,946.50.

Motion #2 by Trustee Voorhis, seconded by Trustee Lynn, that the Consent Agenda be approved with the minutes as written and expenditures as stated. A roll call vote was taken: Douglas – aye, Dodge – aye, Just – aye, Voorhis – aye, Lynn – aye. The motion carried unanimously.

CITIZEN COMMENTS

Laurence Burnett, 490 8th Street, stated she was glad to see all the uniformed Officers because her concern was the lack of police presence in Town. She stated the need for enforcement was out there.

BADGE PINNING CEREMONY

- A. Administration of Oaths of Office and Badge Pinning Ceremony for new Officers of the Fairplay Police Department.**

Chief Worley invited Sheriff Tom McGraw up first and presented him with a plaque of appreciation for their work covering the Town during the rebuilding. Worley stated McGraw had been a true partner and he was truly grateful for the excellent service provided to Fairplay during its rebuild and the sign of true partnership in law enforcement is the willingness to come to the assistance of one's brothers and sisters in need. Worley personally thanked McGraw stating he welcomed him and made his transition to Chief of Fairplay easy. McGraw accepted the plaque and stated he looked forward to working with all of the new Officers and Chief Worley.

Worley then explained the Badge Pinning Ceremony was an age-old tradition. He addressed the Officers specifically and told a story of a young boy in a school that told him the badge looked like a shield. He stated it is a shield and it is meant to protect and a sacred symbol of what you will do for the people in Fairplay and Alma. Worley asked Officer to wear the badge with pride, to serve the people with excellence, to work with sister and brother agencies, and to do it with great honor; He asked the Officers remember that you they wear the badge not to protect themselves, not to gain any advantage, but rather to give of themselves to those that they serve and to remember that many came from other jurisdictions and that law enforcement is a not just a job, but a great calling and a means to take care of their families. Worley then asked they remember that when they were taking care of the wonderful citizens of Fairplay and Alma, someone else wearing another badge was out there protecting their

families and he asked that they wear the badge with honor. He then asked that the Officers stand and raise their right hands and administered their Oath of Office. Worley then invited Officer Steve Berlanga, Officer James DeSchryver, Sergeant Brian Knellinger, Sergeant Ronald Martinez, Officer Jordan Peters, Officer Mason Prickett, and Officer Desiree Wood up one-by-one to be pinned by a friend, family member or loved-one. Mayor Just welcomed them to their new home with the Town of Fairplay and their new family and extended best wishes from the Board. He thanked them for choosing Fairplay.

In order for Worley to be able to leave the meeting to attend a reception with the Officers, New Business Item A, IGA with Alma, was moved up on the agenda.

NEW BUSINESS

A. FIRST READING – Should the Board of Trustees for the Town of Fairplay adopt Resolution No. 7, Series of 2024, entitled “**A RESOLUTION OF THE BOARD OF TRUSTEES FOR THE TOWN OF FAIRPLAY, COLORADO, APPROVING AN INTERGOVERNMENTAL AGREEMENT FOR LAW ENFORCEMENT SERVICES BETWEEN THE TOWN OF FAIRPLAY AND THE TOWN OF ALMA.**”?

Town Administrator Sciacca reviewed the Staff Report reminded that this proposal had been contemplated for a while but never materialized until it was proposed to Chief Worley who took it and ran with the unique opportunity. The agreement benefits both communities. Worley stated that in conversations with Alma Administrator Goettelman and Mayor Golgoon this agreement was seen as a mutual benefit and good partnership due to the close proximity of Alma and Fairplay. Sciacca advised that both Alma Administrator Goettelman and Mayor Golgoon were also in attendance and the town of Alma approved the agreement the prior Tuesday. Mayor Just stated he read the agreement multiple times and found it to be well written and thanked the Chief for drafting it. The Board generally expressed similar sentiments and appreciation for Worley working to figure out the details with Alma.

Motion #3 by Trustee Douglas, seconded by Trustee Voorhis, to continue Resolution No. 7, Series of 2024, as presented approving an Intergovernmental Agreement for Law Enforcement Services between the Town of Fairplay and the Town of Alma. A roll call vote was taken: Douglas – aye, Dodge – aye, Just – aye, Voorhis – aye, Lynn – aye. Motion carried unanimously.

PROCLAMATIONS, PRESENTATION AND UPDATES

B. Presentation and Market Update by ColoTrust Investment Services Director Brett Parsons.

Parsons introduced himself and provided a brief history of his background and meeting Town Administrator Sciacca as a Colorado City and County Managers Conference. He then reviewed a PowerPoint presentation regarding the ColoTrust program and a market outlook for 2024 and answered questions of the Board. The Board expressed their appreciation for the information shared and indicated a desire to have ColoTrust present at the 2nd meeting of January of every year moving forward.

NEW BUSINESS - CONTINUED

B. FIRST READING – Should the Board of Trustees for the Town of Fairplay adopt Resolution No. 8, Series of 2024, entitled “**A RESOLUTION OF THE BOARD OF TRUSTEES FOR THE TOWN OF FAIRPLAY, COLORADO APPROVING A FIRST AMENDMENT TO THE INTERGOVERNMENTAL AGREEMENT FOR PROVISION OF INTERCOUNTY COMMUTER BUS TRANSIT SERVICES FOR THE PARK COUNTY COMMUTER ROUTE.**”?

Town Administrator Sciacca presented an overview of the Staff Report reminding that in the original agreement for the Summit Stage service, the Town of Fairplay committed to provide shelter for the transit vehicles and entered into an agreement with CDOT for use of the 850 Hathaway Barn. That agreement was terminated by CDOT when they decided to build Workforce Housing on the site. She reminded that there were no other facilities in Fairplay which could meet the current storage needs for full-size buses, so the agreement had to be amended to allow the Town to provide financial support instead. The agreed upon amount would be \$18,000 and she recommended approval of the amended agreement to continue the vital transportation service provided by the Summit Stage. She also noted that the master agreement would most likely be renegotiated in 2024 as it was set to expire in 2025. She also noted that an additional stop had been added at Town Hall.

Motion #4 by Trustee Voorhis, seconded by Trustee Lynn, to approve Resolution No. 8, Series of 2024, as presented approving a First Amendment to the Intergovernmental Agreement for Provision of Intercounty Commuter Bus Transit Services for the Park County Commuter Route. A roll call vote was taken: Douglas – aye, Dodge – aye, Just – aye, Voorhis – aye, Lynn – aye. Motion carried unanimously.

C. FIRST READING - Should the Board of Trustees Approve the Adoption of Resolution No. 9, Series of 2024, entitled, **“A RESOLUTION OF THE BOARD OF TRUSTEES FOR THE TOWN OF FAIRPLAY, COLORADO APPROVING A PROFESSIONAL SERVICES AGREEMENT WITH PRINCETON HYDRO FOR BATHYMETRIC SURVEY SERVICES FOR THE FAIRPLAY RIVER PARK.”?**

Town Administrator Sciacca presented an overview of the Staff Report stating this matter originated when fish started dying at the Beach during the hotter temperatures over the summer. She noted there was also more algae and when she brought this up in discussions with Mayor Just, he shared history on the recreational area and an unsuccessful prior contract to complete dredging and return the water to historical depths. In those discussions it was determined that this should be attempted again, and she began researching companies that could do this and was provided Princeton Hydro’s contact information from Jane Mannon with the Coalition for the Upper South Platte. Sciacca made contact and scheduled an online meeting with Chris Mikolajczyk and Mayor Just. Just shared historic data and following discussions, Princeton Hydro prepared and submitted the proposed bathymetric services proposal which would be the first step of the project. Following questions from the Board, she reported that Princeton Hydro did this type of work nationwide and had many connections and she was recommending approval of the agreement as presented in the amount of \$8,175.00

Motion #5 by Mayor Pro Tem Dodge, seconded by Trustee Douglas, to approve Resolution No. 9, Series of 2024, as presented approving a Professional Services Agreement with Princeton Hydro for Bathymetric Survey Services for the Fairplay River Park. A roll call vote was taken: Douglas – aye, Dodge – aye, Just – aye, Voorhis – aye, Lynn – aye. Motion carried unanimously.

REVIEW AND DISCUSSION ITEMS

A. Impact Fee Study Proposal; Burro Park Drainage and Potential Park Plan; Hathaway Water Main Replacement – Town Engineer Deron Dirksen.

Dirksen reviewed the reports in the packet regarding an Impact Fee Study, Burro Park drainage and a potential development plan, and the Hathaway 4” water main replacement project related to the CDOT Workforce Housing project. Dirksen admitted he had not completed an Impact Fee Study but had conducted research and with his knowledge of the Town and other similar studies and approval from SGM to attend training specific to the matter, he was confident that he could conduct the study. He also noted the pricing separation for the Town-related fees and School District fees. He felt the study could be completed in 6 months. Sciacca noted that when this subject came up, she researched other companies that were conducting these studies for Colorado communities, and she just happened to be talking with Dirksen about it one day and afterwards he felt SGM could do this and it would be another important service that could be added to their portfolio and provided to the Town. Sciacca advised that due to the expense, and the project being unbudgeted, she would be trying to obtain an administrative grant from DOLA to bring the overall expense down for the Town. She also noted that she would provide the proposal to the School to see if they wanted to participate and pay for the school portion. The Board was overall comfortable allowing SGM to provide this service and requested Staff bring it back to them with an approving resolution when ready to proceed.

Dirksen then reported that the survey for Burro Park was done and the drawing in the packet was created by himself and an SGM colleague to show potential improvements that could be done. He advised that the property to the Northwest was not owned by the Town, and he was seeking additional guidance on how to move forward. Dirksen reviewed some aspects of the plan and discussion ensued relative to making Front Street a dead end at the parking lot and eliminating the connection to 8th street which would clean up the corner and open up additional space and the light pole could be moved. The Board generally felt the neighborhood would like the private park feel and less traffic and asked Dirksen to take a look at that and bring some drawings back to them for review that included a drive-aisle for emergency services to utilize.

Dirksen then reported the civil drawings were complete for the Hathaway water line replacement project. The proposed new main would be built independently of the existing main. Sciacca noted that an agreement with Rocks and Walls had already been reached for the actual work and Staff would make sure the agreement was updated as necessary to account for anything that had changed.

B. Interpretation of “residential associated with business” meaning for UDC in Town Center Overlay Zoning District and potential CU Denver Urban and Regional graduate assistance opportunity – Town Planner Scott Hunn. Town Planner Scot Hunn presented reminding that the current Municipal Code and a use of residential in the same building as business which is a permit use by right in several zone districts. He noted this interpretation has come up several times and is not well addressed, so his concern was that that this was not defined or clear what the intent was, and he was asking for clear direction from the Board. Hunn suggested that one option was to put no limit on the residential units associated with a business, but require they be deed restricted for employee housing and the other option was to address each on a case-by-case basis. Following discussion, general direction from the Board was that they did not want to see units as short-term rentals and housing should be for employees of the business or the town and asked Hunn to work with the Town Administrator and Attorney to work out language.

Hunn then reported that a friend of his named Andy Rutz, who was a professional urban design planner who teched urban planning and urban design courses had offered Hunn the opportunity to utilize some summer students for field intensive work and real-world planning. Essentially, they act like professional consultants. Sciacca stated that she thought is a was a great opportunity for the Town with all the code and plan updates Staff was hoping to accomplish and it could save the Town some money and provide experience for future planners. The Board thanked Hunn for the opportunity and provided general agreement to move forward. Hunn stated he would have a follow up conversation with his colleague to determine if some of Staff’s ideas matched up with the needs of the class.

Mayor Just asked that Administrator Sciacca introduce an attendee in the audience. Sciacca announced that Erik Baum, who had submitted a petition to run for Trustee, was in attendance. Baum stated he lived in Fairplay for 10 years and had attended meetings in the past. He said he saw the notice in the water and sewer bill and said what the heck, let’s do a little more service for the country. Sciacca announced that January 22 was the last day to submit a petition, unless someone submitted as a write-in. If no write-in petitions were received, she would be presenting a resolution at an upcoming meeting to cancel the election and declare the current candidates, Douglas and Baum, elected.

BOARD OF TRUSTEE AND STAFF REPORTS

A. 4th Quarter 2023 Operator in Responsible Charge (ORD) Report from Warm Springs, LLC – Operators Marty Deline and Keith Chisholm.

ORCs Deline and Chisholm reviewed information in the packet and briefed the Board on a sewage leak below the Town that was discovered. They relayed what led up to the leak and that it was found to have originated in an unknown manhole found in the willows across the river from the Middle Fork RV park and below the Town’s pump station. The leak was reported as required and Staff will look to clean it up as per regulations when the snow melts. Deline and Chisholm extended appreciation to Trustee Lynn for jumping in to help out with the situation. Sciacca also reported that Staff would be sitting down tomorrow to discuss roles and responsibilities with the recent reorganization upon the prior Public Works Director’s departure. The Board thanked Deline and Chisholm for their work and encouraged them to continue to bring needs up to the board as proactive measures instead of the Town having to be reactive.

Trustee Lynn thanked Deline and Chisholm for what they do for the town. He also thanked the Public Works crews for getting out trash cans and dog poop bags and then stated the plowing around Tow was better than he had seen it in a long time.

Mayor Pro Tem Dodge reported that he was told visitors to Town Hall were told they could not use the restrooms and were directed to the Library. Sciacca advised that the Staff would never have told someone that and she could send anyone in to talk with her if they wanted to complain or provide information on who told them that.

Treasurer Danner explained a glitch with the Utility billing system that resulted in penalties being issued to most users. Those were removed and Staff would work to try ensure that did not occur again in the future.

Town Administrator Sciacca reported that the Town received the referral from Park County for the proposed asphalt and concrete plant review. Trustee Voorhis inquired if the County was asking for responses in 45 days. Sciacca replied the referral came in earlier in the day and was due back to the County for the Planning Commission hearing scheduled for February 14, so the Town had to have comments back to them by the 13th.

Trustee Douglas reported that he attended the Park County Fairgrounds meeting held Saturday and it went through his mind that it could be a very big water user issue and there was a lot of pie in the sky ideas and that on a Park County budget that would not happen. He felt there was a big disconnect between what would happen and what was wanted. Sciacca noted there were plans available online for review and comment. She said it could be a huge draw for the community if it is done and done right.

ADJOURNMENT

There being no other regular business before the Fairplay Board of Trustees, Mayor Just declared the meeting adjourned at 9:02 p.m.

BOARD OF TRUSTEES, FAIRPLAY, COLORADO

Frank Just, Mayor

ATTEST:

Janell Sciacca, Town Clerk



MEMORANDUM

TO: Mayor and Board of Trustees

FROM: Jennie Danner, Treasurer

RE: Paid Bills and Financial Statements

DATE: April 11th, 2024

Attached is the list of the invoices paid between March 28th, 2024, and April 11th, 2024. Total Expenditures: \$237,345.01. Upon motion to approve the consent agenda, the expenditures will be approved.

Please note \$60,740.00 was paid to Velocity Constructors Inc. for the gallery project pay app #4, \$55,614.44 was paid to JOC Construction for 501 main pay app #2, \$20,000 was paid to J&M Displays for Burro Days fireworks, and \$25,438.97 was paid to AV-TCH for vehicle upfitting for the new PD F150.

ESTIP agreement with Mountain Essentials ends on 5/31/2024 and Otto's on 5/31/2027 or if maximum amount of \$75,000 is reached. Since 2019 Mountain Essentials has been paid out \$14,086.13 and since 2022 Otto's has been paid out \$33,783.72.

Attached are quarterly financial statements through March 31st 2024.

Recent activities: Attended trainings for "Internal Control Best Practices" and "Excel 1.0". Paid \$4,645.86 to Colorado Water Resources and Power Development Authority for Water Loan Payment. Loan schedule is attached.

Report Criteria:
Detail report type printed

Check Issue Date	Check Number	Name	Description	Seq	Invoice Date	Check Amount	GL Account
04/11/2024	20164	O'Rourke Media Group, LL	public notice of election ca	1	04/10/2024	22.70	105050
Total 868:						22.70	
04/03/2024	20144	Utility Notification Center	locates water	1	03/31/2024	25.80	517455
04/03/2024	20144		sewer locate	1	03/31/2024	25.80	517650
Total 2194:						51.60	
04/03/2024	20146	Xcel Energy	901 main st	1	03/22/2024	221.77	105023
04/03/2024	20146		22252 hwy 285	1	03/22/2024	108.09	517680
04/03/2024	20146		1507 county rd 16	2	03/22/2024	3,764.13	517680
04/03/2024	20146		1800 beaver creek rd	3	03/22/2024	757.86	517470
04/03/2024	20146		fairplay sign	1	03/22/2024	14.46	105640
04/03/2024	20146		747 bogue st	1	03/22/2024	16.19	105841
04/03/2024	20146		1190 castello	1	03/22/2024	130.94	105650
04/03/2024	20146		200 2nd st	2	03/22/2024	89.82	517470
04/03/2024	20146		157 6th st	3	03/22/2024	63.51	105640
04/03/2024	20146		156 5th st	4	03/22/2024	12.69	105640
04/03/2024	20146		589 platte dr	5	03/22/2024	12.69	105841
04/03/2024	20146		419 front st	6	03/22/2024	13.11	105640
04/03/2024	20146		fairplay chlorinator	1	03/22/2024	128.12	517470
04/03/2024	20146		1800 beaver creek rd	1	03/22/2024	757.86	517470
04/03/2024	20146		501 main st	1	03/22/2024	505.76	105195
04/03/2024	20146		town sign	1	03/22/2024	29.90	105640
04/03/2024	20146		117 silverheels	1	03/26/2024	12.69	105841
04/11/2024	20171		fairplay st lights	1	04/01/2024	920.50	105640
Total 2296:						7,560.09	
04/11/2024	20150	AV-TECH	veh upfit F150	1	03/28/2024	25,438.97	105428
Total 2361:						25,438.97	
04/11/2024	20167	South Park Ace & Lumber	PW shop supplies	1	04/10/2024	101.67	105630
04/11/2024	20167		repair gate WWTP	2	04/10/2024	39.99	517480
04/11/2024	20167		sander grate	3	04/10/2024	9.24	105625
04/11/2024	20167		fix town light	4	04/10/2024	36.98	105630
Total 2405:						187.88	
04/03/2024	20147	Family Support Registry	15890460	1	04/03/2024	285.69	102265
04/03/2024	20147		14128920	2	04/03/2024	252.00	102265
Total 2456:						537.69	
Multiple	19973	AmeriGas	1800 beaver creek rd prop	1	01/24/2024	.00	517495
			1800 beaver creek rd prop	2	01/24/2024		517495
Multiple	19973		501 main propane	1	01/25/2024	.00	105195
			501 main propane	2	01/25/2024		105195
Multiple	19973		propane 1800 beaver cree	1	01/24/2024	.00	517495
			propane 1800 beaver cree	2	01/24/2024		517495
04/03/2024	20132		1800 beaver creek rd prop	1	03/25/2024	2,214.19	517495

Check Issue Date	Check Number	Name	Description	Seq	Invoice Date	Check Amount	GL Account
Total 2468:						2,214.19	
04/03/2024	20133	Carrot-Top Industries	flags	1	03/29/2024	160.38	105027
04/03/2024	20133		flags	2	03/29/2024	343.35	105850
Total 2579:						503.73	
04/11/2024	20163	NAPA Auto Parts	oil and fluid for trucks	1	04/10/2024	204.39	105620
04/11/2024	20163		hydraulic fluid for plows	2	04/10/2024	47.97	105670
04/11/2024	20163		welding gloves	3	04/10/2024	47.69	105635
04/11/2024	20163		vehicle recovery equip	4	04/10/2024	258.98	105630
04/11/2024	20163		PD supplies	5	04/10/2024	41.54	105420
Total 2608:						600.57	
04/11/2024	20154	Colorado Natural Gas, Inc.	PW shop	1	04/03/2024	1,157.97	105650
04/11/2024	20154		901 Main Street	1	04/03/2024	305.27	105023
04/11/2024	20154		sewer treatment plant	1	04/03/2024	3,080.78	517680
04/11/2024	20154		san office	1	04/03/2024	283.02	517234
Total 2728:						4,827.04	
04/11/2024	20162	Mobile Record Shredders	monthly record destruction	1	04/10/2024	13.20	105070
Total 2793:						13.20	
04/03/2024	20136	J & M Displays	fireworks burro days	1	04/02/2024	20,000.00	105162
Total 2800:						20,000.00	
04/03/2024	20134	Chaffee County Waste	2 yd biweekly	1	04/03/2024	98.90	517675
04/03/2024	20134		6 yd weekly	2	04/03/2024	278.64	105650
Total 2801:						377.54	
04/03/2024	20135	Colorado Analytical Lab	waste water testing	1	04/01/2024	403.00	517665
Total 2864:						403.00	
04/03/2024	20142	Triangle Electric, Inc.	blower repair	1	03/26/2024	3,734.39	517655
Total 2876:						3,734.39	
04/11/2024	20165	Promark Industries, LLC	vehicle maintenance 2016 f	1	03/20/2024	1,072.29	105420
04/11/2024	20165		vehicle maintenance 09 tah	1	04/02/2024	2,256.47	105420
Total 2887:						3,328.76	
04/03/2024	20141	SGM	habitat workforce housing	1	03/26/2024	570.00	105105
04/03/2024	20141		prof fees- gen eng	1	03/26/2024	560.67	105105
04/03/2024	20141		pro fees- bill back mustang	1	03/27/2024	4,460.00	105107
04/03/2024	20141		pro fees- bill back stone cr	1	03/26/2024	1,282.50	105107
04/03/2024	20141		gen eng- cdot housing wat	1	03/26/2024	47.50	105105
04/03/2024	20141		burro park drainage & desi	1	03/26/2024	90.00	105887
04/03/2024	20141		hathaway water line	1	03/26/2024	135.00	517350
04/03/2024	20141		pro fees-PW manual updat	1	03/26/2024	2,701.00	105105

Check Issue Date	Check Number	Name	Description	Seq	Invoice Date	Check Amount	GL Account
04/03/2024	20141		eng fees-sewer design	1	03/26/2024	751.00	517432
04/03/2024	20141		prof fees- county proj rev	1	03/26/2024	190.00	105105
04/03/2024	20141		prof fees-gen engineering	1	03/26/2024	285.00	105105
Total 3272:						11,072.67	
04/11/2024	20155	Ernst, Sarah	reimburse cell phone	1	04/10/2024	50.00	105065
Total 3313:						50.00	
04/11/2024	20156	Global Software	rms training	1	12/31/2023	2,000.00	105424
Total 3321:						2,000.00	
04/03/2024	20139	Park County Government	monthly internet	1	04/01/2024	105.00	517226
04/03/2024	20139		monthly internet	2	04/01/2024	52.50	105065
04/03/2024	20139		monthly internet	3	04/01/2024	52.50	105455
Total 3381:						210.00	
04/11/2024	20151	Axon Enterprises, Inc.	taser	1	04/01/2024	918.00	105450
Total 3404:						918.00	
04/03/2024	20145	Warm Springs Consulting	contract watersystem overs	1	04/01/2024	4,500.00	517417
04/03/2024	20145		contract wastewater operat	1	04/01/2024	5,000.00	517627
Total 3463:						9,500.00	
04/03/2024	20140	Phoenix Technology Group	admin IT	1	04/01/2024	663.20	105060
04/03/2024	20140		pd IT	2	04/01/2024	663.20	105465
04/03/2024	20140		pw IT	3	04/01/2024	663.20	105645
04/03/2024	20140		utilities IT	4	04/01/2024	663.20	517206
Total 3580:						2,652.80	
04/11/2024	20166	Sciacca, Janell	PD tahoe title reimb	1	04/10/2024	26.06	105420
Total 3583:						26.06	
04/11/2024	20170	Wilson Williams LLP	General Counsel- mar 24	1	03/31/2024	1,650.00	105057
Total 3586:						1,650.00	
04/11/2024	20161	Kleinschmidt, Sean	cdl training meal per diem	1	04/10/2024	181.00	105635
Total 3590:						181.00	
04/03/2024	20143	Utility Associates, Inc.	annual body cam fee	1	03/06/2024	11,610.00	105450
Total 3604:						11,610.00	
04/11/2024	20157	Hardesty Engineering and	on call eng fees mar 24	1	03/30/2024	1,276.07	517432
04/11/2024	20157		gallery project construction	1	03/30/2024	4,207.60	517430
Total 3618:						5,483.67	

Check Issue Date	Check Number	Name	Description	Seq	Invoice Date	Check Amount	GL Account
04/03/2024	20137	Konica Minolta Premier Fin	copier	1	03/23/2024	101.13	105166
04/03/2024	20137		copier	2	03/23/2024	101.14	105130
Total 3700:						202.27	
04/11/2024	20160	JOC Construction	501 main pay app #2	1	04/02/2024	55,614.44	105196
Total 3758:						55,614.44	
04/11/2024	20153	Central Mountain Pest Con	pest control PW office	1	04/03/2024	100.00	517260
Total 3769:						100.00	
04/11/2024	20158	Hotel Colorado	CCCMA conf lodging exp-s	1	04/10/2024	310.00	105015
Total 3771:						310.00	
04/11/2024	20172	AT&T MOBILITY	pd phones	1	04/11/2024	1,879.14	105455
04/11/2024	20172		admin phones	2	04/11/2024	626.38	105065
04/11/2024	20172		UT phones	3	04/11/2024	313.19	517226
04/11/2024	20172		pw phones	4	04/11/2024	313.19	105645
Total 3786:						3,131.90	
04/11/2024	20169	Velocity Constructors Inc.	pay app #4 gallery project	1	03/31/2024	60,740.00	517430
Total 3788:						60,740.00	
04/11/2024	20159	Iron Mountain	records storage fee	1	03/31/2024	189.00	105070
Total 3789:						189.00	
04/03/2024	20138	OCCUPATIONAL HEALTH	physical exam	1	12/14/2023	209.00	105480
Total 3814:						209.00	
04/11/2024	20168	Town of Julesburg	CML lodging- sciacca	1	04/10/2024	765.15	105015
Total 3815:						765.15	
04/11/2024	20152	BAILEY PROPANE	recruiting expense	1	04/10/2024	308.79	105480
Total 3816:						308.79	
04/11/2024	20148	SKAGGS COMPANIES, IN	uniforms	1	03/21/2024	78.99	105410
04/11/2024	20148		uniforms	1	04/04/2024	398.92	105410
Total 3817:						477.91	
04/11/2024	20149	ARTISTIC CUSTOM BAD	new badges	1	04/02/2024	141.00	105480
Total 3818:						141.00	
Grand Totals:						237,345.01	

Check Issue Date	Check Number	Name	Description	Seq	Invoice Date	Check Amount	GL Account
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Report Criteria:
Detail report type printed

TOWN OF FAIRPLAY
 COMBINED CASH INVESTMENT
 APRIL 30, 2024

COMBINED CASH ACCOUNTS

01-1030	TBK BANK - DISBURSEMENT ACCT	(	257,835.97)
01-1031	TBK BANK- DISBURSE ACCT-SHADOW		300,000.00
01-1040	TBK BANK - DEPOSIT ACCT		243,490.02
01-1041	TBK BANK- DEPOSIT ACCT-SHADOW		85,866.60
01-1050	XBP - DEPOSIT ACCT		31,282.22
01-1060	TBK BANK - SQUARE CC ACCT		11,412.08
			<hr/>
	TOTAL COMBINED CASH		414,214.95
01-0100	CASH ALLOCATED TO OTHER FUNDS	(	414,214.95)
			<hr/>
	TOTAL UNALLOCATED CASH		.00
			<hr/> <hr/>

CASH ALLOCATION RECONCILIATION

10	ALLOCATION TO GENERAL FUND	(	6,926.18)
20	ALLOCATION TO CONSERVATION TRUST FUND		29,711.88
32	ALLOCATION TO INTERNAL SERVICE FUND		173,476.69
51	ALLOCATION TO FAIRPLAY UTILITY ENTERPRISE		217,952.56
			<hr/>
	TOTAL ALLOCATIONS TO OTHER FUNDS		414,214.95
	ALLOCATION FROM COMBINED CASH FUND - 01-0100	(	414,214.95)
			<hr/>
	ZERO PROOF IF ALLOCATIONS BALANCE		.00
			<hr/> <hr/>

TOWN OF FAIRPLAY
BALANCE SHEET
APRIL 30, 2024

GENERAL FUND

ASSETS

10-0100	CASH IN COMBINED CASH FUND	(	6,926.18)	
10-1002	PETTY CASH	(	200.00)	
10-1003	#1640-5 COLOTRUST		3,470,244.71	
10-1004	CASH DRAWER		50.00	
10-1005	TBK BANK - ST CUT BOND ACCT		39,276.89	
10-1330	PROPERTY TAX RECEIVABLE		236,805.00	
10-1350	SALES TAX RECEIVABLE		238,600.30	
10-1351	SALES TAX RECEIVABLE - STREETS		79,533.43	
10-1380	OTHER RECEIVABLES		5,908.68	
10-1390	PRE PAID EXPENSES		16,755.83	
	TOTAL ASSETS			4,080,048.66

LIABILITIES AND EQUITY

LIABILITIES

10-2000	ACCOUNTS PAYABLE		10,925.11	
10-2010	ACCRUED SALARIES PAYABLE		10,728.64	
10-2020	DEFERRED PROPERTY TAX COLLECTD		236,805.00	
10-2120	ESCROW FUNDS STREET CUT BOND		3,000.00	
10-2200	FEDERAL WITHHOLDING PAYABLE		4,785.73	
10-2210	FICA PAYABLE		4,141.40	
10-2220	STATE WITHHOLDING PAYABLE		1,591.61	
10-2240	EMPLOYEE HEALTH INS PAYABLE		20,750.66	
10-2255	401A/457 PAYABLE		4,067.48	
10-2260	POLICE PENSION PAYABLE		7,029.13	
10-2265	OTHER WITHHOLDINGS	(	283.39)	
10-2270	ACCRUED UNEMPLOYMENT PAYABLE		318.40	
10-2290	CEMETARY DEPOSIT		600.00	
10-2295	UNEARNED FEES		15,940.00	
10-2310	DEFERRED GRANTS		214,112.26	
	TOTAL LIABILITIES			534,512.03

FUND EQUITY

	UNAPPROPRIATED FUND BALANCE:			
10-3100	FUND BALANCE-BEGINNING OF YEAR		4,003,181.79	
	REVENUE OVER EXPENDITURES - YTD	(	457,645.16)	
	BALANCE - CURRENT DATE		3,545,536.63	
	TOTAL FUND EQUITY			3,545,536.63
	TOTAL LIABILITIES AND EQUITY			4,080,048.66

TOWN OF FAIRPLAY
REVENUES WITH COMPARISON TO BUDGET
FOR THE 4 MONTHS ENDING APRIL 30, 2024

GENERAL FUND

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEARNED	PCNT
<u>TAXES</u>					
10-40-05 AD VALOREM TAX	88,490.70	88,490.70	235,000.00	146,509.30	37.7
10-40-10 SPEC. OWNERSHIP TAX	2,521.06	6,577.91	27,000.00	20,422.09	24.4
10-40-30 INTEREST ON PROPERTY TAX	.00	.00	600.00	600.00	.0
10-40-55 50% SHAREBACK OF R&B LEVY	1,807.18	1,897.28	9,000.00	7,102.72	21.1
10-40-60 MOTOR VEHICLE REGISTRATION	223.56	744.73	4,000.00	3,255.27	18.6
10-40-70 SALES TAX	112,533.60	353,799.26	1,500,000.00	1,146,200.74	23.6
10-40-75 SALES TAX - STREETS	37,511.20	117,933.09	500,000.00	382,066.91	23.6
10-40-80 HIGHWAY USER'S TAX	3,535.35	9,847.10	37,500.00	27,652.90	26.3
10-40-85 SEVERANCE TAX	.00	.00	500.00	500.00	.0
10-40-86 MINERAL LEASE REVENUE	.00	.00	500.00	500.00	.0
10-40-90 CIGARETTE TAX	248.71	831.47	2,500.00	1,668.53	33.3
10-40-96 LODGING TAX	6,302.00	11,308.00	60,000.00	48,692.00	18.9
TOTAL TAXES	253,173.36	591,429.54	2,376,600.00	1,785,170.46	24.9
<u>LICENSES</u>					
10-41-10 LIQUOR LICENSES	350.00	797.50	4,000.00	3,202.50	19.9
10-41-30 DOG LICENSES	15.00	45.00	200.00	155.00	22.5
10-41-32 LIVESTOCK PERMIT	.00	.00	50.00	50.00	.0
10-41-34 COMMERCIAL FISHING PERMIT	150.00	300.00	750.00	450.00	40.0
10-41-39 PLAN REVIEW FEES	.00	.00	10,500.00	10,500.00	.0
10-41-40 BUILDING PERMITS	1,659.17	1,659.17	30,000.00	28,340.83	5.5
10-41-41 SURCHARGE: STREETS	92.18	92.18	1,500.00	1,407.82	6.2
10-41-42 SURCHARGE: PARKS & REC	92.18	92.18	1,500.00	1,407.82	6.2
10-41-45 EZ BUILDING PERMIT	.00	.00	500.00	500.00	.0
10-41-50 FRANCHISE TAX	3,710.07	27,452.49	70,000.00	42,547.51	39.2
10-41-60 GOLD PANNING PERMITS/DONATION	30.00	1,615.00	6,000.00	4,385.00	26.9
10-41-70 BUSINESS LICENSES	600.00	4,950.00	6,000.00	1,050.00	82.5
10-41-74 SHORT TERM RENTAL PERMITS	300.00	1,500.00	6,000.00	4,500.00	25.0
10-41-97 SPECIAL EVENTS PERMIT	.00	.00	1,500.00	1,500.00	.0
TOTAL LICENSES	6,998.60	38,503.52	138,500.00	99,996.48	27.8
<u>FEE INCOME</u>					
10-42-75 PLANNING & DEVELOPMENT FEES	2,750.00	2,760.00	3,000.00	240.00	92.0
10-42-80 PLASTIC BAG FEES	.00	1,715.88	6,000.00	4,284.12	28.6
10-42-90 COPIES & FAXES	.00	.00	75.00	75.00	.0
TOTAL FEE INCOME	2,750.00	4,475.88	9,075.00	4,599.12	49.3
<u>SOURCE 43</u>					
10-43-10 GRANT REVENUE	.00	.00	100,120.00	100,120.00	.0
TOTAL SOURCE 43	.00	.00	100,120.00	100,120.00	.0

TOWN OF FAIRPLAY
 REVENUES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

GENERAL FUND

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEARNED	PCNT
<u>LAW ENFORCEMENT</u>					
10-45-05 TRAFFIC FINES	2,241.00	3,051.00	9,000.00	5,949.00	33.9
10-45-10 SURCHARGE: POLICE TRAINING	303.00	423.00	1,500.00	1,077.00	28.2
10-45-15 COURT COSTS	.00	.00	400.00	400.00	.0
10-45-30 OTHER FINES	.00	.00	400.00	400.00	.0
10-45-80 VIN INSPECTIONS	25.00	35.00	.00	(35.00)	.0
10-45-90 MISCELLANEOUS	41.49	51.49	1,000.00	948.51	5.2
TOTAL LAW ENFORCEMENT	2,610.49	3,560.49	12,300.00	8,739.51	29.0
<u>INTEREST INCOME</u>					
10-46-05 INTEREST ON COLOTRUST	15,368.62	44,920.38	140,000.00	95,079.62	32.1
10-46-30 INTEREST ON CHECKING	23.34	74.06	350.00	275.94	21.2
TOTAL INTEREST INCOME	15,391.96	44,994.44	140,350.00	95,355.56	32.1
<u>MISCELLANEOUS INCOME</u>					
10-47-00 MISCELLANEOUS INCOME	.00	.00	10,000.00	10,000.00	.0
10-47-10 CEMETERY	.00	600.00	300.00	(300.00)	200.0
10-47-38 TOWN CLEAN UP DONATIONS	.00	.00	500.00	500.00	.0
10-47-39 FOURTH OF JULY	.00	833.32	7,000.00	6,166.68	11.9
10-47-49 STREET LIGHTING	1,008.37	1,008.37	10,800.00	9,791.63	9.3
10-47-50 SUMMER CONCERT SERIES	2,500.00	5,050.00	15,000.00	9,950.00	33.7
10-47-52 REAL COLORADO CHRISTMAS	.00	.00	500.00	500.00	.0
10-47-56 BURRO DAYS	2,080.00	5,726.68	70,000.00	64,273.32	8.2
10-47-59 RETAIL SALES	11.00	38.00	2,000.00	1,962.00	1.9
10-47-62 501 MAIN - RENT & UTILITY	.00	(969.99)	1,500.00	2,469.99	(64.7)
10-47-65 MARDI GRAS	.00	13,899.96	15,000.00	1,100.04	92.7
10-47-75 COMMERCIAL FISHING FEES	60.58	60.58	6,000.00	5,939.42	1.0
10-47-82 CAMPING PERMITS/FACILITY USE	.00	10.00	700.00	690.00	1.4
10-47-88 GRANT - RIVER PARK	.00	.00	750,000.00	750,000.00	.0
10-47-90 MISCELLANEOUS REVENUE-EVENTS	(2,054.11)	.00	.00	.00	.0
10-47-91 TOWN HALL - 901 MAIN	.00	.00	12,397.00	12,397.00	.0
TOTAL MISCELLANEOUS INCOME	3,605.84	26,256.92	901,697.00	875,440.08	2.9
TOTAL FUND REVENUE	284,530.25	709,220.79	3,678,642.00	2,969,421.21	19.3

TOWN OF FAIRPLAY
 EXPENDITURES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

GENERAL FUND

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEXPENDED	PCNT
<u>ADMINISTRATION</u>					
10-50-02 401(A) EMPLOYER MATCH	733.60	4,352.51	9,858.00	5,505.49	44.2
10-50-05 SALARIES -ADMIN./CLERK/TREASUR	31,320.59	90,690.67	328,600.00	237,909.33	27.6
10-50-10 EMPLOYEE HEALTH AND WELLNESS	261.45	737.16	7,000.00	6,262.84	10.5
10-50-11 SS/MEDICARE EXPENSE	2,065.38	5,891.52	25,468.00	19,576.48	23.1
10-50-12 UNEMPLOYMENT EXPENSE	54.01	154.97	666.00	511.03	23.3
10-50-13 EMPLOYEE HEALTH INSURANCE	4,895.37	13,549.60	57,804.00	44,254.40	23.4
10-50-14 WORKER'S COMPENSATION	.00	593.71	789.00	195.29	75.3
10-50-15 EDUCATION	1,252.60	2,422.60	10,000.00	7,577.40	24.2
10-50-16 ADMIN VEHICLE	(4,115.39)	.00	6,000.00	6,000.00	.0
10-50-23 TOWN HALL EXPENSE - UTILITIES	1,105.21	2,449.58	8,000.00	5,550.42	30.6
10-50-25 TOWN HALL EXP - REPAIR & MAINT	.00	907.12	25,000.00	24,092.88	3.6
10-50-27 TOWN HALL EXPENSE - SUPPLIES	202.37	336.60	1,000.00	663.40	33.7
10-50-30 OFFICE SUPPLIES	(743.26)	336.81	4,000.00	3,663.19	8.4
10-50-32 EQUIPMENT RENTAL	318.71	977.39	7,100.00	6,122.61	13.8
10-50-35 POSTAGE EXPENSE	9.41	326.15	500.00	173.85	65.2
10-50-40 BANK/CREDIT CARD FEES	363.73	1,248.88	5,500.00	4,251.12	22.7
10-50-50 ELECTION EXPENSE	22.70	83.58	3,000.00	2,916.42	2.8
10-50-55 BOARD OF TRUSTEE SALARY	75.00	420.01	4,320.00	3,899.99	9.7
10-50-57 TOWN ATTY LEGAL SERVICES	2,005.50	6,327.30	30,000.00	23,672.70	21.1
10-50-58 BUILDING OFFICAL CONTRACT	4,700.71	4,753.21	26,000.00	21,246.79	18.3
10-50-60 COMPUTER/SOFTWARE/SUPPORT	4,605.62	9,245.94	40,000.00	30,754.06	23.1
10-50-65 TELEPHONE/INTERNET	831.38	1,637.56	12,000.00	10,362.44	13.7
10-50-70 MISCELLANEOUS EXPENSE	2,241.20	12,955.21	20,000.00	7,044.79	64.8
10-50-75 CODIFICATION	.00	1,157.10	20,000.00	18,842.90	5.8
10-50-76 ESTIP AGREEMENT	6,269.88	6,269.88	20,000.00	13,730.12	31.4
TOTAL ADMINISTRATION	58,475.77	167,825.06	672,605.00	504,779.94	25.0

TOWN OF FAIRPLAY
 EXPENDITURES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

GENERAL FUND

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEXPENDED	PCNT
<u>COMMUNITY DEVELOPMENT</u>					
10-51-05 PROFESSIONAL FEES	14,901.67	17,445.98	80,000.00	62,554.02	21.8
10-51-07 PROFESSIONAL FEES-BILL BACK	8,920.75	10,787.75	.00	(10,787.75)	.0
10-51-10 EDUCATION/BENEVOLENCE (BOT)	3,000.00	10,052.39	15,000.00	4,947.61	67.0
10-51-20 VISITOR CENTER	411.80	1,431.40	5,000.00	3,568.60	28.6
10-51-30 ADVERTISING AND MARKETING	2,711.85	3,339.87	15,000.00	11,660.13	22.3
10-51-34 TOWN BEAUTIFICATION	.00	8,468.18	15,000.00	6,531.82	56.5
10-51-35 TOWN CLEAN UP	.00	.00	15,000.00	15,000.00	.0
10-51-40 DUES AND MEMBERSHIPS	.00	822.00	5,000.00	4,178.00	16.4
10-51-45 WORKFORCE HOUSING	.00	.00	100,000.00	100,000.00	.0
10-51-50 TGIFAIRPLAY EXPENSE	1,500.00	1,750.00	25,000.00	23,250.00	7.0
10-51-62 BURRO DAYS	21,000.00	21,258.25	100,000.00	78,741.75	21.3
10-51-66 MARDI GRAS	856.08	14,502.00	15,000.00	498.00	96.7
10-51-70 MISCELLANEOUS EVENTS	.00	.00	5,000.00	5,000.00	.0
10-51-71 FIREWORKS/4TH OF JULY	20,500.00	20,500.00	35,000.00	14,500.00	58.6
10-51-74 REAL COLORADO CHRISTMAS	.00	1,242.37	3,000.00	1,757.63	41.4
10-51-75 DONATIONS	.00	1,000.00	10,000.00	9,000.00	10.0
10-51-76 EMERGENCY SUPPLIES	.00	.00	3,000.00	3,000.00	.0
10-51-80 FAIRPLAY FORWARD	.00	.00	10,000.00	10,000.00	.0
10-51-85 PROPERTY IMPROVEMENT INCENTIV	.00	.00	20,000.00	20,000.00	.0
10-51-95 501 MAIN STREET	1,561.19	3,543.41	25,000.00	21,456.59	14.2
10-51-96 501 MAIN STREET REMODEL	202,792.33	246,846.56	400,000.00	153,153.44	61.7
TOTAL COMMUNITY DEVELOPMENT	278,155.67	362,990.16	901,000.00	538,009.84	40.3
<u>TRANSIT</u>					
10-52-05 SALARIES	68.46	.00	60,000.00	60,000.00	.0
10-52-11 SS/MEDICARE EXPENSE	.00	.00	5,000.00	5,000.00	.0
10-52-12 UNEMPLOYMENT EXPENSE	.00	.00	120.00	120.00	.0
10-52-14 WORKERS COMPENSATION	.00	.00	1,000.00	1,000.00	.0
10-52-15 DRIVER TRAINING/PHYSICALS	.00	.00	2,000.00	2,000.00	.0
10-52-30 OFFICE SUPPLIES	.00	.00	1,000.00	1,000.00	.0
10-52-35 INSURANCE	.00	.00	5,000.00	5,000.00	.0
10-52-40 OPERATING SUPPLIES	.00	.00	1,000.00	1,000.00	.0
10-52-45 MISCELLANEOUS	.00	.00	2,500.00	2,500.00	.0
10-52-50 TELEPHONE	.00	17.30	1,000.00	982.70	1.7
10-52-55 UTILITIES	.00	.00	1,500.00	1,500.00	.0
10-52-60 VEHICLE MAINTENANCE	.00	.00	10,000.00	10,000.00	.0
10-52-70 FUEL	.00	.00	10,000.00	10,000.00	.0
10-52-75 SUMMIT STAGE FUNDING	.00	.00	18,000.00	18,000.00	.0
TOTAL TRANSIT	68.46	17.30	118,120.00	118,102.70	.0

TOWN OF FAIRPLAY
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 4 MONTHS ENDING APRIL 30, 2024

GENERAL FUND

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEXPENDED	PCNT
<u>JUDICIAL SYSTEM</u>					
10-53-02 401(A) EMPLOYER MATCH	12.00	39.30	156.00	116.70	25.2
10-53-05 MUNICIPAL JUDGE SALARY	846.16	2,466.12	9,500.00	7,033.88	26.0
10-53-10 COURT CLERK	400.00	1,310.01	5,200.00	3,889.99	25.2
10-53-11 SS/MEDICARE EXPENSE	95.32	288.87	1,125.00	836.13	25.7
10-53-12 UNEMPLOYMENT EXPENSE	2.50	7.57	29.00	21.43	26.1
10-53-13 EMPLOYEE HEALTH INSURANCE	96.05	288.79	1,145.00	856.21	25.2
10-53-14 WORKER'S COMPENSATION	.00	197.91	37.00	(160.91)	534.9
10-53-20 COURT ATTORNEY	.00	.00	500.00	500.00	.0
10-53-30 EDUCATION	.00	.00	500.00	500.00	.0
10-53-40 OPERATING EXPENSE	.00	.00	250.00	250.00	.0
10-53-50 DUES AND MEMBERSHIPS	.00	137.38	50.00	(87.38)	274.8
TOTAL JUDICIAL SYSTEM	1,452.03	4,735.95	18,492.00	13,756.05	25.6
<u>PUBLIC SAFETY</u>					
10-54-01 POLICE SALARIES	55,866.27	155,389.59	622,098.00	466,708.41	25.0
10-54-04 PART TIME OFFICERS	1,680.00	3,705.00	15,000.00	11,295.00	24.7
10-54-05 PENSION CONTRIBUTION	7,282.46	18,183.38	84,605.00	66,421.62	21.5
10-54-10 UNIFORMS AND ACCESSORIES	1,576.62	5,790.42	8,000.00	2,209.58	72.4
10-54-11 SS/MEDICARE EXPENSE	925.35	3,104.97	10,168.00	7,063.03	30.5
10-54-12 UNEMPLOYMENT EXPENSE	113.33	279.84	1,274.00	994.16	22.0
10-54-13 EMPLOYEE HEALTH INSURANCE	14,396.90	45,013.65	169,126.00	124,112.35	26.6
10-54-14 WORKER'S COMPENSATION	.00	10,291.04	23,000.00	12,708.96	44.7
10-54-15 FUEL	1,484.42	2,851.00	25,000.00	22,149.00	11.4
10-54-20 VEHICLE MAINTENANCE	6,469.46	6,818.63	15,000.00	8,181.37	45.5
10-54-24 PROFESSIONAL TRAINING EXPENSE	2,000.00	4,000.00	5,000.00	1,000.00	80.0
10-54-26 IN-SERVICE TRAINING EXPENSE	.00	211.88	500.00	288.12	42.4
10-54-28 VEHICLE RENTAL PAYMENT	28,573.23	87,316.75	50,811.00	(36,505.75)	171.9
10-54-30 RADAR & RADIO MAINTENANCE	2,690.35	2,690.35	2,500.00	(190.35)	107.6
10-54-32 AMMUNITION	.00	.00	600.00	600.00	.0
10-54-45 OPERATING SUPPLIES	965.18	1,986.40	2,000.00	13.60	99.3
10-54-50 EQUIPMENT EXPENSE	33,208.13	34,334.93	30,000.00	(4,334.93)	114.5
10-54-55 TELEPHONE - POLICE LINE	2,201.98	2,996.26	10,000.00	7,003.74	30.0
10-54-60 MEMBERSHIPS - DUES	.00	.00	600.00	600.00	.0
10-54-65 COMPUTER/SOFTWARE/SUPPORT	2,022.90	40,760.70	55,000.00	14,239.30	74.1
10-54-75 INVESTIGATIVE SERVICES	.00	(129.81)	2,500.00	2,629.81	(5.2)
10-54-78 MISCELLANEOUS	9,770.00	13,770.00	30,000.00	16,230.00	45.9
10-54-80 OFFICER RECRUITING	4,052.61	14,480.04	15,000.00	519.96	96.5
10-54-87 LIABILITY INSURANCE	.00	18,499.86	15,857.00	(2,642.86)	116.7
10-54-97 PUBLIC RELATIONS	96.00	173.90	5,000.00	4,826.10	3.5
TOTAL PUBLIC SAFETY	175,375.19	472,518.78	1,198,639.00	726,120.22	39.4

TOWN OF FAIRPLAY
EXPENDITURES WITH COMPARISON TO BUDGET
FOR THE 4 MONTHS ENDING APRIL 30, 2024

GENERAL FUND

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEXPENDED	PCNT
<u>PUBLIC WORKS</u>					
10-56-01 SALARIES	10,717.95	41,813.78	195,175.00	153,361.22	21.4
10-56-02 401(A) EMPLOYER MATCH	313.63	1,085.75	5,855.00	4,769.25	18.5
10-56-10 SEASONAL WAGES	.00	.00	45,000.00	45,000.00	.0
10-56-11 SS/MEDICARE EXPENSE	799.78	2,497.24	16,078.00	13,580.76	15.5
10-56-12 UNEMPLOYMENT EXPENSE	20.93	61.74	420.00	358.26	14.7
10-56-13 EMPLOYEE HEALTH INSURANCE	3,657.52	9,235.99	64,680.00	55,444.01	14.3
10-56-14 WORKER'S COMPENSATION	.00	5,937.14	6,248.00	310.86	95.0
10-56-15 FUEL	768.35	2,134.93	7,000.00	4,865.07	30.5
10-56-20 AUTO PARTS	204.39	204.39	.00	(204.39)	.0
10-56-25 REPAIRS & MAINT - EQUIPMENT	3,964.85	5,711.78	15,000.00	9,288.22	38.1
10-56-30 TOOLS, MAT'LS, & SUPPLIES	654.70	894.50	5,000.00	4,105.50	17.9
10-56-35 EDUCATION & TRAINING	4,293.69	4,468.69	2,000.00	(2,468.69)	223.4
10-56-40 ELECTRIC STREET LIGHTS & SIGNS	1,201.25	4,361.71	13,000.00	8,638.29	33.6
10-56-45 TELEPHONE/COMPUTER	2,336.09	4,255.72	8,000.00	3,744.28	53.2
10-56-50 MAINTENANCE BUILDING - UTILITY	3,072.78	6,125.32	11,000.00	4,874.68	55.7
10-56-55 MAPPING	.00	728.25	10,000.00	9,271.75	7.3
10-56-60 VEHICLE RENTAL PAYMENT	5,302.18	15,906.54	62,885.00	46,978.46	25.3
10-56-70 STREET REPAIRS	1,685.15	8,203.26	300,000.00	291,796.74	2.7
10-56-80 UNIFORMS AND SAFETY EQUIPMENT	119.96	482.22	2,000.00	1,517.78	24.1
10-56-82 TOWN SHOP BUILDING REPAIRS	1,356.68	1,747.18	2,000.00	252.82	87.4
10-56-90 EQUIPMENT	.00	.00	50,000.00	50,000.00	.0
TOTAL PUBLIC WORKS	40,469.88	115,856.13	821,341.00	705,484.87	14.1
<u>PARKS & RECREATION</u>					
10-58-30 TOOLS, MATERIALS, & SUPPLIES	237.77	237.77	7,500.00	7,262.23	3.2
10-58-41 PARKS UTILITIES	142.31	215.61	500.00	284.39	43.1
10-58-42 VAULT RESTROOMS MAINTENANCE	215.80	863.20	7,000.00	6,136.80	12.3
10-58-50 CEMETERY EXPENSE	388.32	388.32	1,000.00	611.68	38.8
10-58-83 COHEN PARK PROJECT	.00	.00	40,000.00	40,000.00	.0
10-58-86 FAIRPLAY RIVER PARK	.00	.00	1,000,000.00	1,000,000.00	.0
10-58-87 BURRO PARK	90.00	90.00	10,000.00	9,910.00	.9
TOTAL PARKS & RECREATION	1,074.20	1,794.90	1,066,000.00	1,064,205.10	.2
<u>NON-DEPARTMENTAL EXPENDITURE</u>					
10-61-15 LIABILITY INSURANCE	.00	22,315.46	22,096.00	(219.46)	101.0
10-61-17 AUDIT FEES	3,850.00	3,850.00	4,775.00	925.00	80.6
10-61-23 TREASURER'S FEES - MILL LEVY	1,769.81	1,769.81	6,000.00	4,230.19	29.5
10-61-25 PUBLISHING EXPENSE	58.82	168.72	1,800.00	1,631.28	9.4
10-61-30 DUES & MEMBERSHIPS	.00	13,023.68	6,000.00	(7,023.68)	217.1
10-61-60 ABATEMENT	.00	.00	2,000.00	2,000.00	.0
TOTAL NON-DEPARTMENTAL EXPEND	5,678.63	41,127.67	42,671.00	1,543.33	96.4

TOWN OF FAIRPLAY
 EXPENDITURES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

GENERAL FUND

	<u>PERIOD ACTUAL</u>	<u>YTD ACTUAL</u>	<u>BUDGET</u>	<u>UNEXPENDED</u>	<u>PCNT</u>
TOTAL FUND EXPENDITURES	560,749.83	1,166,865.95	4,838,868.00	3,672,002.05	24.1
NET REVENUE OVER EXPENDITURES	<u>(276,219.58)</u>	<u>(457,645.16)</u>	<u>(1,160,226.00)</u>	<u>(702,580.84)</u>	<u>(39.4)</u>

TOWN OF FAIRPLAY
 BALANCE SHEET
 APRIL 30, 2024

CONSERVATION TRUST FUND

<u>ASSETS</u>			
20-0100	CASH IN COMBINED CASH FUND		29,711.88
20-1003	CSAFE SAVINGS		1,945.66
			<hr/>
	TOTAL ASSETS		31,657.54
			<hr/> <hr/>
 <u>LIABILITIES AND EQUITY</u>			
 <u>FUND EQUITY</u>			
UNAPPROPRIATED FUND BALANCE:			
20-3100	FUND BALANCE-BEGINNING OF YEAR	31,430.62	
	REVENUE OVER EXPENDITURES - YTD	226.92	
		<hr/>	
	BALANCE - CURRENT DATE		31,657.54
			<hr/>
	TOTAL FUND EQUITY		31,657.54
			<hr/>
	TOTAL LIABILITIES AND EQUITY		31,657.54
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TOWN OF FAIRPLAY
 REVENUES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

CONSERVATION TRUST FUND

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEARNED	PCNT
<u>INTERGOVERNMENTAL REVENUES</u>					
20-44-10 COLORADO LOTTERY FUNDS	1,278.53	1,278.53	4,500.00	3,221.47	28.4
TOTAL INTERGOVERNMENTAL REVE	1,278.53	1,278.53	4,500.00	3,221.47	28.4
<u>INTEREST INCOME</u>					
20-46-50 INTEREST INCOME SAVINGS	.00	.00	50.00	50.00	.0
20-46-60 CSAFE INTEREST INCOME	8.99	26.39	.00	(26.39)	.0
TOTAL INTEREST INCOME	8.99	26.39	50.00	23.61	52.8
TOTAL FUND REVENUE	1,287.52	1,304.92	4,550.00	3,245.08	28.7

TOWN OF FAIRPLAY
 EXPENDITURES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

CONSERVATION TRUST FUND

	<u>PERIOD ACTUAL</u>	<u>YTD ACTUAL</u>	<u>BUDGET</u>	<u>UNEXPENDED</u>	<u>PCNT</u>
<u>OPERATION EXPENSE</u>					
20-73-75 BURRO PARK	1,078.00	1,078.00	.00	(1,078.00)	.0
TOTAL OPERATION EXPENSE	1,078.00	1,078.00	.00	(1,078.00)	.0
TOTAL FUND EXPENDITURES	1,078.00	1,078.00	.00	(1,078.00)	.0
NET REVENUE OVER EXPENDITURES	209.52	226.92	4,550.00	4,323.08	5.0

TOWN OF FAIRPLAY
 BALANCE SHEET
 APRIL 30, 2024

INTERNAL SERVICE FUND

ASSETS

32-0100	CASH ALLOCATED TO OTHER FUNDS	173,476.69	
32-1630	EQUIPMENT	521,081.93	
32-1631	ACCUMULATED DEPRECIATION	(120,127.76)	
	TOTAL ASSETS		<u>574,430.86</u>

LIABILITIES AND EQUITY

FUND EQUITY

UNAPPROPRIATED FUND BALANCE:			
32-3100	FUND BALANCE-BEGINNING OF YEAR	543,316.54	
	REVENUE OVER EXPENDITURES - YTD	<u>31,114.32</u>	
	BALANCE - CURRENT DATE	<u>574,430.86</u>	
	TOTAL FUND EQUITY		<u>574,430.86</u>
	TOTAL LIABILITIES AND EQUITY		<u>574,430.86</u>

TOWN OF FAIRPLAY
 REVENUES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

INTERNAL SERVICE FUND

	<u>PERIOD ACTUAL</u>	<u>YTD ACTUAL</u>	<u>BUDGET</u>	<u>UNEARNED</u>	<u>PCNT</u>
<u>REVENUE</u>					
32-47-20 DEPT RENTAL PAYMENTS	10,371.44	31,114.32	136,145.00	105,030.68	22.9
32-47-30 SALE OF VEHICLE/EQUIPMENT	.00	.00	6,000.00	6,000.00	.0
TOTAL REVENUE	<u>10,371.44</u>	<u>31,114.32</u>	<u>142,145.00</u>	<u>111,030.68</u>	<u>21.9</u>
TOTAL FUND REVENUE	<u>10,371.44</u>	<u>31,114.32</u>	<u>142,145.00</u>	<u>111,030.68</u>	<u>21.9</u>

TOWN OF FAIRPLAY
 EXPENDITURES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

INTERNAL SERVICE FUND

	<u>PERIOD ACTUAL</u>	<u>YTD ACTUAL</u>	<u>BUDGET</u>	<u>UNEXPENDED</u>	<u>PCNT</u>
<u>EXPENDITURES</u>					
32-58-10 POLICE VEHICLES	.00	.00	225,000.00	225,000.00	.0
TOTAL EXPENDITURES	.00	.00	225,000.00	225,000.00	.0
TOTAL FUND EXPENDITURES	.00	.00	225,000.00	225,000.00	.0
NET REVENUE OVER EXPENDITURES	10,371.44	31,114.32	(82,855.00)	(113,969.32)	37.6

TOWN OF FAIRPLAY
 BALANCE SHEET
 APRIL 30, 2024

FAIRPLAY UTILITY ENTERPRISE

ASSETS

51-0100	CASH IN COMBINED CASH FUND		217,952.56
51-1003	COLOTRUST - SAVINGS ACCT		1,419,244.69
51-1004	ZIONS BANK - LOAN RESERVE		350,020.66
51-1005	CSAFE - SAVINGS ACCT		26,873.28
51-1017	UTILITY CASH CLEARING ACCOUNT	(	253,315.34)
51-1310	ACCTS REC - UTILITY BILLINGS		76,893.73
51-1605	LAND		75,739.60
51-1610	TRANSMISSION LINES		2,307,114.20
51-1615	WATER TREATMENT PLANT		1,022,484.42
51-1620	MACHINERY & EQUIPMENT		137,108.59
51-1621	DEPRECIATION-MACH & EQUIP	(	3,361,031.35)
51-1630	GALLERY SYSTEM		604,408.52
51-1635	FIRE HYDRANTS		58,877.68
51-1640	BUILDINGS AND STRUCTURES		141,449.60
51-1645	COMPUTER SOFTWARE		157,966.64
51-1650	DITCH/DRAINAGE IMPROVEMENTS		52,821.84
51-1655	CONSTRUCTION IN PROGRESS		138,122.64
51-1805	LAND & LAND RIGHTS		62,372.98
51-1810	LINE IMPROVEMENTS		1,055,518.20
51-1815	TREATMENT PLANT		3,646,973.43
51-1830	BUILDINGS & IMPROVEMENTS		112,188.95
51-1840	EQUIPMENT		248,514.86
			<hr/>
	TOTAL ASSETS		8,298,300.38
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LIABILITIES AND EQUITY

LIABILITIES

51-2001	ACCRUED SALARIES PAYABLE		2,925.04
51-2200	ACCRUED INTEREST PAYABLE		3,807.28
51-2300	ACCRUED COMPENSATED ABSENCES		10,315.51
51-2800	BOND PAYABLE		2,681,600.00
51-2999	CONTRIBUTION FROM FSD		2,735,766.27
			<hr/>
	TOTAL LIABILITIES		5,434,414.10

FUND EQUITY

UNAPPROPRIATED FUND BALANCE:			
51-3100	RETAINED EARNINGS	3,183,399.92	
	REVENUE OVER EXPENDITURES - YTD	(	319,513.64)
			<hr/>
	BALANCE - CURRENT DATE		2,863,886.28
			<hr/>
	TOTAL FUND EQUITY		2,863,886.28
			<hr/> <hr/>
	TOTAL LIABILITIES AND EQUITY		8,298,300.38
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TOWN OF FAIRPLAY
REVENUES WITH COMPARISON TO BUDGET
FOR THE 4 MONTHS ENDING APRIL 30, 2024

FAIRPLAY UTILITY ENTERPRISE

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEARNED	PCNT
<u>WATER REVENUE</u>					
51-42-05 POTABLE WATER	31,509.30	31,634.70	400,000.00	368,365.30	7.9
51-42-20 LIEN REVENUE	380.34	380.34	4,000.00	3,619.66	9.5
51-42-32 WATER FACILITY MAINTENANCE FEE	.00	.00	487.00	487.00	.0
51-42-34 WATER METERS, PRV, PARTS	.00	5,485.08	1,000.00	(4,485.08)	548.5
51-42-36 PENALTY NON-COMPLIANCE	40.00	40.00	440.00	400.00	9.1
51-42-40 PLANT INVESTMENT FEES	.00	112,800.00	133,000.00	20,200.00	84.8
51-42-60 OTHER WATER REVENUE	.00	(123,937.00)	445,000.00	568,937.00	(27.9)
TOTAL WATER REVENUE	31,929.64	26,403.12	983,927.00	957,523.88	2.7
<u>WASTEWATER REVENUE</u>					
51-46-05 WW USER FEES	57,100.20	57,100.20	692,402.00	635,301.80	8.3
51-46-20 LIEN REVENUE	365.43	365.43	.00	(365.43)	.0
51-46-30 LIEN REVENUE - INTEREST	.00	.00	100.00	100.00	.0
51-46-40 PLANT INVESTMENT FEES	.00	100,212.00	116,914.00	16,702.00	85.7
51-46-60 OTHER WASTEWATER REVENUE	.00	.00	100.00	100.00	.0
TOTAL WASTEWATER REVENUE	57,465.63	157,677.63	809,516.00	651,838.37	19.5
<u>INTEREST/FEE REVENUE</u>					
51-48-10 INTEREST ON INVESTMENTS	6,567.32	19,490.15	50,000.00	30,509.85	39.0
51-48-30 LATE FEES	.00	.00	8,000.00	8,000.00	.0
TOTAL INTEREST/FEE REVENUE	6,567.32	19,490.15	58,000.00	38,509.85	33.6
TOTAL FUND REVENUE	95,962.59	203,570.90	1,851,443.00	1,647,872.10	11.0

TOWN OF FAIRPLAY
 EXPENDITURES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

FAIRPLAY UTILITY ENTERPRISE

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEXPENDED	PCNT
<u>EMPLOYEE EXPENSES</u>					
51-70-01 SALARIES	12,378.64	42,287.00	132,525.00	90,238.00	31.9
51-70-02 401A EMPLOYER MATCH	436.94	1,123.18	3,976.00	2,852.82	28.3
51-70-10 EMPLOYEE HEALTH AND WELLNESS	185.26	232.30	3,000.00	2,767.70	7.7
51-70-11 SS/MEDICARE EXPENSE	929.12	2,957.75	10,358.00	7,400.25	28.6
51-70-12 UNEMPLOYMENT EXPENSE	24.26	66.81	271.00	204.19	24.7
51-70-13 EMPLOYMENT HEALTH INSURANCE	2,138.70	4,942.42	32,385.00	27,442.58	15.3
51-70-14 WORKER'S COMPENSATION	.00	2,770.67	2,148.00	(622.67)	129.0
51-70-15 BOARD OF TRUSTEE SALARIES	30.00	150.00	2,880.00	2,730.00	5.2
TOTAL EMPLOYEE EXPENSES	16,122.92	54,530.13	187,543.00	133,012.87	29.1
<u>OFFICE/GENERAL EXPENSE</u>					
51-72-02 BANK/CREDIT CARD FEES	547.99	1,402.72	5,000.00	3,597.28	28.1
51-72-06 COMPUTER/SOFTWARE/SUPPORT-O	4,038.73	6,948.69	20,000.00	13,051.31	34.7
51-72-10 MISCELLANEOUS	.00	.00	1,400.00	1,400.00	.0
51-72-14 OFFICE SUPPLIES	.00	41.76	2,500.00	2,458.24	1.7
51-72-18 POSTAGE EXPENSE	527.11	870.82	4,000.00	3,129.18	21.8
51-72-22 PUBLISHING EXPENSE	.00	.00	200.00	200.00	.0
51-72-26 TELEPHONE/INTERNET EXPENSE	523.19	1,002.86	4,000.00	2,997.14	25.1
51-72-30 TOWN HALL RENTAL PAYMENT	.00	.00	12,397.00	12,397.00	.0
51-72-34 UTILITIES-OFFICE	603.02	1,364.06	2,500.00	1,135.94	54.6
51-72-38 VEHICLE/EQUIP RENTAL TO ISF	1,935.00	5,805.00	22,449.00	16,644.00	25.9
51-72-42 VEHICLE MAINTENANCE/REPAIR	1,000.03	1,393.03	2,500.00	1,106.97	55.7
51-72-44 FUEL	768.35	2,134.94	9,000.00	6,865.06	23.7
51-72-45 UNIFORMS AND SAFETY EQUIPMENT	.00	.00	1,000.00	1,000.00	.0
51-72-60 REPAIR & MAINT - OFFICE BLDG	1,456.68	1,930.85	3,000.00	1,069.15	64.4
TOTAL OFFICE/GENERAL EXPENSE	11,400.10	22,894.73	89,946.00	67,051.27	25.5
<u>CONTRACTUAL FEES</u>					
51-73-20 AUDITOR FEES	3,850.00	3,850.00	4,775.00	925.00	80.6
51-73-40 INSURANCE-PROPERTY/LIABILITY	.00	15,794.14	14,731.00	(1,063.14)	107.2
51-73-50 PROFESSIONAL FEES	2,785.97	11,656.97	.00	(11,656.97)	.0
51-73-60 LEGAL FEES	63.00	1,171.00	5,000.00	3,829.00	23.4
51-73-70 TREASURER FEES	74.58	74.58	1,000.00	925.42	7.5
TOTAL CONTRACTUAL FEES	6,773.55	32,546.69	25,506.00	(7,040.69)	127.6

TOWN OF FAIRPLAY
 EXPENDITURES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

FAIRPLAY UTILITY ENTERPRISE

	PERIOD ACTUAL	YTD ACTUAL	BUDGET	UNEXPENDED	PCNT
<u>WATER - PLANT & EQUIPMENT</u>					
51-74-15	COMPUTER EXPENSE-WATER SYSTE	1,949.94	1,949.94	5,000.00	3,050.06 39.0
51-74-17	CONTRACT PLANT OPERATOR	9,000.00	18,000.00	54,000.00	36,000.00 33.3
51-74-20	DITCH MAINTENANCE	.00	.00	500.00	500.00 .0
51-74-25	EDUCATION	.00	915.00	5,000.00	4,085.00 18.3
51-74-30	INFILLTRATION GALLERY PROJECT	255,158.08	258,103.25	445,000.00	186,896.75 58.0
51-74-32	ENGINEERING FEES	4,057.07	9,637.07	15,000.00	5,362.93 64.3
51-74-40	HASP MEMBERSHIP DUES	.00	300.00	2,500.00	2,200.00 12.0
51-74-45	LEAKS AND REPAIRS	.00	.00	150,000.00	150,000.00 .0
51-74-50	MISCELLANEOUS	.00	.00	1,000.00	1,000.00 .0
51-74-55	PERMITS/DUES/LOCATES	42.57	267.85	1,500.00	1,232.15 17.9
51-74-65	REPAIR & MAINTENANCE-EQUIP	31.35	31.35	10,000.00	9,968.65 .3
51-74-70	UTILITIES	3,224.88	3,624.72	3,000.00	(624.72) 120.8
51-74-75	TESTING CHEMICALS AND SUPPLIES	259.00	3,829.15	5,000.00	1,170.85 76.6
51-74-80	TOOLS AND SUPPLIES	165.79	220.30	8,000.00	7,779.70 2.8
51-74-85	WATER METERS	.00	16,894.87	10,000.00	(6,894.87) 169.0
51-74-90	WATER TANKS	59.65	59.65	10,000.00	9,940.35 .6
51-74-95	WATER TREATMENT PLANT	2,966.85	5,407.06	25,000.00	19,592.94 21.6
	TOTAL WATER - PLANT & EQUIPMENT	276,915.18	319,240.21	750,500.00	431,259.79 42.5
<u>WASTEWATER-PLANT & EQUIPMENT</u>					
51-76-10	CAPITAL EXPENDITURES	.00	.00	100,000.00	100,000.00 .0
51-76-20	COLLECTION SYSTEM MAINTENANC	.00	3,500.00	12,000.00	8,500.00 29.2
51-76-25	COMPUTER EXPENSE-WW SYSTEM	151.33	151.33	8,000.00	7,848.67 1.9
51-76-27	CONTRACT - ORC	10,000.00	20,000.00	60,000.00	40,000.00 33.3
51-76-30	EDUCATION	.00	.00	5,000.00	5,000.00 .0
51-76-35	ENGINEERING FEES	2,779.00	2,779.00	5,000.00	2,221.00 55.6
51-76-36	LIFT STATION	1,291.61	4,169.66	5,000.00	830.34 83.4
51-76-45	MISCELLANEOUS	.00	390.50	.00	(390.50) .0
51-76-50	PERMITS/DUES/LOCATES	42.57	78.69	4,300.00	4,221.31 1.8
51-76-55	REPAIRS AND MAINTENANCE-EQUIP	4,215.33	4,535.33	40,000.00	35,464.67 11.3
51-76-60	SLUDGE REMOVAL/DISPOSAL	6,441.00	21,657.00	125,000.00	103,343.00 17.3
51-76-65	TESTING CHEMICALS AND SUPPLIES	403.00	1,612.00	8,000.00	6,388.00 20.2
51-76-70	TOOLS AND SUPPLIES	88.46	1,762.61	2,000.00	237.39 88.1
51-76-75	TRASH	184.90	356.90	1,500.00	1,143.10 23.8
51-76-80	UTILITIES-PLANT	14,044.28	28,233.90	75,000.00	46,766.10 37.7
	TOTAL WASTEWATER-PLANT & EQUIP	39,641.48	89,226.92	450,800.00	361,573.08 19.8
<u>DEBT SERVICE</u>					
51-80-02	LOAN PRINCIPAL	.00	.00	238,400.00	238,400.00 .0
51-80-04	LOAN INTEREST	.00	.00	79,154.00	79,154.00 .0
51-80-06	LOAN PRINCIPAL-WATER PLANT	2,599.51	2,599.51	5,238.00	2,638.49 49.6
51-80-08	LOAN INTEREST-WATER PLANT	2,046.35	2,046.35	4,054.00	2,007.65 50.5
	TOTAL DEBT SERVICE	4,645.86	4,645.86	326,846.00	322,200.14 1.4

TOWN OF FAIRPLAY
 EXPENDITURES WITH COMPARISON TO BUDGET
 FOR THE 4 MONTHS ENDING APRIL 30, 2024

FAIRPLAY UTILITY ENTERPRISE

	<u>PERIOD ACTUAL</u>	<u>YTD ACTUAL</u>	<u>BUDGET</u>	<u>UNEXPENDED</u>	<u>PCNT</u>
TOTAL FUND EXPENDITURES	355,499.09	523,084.54	1,831,141.00	1,308,056.46	28.6
NET REVENUE OVER EXPENDITURES	(259,536.50)	(319,513.64)	20,302.00	339,815.64	(1573.



Town of Fairplay
 400 Front Street • P.O. Box 267
 Fairplay, Colorado 80440
 (719) 836-2622 phone
 (719) 836-3279 fax
 www.fairplayco.us

STAFF REPORT

TO: Mayor and Board of Trustees

FROM: Janell Sciacca, Town Administrator

RE: New Business Item D, E, F & G – Appointment of Officers
 Resolutions 16-19, Series of 2024

DATE: April 15, 2024

BACKGROUND/ANALYSIS:

The Town of Fairplay Municipal Code Section 2-3-10(a) sets forth that the following officers of the Town shall be appointed by a majority vote of all the members of the Board of Trustees:

1. Town Attorney;
2. Town Clerk;
3. Town Treasurer; and
4. Municipal Judge.

This section further sets forth that officers shall serve until the next regular municipal election at which time they may or may not be reappointed at the discretion of the Board of Trustees, and that reappointment and/or appointment of new officers shall occur no later than the second regular meeting of the Board of Trustees after each regular municipal election.

Section 2-3-40 also sets forth that The Town Administrator shall be subject to reappointment after every regular municipal election and shall serve at the pleasure of the Board of Trustees.

The Town's Regular Municipal Election was scheduled for April 2, 2024. The election was cancelled as per Colorado Election Law and the Fairplay Municipal Code when there were not more candidates than offices to be filled.

Resolutions 16-19, Series 2024 are presented in accordance with, and to fulfill, the requirements of the Town's code.

PROPOSED MOTIONS:

Staff recommends the Board approve Resolutions No 16-19. Series of 2024 by a separate motion, second and roll call vote for each.

Attachments:

- Resolutions 16, 17, 18, and 19 of Series 2024

“Where History Meets the High Country”

TOWN OF FAIRPLAY, COLORADO

**RESOLUTION NO. 16
(Series of 2024)**

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, APPOINTING JANELL SCIACCA AS TOWN CLERK AND TOWN ADMINISTRATOR.

WHEREAS, Sec. 2-3-10 of the Fairplay Municipal Code authorizes and directs the Board of Trustees to appoint town officers by a majority vote of all members of the Board; and

WHEREAS, Sec. 2-3-10(c) of the Fairplay Municipal Code is written that all Town officers shall hold their respective offices at the pleasure of the Board of Trustees and, unless earlier removed from office, shall serve until the next regular municipal election at which time they may or may not be reappointed at the discretion of the Board of Trustees; and

WHEREAS, the Town of Fairplay 2024 Regular Municipal Election was scheduled for April 2, 2024, but was cancelled as per Colorado Election Law and the Fairplay Municipal Code when there were not more candidates than offices to be filled, and the candidates were declared elected.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES FOR THE TOWN OF FAIRPLAY, COLORADO that

Section 1. Janell Sciacca shall be and is hereby appointed as Town Clerk and Town Administrator and that, unless otherwise specified, shall hold such office until the second regular meeting of the Board of Trustees after the next regular municipal election, and in no event longer than thirty (30) days after the swearing-in of the next elected Board, unless removed earlier in accordance with the Section 2-3-10(c) of the Town of Fairplay Municipal Code or C.R.S. 31-4-307:

RESOLVED, APPROVED, AND ADOPTED this 15th day of April, 2024.

TOWN OF FAIRPLAY, COLORADO

Frank Just, Mayor

ATTEST:

Janell Sciacca, Town Clerk

TOWN OF FAIRPLAY, COLORADO

**RESOLUTION NO. 17
(Series of 2024)**

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, APPOINTING JENNIFER DANNER AS TOWN TREASURER.

WHEREAS, Sec. 2-3-10 of the Fairplay Municipal Code authorizes and directs the Board of Trustees to appoint town officers by a majority vote of all members of the Board; and

WHEREAS, Sec. 2-3-10(c) of the Fairplay Municipal Code is written that all Town officers shall hold their respective offices at the pleasure of the Board of Trustees and, unless earlier removed from office, shall serve until the next regular municipal election at which time they may or may not be reappointed at the discretion of the Board of Trustees; and

WHEREAS, the Town of Fairplay 2024 Regular Municipal Election was scheduled for April 2, 2024, but was cancelled as per Colorado Election Law and the Fairplay Municipal Code when there were not more candidates than offices to be filled, and the candidates were declared elected.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES FOR THE TOWN OF FAIRPLAY, COLORADO that

- Section 1. Jennifer Danner shall be and is hereby appointed as Town Treasurer and that, unless otherwise specified, shall hold such office until the second regular meeting of the Board of Trustees after the next regular municipal election, and in no event longer than thirty (30) days after the swearing-in of the next elected Board, unless removed earlier in accordance with the Section 2-3-10(c) of the Town of Fairplay Municipal Code or C.R.S. 31-4-307:

RESOLVED, APPROVED, AND ADOPTED this 15th day of April, 2024.

TOWN OF FAIRPLAY, COLORADO

Frank Just, Mayor

ATTEST:

Janell Sciacca, Town Clerk

TOWN OF FAIRPLAY, COLORADO

**RESOLUTION NO. 18
(Series of 2024)**

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, APPOINTING BRIAN GREEN AS MUNICIPAL COURT JUDGE.

WHEREAS, Sec. 2-3-10 of the Fairplay Municipal Code authorizes and directs the Board of Trustees to appoint town officers by a majority vote of all members of the Board; and

WHEREAS, Sec. 2-3-10(c) of the Fairplay Municipal Code is written that all Town officers shall hold their respective offices at the pleasure of the Board of Trustees and, unless earlier removed from office, shall serve until the next regular municipal election at which time they may or may not be reappointed at the discretion of the Board of Trustees; and

WHEREAS, the Town of Fairplay 2024 Regular Municipal Election was scheduled for April 2, 2024, but was cancelled as per Colorado Election Law and the Fairplay Municipal Code when there were not more candidates than offices to be filled, and the candidates were declared elected.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES FOR THE TOWN OF FAIRPLAY, COLORADO that

- Section 1. Brian Green shall be and is hereby appointed as Municipal Court Judge and that, unless otherwise specified, shall hold such office until the second regular meeting of the Board of Trustees after the next regular municipal election, and in no event longer than thirty (30) days after the swearing-in of the next elected Board, unless removed earlier in accordance with the Section 2-3-10(c) of the Town of Fairplay Municipal Code or C.R.S. 31-4-307:

RESOLVED, APPROVED, AND ADOPTED this 15th day of April, 2024.

TOWN OF FAIRPLAY, COLORADO

Frank Just, Mayor

ATTEST:

Janell Sciacca, Town Clerk

TOWN OF FAIRPLAY, COLORADO

**RESOLUTION NO. 19
(Series of 2024)**

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, APPOINTING WILSON WILLIAMS FELLMAN DITTMAN TOWN ATTORNEY.

WHEREAS, Sec. 2-3-10 of the Fairplay Municipal Code authorizes and directs the Board of Trustees to appoint town officers by a majority vote of all members of the Board; and

WHEREAS, Sec. 2-3-10(c) of the Fairplay Municipal Code is written that all Town officers shall hold their respective offices at the pleasure of the Board of Trustees and, unless earlier removed from office, shall serve until the next regular municipal election at which time they may or may not be reappointed at the discretion of the Board of Trustees; and

WHEREAS, the Town of Fairplay 2024 Regular Municipal Election was scheduled for April 2, 2024, but was cancelled as per Colorado Election Law and the Fairplay Municipal Code when there were not more candidates than offices to be filled, and the candidates were declared elected.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES FOR THE TOWN OF FAIRPLAY, COLORADO that

- Section 1. The firm of Wilson Williams Fellman Dittman shall be and is hereby appointed as Town Attorney and that, unless otherwise specified, shall hold such office until the second regular meeting of the Board of Trustees after the next regular municipal election, and in no event longer than thirty (30) days after the swearing-in of the next elected Board, unless removed earlier in accordance with the Section 2-3-10(c) of the Town of Fairplay Municipal Code or C.R.S. 31-4-307:

RESOLVED, APPROVED, AND ADOPTED this 15th day of April, 2024.

TOWN OF FAIRPLAY, COLORADO

Frank Just, Mayor

ATTEST:

Janell Sciacca, Town Clerk



MEMORANDUM

TO: Mayor and Board of Trustees
FROM: Jennie Danner
RE: New Bank Account Signers - Resolution Number 20
DATE: April 11th, 2024

Attached please find Resolution Number 20 authorizing the following financial institution changes. We need to have new signature cards prepared for all of our financial institutions.

The current signers are Frank Just, Scott Dodge, Janell Sciacca and Julie Bullock. The new signers will be Frank Just, Ray Douglas, Janell Sciacca and Julie Bullock.

The accounts to be updated at TBK Bank are as follows:

- TOF – Disbursement Account ending in 3402
- TOF – Deposit Account ending in 3403
- TOF – Square Reader Account ending in 3404
- TOF – Street Cut Escrow Account ending in 8210

There will be no other changes to the account information at this time.

The accounts to be updated at Csafe are as follows:

- TOF – Water Fund
- TOF – Conservation Trust Fund

The accounts to be updated at ColoTrust are:

- TOF – General Fund CO-01-0580-1640
- TOF – Water Fund – CO-01-0580-2330

I will have forms for the new signers to complete.

Recommended Motion: Approval of Resolution Number 20. This will require a 2nd and a voice vote.

TOWN OF FAIRPLAY, COLORADO

**RESOLUTION NO. 20
(Series of 2024)**

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, DESIGNATING THOSE PERSONS AUTHORIZED TO SIGN ON TOWN BANK ACCOUNTS.

WHEREAS, the Town of Fairplay, Colorado (“Town”) is a statutory town, duly organized and existing under the laws of the state of Colorado; and

WHEREAS, C.R.S. 31-15-302 provides that the Board of Trustees shall have general powers in relation to the finances of the Town; and

WHEREAS, the Town of Fairplay Municipal Code Section 4-2-10 sets forth rules and regulations for the custody and management of funds; and

WHEREAS, the Town Treasurer is recommending to update the current list of Town Staff and Board of Trustee members who are authorized to sign financial instruments for the Town;

NOW, THEREFORE, BE IT HEREBY RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO:

Section 1. The foregoing recitals are hereby incorporated as conclusions, determinations, facts, and findings of the Board of Trustees.

Section 2. The following persons are hereby authorized to sign instruments for all bank or financial institution accounts maintained by the Town of Fairplay:

- A. Frank Just, Mayor
- B. Raymond Douglas, Trustee
- C. Julie Bullock, Special Events Coordinator
- D. Janell Sciacca, Town Administrator/Town Clerk

All checks or other instruments evidencing the withdrawal of Town funds from any bank or other financial institution shall be signed by either Frank Just, Mayor, or Raymond Douglas Trustee, *and* by either Janell Sciacca, Town Administrator/Town Clerk, or Julie Bullock, Special Events Coordinator.

Section 3. This resolution shall become effective upon adoption.

ADOPTED the 15th day of April, 2024.

TOWN OF FAIRPLAY, COLORADO

Frank Just, Mayor

ATTEST:

Janell Sciacca, Town Clerk



Town of Fairplay
 400 Front Street • P.O. Box 267
 Fairplay, Colorado 80440
 (719) 836-2622 phone
 (719) 836-3279 fax
 www.fairplayco.us

STAFF REPORT

TO: Mayor and Board of Trustees

FROM: Janell Sciacca, Town Administrator

RE: New Business Item I – American Civil Constructors Mountain West Sidewalk Proposal
 Resolution 21, Series of 2024

DATE: April 15, 2024

BACKGROUND/ANALYSIS:

It was brought to the Town’s attention by American Civil Constructors (ACC) that a portion of sidewalk between the Western Motel at 490 US Highway 285 and the Sinclair Gas Station at 640 US Highway 285 was not included in the current CDOT highway widening project. Staff met with CDOT representatives and was told this could not be added due to the significant overage of the project and that if the Town could procure grant funding, the current contractor could install the sidewalks before the end of the project.

Staff was in process of identifying and preparing to apply for grants when ACC Engineer Nick Maleski advised that it had been cleared by CDOT to allow the current subcontractor putting these improvements in as part of the project to finish the sidewalk, curb and gutter if the Town would pay for them. Maleski was asked to provide a proposal which is attached to Resolution No. 21 as Exhibit A. Funding for sidewalks was included in the budget for 2024, and while not specifically for this project, the amount that has been quoted is quite reasonable and Staff is recommending the Board accept the proposal as written.

PROPOSED MOTION:

Staff recommends the Board approve Resolution No. 21, Series of 2024, by motion, second and roll call to approve the US285 Fairplay Sidewalk Proposal from American Civil Constructors Mountain West in the amount of \$35,031.90.

Attachments:

- Resolutions 21, Series of 2024
- Exhibit “A” US285 Fairplay Sidewalk Proposal

“Where History Meets the High Country”

TOWN OF FAIRPLAY, COLORADO

**RESOLUTION NO. 21
(Series of 2024)**

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FAIRPLAY, COLORADO, APPROVING A PROPOSAL FROM AMERICAN CIVIL CONSTRUCTORS MOUNTAIN WEST FOR COMPLETION OF A PORTION OF SIDEWALK ALONG THE WEST SIDE OF US HIGHWAY 285.

WHEREAS, the Town of Fairplay (the "Town") has the authority to enter into contracts for any lawful municipal purpose pursuant to C.R.S. § 31-15-101, and also has the authority pursuant to C.R.S. § 31-15-702 to provide for the construction and maintenance of sidewalks, curbs, and gutters; and

WHEREAS, it has been brought to the Town's attention that a portion of sidewalk along US Highway 285 is not being installed as part of the current CDOT US285 widening project; and

WHEREAS, American Civil Constructors Mountain West has provided a proposal to the Town to complete the sidewalk which will help satisfy ADA requirements; and

WHEREAS, the Town included funds in the 2024 budget for sidewalk improvements and feels that it is in the best interests of its residents, visitors and businesses to complete the sidewalk to ensure ADA accessibility and provide a safe means of walking along US 285 for pedestrians; and

WHEREAS, the Town finds the proposal from American Civil Constructors Mountain West to be fair and reasonable.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES FOR THE TOWN OF FAIRPLAY, COLORADO, THAT:

Section 1. The Board of Trustees hereby approves the US285 Fairplay Sidewalk Proposal attached hereto as "Exhibit A" and authorizes the Town Administrator work with American Civil Constructors West Region for completion of the improvements.

Section 2. The total amount of payment for services under the agreement shall not exceed \$35,031.90.

Section 3. This resolution shall become effective upon adoption.

RESOLVED, APPROVED, and ADOPTED this 15th day of April, 2024.

TOWN OF FAIRPLAY, COLORADO

ATTEST:

Frank Just, Mayor

Janell Sciacca, Town Clerk

Colorado Department of Transportation



5615 Wills Boulevard
Pueblo, CO 81008
Phone: 719-546-5454
FAX: 719-546-5414

Region 2

PM

Sheet Revisions

Date	Description	Initials
10/11/21	Revised TE-19	PMM
11/09/21	Added TE-18A, RW-20 New Owner	
12/08/21	RW-20 Changed to PE-20 and new owner	

Sheet Revisions

Date	Description	Initials
mm/dd/yy	XXXXXXXX	XXX

Sheet Revisions

Date	Description	Initials
mm/dd/yy	XXXXXXXX	XXX

Right of Way Plans

Plan Sheet

Project Number: STA M420-001			
Project Location: Intersection US 285 and SH 9			
At Fairplay, CO			
Project Code:	Last Mod. Date:	Subset:	Sheet No.:
20638-Combo	12-08-21	7.05 of 7.08	7.05

PE-17
LJJ Properties, LLC
PO Box 496
Erie, CO 80516

* See Sheet 7.04 for RW-17 Details

Existing 20' Easement Reception No. 692684

Existing 20' Easement Reception No. 692684

RW-19 Line Table

Name	Direction	Length
L21	N 62°34'45" W	10.00
L22	N 27°25'15" E	50.00
L23	S 53°47'45" E	10.12
L24	S 27°25'15" W	48.45

TE-19 Line Table

Name	Direction	Length
L1	N 53°47'45" W	10.12
L2	N 27°25'15" E	26.50
L3	S 62°34'45" E	19.62
L4	S 27°25'15" W	43.49
L5	S 62°34'45" E	19.62
L6	S 27°25'15" W	34.65
L7	S 62°34'45" E	10.00
L8	S 27°25'15" W	106.18

TE-19 Rev. Area = 1,907 sf (0.044 acres)
1010 Costello, LLC
PO Box 1008
Salida, CO 81201

RW-19 Area = 492 sf (0.011 acres)

TE-22 Area = 2,351 sf (0.054 acres)
RW-22 Area = 1,740 sf (0.040 acres)
Anannt Enterprises, LLC
PO Box 187
Fairplay, CO 80440

TE-22 Line Table

Name	Direction	Length
L9	N 65°17'29" W	32.11
L10	N 07°16'12" E	45.53
L11	N 87°00'13" E	55.38
L12	S 27°25'15" W	69.26

RW-20 Line Table

Name	Direction	Length
L13	N 67°51'43" W	10.04
L14	N 27°25'15" E	171.83
L15	S 89°46'59" E	11.24
L16	S 27°25'15" W	176.05

TE-23 Area = 1,645 sf (0.038 acres)

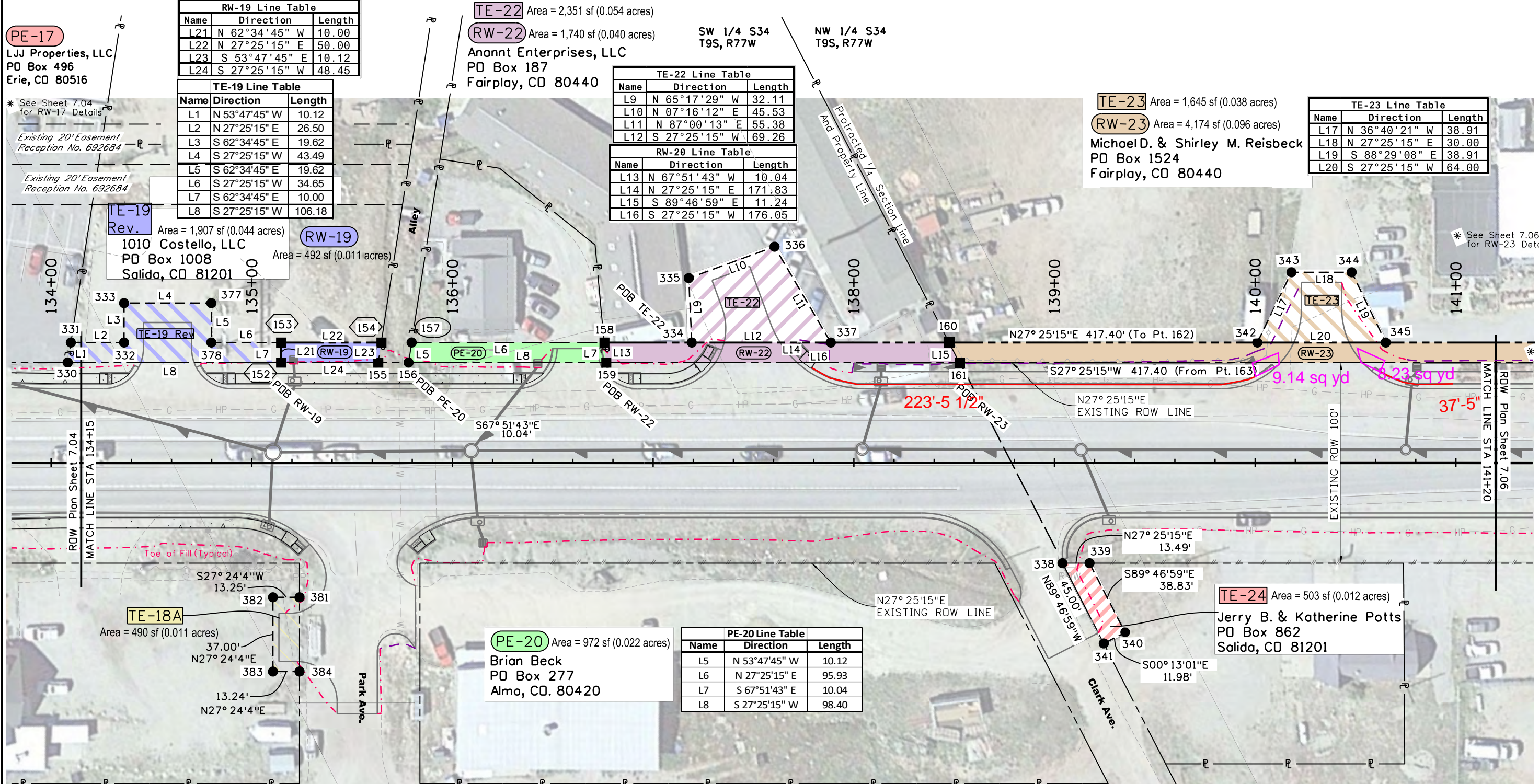
RW-23 Area = 4,174 sf (0.096 acres)

Michael D. & Shirley M. Reisbeck
PO Box 1524
Fairplay, CO 80440

TE-23 Line Table

Name	Direction	Length
L17	N 36°40'21" W	38.91
L18	N 27°25'15" E	30.00
L19	S 88°29'08" E	38.91
L20	S 27°25'15" W	64.00

* See Sheet 7.06 for RW-23 Details



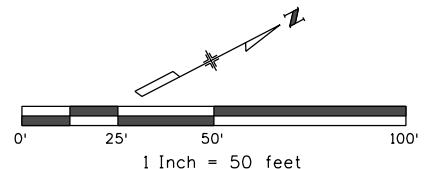
TE-18A
Area = 490 sf (0.011 acres)
37.00'
N27° 24'4" E
382
381
383
384
13.24'
N27° 24'4" E

PE-20 Area = 972 sf (0.022 acres)
Brian Beck
PO Box 277
Alma, CO. 80420

PE-20 Line Table

Name	Direction	Length
L5	N 53°47'45" W	10.12
L6	N 27°25'15" E	95.93
L7	S 67°51'43" E	10.04
L8	S 27°25'15" W	98.40

TE-24 Area = 503 sf (0.012 acres)
Jerry B. & Katherine Potts
PO Box 862
Salida, CO 81201



Colorado Department of Transportation



5615 Wills Boulevard
Pueblo, CO 81008
Phone: 719-546-5454
FAX: 719-546-5414

Region 2

PM

Sheet Revisions

Date	Description	Initials
8/27/21	Deleted PE-28	PMM

Sheet Revisions

Date	Description	Initials
mm/dd/yy	XXXXXXXX	XXX

Sheet Revisions

Date	Description	Initials
mm/dd/yy	XXXXXXXX	XXX

Right of Way Plans

Plan Sheet

Project Number: STA M420-001			
Project Location: Intersection US 285 and SH 9			
At Fairplay, CO			
Project Code:	Last Mod. Date:	Subset:	Sheet No.:
20638-Combo	8-30-21	7.06 of 7.08	7.06

NW 1/4 S34
T9S, R77W

TE-23 Area = 1,645 sf (0.038 acres)
RW-23 Area = 4,174 sf (0.096 acres)
 Michael D. & Shirley M. Reisbeck
 PO Box 1524
 Fairplay, CO 80440

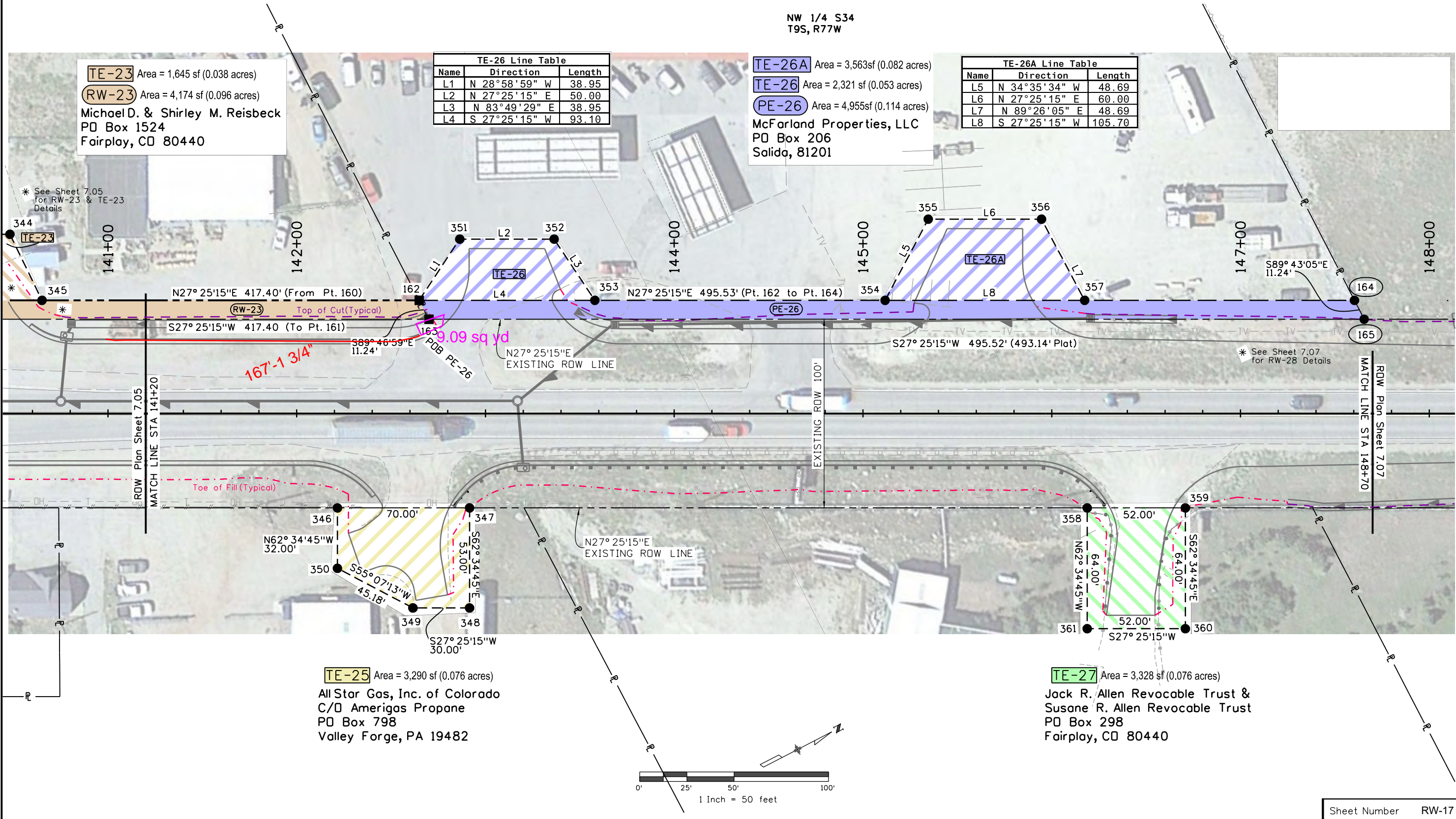
TE-26 Line Table

Name	Direction	Length
L1	N 28°58'59" W	38.95
L2	N 27°25'15" E	50.00
L3	N 83°49'29" E	38.95
L4	S 27°25'15" W	93.10

TE-26A Area = 3,563sf (0.082 acres)
TE-26 Area = 2,321 sf (0.053 acres)
PE-26 Area = 4,955sf (0.114 acres)
 McFarland Properties, LLC
 PO Box 206
 Salida, 81201

TE-26A Line Table

Name	Direction	Length
L5	N 34°35'34" W	48.69
L6	N 27°25'15" E	60.00
L7	N 89°26'05" E	48.69
L8	S 27°25'15" W	105.70



Region 2



Town of Fairplay
400 Front Street • P.O. Box
267 Fairplay, Colorado
80440
(719) 836-2622 phone
(719) 836-3279 fax
www.fairplayco.us

STAFF REPORT

TO: Mayor and Board of Trustees

FROM: Janell Sciacca, Town Administrator

RE: Public Hearings A&B – Request to continue Ordinances No. 2 and 3 to May 6, 2024

DATE: April 15, 2024

BACKGROUND/ANALYSIS:

Ordinance No. 2 regarding Snow Loads was set to come back to the Board April 15, 2024. Building Official Kyle Parag has asked that the Ordinance be continued to May 6, 2024 as he will not be able to attend until then as he is taking 2 weeks off to be with his wife and new baby that arrived April 12. Congratulations Kyle and Gesselle!

Ordinance No. 3 regarding parking and noise needs a little more research and tweaking, so Staff is asking that this matter also be continued to May 6, 2024.

REQUESTED ACTION:

Staff recommends the Board continue Ordinance No. 2 and Ordinance No. 3, Series of 2024, to May 6, 2024 by a separate motion with second and roll call vote.



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STAFF REPORT

TO: Mayor and Board of Trustees

FROM: Janell Sciacca, Town Administrator

RE: DRAFT Updates of Public Works Manual; Wastewater Design Criteria, Technical Specifications and Construction Details; and Wastewater Rules & Regulations

DATE: April 15, 2024

BACKGROUND/ANALYSIS:

Town Engineer Deron Dirksen has been working on revisions to the following documents for the Town:

- Fairplay Public Works Manual
- Fairplay Wastewater Design Criteria, Technical Specifications and Construction Details
- Fairplay Wastewater Rules & Regulations

These updates are intended to eliminate conflicting information, bring the documents up to date and include previously missing or omitted information and are being presented tonight to get them in front of the Board and public for review and comment prior to final adoption.

Deron's cover memorandums outline some of the important changes, but again, Staff requests the Board review these in depth and provide feedback. Staff will also post each on the Town's website and solicit feedback from the public.

REQUESTED ACTION:

No action is requested to be taken on April 15 and the documents will be brought back at a future meeting following sufficient time for review and input.



Town of Fairplay – Monthly Board Memo

TO: Town of Fairplay: Mayor and Board of Trustees
FROM: Deron Dircksen, PE
DATE: April 15, 2024
SUBJECT: Board Memo – Town of Fairplay: Public Works Manual

Dear Board:

Background/Analysis:

The Public Works Manual was adopted in 2022 and SGM has been referencing it for design reviews and it has been a very useful document. Over the past two years, I have made a few notes/updates to be incorporated into the document. These few notes/updates will provide clarity, reflect new laws and regulations, provide consistency with the town's Municipal Code, etc. There were also a few areas that need additional input and have been provided to you for discussion. This was not a full review of the Public Works Manual. This is a working document and should be updated every so often to reflect new regulations, policies, best practices, etc.

The Public Works Manual has been submitted to you for your review and comment and then SGM will incorporate those changes prior to adopting the new PW Manual.

Updates:

Division 2:

1. Section 2.01 Easements (page 5): updated for clarity.
2. Section 2.05 Water Distribution (page 6): updated for better water quality, better fire flow, resilient water distribution system, etc.
3. Section 2.06 All Other Utilities* (page 6) – updated to be consistent with Municipal Code Section 16-17-50
4. Section 2.10: Street Lighting (page 7-8): updated for clarity.

Division 3:

1. Section 3.02 Pipeline Depth (page 17): consistent with Municipal Code Section 16-16-20 #7.
2. Section 3.10 Tracer Wire (page 20): updated per new law.
3. Section 2.01: "COPPER SERVICE PIPE" to "WATER SERVICE PIPE". Tracer wire needs to be installed regardless of pipe material. (page 21): updated per new law and update title of section.
4. Section 3.02 Service Line Depth (page 2): consistent with Municipal Code Section 16-16-20 #7.

Division 4:

1. Section 4.03 Street Design G: updated to be consistent with Municipal Code Section 16-17-30.
2. Section 4.08 Drainage: Driveway culverts (page 58 of 251): updated to provide direction.
3. Section 4.6 Street Improvements*. (page 117) Input needed. As of now, SGM updated the Public Works Manual to reflect Municipal Code Section 16-17-30(D)2-5. More work needs to be completed to update street cross-sections.
 - a. Reflect town preferences between Front Street vs Clark Street.

- b. Does the previous Town of Fairplay Street and Drainage Master Plan dated April 2001 need to be incorporated into the street cross-sections for stormwater conveyance?
- c. The existing right-of-way widths can also determine if on-street parking, landscape/snow storage strip, etc. are feasible or wanted, etc.

Division 7:

Index Standard Details (page 198): deleted Sanitary sewer details since those details are part of the wastewater manuals.

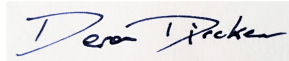
Section 8.18 Record Drawings (page 208): updated to include GIS.

Other updated items:

General formatting, cleanup, etc. throughout the Public Works Manual

Sincerely,

SGM



Deron Dirksen, P.E.
Senior Engineer 1

PUBLIC WORKS MANUAL

TOWN OF FAIRPLAY



2024

PREPARED BY:

SGM

245 E. HIGHWAY 50, SUITE 1
SALIDA, CO 81201



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DIVISION 1



Division 1 Introduction

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INTRODUCTION

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Key Players	1.05
Key Documents	1.06
Design Review Process Key Concepts	1.07

PART 1 GENERAL**1.01 INTRODUCTION.**

This Public Works Manual for the Town of Fairplay has been authorized by Resolution No. _____. This document shall be known as the “Town of Fairplay Public Works Manual.”

1.02 PURPOSE

The purpose of this Public Works Manual is to act as a guide for the uniform design and construction of infrastructure including roads, water and sewer facilities, drainage conveyance structures, and other municipal infrastructure and appurtenances within the Town of Fairplay. This Manual identifies the minimum standards, specifications, and processes necessary to achieve public safety, functional effectiveness, ease of maintenance, uniform materials and consistent lines of communication.

1.03 SCOPE AND APPLICATION

These regulations apply to lands within the town limits of the Town of Fairplay and adjacent lands served or impacting the Town.

1.04 WAIVER.

No waiver of these regulations, standards and specifications shall be valid unless approved by the Town or representatives of the Town in writing. A waiver shall be project specific and shall not establish a precedent for any other proposed waiver. A request for a waiver must be made in writing and identify a detailed explanation of why the proposed waiver is warranted by site-specific conditions. No public hearing is required for determination of a waiver by the Town Administrator or Town Engineer.

1.05 KEY PLAYERS

1. Town of Fairplay
 - a. Board of Trustees
 - b. Town Administrator
 - c. Town Staff
 - d. Town Engineer

1.06 KEY DOCUMENTS

1. Fairplay Municipal Code
2. Establishing Contract
3. Town of Fairplay Public Works Manual

1.07 DESIGN REVIEW PROCESS KEY CONCEPTS

1. The Town will review all civil infrastructures within its jurisdiction through the Town Engineer for compliance with the Public Works Manual.
2. The Town will ask the Owner’s Engineer to submit during the land use process, a report, which discusses compliance with the Comprehensive Plan and the trigger points for expansion of the wholesale infrastructure if needed.

DIVISION 2



Division 2 Submittal Requirements

INDEX

SUBMITTAL REQUIREMENTS

Title	Section
Easements	2.01
Drainage	2.02
Drainage Criteria References	2.03
General Utilities	2.04
Water Distribution	2.05
All other Utilities	2.06
Sidewalks	2.07
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Detention and Treatment	
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Erosion and Sediment Control Plan	

2.01 EASEMENTS

All utilities shall be located in the right-of-way or an approved easement. Minimum easement width shall be 25 feet for water. Over-depth installations shall require wider easements. Electric, telephone, TV cable, gas, and future utilities shall be located completely within the right-of-way or easements approved by the respective utility provider.

Minimum Easement Width:

Calculate easement width as follows:

$$W = (\text{Depth to top of pipe} \times 2) + 3 \text{ feet (round up in 5-foot increments)}$$

Example:

$$10\text{-foot deep pipe} = (10 \times 2) + 3 = 23 \text{ feet}$$

$$W = 25\text{-foot wide easement (rounded up)}$$

WATER MAIN COVER DEPTH	MINIMUM EASEMENT WIDTH REQUIRED
9.5-FEET TO 11-FEET	25-FEET
11.1-FEET TO 13.5-FEET	30-FEET

2.02 DRAINAGE.

Drainage easements and improvements shall be designed by a registered engineer to accommodate expected run-off as determined by the drainage plan. Improvements shall be installed to specification by the Town Board of Trustees through their designated representative. All drainage improvements described herein shall be the financial responsibility of the sub-divider, subject to provision of Fairplay Municipal Code and this Public Works Manual.

2.03 DRAINAGE CRITERIA.

Project specific requirements should be discussed with the Town Engineer as early as possible in the application process. The rate of runoff from any developed area shall not exceed the historic rate of runoff based on a ten (10) year and one hundred (100) year rainfall event.

The following methods of runoff estimation may be utilized for determining the rate of runoff from a particular site as applicable:

1. Rational Method. Used for Drainage Basins less than 200 acres in size and for minor system design.
2. SCS TR 55 Methods. Used for drainage basins up to 20 square miles in size for flood flow determination and design in minor and major systems. Also used to compute flood storage volumes.
3. Unit Hydrograph. Advance approval of method and application required. Used for drainage basins up to 1,000 square miles in size. Also used for flood flow determination and design in minor and major systems. Also used to compute flood storage volumes.

2.04 GENERAL UTILITIES

In the event oversized utilities are required, arrangements for reimbursements shall be made, whereby the developer shall be allowed to recover the cost of the utilities that have been provided by him beyond the needs of his development and standard Town specification. The method and time of payment under the reimbursements shall be established in accordance with the current policies of the Town relating to the placement of such oversized utilities.

2.05 WATER DISTRIBUTION

The water main distribution system shall be designed to connect with the Town water system and make water available to each lot in the proposed subdivision. Fire hydrants shall be located to insure protection to each lot in accordance with International Fire Code requirements. The design of the system shall be the responsibility of the sub-divider with all plans subject to approval of the Board of Trustees through their designated representatives. Installations of the system shall be to Town specifications and at the direction of the Board of Trustees through their designated representatives. Financial responsibility for the water distribution system shall be subject to existing Town regulations and the agreement relating thereto between the Board of Trustees and the sub-divider, subject to the provision of the Town of Fairplay Public Works Manual.

All exterior main feed water supplies to developments shall be looped and the internal water system shall be looped for dependability and to meet the pressure requirements of peak day water usage plus fire flows. Looping and valve locations shall be such that an interruption of service due to a water main break will put no more than 750 feet of main or more than two fire hydrants out of service while maintaining adequate flows and pressure in the remaining portion of the system. All new water line extensions will be looped unless approved by the Town's Public Works Director.

2.06 ALL OTHER UTILITIES.

Telephone, electric, gas and other similar utility lines and services shall be placed underground unless otherwise authorized by the Board of Trustees. Transformers, switching boxes, terminal boxes, metering, roadway lighting, signal devices, gas regulators, compressor stations or other similar facilities necessary and appurtenant to underground facilities may be placed above ground. Utility lines may be placed either within public road rights-of-way within the subdivision in accordance with adopted encroachment requirements or within easements or rights-of-way provided for the particular facilities in accordance with the approved improvements plan.

2.07 SIDEWALKS

Sidewalks are required on both sides of Collector and Local Residential-Higher Volume streets unless special circumstances warrant the Board of Trustees to specifically waive the installation in writing. Sidewalks shall be at least four feet (4') wide in residential areas and eight feet (8') wide in commercial areas. Collector streets and Local Residential-Higher Volume shall have vertical curb and gutter and attached sidewalk. Design of streets in commercial and industrial areas shall be approved by the Board of Trustees. Sidewalks are not required on Local Residential streets.

Construction of sidewalks shall be to specifications set by the Board of Trustees through their designated representatives.

All sidewalks shall be ramped at all street intersections or other pedestrian crossing areas. The design and construction of sidewalk ramps must meet current applicable requirements of the "Americans with Disabilities Act" (ADA).

2.08 SIGNING AND STRIPING PLANS

A complete signing and striping plan shall be submitted as part of the construction drawings. This plan shall include all project streets and intersections and all intersections with existing streets. The design of these improvements shall be in accordance with the latest version of the Manual on Uniform Traffic Control Devices (MUTCD) and shall include all necessary traffic control signage. Street name signs shall be installed at all intersections. The developer will be responsible for their installation.

2.09 BICYCLE PATHS.

Developers, when required, shall install a bicycle path at least ten feet (10') in width along the right-of-way of any sub-arterial street and any arterial street which is not bordered by a frontage road. The initial site of the path along any street shall be determined by the Board of Trustees and the Town's Engineer. Each developer who extends the path shall keep the path continuous and with as little change in grade as possible. If topography necessitates that the path change from one side of the street to the other, or if the path intersects with another arterial or sub-arterial street, crossways shall be provided. All bicycle paths shall be ramped at intersections. Paths and crossways shall meet construction and design standards set by the Board of Trustees through their designated representatives.

2.10 STREET LIGHTING.

Xcel Energy will design the electrical circuits, disconnect, photo eye, etc.

The developer shall work with the Town and Xcel Energy to design streetlights at points designated.

The Developer/Applicant shall be required to design, pay for the streetlights, and pay for the installation of streetlights through Xcel Energy. Developer/Applicant shall warrant the streetlights for two years.

After the Town has taken over the streetlights, they will still be owned and operated by Xcel Energy, but in case of an accident, the Town is required to purchase the streetlights. Therefore, the Town has chosen two streetlights that are common, normal costs, and normal lead times.

LED Luminaire Styles:

1. Traditional

- a. Fiberglass poles
- b. Work with Xcel Designer for appropriate height. Probably 25-feet.
- c. Black
- d. Letter Designation: B
- e. Delivered Lumens: 4,000 lm
- f. Equivalent HPS Wattage 100W



Traditional

Displays the old-fashioned charm of traditional area lighting, enhancing any setting with distinctive styling. Downlight configuration delivers uniform and efficient illumination to pedestrian and roadway applications.

- Colors: Dark Bronze, Black
- Available on the Fiberglass, Fluted Aluminum, Columbus, or Fluted Fiberglass poles.
- Dark Sky Friendly
- Available in LED Type A, B, and C

Eligible Rate(s):
– Rate Codes: SL, SLU, PLL

2. Cobra
 - a. Tenon Upsweep
 - b. Span per Xcel designer.
 - c. Black
 - d. Letter Designation: A
 - e. Delivered Lumens: 3,000 lm
 - f. Equivalent HPS Wattage 70W



Cobra

Appreciated for function and form that contributes to the safety and security of well-lit streets for your residents and business patrons.

- Colors: Grey, Dark Bronze, Black, Federal Green
- Available on the Steel 3-Bolt, Steel Davit, Fiberglass, and Steel Evans poles.
- Dark Sky Friendly
- Available in LED Type A, B, C, D, and E

Eligible Rate(s):
– Rate Codes: SL, PLL, SLU, CAL, RAL

There are a few areas of town that the town does own and maintain the pedestrian lights. These specifications can be provided by Mountain States Lighting located in Conifer, CO. 303-838-4430.

2.11 CONTROL OF EROSION AND SEDIMENTATION.

A. Purpose and Applicability.

1. Purpose: The goal of these requirements is to minimize the water quality impacts resulting from construction, clearing, grading, excavation and other land disturbing activities. Siltation is often a cause of water quality impairment in waterbodies in Colorado.
2. Applicability: These regulations apply to any land development and or disturbing activities. Land disturbing activities include grading, excavation, clearing timber or vegetation, and construction
3. Exemption: Single Family Construction
Construction of single-family residential units shall be exempt from these regulations if:
 - a. Less than ½ acre.
 - b. The Town determines that exempting construction will not have a significant impact on water quality.
4. Other:
Occasions may arise where these minimum standards are either inappropriate or cannot be practically implemented. In these cases a variance to these criteria shall be considered. Written requests for each variance should be directed to the Town of Fairplay Building Official or designated representative.

B. Erosion and Sediment Control Requirements

1. Minimize Erosion on The Site.

- a. Phase construction - Stage and schedule the timing of earth disturbing construction activities, such as clearing, grading, road construction, and utilities installation to minimize soil exposure.
- b. Install erosion and sediment control measures before site grading or other construction, to the greatest extent practicable.
- c. Soil stabilization - Disturbed areas and soil stockpiles shall be stabilized or protected to effectively control erosion. These areas should be surface roughened, mulched, or seeded and mulched, or otherwise protected from erosive forces if they will remain exposed and inactive for periods longer than 14 days. This requirement also applies if soil is expected to be exposed over winter to minimize erosion from occurring during spring snowmelt. Disturbed areas should be mulched, or seeded and mulched within 7 days after final grade is reached, weather permitting.
- d. On slopes steeper than ten percent (10%), or within one hundred feet (100') of any waterbody, exposed soils shall be stabilized using appropriate techniques.
- e. Temporary and permanent revegetation - Disturbed areas that will not be built upon for one (1) year shall incorporate a temporary cover crop to promote soil stability. Areas exposed for two (2) or more years must be revegetated with a perennial, native grass mix (or other grass mixtures as recommended by the local Natural Resources Conservation Service office). Within two (2) full growing season of project completion, vegetative site coverage shall have a perennial herbaceous component equal to or greater than seventy percent (70%) of the adjacent undisturbed areas.
- f. Cut and fill slopes - Where cut and fill cannot be avoided, slopes shall be designed for long-term stability. Permanent vegetation shall be used as the priority approach to stabilization of cut and fill areas where slopes are less than or equal to 3:1. On steeper cut and fill slopes, stabilization may be attained by utilizing a combination of retaining walls, rock walls, up slope runoff diversions, terracing, slope drains, soil nailing, mulch binders, erosion control blankets, vegetation or other measures appropriate for the specific situation. Retaining walls over four feet (4') in height or step retaining walls shall be designed by a Colorado registered engineer. The soil surface of cut and fill slope shall not remain exposed without an approved method of soil stabilization.
- g. Construction in or directly adjacent to any waterbody, such as culvert or bridge installation, shall require measures to protect water quality and channel stability. This requirement may include stream isolation through the use of cofferdams, complete containment of the stream in the area of the disturbance, stream crossing structures, or limitations on the dates when in-stream work can be performed. In all cases construction shall conform to applicable USACE Section 404 permitting requirements and Colorado Parks & Wildlife.
- h. Protect new or re-routed irrigation ditches, swales, receiving channels and streams from accelerated erosion until conveyance section has established vegetation and is stable under flows for which the feature was designed. The minimum recurrence frequency storm during active construction for channel stability design is the 2-year event for the entire drainage area served by that flow conveyance feature. Diverting off-site flows around construction sites can effectively reduce the design flow. Must have approval from Ditch Company.
- i. Protect culvert outlets from erosive flows by installing velocity reducers such as gravel dikes, riprap or similar measures.

1. Minimize Sediment Leaving the Site
 - a. Manage stormwater runoff flows to minimize erosion and sediment transport off-site. Divert concentrated flows away from disturbed slopes and minimize length and steepness of disturbed slopes or use slope drains.
 - b. Minimize sediment and mud from leaving the construction site by protecting access routes by either immediate placement of street base or construction of vehicle tracking pads. Vehicle tracking pads shall be at least fifty feet (50') in length, if available, and comprised of angular rock and/or a wheel washing facility.
 - c. Protect adjacent properties from sediment-laden runoff by using sediment fences, and sediment or silt traps or other appropriate control options.
 - d. Storm sewer inlets shall be protected from entry of sediment-laden water. Straw bales, supported silt fence structures, dumped rock or other barriers may accomplish this.
 - e. Divert off-site runoff around construction site when practical.
2. Detention and Treatment
 - a. When the contributing drainage area, including off-site area (unless bypassed), is greater than five (5) acres, one or more sedimentation basin(s) shall be constructed to provide a total of 1800 cubic feet of basin volume for every acre contributing runoff into the basin. The outlet of the sediment basin should be designed to empty the storage volume in no less than 12 hours. The basin's length should be no less than twice the basin's width; otherwise a baffle may be installed to minimize short-circuiting. If the discharge from the basin is passed through a filtration device (i.e. a vegetated field, forested area, or a constructed wetland) the basin volume requirements may be reduced.
 - b. Where the contributing drainage area is less than five (5) acres, a specific engineered design for sediment trapping facilities is not necessary. Silt traps may be used to detain and treat runoff if the contributing drainage area is less than 5 acres.
 - c. Sedimentation basins will be removed after successful revegetation of the site. Embankments to be left as permanent facilities shall have a capacity to safely pass the 100-year flood and meet any relevant dam and diversion requirements of the Colorado State Engineer's Office.
3. Construction De-watering
 - a. Construction dewatering activities will conform to the State's NPDES construction dewatering permit requirements.
 - b. Discharges from construction dewatering operations shall be done in a manner which minimizes erosion and utilizes best management practices such as velocity reducers, sediment basins, straw bales or other measures.
4. Inspection and Maintenance of Erosion and Sediment Control Devices
 - a. Inspection The applicant or the applicants designated representative shall inspect all erosion and sediment control devices and make repairs at a minimum, of every 14 days, or after precipitation or snowmelt event that causes surface erosion. An inspection log shall be kept on site for review by the Town until the project is complete and submitted to the Town upon request.
 - b. Maintenance Erosion and sediment control devices shall be maintained in a manner to support their effectiveness. Accumulated sediment should be periodically removed from sediment basins and traps; straw bale and silt fence barriers should be checked for undermining and bypass and repaired or expanded as needed; and mulched soils shall be re-mulched where mulch has been lost or damaged.

C. SUBMITTAL REQUIREMENT

1. Erosion and Sediment Control Plan - Must be submitted for review and approval. The Erosion and Sediment Control Plan shall be prepared by a Colorado registered engineer, or if not needed for building plans a Colorado registered architect. This information may be included as part of a Stormwater Quality Control Plan, if required. A concise erosion and sediment control plan shall be submitted that addresses site-specific issues and contains the following information:
 - a. A site map showing construction site boundaries, locations of any existing structures, waterbodies or hydrologic features on the site, including intermittent water features, springs, landscape irrigation return flows, wetlands and the 100-year floodplain boundaries.
 - b. Locations of existing and proposed drainage structures or natural drainage features on the land adjacent to the site and within a minimum of 100 feet of the site boundary line, including as examples: Street gutters, storm sewers, drainage channels, other water conveyance structures, wetlands or other waterbodies receiving storm runoff from the site.
 - c. Existing topography at reasonable contour intervals, 2-foot or less if possible, to provide necessary detail of the site. The map should extend a minimum of 100 feet beyond the property line and show the location of the property line.
 - d. Proposed development plan and grading plan. The proposed topography at reasonable contour intervals that provide necessary detail of the site shall be submitted. The map should show elevations, dimensions, location, extent and slope of all proposed clearing and grading including building site, areas of cut and fill, and driveway grades.
 - e. Probable locations of soil stockpiles and snow storage areas.
 - f. Proposed drainage plan
 - g. Location of storage areas designated for equipment, fuel, lubricants, fertilizers, chemical and waste storage with an explanation of spill containment structures.
 - h. Location of temporary roads designed for use during construction period.
 - i. Areas of steep slope locations must be shown for the following conditions:

Existing Site:	areas greater than or equal to 10%
	areas greater than or equal to 30%
Developed Area:	areas greater than or equal to 10%
	areas greater than or equal to 30%
 - j. Construction schedule indicating the anticipated starting and completion time periods of the site grading and/or construction sequence including the installation and removal of erosion and sediment control measures, and the estimated duration of exposure of each area prior to the completion of temporary erosion and sediment control measures.
 - k. Permanent stabilization - A brief description of existing vegetation at the site including an estimate of the percent vegetative ground cover and a description of how the site will be stabilized after construction is completed.
 - l. Plan view drawings of all erosion and sediment control measures (such as sediment traps, silt fence, inlet protection, etc.) showing approximate locations and site drainage patterns. Text may be necessary to accompany and explain the drawings.
 - m. Detail drawings - For those measures that are not typical erosion control practices or require specific engineering design, such as sediment basin outlet works.
 - n. Estimated total cost (installation and maintenance) of the required temporary soil erosion and sediment control measures to assist the Town to determine performance

- guarantees, if any, for the proposed plan.
- o. Calculations - Any calculations made for determining rainfall, runoff, sizing any sediment basins, diversions, conveyance or detention/retention facilities.
 - p. Other information or data as may be reasonably required by the local jurisdiction.
 - q. Signature block for owner or legal agent acknowledging the review and acceptance of responsibility, and a signature and stamped statement by the qualified individual acknowledging responsibility for the preparation of the Erosion and Sediment Control Plan.
 - r. A copy of the required NPDES Construction Permit, if required. State and federal law mandates a Stormwater Permit for construction sites disturbing one acre or more even where the disturbance is phased. In most cases the information required herein will meet state submittal requirements.

DIVISION 3



Division 3 Water

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WATER

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SECTION 1**WATER TRANSMISSION AND DISTRIBUTION LINES****PART 1 SCOPE****1.01 SCOPE**

This section shall include all materials, labor, equipment and miscellaneous items necessary to install all raw water, potable water transmission and distribution pipelines and appurtenances as specified herein for the Town of Fairplay.

1.02 PROTECTION OF WORK

All pipe, fittings, valves and equipment shall be carefully handled, stored and protected to prevent damage to materials, protective coatings and linings. At no time shall such materials be dropped or dumped into the trench.

Precautions shall be taken to prevent foreign matter from entering the pipe, fittings and valves prior to and during installation. No debris, tools, clothing or any other material shall be placed in the pipe during installation. Whenever pipe installation is suspended, either temporarily or overnight, the open end of the pipe shall be sealed with a watertight plug to prevent the entrance of trench water, debris or foreign matter into the pipeline system.

Under no circumstances shall trench water be allowed to enter the pipeline. When water is present in the trench, the plug shall remain in place until the trench is pumped dry. Whenever trench water becomes evident, measures shall be taken to prevent pipe flotation.

If, in the opinion of the Engineer, the Contractor is incapable of keeping the pipe free of foreign matter during installation, the Engineer shall require the Contractor to protect the pipe ends with watertight plugs until the start of the joining operation.

PART 2 MATERIALS**2.01 GENERAL**

This item covers the types of materials that will be required for the construction and installation of water lines. All materials used shall be new, of the best quality available, and conform to applicable standards as indicated herein.

2.02 DUCTILE IRON (DIP) PIPE AND FITTINGS**A. DIP Pipe:**

1. Reference Standard -ANSI 21.51 / AWWA C151, latest edition, 4" - 12".
2. Thickness Class52.
3. Reference Standard – ANSI A21.44.Specialties - Tracing wire, 12-gauge stranded copper insulated wire with bolt type splices on all water mains, services and fire hydrants. All splices shall be watertight and underground. Tape wire to pipe and outside of valve boxes.
4. Size - Shall conform to outside diameter of DIP.

5. Restrained Joint Pipe – Shall be ductile iron manufactured in accordance with requirements of ANSI A21.5 / AWWA C151. Push-on joints for such pipe shall be in accordance with ANSI A21.11/AWWA C111. Pipe shall be Griffin Snap Lok or equal. Unless otherwise specified on engineered drawings.
 6. Cement mortar lining and bituminous outside coatings for the pipe and fittings shall be as specified above for ductile iron pipe.
 7. Restrained push-on pipe shall be capable of being deflected after assembly. Any special assembly tools recommended by the manufacturer will be supplied by the Town.
- B. Fittings
1. Reference Standard - ANSI A21.10 or 21.53 / AWWAC153. Fittings for pipes of 12” and smaller shall be C250 and for pipes larger than 12” C150
 2. Pressure Rating – 350 psi for C153 and 300 for C150.
 3. Gasket Reference Standard - ANSI A21.11, latest edition.
 4. The interior of the fittings shall be cement-mortar lined, as is required for the pipe with a 1 mil bituminous exterior coating. Gaskets for the joints shall be suitable for potable water service.
 5. Mega Lugs are required on all fittings.
 6. Core Blue bolts to be used on all fittings.
 7. Restrained push-on pipe shall be capable of being deflected after assembly. Any special assembly tools recommended by the manufacturer will be supplied by the Town.
- C. Joints
1. Push-on rubber gasket.
 2. Gasket Reference Standard - ANSI 2 A21.11, latest edition.
 3. Restrained joint fittings shall be ductile iron in accordance with applicable requirements of ANSI 21.10/AWWA C110 with the exception of the manufacturer’s proprietary design dimensions. Push-on joints for such fittings shall be as specified above for the pipe. Fittings Shall be provided by the pipe manufacturer.
- D. Polyethylene Encasement
1. Reference Standard – ANSI A21.5/AWWA C105. See Standard Detail W01.
 2. Polyethylene – The polyethylene film shall be manufactured of virgin polyethylene material conforming to the requirements of ASTM D-1248. The raw materials shall be Type 1, Class A (Natural) or C (Black, Grade E-1 with flow rate of 0.4 max. and dielectric strength of 10 ohm-cm min.
 3. Polyethylene Film – The finished polyethylene film shall have a minimum nominal thickness of .008-inch (8mil), and the minus tolerance on thickness shall not exceed 10 percent of the nominal thickness. The film shall have a minimum tensile strength of 1200 psi with an elongation of 300 percent minimum. The dielectric strength shall be 800 volts/mil thickness minimum.
 4. Tube Size or Sheet Width: The tube size of sheet width for each pipe diameter shall be as listed in the following table: Nominal Minimum Width (inch)

Nominal Pipe Diameter (inch)	Nominal Width (inch)	
	Flat Tube	Sheet
4	16	32
6	20	40
8	24	48
10	27	54
12	30	60
14	34	68
16	37	74

E. Thrust Restraint

1. Thrust Restraint- To be used where specified on engineered drawings or where existing conditions do not permit the use of concrete thrust blocks, fitting restraints shall be made with tie rods and clamps or special fitting bolts. Tie rod restraint system shall have a minimum of 2 bolts or rods per joint or clamp. Minimum tie bolt sizes are as follows: See Standard Details W02 and W03

Pipe Size	Bolt Diameter
4" – 8"	5/8"
10" – 14"	3/4"
16"	1"

The tie bolts shall be fabricated from "Cor-Ten" steel or equal according to the requirements of ASTM A242 with a minimum yield stress of 46,000 psi. Retainer clamps shall be equal to "socket clamp" as manufactured by ITT-Grinnell,

PART 3 INSTALLATION

3.01 GENERAL

All transmission and distribution lines to be dedicated to the Town of Fairplay shall be located a minimum of ten feet inside a public easement. The location of water lines within side lot line easements or rear lot easements is discouraged. Refer to Detail W09.

When site conditions allow, the water line should be located outside Concrete/paved areas. At all times, water lines shall be located so that Town maintenance personnel can easily maintain and operate those lines.

3.02 PIPELINE DEPTH

The minimum depth of bury of water mains shall be as follows: (Depth of bury equals depth to top of pipe).

- A. Mains shall be buried to a minimum depth of 9.5 feet below grade in all locations to top of water line. Mains shall not be buried more than 13.5-feet below grade in all locations to top of water line. Any water main that is outside of the required depth of bury must have an approved variance.
- B. When water mains are to be located underneath storm drains, culverts or any other submerged air space, the required depth of bury shall be 9.5 feet deeper than crossing

elevation. This is necessary to ensure that the water line is beyond the frost depth associated with the storm drain culvert, etc. In some cases, the Town Engineer may allow insulation in place of increased depth where water lines cross under one of the above. Of the ratio that 1 inch of insulation is equal to 1 foot of bury.

3.03 CLEANING AND INSPECTION

Clean all pipe, fittings, valves and related materials thoroughly of all foreign material; inspect for cracks, flaws, or other defects prior to installation. Mark all defective, damaged or unsound materials with bright marking crayons or paint and remove from job site. Of particular concern should be the gasket groove in the pipe bell. All spurs, excess paint, and any other defects within the gasket groove shall be either removed or repaired, or the pipe shall be deemed unacceptable.

The Contractor shall take all necessary precautions to prevent any construction debris from entering the water lines during construction of water lines and appurtenances. If debris shall enter the distribution system, the Contractor shall furnish all labor and materials necessary to clean the system. Under no circumstances will the Contractor flush the debris into an existing distribution system.

3.04 INSTALLATION

Pipe shall be laid in straight sections with bell ends facing the direction of laying unless otherwise directed by the Town. Where pipe is laid on grade of 10% or greater, the installation shall proceed uphill with the bell ends facing upgrade. The pipeline shall be installed so that a continuous positive or negative grade is maintained between high and low points to avoid air pockets. At no time will a high point in the line be acceptable unless an air and vacuum valve is installed to relieve air pockets. Jointing of the pipe shall be made in accordance with the directions of the manufacturer of the pipe and the manufacturer of the couplings. The allowable pipe deflection per joint shall not exceed the maximum deflection tolerances specified by the manufacturer.

Pipe shall be lowered into the trench with ropes, slings or machinery. Under no circumstances should the pipe be pushed off the bank and allowed to fall into the trench. In joining the pipe, the exterior four inches of the pipe end (at the spigot), and the inside of the adjoining bell shall be thoroughly cleaned to remove oil, grit, tar and other foreign material. The gasket shall be placed in the bell so it will spring into its proper position inside the pipe bell. A thick film of the non-toxic NSF approved joint lubricant shall be applied over the entire surface of the gasket. The spigot end of the pipe shall then be wiped clean and inserted into the bell to contact the gasket. The pipe shall be pushed all the way into the bell by crowbar or by jack and choker slings. Extreme care shall be exercised when joining the pipe to avoid damaging the bell or rolling the gasket. The bell end of the pipe shall be protected by a piece of wood when pushing the pipe. Generally, every pipe has a depth of insertion stripe on the spigot end. The pipe shall be inserted to the full depth of the stripe. Check bells for rolled gasket with feeler gauge.

The cutting of pipe for fittings or closure pieces shall be done in a neat and workmanlike manner to prevent damage to the pipe or lining. All cuts should leave a smooth end at right angles to the axis of the pipe. Once a pipe is cut, the cut end shall be beveled free of spurs, which may damage rubber gaskets.

3.05 ALLOWABLE PIPE DEFLECTION

- A. If permitted by the Town, gasket-joined pipe may be deflected with the following limitations as defined in the most current version of Ductile Iron Pipe Research Association (DIPRA).
 1. Contractor shall block or brace pipe joints to ensure bending of pipe does not result in joint offset that exceeds the manufacturer’s published limits as damage may occur.
 2. Deflection shall not exceed limits shown in table below.

<u>DUCTILE-IRON PIPE HORIZONTAL & VERTICAL DEFLECTION</u>			
<u>Size of Pipe</u>	<u>Bend in One Joint</u>	<u>Deflection in One 18-Foot Length</u>	<u>Approx. Radius of Curve Produced by Succession of 18-Foot Joints</u>
4"	4°	15"	250'
6"	4°	15"	250'
8"	4°	15"	250'
10"	4°	15"	250'
12"	4°	15"	250'
14"	2°	7.5"	510'
16"	2°	7.5"	510'

3.06 CONNECTION TO EXISTING WATER FACILITIES

All main line connections between existing and proposed piping shall be made during non-business hours or at a time which is acceptable to the Town. All shut-offs shall be planned 72 hours in advance and all persons affected by the shut-off shall be given 24-hour notice. Special circumstances may exist calling for evening or weekend shutoffs. Shutoffs will not be allowed on Fridays or weekends or holidays unless pre-approved. Take all precautions to prevent contamination when making connections to existing potable water lines. No trench water, mud, or other contaminating substances shall be permitted to enter the pipeline.

3.07 FUTURE CONNECTIONS

At intersections, dead-end runs, or other locations where the possibility may exist for a future connection, a tee or cross and a valve should be provided. In addition, the stub out must extend to the property line. This procedure allows a future connection to be made while keeping the existing main line in service at all times. In each case, the valve shall be properly restrained to the tee or cross, using restraining rods with eyebolts. In addition, a concrete reaction block will be placed on the plugged end of the valve. Valve box shall not be extended to surface grade.

3.08 PROTECTION OF WATER SUPPLIES

Water lines shall be located a minimum of 10 feet horizontally from existing or proposed sewer mains. Wherever the sewer line crosses above or within 18 inches beneath the water lines, the sewer line shall be made impervious by the following method listed below also refer to Detail W11.

- A. Twenty feet of AWWA DR18 C-900 PVC, shall be used for sewer pipe and centered over the water main. The joints between the sewer pipe and the placement pipe (PVC) shall be sealed with solid sleeves with transition gaskets. All work should be in strict conformance with the current Colorado Department of Health and Environment's "Design Criteria for Potable Water Systems".

3.09 REACTION ANCHOR AND BLOCKING

Concrete thrust blocks shall be provided as shown in detail W-7 for all tees, elbows, plugs, reducers, valves, fire hydrants, and crosses if one or more sides of the cross are plugged. The bearing area of the block shall be at least equal to that stated on the attachment. The bearing surface shall be against undisturbed earth. The block shall be placed normal to the thrust as show on the drawings. Concrete for thrust blocks shall have a 28 day 4,000 psi compressive strength. (NOTE: No other materials other than concrete may be used in thrust blocks and ready mix or bagged concrete is not allowed).

If the concrete has not had sufficient time to cure (e.g., restoring water service), the Contractor shall be required to use temporary bracing for added strength. Use of additional wood bracing will help prevent fitting and valves from leaking or "blowing off" when water pressure is restored to the main line.

Whenever a concrete thrust block is placed, wood or plastic sheets shall be used to prevent concrete from adhering to nuts and bolts. Any concrete splattering onto a nut or bolt will be removed before the line is backfilled.

3.10 TRACER WIRE

Electrical tracing wire shall be required on all water mains. The wire shall be taped to the top of the pipe at 10-foot intervals to prevent dislocation of the wire during backfilling. The tracer wire shall be extended to the surface at all valves and fire hydrants. The wire shall be extended towards the ground on the outside of the valve box until the wire is within 4 inches of the top of the lid, at which point it shall be brought back inside the box and securely fastened. Sufficient slack in the outside of the wire shall be provided to compensate for any future adjustment to the valve box. The tracer wire shall be continuity tested prior to acceptance of the pipeline.

3.11 DETECTABLE UNDERGROUND MARKING TAPE

Underground marking tape shall be a 3-inch width detectable marking tape, with a minimum 5.0 mil overall thickness. Tape shall be manufactured using a 0.8 mil clear virgin polypropylene film, reverse printed and laminated to a 0.35 mil solid aluminum foil core, and then laminated to a 3.75 mil clear virgin polyethylene film. Tape shall be printed using a diagonally striped design for maximum visibility and meet the APWA Color-Code standard for identification of buried utilities.

PART 4 SIZING OF MAINS

4.01 GENERAL

All main water lines shall be sized for peak hour flow plus fire flows required by the North-West Fire Protection District at a 20 PSI residual flow. The minimum size shall be 8-inches in diameter. The town has developed a hydraulic model of the water distribution system. This model shall be used for all new water main sizing.

SECTION 2**WATER SERVICE LINES AND APPURTENANCES****PART 1 GENERAL****1.01 SCOPE**

This section shall include furnishing all materials, labor, equipment and miscellaneous items necessary to install all water service lines and appurtenances as specified herein for the Town. Note: The customer will own and maintain the service line from the main line up to the residence/building including the curb valve. The curb valve shall be placed on the property line; however, at all times, it will fall on the Town side of the property line. All work and materials from the curb valve to the building shall be in conformance to the most recently adopted Uniform Plumbing Code.

PART 2 MATERIALS**2.01 WATER SERVICE PIPE**

- A. Reference Standard - ASTM B88, latest revision, Type K soft or HDPE of equal inside diameter (ID) to type K Copper. Tracer wire must be used with service line.
- B. Size - 1.0 – 2.0 inches.
- C. Do not use any pipe lubricants for service line fittings.

2.02 CORPORATION STOPS

- A. Material - Brass or bronze.
- B. Size - Same as copper service line.
- C. Reference Standard - AWWA C800, latest revision.
- D. Inlet - Threaded CC type.
- E. Outlet - Compression fittings.
- F. Manufacturer Reference-Ford Meter Box.

2.03 SERVICE SADDLES

- A. Materials - Bronze service clamp, 'O' ring gasket, double strap, brass, CC thread.
- B. The Town will require saddles to be installed on all service connections.
- C. Manufacturers reference – Mueller or Ford.

2.04 CURB STOP

- A. Materials - Cast bronze body, resilient 'O' ring seals, standard tee head operator, Teflon ball valve type.

- B. Riser rods – Stainless steel
- C. Inlet - Compression fitting.
- D. Outlet - Compression fitting.
- E. Standard reference AWWA C800, latest revision.
- F. Manufacturer's reference - Ford Meter Box.

2.05 CURB BOX

- A. 1.0 inch to 1.25 inch, Manufacturer's reference - Ford Meter Box.
- B. 1.5 inch to 2.0 inch, Manufacturer's reference - Ford Meter Box.
- C. Curb box must be traffic rated when located within traffic areas.
- D. Material type – Cast Iron

2.06 COUPLINGS

- A. Couplings are not allowed for services less than 100 feet long from the curb stop to the main and curb stop to house. In the case of a service line exceeding the available length of copper piping, couplings may be used. If a coupling is used the service line must be tested to 1.5 times normal working pressure or 150 psi minimum with the coupling exposed so a Town representative can verify.

PART 3 INSTALLATION

3.01 SERVICE LINE INSTALLATION

All trenching, backfilling and compaction shall conform to Section VI of these regulations. All service lines shall be disinfected and pressure tested as per Sections VII and VIII of these regulations. Refer to Detail W03.

3.02 SERVICE LINE DEPTH.

A depth of bury for all service lines shall be a minimum of 9.5 feet.

3.03 TAPPING PRESSURIZED MAINS

All 1-inch residential taps shall be a standard. Services greater than 1-inch are allowed with approval of the Town.

3.04 PERMITS

A road cut permit for excavation in Fairplay streets, alleys and easements must be completed prior to tap. 72 business hour notice is required by the Town prior to making taps and locating lines. Taps and locations will not be done without a water application filled out by Customer. Permits can be obtained from 8:30 am to 4:30 pm, Monday through Friday.

3.05 SERVICE LINE SIZING

Service lines are to be 3/4". Maximum copper service line allowed will be 1.0 inch with approval from the Town. The customer is encouraged to have an engineer size the service line. The Town will not provide this service.

3.06 EXTENDED SERVICE CONNECTIONS OVER 100 FEET

Extended service connections 3/4 or 1.0 inch in size shall be of k type soft copper or HDPE, pipe unions shall be connected with curb stop valves.

3.07 FINAL INSPECTION

The final inspection shall be scheduled with the Town 72 business hours in advance. The inspection will include inspection of the service connection, water meter, backflow device (if required), PRV, curb valve and sewer cleanout, and as-builts of all service lines.

PART 4 METERS

4.01 TYPE

Magnetic drive, sealed register, radio read meter interface unit. Turbo meters for 3 inch and larger.

4.02 MANUFACTURER'S REFERENCE

Sensus

4.03 INSTALLATION

Install all meters in a horizontal position with a suitable holding device to support piping, meter and provide electrical bond when meter is taken out for testing. Pre-manufactured holding devices or yolks are available which cut down labor time to install meter. Install in building where meter and pressure reducing valve will not freeze. Upon final inspection, if the meter is not able to be read by radio from the street, the MXU may need to be relocated on an outside wall at least 36-48" above grade where it is freely accessible and where falling or melting snow will not cover it (stucco construction can prevent the meters from being read by radio). MXU shall be easily accessible and located near the other utilities.

Turbine meters should be installed with five pipe diameters upstream or downstream of bends, valves, PRV's, check valves or any other fitting that causes turbulence.

4.04 METER INSPECTION

The water meter must be inspected by the Town at final inspection after it is installed and before the Certificate of Occupancy is issued.

PART 5 PRESSURE REDUCING VALVE (PRV) (REQUIRED IN-HOUSE)

5.01 MANUFACTURER'S REFERENCE

Zurn Wilkens.

5.02 INSTALLATION

Install downstream on all meters. Allow for easy access to strainer and cleanout plug.

5.03 PRESSURE TESTING

Downstream pressure to be set at 70 psi for single family and 90 psi for multi-story.

5.04 INSPECTION

PRV will be inspected during final inspection.

PART 6 BACKFLOW PREVENTION DEVICES

A testable backflow device may be required for new construction - consult with Town of Fairplay Public Works Director. Commercial complexes (low risk) and residential complexes that have a common water line are required to install a testable double check device. Testable devices must be tested every year and the results sent to the Town. Commercial and industrial complexes that use hazardous materials are required to install a reduced pressure assembly (RP). The RP device must be tested every year with the results sent to the Town.

A single backflow device may be insufficient to protect the water supply. Irrigation systems that use potable water must have a separate vacuum breaker. Most of the secondary installations are addressed in the plumbing code.

Because backflow devices prevent pressure from bleeding back to the water main, an expansion tank will need to be installed to prevent damage to the buildings water system.

6.01 TYPE

Double check backflow preventer or as required by state law

6.02 MANUFACTURER'S REFERENCE

Febco/Watts

6.03 INSTALLATION

Backflow prevention device must be installed after the meter and before the pressure reducing valve.

6.04 INSPECTION

Backflow preventer will be inspected during final inspection.

PART 7 ABANDONMENT OF SERVICES

7.01 WATER SERVICES

Shall be abandoned at the main. Abandonment will consist of removing the service from the corporation valve and closing the corporation valve and/or tapping valve.

7.02 WATER WELLS

All wells located on the subject property must be properly plugged and sealed as required by Rule 15 of the Colorado State Engineer's Regulations, or any amendment or revision of that rule. There shall be no direct connection between a private well and the Town's water system. It is the ultimate responsibility of the well owner to have a well properly plugged and sealed. Water rights associated with such wells must be assigned to the Town of Fairplay

before water service will be extended to such property. Evidence of well abandonment must be provided to the Town of Fairplay prior to issuance of Certificate of Occupancy. Additionally, a recorded copy of the Colorado State Well Abandonment filing must be provided to the Town of Fairplay within 90 days of abandonment.

SECTION 3**FIRE PROTECTION FACILITIES****PART 1 GENERAL****1.01 SCOPE**

This section shall include furnishing all materials, labor, equipment and miscellaneous items necessary to install fire hydrants as specified herein for the Town of Fairplay.

PART 2 MATERIALS**2.01 FIRE HYDRANTS**

- A. Type - Dry barrel, traffic model with breakaway flange bolts and coupling.
- B. Reference Standard - AWWA C502, latest revision
- C. Outlet Size - One 4.5 inch NST, two 2.5 inch NST
- D. Hydrant Size – 8 feet or greater, from bury line to top of pipe
- E. Inlet Size - 6 inch
- F. Operation – 1.5 inch pentagonal national standard operating nut, open counterclockwise, lubricating reservoir.
- G. Depth of Bury – 9.5 feet minimum
- H. Additional Requirements - Furnish hydrant complete with pipe and tee, 6 inch restrained mechanical joint gate valve and thrust blocks. Hydrant shall be restrained to the hydrant tee by 0.75 inch Core Blue bolts protected from corrosion by the use of an approved bituminous coating. Furnish hydrant with bronze seat and lubrication reservoir. Either all thread or mega lugs can be used.
- J. Manufacturer's Reference - Watrous
- K. Color - Hydrant to be painted red above the bury line.
- L. Pressure Rating - 250 psi

PART 3 INSTALLATION**3.01 HYDRANT SPACING**

The development density and type of development shall determine the spacing of fire hydrants that each hydrant is to serve. In a low-density residential area, the maximum spacing of fire hydrants shall not exceed 500 feet. In medium to high-density residential areas, the maximum spacing shall not exceed 400 feet. In commercial and high-risk areas, the spacing shall not exceed 300 feet. The maximum distance from commercial buildings to hydrants shall be 150 feet and shall be based on hose length.

3.02 LOCATION

Fire hydrants shall be located whenever possible at an intersection and in a public right-of-way or a utility easement. There shall be a minimum of 1.5 feet between outlet nozzle and back of curb or sidewalk. In all cases, hydrants shall be located out of the direct flow of pedestrian and vehicular traffic. Wherever possible, hydrants located consecutively along a street shall be placed on opposite sides of the street so that stringing fire hoses across a street during a fire can be kept to a minimum. Hydrants shall be placed at all intersections, at end of cul-de-sacs and at all dead-end runs. Hydrant location shall be approved by North-West Fire Protection District.

3.03 INSTALLATION

The bury line shall be located at finished grade. If the previously mentioned conditions are not met after the hydrant is installed and the street is at final grade, the hydrant must be brought to proper grade by installing extensions or other modifications as required. Bag all hydrants that are not in service. If the hydrants have been accepted by the Town and the hydrant needs to be raised due to homeowner landscaping problems then the cost of the hydrant raising will be the responsibility of the homeowner. All hydrants shall be plumb. Refer to Detail W-4.

3.04 HYDRANT APPURTENANCES

All fire hydrants shall be connected to the main line by means of a mechanical joint tee with 6 inch branch piping to hydrant. Each fire hydrant shall have a 6 inch valve on the branch pipe conforming to standards as outlined under Section V of these standards. The 6 inch gate valve shall not be located in the sidewalk, curb line, or gutter of the proposed street and shall be rodded to the main tee. Refer to Detail W-4.

3.05 HYDRANT RESTRAINT

The hydrant shall be restrained to the main line with 0.75 inch all-thread rod extending from the main line tee to the 6 inch valve and then from the 6 inch valve to the hydrant. The 0.75 inch rods shall be tied to each joint with the use of eyebolts. A bitumastic coating (to prevent corrosion) shall be liberally applied to the all-thread rod and eye bolts. In addition, the hydrant and main line tee shall be provided with concrete thrust blocks.

3.06 DRY BARREL TYPE DRAINAGE

All hydrants shall be provided with a minimum of 0.33 cubic yard of 0.75 inch screened, crushed rock and shall be placed under the weep hole outlet to assure proper drainage. The crushed rock shall be encased in separator fabric to prevent the mitigation of fines. Prior to the screened rock being placed under the weep hole outlet, the area around the weep holes on the hydrant will be covered with plastic sheeting allowing enough room under the sheeting for the hydrant to drain and also preventing concrete from entering the weepholes and covering any hardware.

3.07 INSPECTION

Prior to backfilling around the hydrant, a visual test shall be conducted to ensure the proper operation of the weep holes. The hydrant shall be partially opened and then closed. Water trapped in the hydrant barrel section should begin to drain. If water is not draining, the weepholes should be cleared of any obstructions restricting the flow of water.

SECTION 4

VALVES

PART 1 GENERAL

1.01 SCOPE

This section shall include furnishing all materials, labor, equipment, and miscellaneous items necessary to install gate valves, air release and vacuum valves, and valve boxes as specified herein for the Town of Fairplay.

PART 2 GATE VALVES

2.01 MATERIALS

A. Resilient seat.

2. Reference Standard - AWWA C509, latest revision.
3. Style - Iron body, resilient seat, parallel-seal conforming to AWWA C509 for buried service.
4. Pressure Rating - 250 psi.
5. Wrench Nut - Two-inch square, open by turning to the left (counterclockwise).
6. Stem - Non-rising.
7. Epoxy coated.
8. Manufacturers Reference – American Flow Control 2500 series resilient wedge.
9. All bolts shall be Core Blue
10. Mechanical joints shall be in accordance with ANSI A21.11 for valves connected to ductile iron pipe.

2.02 LOCATION

Whenever possible, water main valves shall be located at street intersections. Valves must be placed on all runs of a tee or cross. For instance, each cross shall have four valves located at the intersection while tees shall have three valves located at the intersection. Valves shall be located at the intersection within 3 feet of a tee, cross, or bend and all connections shall have Mega-Lug on the fitting. All mechanical joint fittings including those with tie rods will have Mega-Lug fittings and concrete thrust blocks. Valves shall be located at the end of all dead-end intersections for future connections.

2.03 VALVE SPACING

Valves on cross-connecting or looped mains shall be spaced such that no single break shall require more than 500 feet of line to be out of service at one time. All distribution mains connecting to transmission mains must be valved at the tie-in. Valves shall be required every 1,000 feet on transmission mains where service is limited.

2.04 INSTALLATION

All gate valves shall be installed with the 2 inch operating nut plumb and true with the vertical and centered within the valve box. Town personnel will inspect the valve and valve box after installation to ensure that a valve key can easily be set on the operating nut. The operating nut shall be within 8 feet of finished grade or an extension must be provided attached to the nut. Refer to Detail W-3.

PART 4 AIR RELEASE AND VACUUM VALVES**4.01 GENERAL**

This specification covers all air release, vacuum valves or combination air release valves. The type of valve used shall be dependent upon the conditions under which it will operate.

4.02 MATERIALS

- A. Size - To be designed by Engineer for proper application.
- B. Body - Cast iron.
- C. Float - Stainless steel.
- D. Seat - Buna-N.
- E. Pressure Rating - 200 psi.

4.03 LOCATIONS

Air release, vacuum valves or combination air release valves shall be installed on transmission and long distribution lines to permit efficient filling or draining of long pipelines. In addition, they should provide protection against vacuum and shall continuously vent pockets of air accumulated in the pipeline. The type of valve shall depend upon the intended use of operation.

4.04 INSTALLATION

Air release, vacuum valves or combination release valves shall always be installed at the extreme high point of the distribution or transmission line. These valves shall be installed in a precast manhole vault with the fittings as shown in Detail W-8.

PART 5 VALVE BOXES**5.01 MATERIALS**

- A. Material - Cast iron.
- B. Type - Two piece, screw type.
- C. Size – 5.25 inch diameter.
- D. Cover - Deep socket type with the word "Water" cast in the top. Buried to a 9.5 feet minimum.
- E. Base - No. 160 type with 20.5 inch wide oval base.
- F. Valve Markers - For valves that fall outside of road pavement and shoulders, install a 6 foot long, green "carsonite" marker or green metal "T" stake on all new valves. Marker shall have valve decal at top.
- G. Debris caps are required on all valve boxes.

H. Manufacturer's Reference - Tyler.

5.02 INSTALLATION

Valve boxes shall be installed plumb and true, and centered over the 2 inch operating nut. Bricks shall be placed under the flange of the valve box bottom so that at no time loadings on the valve box will be transmitted to the valve. Valve box lid to be placed 0.5 inch below grade when located in asphalt or concrete. A debris cap shall be installed as close as possible to the cast iron cap without interfering with the operation of the cap. Valves that are greater than 9 feet in depth, extension rods with a rod centering ring and set screw are required to bring valve nut within 5 feet of final grade. In addition, for valves over 9 feet deep, solid pipe are required instead of sectional valve boxes, these will incorporate valve box tops with standard lid. Refer to Detail W-3.

SECTION 5

PRESSURE TESTING AND FLOW TESTING

PART 1 GENERAL

1.01 SCOPE

This section shall include furnishing all materials, labor, equipment and miscellaneous items necessary to perform pressure and leakage tests all distribution, transmission and service lines as specified herein for the Town as defined in latest version of AWWA 605.

1.02 HYDROSTATIC TESTS

Pressure and leakage tests shall be conducted on all newly laid pipe and service lines. Contractor is to furnish all the necessary equipment and materials and conduct the test under the supervision of a Town engineer. Contractor shall test through fire hydrants if possible and will be responsible for installing the appropriate taps as approved by the Town engineer if a hydrant is not available used.

The test shall be conducted between valved sections of the pipeline, or as approved by the Town. Water service lines will be tested up to the closed curb stop. A visual inspection of the water service connection, at the water main and at the curb stop, will be performed to check the leakage; thus, Contractor shall not backfill the corporation and curb stop connections until inspection by a Town representative has been completed and accepted.

Furnish the following equipment and material for the tests:

<u>Amount</u>	<u>Description</u>
2	Approved graduated containers.
2	Pressure gauges.
1	Hydraulic force pump approved by the Town.
1	Additional 0.75 inch pressure tap for Town's gauge.
1	Suitable hose and suction pipe as required.

Conduct the tests after the trench has been backfilled or partially backfilled with the joints left exposed for inspection, or when completely backfilled, as permitted by the Town. Where any section of pipe is provided with concrete reaction blocking, do not make the pressure tests until at least 5 days have elapsed after the concrete thrust blocking is installed. If High-Early cement is used for the concrete thrust blocking, the time may be cut to 2 days.

Conduct pressure test in the following manner unless otherwise approved by the Town: After the trench has been backfilled as specified, fill the pipe with water, expelling all air during the filling. The test pressure shall be 1.5 times normal static system working pressure of the pipe at the point of lowest elevation (test minimum 165 psi).

A. Duration

1. The duration of each pressure test shall be two hours, unless otherwise directed by the Town.

- E. Flow Test
- D. Correction of Excessive Leakage
- C. Leakage
- B. Procedure

1. After new main has been leak tested, the line shall be flushed by opening 1 or more fire hydrants for approximately 10 minutes or until sediment has been flushed from system.

1. Should any test of pipe laid disclose leakage greater than that allowed, locate and repair the defective joints or pipe until the leakage of a subsequent test is within the specified allowance.

- Q = Allowable leakage (gallons per hour)
- L = Tested length of pipe (feet)
- D = Nominal diameter of pipe (inches)
- P = Average test pressure during the test (psi)

above formula:

$$\tilde{Q} = \frac{LD\sqrt{P}}{148,000}$$

In the

1. Leakage shall be defined as the quantity of water necessary to hold the specified test pressure for the duration of the test period. No pipe installation will be accepted if the leakage is greater than the number of gallons per hour as determined by the following formula:

1. Slowly fill the pipe with water and allow to stand for 24 hours. Expel all air from the pipe. Apply and maintain the specified test pressure by continuous pumping in necessary for the entire test period. The test pressure shall be calculated for the point of lowest elevation, or as specified by the Town. The pump suction shall be in a barrel or similar device, or metered so the amount of water required to maintain the test pressure may be measured accurately. Before the line is pressurized, the Town shall verify that all the necessary main line valves are open or closed with regard to the section of line being tested. In addition, the Town shall verify that all hydrant valves are open.

SECTION 6**DISINFECTION OF POTABLE WATER LINES****PART 1 GENERAL****1.01 DISINFECTION**

The following procedure shall apply to all main extensions within the Town service area. Pipe extensions shall be chlorinated in accordance with AWWA C600 and C651 *Standard for Disinfecting Water Mains*. *The intended high chlorine with any method of chlorination is to be 25 mg/l.*

Before filling the pipe with water, the pipe shall be clean and free of debris to the satisfaction of the Town.

Disinfecting by chlorination of the pipe shall be performed prior to acceptance by the Town. The chlorinating agent and method of application shall be in accordance with AWWA C651. The Contractor shall provide material for disinfecting of water mains.

If the tablet method of chlorination is used, during construction, calcium hypochlorite granules shall be placed at the upstream end of the first section of pipe, at the upstream end of each branch main at 500 foot intervals. The quantity of granules shall be as shown in the table below.

This method may be used only if the pipes and appurtenances have been kept cleaned and dry during construction. This method is not to be used on solvent welded plastic or on screwed joint steel pipe because of the danger of fire or explosion from the reaction of the joint compound with the calcium hypochlorite.

- A. 1.0 Method. Placing of calcium hypochlorite tablets. During construction, 5-g calcium hypochlorite tablets shall be placed in each section of pipe. Also, one tablet shall be placed in each hydrant, hydrant branch, and other appurtenance. Table 1 shows the number of tablets required for commonly used sizes of pipe. The tablets shall be attached by a food-grade adhesive. There shall be adhesive only on the broadside of the tablet attached to the surface of the pipe. Attach tablets inside and at the top of the main, with approximately equal numbers of tablets at each end of a given pipe length. If the tablets are attached before the pipe section is placed in the trench, their position shall be marked on the section to indicate that the pipe has been installed with the tablets at the top.

Table 1 Number of 5-g calcium hypochlorite tablets required for dose of 25mg/L*

Pipe Diameter <i>in.</i>	Length of Pipe Section, <i>ft</i>
	20
Number of 5-g Calcium Hypochlorite Tablets	
4	1
6	1
8	2
10	3
12	4
16	7

*Based on 3.25-g available chlorine per tablet; any portion of tablet rounded to the next higher integer.

2.00 TESTING

TOWN WILL PERFORM ALL CHEMICAL TESTING ON WATER SYSTEM

After the pipe is filled with water and chlorine, and unless approved otherwise by the Town, the chlorinated water shall be held in contact with the pipe for 24 hours. At the end of the 24 hour period, the water in the pipeline shall be tested by the Town to ensure a residual chlorine content of not less than 25 mg/l. The pipeline shall then be tested by the Town thoroughly flushed to remove the heavily chlorinated water and/or debris. Care shall be taken in flushing the pipeline to prevent property damage and danger to the public. Discharge of highly coordinated water shall not be released to any stream or watercourse. Samples of water will be collected for bacteriological examination and residual chlorine content testing before the pipeline is put into service. Testing of residual chlorine and bacteriological sampling and testing will be done by the Town.

No main which has been disinfected and flushed shall stand stagnant for more than 15 days without being re-flushed and a new disinfecting test performed, passed and approved by the Town.

3.00 DISCHARGING CHLORINATED WATER

After the applicable retention period, heavily chlorinated water should not remain in prolonged contact with pipe. In order to prevent damage to the pipe lining or to prevent corrosion damage to the pipe itself, the heavily chlorinated water shall be flushed from the main fittings, valves, and branches until chlorine measurements show that the concentration in the water leaving the main is no higher than that generally prevailing in the distribution system or that is acceptable for domestic use. The environment to which the chlorinated water is to be discharged shall be inspected. If there is any possibility that the chlorinated discharge will cause damage to the environment, a neutralizing chemical shall be applied to the water to be wasted to thoroughly neutralize the residual chlorine. Where necessary, federal, state, local, or provincial regulatory agencies should be contacted to

determine special provisions for the disposal of heavily chlorinated water. The chlorinated water shall not be discharged to the Town's sewer collection system.

4.00 DISINFECTION PROCEDURES WHEN CUTTING INTO OR REPAIRING EXISTING MAINS

The following procedures apply primarily when existing mains are wholly or partially dewatered. After the appropriate procedures have been completed, the existing main may be returned to service prior to the completion of bacteriological testing in order to minimize the time customers are without water. Leaks or breaks that are repaired with clamping devices while the mains remain full of pressurized water may present little danger of contamination and therefore may not require disinfection.

1. Trench treatment. When an existing main is opened, either by accident or by design, the excavation will likely be wet and may be badly contaminated from nearby sewers. Liberal quantities of hypochlorite applied to open trench areas will lessen the danger from this pollution. Tablets have the advantage in this situation, because they dissolve slowly and continue to release hypochlorite as water is pumped from the excavation.
2. Swabbing with hypochlorite solution. The interior of pipe and fittings (particularly couplings and sleeves) used in making the repair shall be swabbed or sprayed with a 1 percent hypochlorite solution before they are installed.
3. Flushing. Thorough flushing is the most practical means of removing contamination introduced during repairs. If valve and hydrant locations permit, flushing toward the work location from both directions is recommended. Flushing shall be started as soon as the repairs are completed and shall be continued until discolored water is eliminated.
4. Slug chlorination. Where practical, in addition to the procedures previously described, the section of the main in which the break is located shall be isolated, all service connections shut off, and the section flushed and chlorinated as described in previous section. The dose may be increased to as much as 300 mg/L and the contact time reduced to as little as 15 min. After chlorination, flushing shall be resumed and continued until discolored water is eliminated and the chlorine concentration in the water exiting the main is no higher than the prevailing water in the distribution system or that which is acceptable for domestic use.

5.00 BACTERIOLOGICAL TESTS

After final flushing and before the new water main is connected to the distribution system, 2 consecutive sets of acceptable samples, taken at least 24 hours apart, shall be collected from the new main. (NOTE: The pipe, the water loaded into the pipe, and any debris exert a chlorine demand that can interfere with disinfection.) At least one set of samples shall be collected from every 1,200 ft of the new water main, plus one set from the end of the line and at least one set from each branch. Samples shall be tested for bacteriological (chemical and physical) quality in accordance with Standard Methods for the Examination of Water and Wastewater; and shall show the absence of coliform organisms; and, if required, the presence of a chlorine residual. Turbidity, pH, and a standard heterotrophic plate count (HPC) test may be required at the option of the purchaser because new material does not typically contain coliforms but does typically contain HPC bacteria.

1. Special conditions. If trench water has entered the new main during construction or if, in the opinion of the Engineer, excessive quantities of dirt or debris have entered the new main, bacteriological samples shall be taken at intervals of approximately

- 200 ft, and the location shall be identified. Samples shall be taken of water that has stood in the new main for at least 16 hours after final flushing has been completed.
2. Sampling procedure. Samples for bacteriological analysis shall be collected in sterile bottles treated with sodium thiosulfate, as required by Standard Methods for the Examination of Water and Wastewater. No hose or fire hydrant shall be used in the collection of samples. (NOTE: For pipe repairs, if no other sampling port is available, well-flushed fire hydrants may be used with the understanding that they do not represent optimum sampling conditions.) There should be no water in the trench up to the connection for sampling. The sampling pipe must be dedicated and clean and disinfected and flushed prior to sampling. A corporation cock may be installed in the main with a copper-tube gooseneck assembly. After samples have been collected, the gooseneck assembly may be removed and retained for future use.
 3. Sample results. If sample results from the lab indicate a measured HPC greater than 500 colony-forming units (cfu) per mL, flushing should be resumed and another coliform and HPC set of samples should be taken until no coliforms are present and the HPC is less than 500 cfu/mL.
 4. Record of compliance. The record of compliance shall be the bacteriological test results certifying that the water sampled from the new water main is free of coliform bacteria contamination and is equal to or better than the bacteriologic water quality in the distribution system.

6.00 REDISINFECTATION

If the initial disinfection fails to produce satisfactory bacteriological results or if other water quality is affected, the new main may be re-flushed and shall be Re-sampled. If check samples also fail to produce acceptable results, the main shall be Re-chlorinated by the continuous-feed or slug method until satisfactory results are obtained—that being two consecutive sets of acceptable samples taken 24 hours apart.

NOTE: High velocities in the existing system, resulting from flushing the new main, may disturb sediment that has accumulated in the existing mains. When check samples are taken, it is advisable to sample water entering the new main to determine the source of turbidity.

7.00 DISINFECTING:

All water piping installed under this Contract shall be disinfected in accordance with AWWA C601 after all construction work has been completed. Chlorine shall be added to the water at the necessary locations in the amount to form a 25 mg/l or ppm free chlorine residual. The chlorine solution shall be left in the pipelines for not less than 24 hours, during which time all valves and fire hydrants shall be operated in order to disinfect the appurtenances. After that length of time, the chlorine residual of the solution at any place in the system shall not be less than 10 ppm. As required, the Contractor shall make all necessary taps for inserting the chlorine solution in the pipeline and venting and draining pipelines using approved corporation stops. After the disinfection has been completed and approved, the corporation stops shall be closed, left in place, and sealed with a cap. All chlorination work must be done under the supervision of the Engineer.

After approval of the disinfection operations, the Contractor shall flush the new system until the chlorine residual is less than 1.0 ppm and a clear water test made. After flushing a bacteriological test is to be performed and must be passed by the local health authority to

ensure adequate disinfection prior to the line being placed into service and approved.

END OF SECTION

SECTION 7**SPECIAL CONSTRUCTION****PART 1 GENERAL****1.01 SCOPE**

This section shall include the design and construction of aerial crossings, river crossings, storage tanks, pressure reducing vaults, and booster stations. Because each of these structures will require an engineered design to meet field conditions and individual design criteria, this section will not attempt to provide complete design guidelines and specifications. Rather, it will provide a general listing of guidelines that must be followed unless the Town approves an equivalent alternative.

PART 2 AERIAL CROSSING**2.01 GENERAL**

This section shall cover the design criteria to be used on aerial crossings, including water lines suspended from existing and proposed bridges, and lines aerially supported over steep canyons and arroyos. In both of the above crossings, an underground or river crossing will be required unless special circumstances render the below grade alternative prohibitive. If it is determined that a bridge crossing is acceptable to the Town, and then the following design criteria shall be followed.

2.02 PIPE SUPPORTS

If pipe is to be supported from an existing bridge, a structural analysis shall be performed to determine if the bridge can withstand the additional loading. If being installed on a new bridge, then additional pipe loading should be included as a dead load consideration.

Pipe shall be supported with a pipe hanger that allows longitudinal movement. Support shall be an adjustable steel yoke pipe roll or approved equal. In addition, a horizontal support from pipe hanger to the bridge shall be provided so that the pipe assembly will not move horizontally due to wind loads, etc. The spacing of the pipe hangers shall depend upon the maximum recommended load of hanger.

2.03 PIPE INSULATION

Aerial pipelines shall be prevented from freezing by pipe insulation. The insulation R-value and thickness shall be designed to a generally accepted standard for the Town of Fairplay area. The insulation should have a minimum R-value of 20. The insulation shall be non-absorbing to water.

2.04 INSULATION PROTECTION

Provide an aluminum jacket with moisture barrier strapped with stainless steel bands. Jacketing thickness shall be a minimum of 16 mil. Provide insulation protection shields.

2.05 PIPE

Provide Ductile Iron Pipe.

2.06. EXPANSION COUPLING

Provide a restrained expansion coupling between each rigidly supported point of the pipe. Follow all manufacturers' recommendations when installing. Expansion couplings shall be accessible to water department personnel for maintaining and making adjustments in couplings.

2.07 AIR AND VACUUM VAULTS

If bridge crossing is at a high point in line, install all air and vacuum valves appropriate for design conditions.

2.08 ISOLATION VALVES

An isolation valve shall be provided on either end of the bridge.

2.09. ACCESSIBILITY

Generally, the pipe should be placed in a location where personnel can easily access and maintain the pipe.

PART 3 RIVER CROSSINGS

3.01 GENERAL

This section covers the design criteria to be used on river crossings.

3.02 ENCASEMENT

Pipe shall be encased in concrete for the length of pipe underneath high-water mark.

3.03 PIPE

For river crossing, the pipe joints shall be push-on joints with joint restraint, Ductile Iron Pipe Class 54 or approved equal by Town Engineer.

3.04 BEND RESTRAINT

All vertical bends shall be restrained with mega lugs and vertical reaction blocks and all thread rods between bends or between bends and concrete thrust tie.

3.05 PERMITS

Generally, a river crossing will require a 404 Permit or Nationwide Utilities Permit from the Army Corps of Engineers. The Applicant should begin the permit process as soon as possible, as the process can take from 30-90 days to secure the permit. A Colorado Parks & Wildlife permit may also be required.

PART 4 STORAGE RESERVOIRS

4.01 GENERAL

This section covers the design criteria to be used on storage reservoirs. The Town may allow either a buried concrete or aboveground steel reservoir. The Town reserves the right to require either a concrete or steel tank depending on the field conditions, size and location of the tank. The Town shall determine the size and location of the storage tanks.

4.02 FOUNDATION DESIGN

A soil and geological report shall be provided which makes recommendations on the required foundation.

4.03 STRUCTURAL DESIGN

Complete structural design, with calculations and shop drawings submitted by a professional engineer shall be provided. If a welded steel tank is provided, it shall conform to AWWA D100, latest revision.

4.04 CDPHE REQUIREMENTS

All Colorado Department of Public Health and Environment, Water Quality Control Division regulations shall be followed.

4.05 TANK INSULATION

Not Applicable.

4.06 STEEL TANK PAINTING

Use an AWWA approved paint system for tank interior and exterior coating on all steel tanks. Painting shall conform to AWWA D102, latest revision.

4.07 RE-CIRCULATION PUMP

A recirculation pump will be required.

4.08 TELEMETRY, SCADA

The reservoir shall be fitted with telemetry that will communicate with the Town's existing SCADA system.

4.09 OVERFLOW

Needs to discharge to adequately sized, non-destructive location.

PART 5 PRESSURE REDUCING VAULTS (PRV) – DETAIL W-11

5.01 GENERAL

This section shall cover the design criteria to be used on pressure reducing vaults. The Town shall determine the location of PRV's.

5.02 PRV VALVE

The PRV valve shall be a Clayton valve as manufactured by the Cla-Valve Company. The main valve shall be a single seated, hydraulically operated, pilot controlled, diaphragm-type globe valve.

5.03 PILOT CONTROL SYSTEM

Cast bronze ASTM B62 with 303 stainless steel trim. Install isolation cocks, closing and opening speed control and strainers on pilot controls.

5.04 PRESSURE GAUGES

Install two stainless steel, liquid-filled, hermetically sealed pressure gauges with pressure snubbers, and isolation cocks. Locate at main inlet and outlet of vault so that if one PRV is isolated, gauges will still register.

5.05 BYPASS PIPING

Install a bypass around main PRV valve so that mainline can be filled and service maintained with PRV valve out of service. Bypass shall be installed with an isolation valve.

5.06 PRESSURE RELIEF VALVE

If damaging downstream pressure can result when PRV is stuck in open position, then a pressure relief valve, that drains to an acceptable location, shall be installed on downstream side of PRV on either the main line or bypass line. Pressure relief valve shall be piped to daylight and appropriate flow dissipation.

5.07 ISOLATED VALVES

Install isolation resilient seat gate valves inside of vault so that main PRV valve can be isolated outside of vault.

5.08 AIR RELEASE.

Install an air release and vacuum valve on both inlet and outlet of pipe in vault. Each air release valve to have an isolation valve.

5.09 PRV VAULT

All valves, appurtenances and pipe to be enclosed in a concrete or steel vault. Install link seal or equivalent between pipe inlets, outlets and vault wall. Provide frost-proof aluminum manhole lid marked "Water" on concrete vaults. Plastic covered steel MH rungs shall be provided on concrete vault with the first step not being greater than 18 inches from finished grade. Install concrete supports under PRV and tees.

5.10 FITTINGS

All main line fittings shall be ductile iron flanged fittings with Core Blue bolts.

5.11 RISING STEM WHERE TELEMETRY EXISTS.**PART 6 WATERLINE INSULATION – DETAIL W-6****6.01 GENERAL**

This section shall cover the installation to be used on water lines when insulation is required. The Town engineer will approve the use of insulation on waterlines if the conditions will not allow the waterline to be buried deep enough to obtain 9.5 feet of depth below the lowest storm drain pipe.

6.02 INSTALLATION

In areas where 9.5 feet of depth is unable to be obtained between the waterline and the lowest storm drain pipe insulation can be approved by the Town engineer. The insulation shall encase the waterline 4 feet in either direction of the crossing. Four inch thick polystyrene (Blue Trustee's) shall be installed 1 foot away from the pipe on both sides and the top. Contractor shall provide a minimum of 18 inches between the top of the insulation and the invert of the storm drain. See Detail W-9.

6.03 TRANSMISSION LINE TAPPING

Not allowed.

6.04 PIPE JACKING/BORING

6.05 GENERAL

This section shall cover the installation of utilities within a pipe casing that has been jacked or bored. Refer to Details W12 and W13 for design and installation details.

6.06 MANUFACTURE'S REFERENCE. CASCADE CST – EX

PART 7 WATER METER VAULT – DETAIL W-10

7.01 GENERAL

This section shall cover the design criteria to be used on water meter vaults. Refer to Detail W-10 for water meter vault details.

END OF SECTION

SECTION 8

CROSS CONNECTION CONTROL ORDINANCE

PART 1 GENERAL

1.01 THE TOWN OF FAIRPLAY'S AUTHORITY TO IMPLEMENT AND MAINTAIN A CROSS-
CONNECTION CONTROL PROGRAM is contained in the following legislation.

1. The Town of Fairplay Municipal Code, Chapter 13, Article II.

END OF SECTION

SECTION 9**TRENCHING, BACKFILLING AND COMPACTION****PART 1 GENERAL****1.01 SCOPE**

Work to be performed under this section shall include all labor, equipment, materials and miscellaneous items necessary to perform all excavation, backfilling and compaction of underground pipelines, conduits, cables and appurtenances shown on the Drawings and specified herein.

All work within the rights-of-way of the Federal Government of the Colorado Division of Highways, County Governments or Municipal Governments shall be done in compliance with requirements issued by those agencies. All such requirements shall take precedence over these Specifications. It shall be the Contractor's responsibility to secure all required excavation permits and pay all costs thereof. Contractor will be required to obtain necessary road cut permits.

1.02 FIELD CONDITIONS

- A. Existing Utilities. Underground utilities, except service lines, known to the Engineer have been shown on the Drawings. Locations are approximate only and may prove to be inaccurate. The Contractor is responsible for verification of the existence, location and protection of all utilities within the construction area.

Before commencing with work, the Contractor shall notify all public and private companies who may have utilities within the project limits. The Contractor shall coordinate with these entities all excavation performed. The Contractor shall obtain all permits required by utility owners.

In the event of damage to any existing utility, the Contractor shall be solely responsible for the repair and payment for repair of all such damage.

The Contractor shall make arrangements for and pay all costs for relocation of utilities requiring relocation as indicated on the Drawings. Should utility obstructions, not shown on the Drawings, be encountered and require relocation, the Contractor shall notify the Owner and the Engineer and shall make arrangements necessary for such relocation. The Owner shall pay the costs for such relocation.

- B. Existing Improvements. The Contractor shall restore or protect from damage all existing improvements encountered in performance of the work. Improvements damaged, as a result of this work shall be restored to original condition or better, as determined by the Engineer.

Adjacent property shall be protected by the Contractor from any damage. The Contractor shall be held solely liable for any damage to adjacent property and shall be responsible for all costs resulting from repair of such damage.

- C. Soil Conditions. It shall be the responsibility of the Contractor to examine soil conditions and characteristics, including the presence of groundwater that will be encountered within the limits of construction.

1.03 PROTECTION OF WORK

- A. Safety. All excavation shall be protected by barricades, lights, signs, etc., as required by governing federal, state and local safety codes and regulations.
- B. Sheet piling, Shoring and Bracing. Where trench walls are not excavated at a stable slope, the Contractor shall provide and maintain support sufficient to prevent caving, sliding or failure and property or bodily damage. Any damage due to inadequate support shall be repaired at the sole expense of the Contractor.

Under normal construction conditions, support shall be removed as work progresses. Support shall remain installed if directed by the Engineer or if pipe does not have sufficient strength to support backfill based on trench width as defined by the sheet piling. Sheet piling shall not be removed after the start of backfilling.

Use of a movable trench shield or coffin box will not be allowed where pipe strength is insufficient to support backfill as defined by the trench width after the trench shield is removed.

The Contractor shall be held solely responsible for any violation of applicable safety standards. Particular attention is called to minimum requirements of OSHA and Colorado Occupational Safety and Health (COSHA).

- C. Site Drainage. Excavation to be protected from surface water at all times. At no time shall excavated area be allowed to fill with storm water runoff. Contractor shall provide proper, temporary drainage structures at their cost to detour runoff from excavated areas.

1.04 BLASTING

No blasting shall be permitted without written consent of the Engineer. Blasting shall be done only after Engineer receives permission from the appropriate governmental authority(ies). Blasting shall be performed only by properly licensed, experienced individuals and in a manner such that no damage to any property or persons will occur due to either the blast or debris. Contractor shall provide proof of insurance as required by these Specifications, the governing authority or as required by Engineer prior to any blasting. All damage, as the result of blasting shall be repaired, at the Contractor's expense, to the satisfaction of the Engineer. All earth or rock loosened by blasting shall be removed from excavations prior to proposed construction.

1.05 CONSTRUCTION IN STREETS

When construction operations are located within streets make provisions at cross streets and walks for free passage of vehicles and pedestrians. Do not block streets or walks without prior approval.

1.06 SUBMITTALS

- A. Bedding Material
 - 1. Submit sieve analysis.
- B. Select Fill
 - 1. Submit sieve analysis.

PART 2 MATERIALS

2.01 EMBEDMENT MATERIAL

Pipeline embedment material shall comply with the appropriate classes as listed below and as illustrated in the approved Construction Drawings:

- A. Class A - Use for all PVC, CMP and concrete pipe under normal construction conditions.
 - 1. Characteristics - Densely compacted Class 6 aggregate granular foundation of depth shown on Typical Details with densely compacted Class 6 aggregate 12 inches above top of pipe.
- B. Class B - Use where improper trenching or unexpected trench conditions require its use as determined by the Engineer.
 - 1. Characteristics - Concrete cradle foundation with densely compacted Class 6 aggregate base backfill to 12 inches above top of pipe, or densely compacted Class 6 aggregate granular foundation with concrete arch cover to 6 inches above top of pipe.

2.02 SELECT MATERIAL

- A. Subject to approval by the Engineer, select material shall be allowed in place of the aggregate backfill for Class A when excavation and soil conditions allow, but only if approved by Engineer.
- B. Contractors shall bid project based upon Class A. If Class B or select material is used, price adjustments shall be made.
- C. Characteristics - Soil materials free from rocks, clods, and organic material.

2.03 CONCRETE FOR EMBEDMENT

Shall be 2,000 psi concrete (28- day compressive strength).

2.04 BACKFILL MATERIAL

- A. Characteristics - Native materials free from debris, organic matter and frozen material. Uniformly graded sufficient to allow proper compaction.
- B. Gradation - No boulders greater than 6 inch diameter in top 12 inches of backfill. Generally, no boulders greater than 12 inch diameter in remainder of trench.

PART 3 METHODS AND PROCEDURES

3.01 SITE PREPARATION

- A. Clearing. Remove all vegetation, stumps, roots, organic matter, debris and other miscellaneous structures and materials from project site. Dispose of off-site.
- B. Topsoil Removal. Strip existing topsoil from all areas to be disturbed by construction. Topsoil to be stockpiled separately from excavated materials.

3.02 TRENCH EXCAVATION.

- A. Limits of Excavation. Trenches to be excavated along lines and grades shown on the Drawings, or as modified in the field by the Engineer. Trench widths for pipe loading to be measured 12 inches above top of pipe.

Trench excavation not to be completed more than 100 feet in advance of pipe installation. Backfill to be completed within 100 feet of pipe installation.

- C. Facilities shall be maintained until all concrete is cured and backfilling is in place at least 24 inches above anticipated water levels before water removal is discontinued; all water removal shall be subject to approval by the Engineer.
- D. Stockpile Excavated Material. Excavated material to be stockpiled so as not to endanger the work or public safety. Maintain existing vehicular and pedestrian traffic with minimum disruption. Maintain emergency access and access to existing fire hydrants and water valves. Maintain natural drainage courses and street gutters.

Backfill material to be segregated from stockpiled topsoil and unusable backfill materials.

- E. Excavation for Appurtenances. Excavation to be done in accordance with these Specifications and as shown on the approved Drawings. Adequate working clearances to be maintained around appurtenances. Provisions for base and bottom preparations shall apply to all appurtenances.

Precautions to be taken to maintain trench widths in the vicinity of adjacent pipelines and conduits.

3.03 BOTTOM PREPARATION

- A. Undisturbed Foundation. Where soils are suitable and have adequate strength, bottom to be graded that pipe barrel rests uniformly on undisturbed soil. All rocks or stones that may result in a point bearing on the pipe shall be removed.

Undisturbed grades shall be within 0.1 feet tolerance. Soils for final pipe grade placed within these limits shall be ¾-inch screened rock.

- B. Bell Holes. Material to be removed to allow installation of all fitting and joint projections without affecting placement of pipe.

- C. Over excavation. Whenever trench is over-excavated to eliminate point bearing by rocks or stones or when undisturbed grade tolerances of 0.1 foot are exceeded, the Contractor is to re-establish grade using Class 6 aggregate bedding material. Compaction shall be 95% maximum density. All work to re-establish grade shall be at the Contractor's expense.
- D. Unstable Materials. Materials that are not capable of supporting super-imposed loadings are defined as unstable materials. Should unstable materials be encountered during excavation, immediately notify Engineer. If, in the opinion of the Engineer, unstable soil excavation is required and the Contractor could not have reasonably been expected to discover the existence of such materials during their site investigation, then a contract price for Unstable Soil Excavation shall be negotiated between Owner and Contractor. No payment shall be made for materials excavated prior to notification of the Engineer and negotiation of payment for extra work.

Inclusion of a bid item for Unstable Soil Excavation indicates such excavation is anticipated. The Contractor is to notify the Engineer prior to any unstable soil excavation; no payment shall be made for excavation prior to authorization of Engineer.

- E. Rock Excavation. Rock excavation shall be defined as removal of boulders in excess of 3 cubic yards of solid or fractured rock, which makes hand shaping of the bottom impossible and which requires techniques, such as blasting or jacking for removal, other than those which are being employed by the Contractor or are normally used in trench excavation, such as use of backhoes, trenchers, draglines, etc. Should unanticipated rock conditions be encountered, immediately notify the Engineer. If in the opinion of the Engineer, rock excavation is required and the Contractor has in fact made a diligent and determined effort to remove the material using normal excavation procedures as stated above, and the Contractor could not have reasonably been expected to determine the existence of such material during their site investigation, then a contract price for rock excavation shall be negotiated between the Contractor and the Owner. No payment shall be made for excavation performed prior to determination of a negotiated price.

Rock shall be removed to a 4 inch depth below grade. Additionally, all rock loosened during jacking, blasting, etc., shall be removed from the trench. For payment purposes, maximum trench width to be paid for shall be as defined in Subsection 3.02,

- F. Maximum depth to be paid for shall be 12 inch below required grade. All over-excavation shall be replaced as specified in Subsection 3.03, C.

Inclusion of a bid item for rock excavation indicates such excavation is anticipated. Contractor to notify Engineer prior to any rock excavating; no payment shall be made for excavation prior to notification.

3.04 BACKFILLING

- A. Tamping Equipment. Except immediately next to the pipe, mechanical or air operated tamping equipment to be used. Hand equipment, such as T-bar to be used to pipe if necessary. Care to be taken when compacting under, alongside and immediately above pipe to prevent crushing, fracturing shifting of the pipe. The Contractor is to note densities required for materials are or being backfilled and shall use appropriate approved equipment to obtain those densities.

Wheel rolling is not considered to be an adequate compaction technique to meet these Specifications and will not be allowed. Where 85% compaction is required, wheel rolling may be considered. Before acceptance, the Contractor shall backfill a portion of the trench and pay for density testing to verify adequacy of the proposed backfill techniques.

A hydro hammer may be allowed to obtain the specified density up to 4 feet in depth. The Contractor will be required to re-excavate those areas that have been tamped so that density tests can be taken to insure that the specified density is being obtained full depth.

- B. **Moisture Control.** Generally maintain moisture of backfill material with 2% of optimum moisture content as determined by ASTM D698. Maintain closer tolerances as needed to obtain densities required.
- C. **Compaction.** Maximum density (100%) based on ASTM D698 or AASHTO T99.
 - 1. Bedding Material, including material used for over-excavation of any kind: 95%.
 - 2. Select Material: 95%
 - 3. Backfill beneath existing or proposed pavement, roadways, sidewalks, curbs, utility lines and other improvements or within 5 feet horizontally of such improvements: 95%.
 - 4. Backfill within public or designated right-of-way: 90% or as shown on the approved Drawings.
 - 5. Backfill within undeveloped, green or undesignated area: 85%.
 - 6. Backfill for any fill over overcut grading in areas of lot/home construction: 95%.
- D. **Placing Backfill.** The maximum loose lifts of backfill material to be as follows: use smaller lifts where necessary to obtain required densities:
 - 1. Bedding and select material: 6 inches (or see Section 3.03A).
 - 2. Backfill Material: 12 inches where 95% compaction required; 24 inch where less than 95% compaction required.
- E. **Backfilling Appurtenances.** Backfilling to be done generally at the same time as adjacent pipelines. Backfilling procedure to conform to this section. Use special techniques or materials as shown on drawings.
- F. **Disposal of Excess Excavation.** Contractor to dispose of excess excavation off site. The Owner shall have the right to elect to have the excess excavation disposed of at a designated site within the project limits. Excavation may be wasted on-site only if approved by the Engineer. Disposal in any case shall be the sole responsibility of the Contractor.
- G. **Jetting.** Jetting and water inundation are generally not permitted methods of compaction. The Engineer may allow jetting under certain field conditions. Techniques including depth of lifts, amount of water to be used, penetration of hose jet, etc., shall be at the direction of the Engineer. No jetting will be allowed on materials with a 200 minus gradation of greater than 15%. Contractor shall pay cost of all water used, soil classification testing and retesting or recompaction required. No jetting shall be done prior to written approval and direction of the Engineer.
- H. **Maintenance of Backfill.** Contractor to maintain all backfill in a satisfactory condition during the extent of the contract and warranty period. All surface deterioration determined to be

the responsibility of the Contractor and the Contractor upon notice by the Owner shall repair all settlement at once. All costs for repair and all liability, as a result of surface deterioration or settlement, shall be the responsibility of the Contractor.

- I. Clay Barrier Water Stops. Because of the presence of ground water, a clay barrier may be required to be installed full depth in trench in place of all bedding material and backfill. This barrier shall be full depth and two feet thick and installed every 100 linear feet of trench. Clay barrier installation shall be considered incidental to the pipe installation and not paid for separately.

3.05 SURFACE RESTORATION

All existing surface improvements and site conditions disturbed or damaged during construction to be restored to a condition equal to pre-construction condition. All restoration costs are considered incidental to excavation and backfill.

- A. Improvements. Replace, repair or reconstruct all improvements as required. Work will not be accepted until restoration is accepted by Engineer and all affected property owners. Improvements include, by example, other utilities, culverts, structures, curb and gutter, mailboxes, signs, sprinkler systems, etc.
- B. Final Grading. The Contractor is to re-establish existing final grade or finish final grades as modified and shown on the approved Drawings. The Contractor is to backfill to proper subgrade elevation with backfill material to allow placement of surface improvements or materials.
- C. Roadways. All roadways to be restored to original condition with material types removed. Materials and methods to conform to applicable portions of current Colorado Department of Transportation (CDOT) specifications. Additional requirements are:
 1. Minimum base course material on gravel roadways or minimum depth gravel on hard surface roadways to be 8 inch, unless shown otherwise on approved Drawings.
 2. Minimum bituminous surfacing to be 3 inch unless shown otherwise on approved Drawings.
 3. Minimum concrete pavement surfacing to be 6 inch, unless shown otherwise on approved Drawings.

PART 4 QUALITY CONTROL - FIELD

4.01 COMPACTION

It should be fully understood that it will be the sole responsibility of the Contractor to achieve the specified densities for all embedment and backfill material placed. Contractor will be responsible for ensuring that correct methods are being used for the placement and compaction of said materials. Correct backfill methods include, but are not limited to:

- A. Use of proper equipment for existing soil condition encountered.
- B. Moisture content of existing soils; determination if water should be added or if soil should be air dried to reduce moisture content.

- C. Thickness of backfill lift. Contractor may, at their own expense, have an approved geotechnical engineer monitor the methods of backfill and compaction used to ensure that the desired densities are being obtained. Inspection and testing will be performed as directed by the Town. Testing will be conducted as a quality control check to verify the Contractor's compliance with the standards indicated the Specifications.

4.02 INSPECTION AND TESTING

Inspection and testing to be performed at the direction of the Engineer. Contractor to cooperate fully with all persons engaged in testing. Contractor to excavate as required to allow testing. Contractor to backfill all test excavations in accordance with these Specifications. Any areas, which require a specified density, including fill, backfill, trenches, embankments, road base, hot bituminous pavement, backfill for structures, shall be tested.

4.03 DENSITY TESTING AND CONTROL

- A. Reference Standards. Density/moisture relationships to be developed for all soil types encountered according to ASTM D698 or AASHTO T99.B.Field Testing. Testing for density during compaction operations to be done in accordance with ASTM D2922 using nuclear density methods.
- C. Frequency of Testing. A minimum of 1 test every 250' trench per lift or as directed by Engineer. Contractor to excavate to depths required by the Town for testing and backfill test holes to density specified.
- D. Retesting. In the event of failure to meet compaction criteria, Contractor shall re-excavate and re-backfill in the direction of Town. All retesting to be paid for by Contractor and to be performed by soils testing firm approved by the Town.

DIVISION 4



Division 4 Minimum Design Standards

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STREET STANDARDS

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SECTION 4.0 – MINIMUM DESIGN STANDARDS

STREETS

4.01 GENERAL

All curb, gutter, sidewalk and street design, rights-of-way and street widths shall conform to the minimum requirements of the Town of Fairplay Street and Drainage Master Plan and the Fairplay Municipal Code. Definition of streets shall be as defined therein. Care shall be taken to ensure continuity of grades, widths, etc., of proposed, existing and future installations. Private non-commercial streets and parking lots shall be built to these standards, including curbs, gutters and sidewalks, unless otherwise approved by the Town Engineer.

4.02 GEOMETRICS AND GRADES

Streets having a percentage of grade along the centerline stationing equal to or greater than one (1) percent shall be designed with two (2) percent crown. Where percentages of grade along centerline stationing are less than one (1) percent, crown shall be increased to three (3) percent. Back of walk elevations shall be set equal on all streets. Where intersection is encountered in the design, the cross section of the street approaching another shall be transitioned (for seventy-five (75') feet) from a crown slope to a cross-slope condition, matching the intersecting streets flowline grade. In no case shall a flowline slope at an intersection.

The following shall be the maximum and minimum grades and minimum length of vertical curves for all street design. The Town Engineer may permit deviations from these requirements when, in his judgment, terrain conditions are such that minimum or maximum grades as set forth are not feasible. Absolute minimum grade that may be considered by the Town will be 0.5% and shall be carried in continuous intervals not to exceed 100 ft. as indicated by centerline stationing. Percentage of grade along the centerline through intersections shall not exceed five (5) percent. Centerline street profiles shall be extended for future construction, beyond the limits of the project being designed, for a distance of 1,000 feet or to connect to an existing improved street, whichever is the lesser.

<u>Design Geometrics</u>	<u>Type of Street</u> Minor &	<u>Unit</u>	<u>Local</u>	<u>Collector</u>	
Nominal Design Speed		MPH	20	20	
Maximum Grade		%	10	8	
Minimum Grade	(1)	%	1	1	
Vertical Curve @ Crest	(1) (2) K		25	50	100
Vertical Curve @ Sag	(1) (2) K		35	50	80
Centerline Radius	(1)	Ft.	100	175	
Sight Distance – Stopping	(1) (3) Ft.		200	250	375
Sight Distance – Intersection	(1) (4) Ft.		300	350	450
Tangent Section between Reverse Curves	(1)	Ft.	50	150	

1. All values are minimums.
2. Length of vertical curve $L=KA$, A= Algebraic difference in grade.
3. Measured from height of eye 3.75 ft. to a height of six (6) inches on pavement.

4. Measured from a point on the minor road at least 15 ft. from the edge of the major road pavement and measured from a height of eye of 3.75 ft. to a height of object of 4.5 ft. on the major road.

4.03 STREET DESIGN

Construction of streets shall conform with the following design standards and regulations:

- A. The street pattern shall conform to any transportation plan or comprehensive plan adopted by the Board of Trustees and shall afford safe and convenient access to all lots within the subdivision.
- B. Streets shall be designed to join with planned or existing streets.
 1. Intersections of streets shall be at right angles unless otherwise approved by the Board of Trustees and the Town Engineer.
 2. No more than two streets shall intersect at one point.
 3. Two local streets meeting a third street from opposite sides shall meet at the same point, or their centerlines shall be offset at least one hundred feet (100').
 4. Collector streets meeting a third street from opposite sides shall meet at the same point, or their centerlines shall be offset at least one hundred feet (100').
 5. The Town Engineer may approve exceptions to the provisions of this subsection in extraordinary circumstances where safety is not compromised.
- C. Streets shall have the names of existing streets which are aligned in the Town, or as specified by the Town of Fairplay Public Works Manual.
- D. Streets which are an extension of existing or platted streets shall bear the same classification as that assigned to the existing or platted street in any adopted transportation or comprehensive plan and shall conform to any special standards pertaining to such classifications.
- E. Local residential streets shall be laid out to discourage through traffic, and where a proposed subdivision borders on or includes a street designated arterial intersections of proposed streets with such arterial shall be held to a minimum. Lots bordering arterial roadways may be either reverse facing on an interior street within the subdivision or served by a frontage road.
- F. Streets shall be designed to bear a logical relationship to the existing topography.
- G. Culs-de-sac shall not exceed four hundred (400) feet in length and shall have a turnaround with a minimum radius of fifty (50) feet at the closed end. In the event the cul-de-sac drains into the closed end, storm sewers or other drainage structure shall be required to dispose of storm water satisfactorily.
- H. All subdivision streets shall comply with the "Typical Roadway Sections" which may be adopted and amended from time to time by resolution of the Board of Trustees. Streets, alleys, rights-of-way, sidewalks and easements shall comply with all federal and state specifications, and in addition, shall meet the following minimum width standards:
 1. Collector streets shall have a minimum right-of-way of sixty (60'), with a minimum paved portion and measured from flow line to flow line, of forty-four feet (44');

2. Local residential streets shall have a minimum right-of-way of sixty feet (60'), with a minimum paved portion of thirty-six feet (36'), measured from flow line to flow line;
3. Alleys (where permitted), twenty feet (20').
4. Crosswalk easements, ten feet (10').
5. Drainage easements, ten feet (10'), or larger if so required by the Town Engineer.
6. Half-streets shall not be permitted, except when required to complete a half street already in existence;
7. All utilities shall be installed before streets or alleys are surfaced;
8. Subdivision as-builts shall show dedicated right-of-way;

4.04 ALLEYS AND EASEMENTS

Paved alleys may be provided and shall be required unless other provisions are made and approved for service access. Easements for utility purposes shall be required along all sides and real lot lines. Drainage easements shall be designed to accommodate expected runoff and shall comply with the provisions of the Town of Fairplay Public Works Manual.

4.05 STREET IMPROVEMENTS

All street improvements described in the Town of Fairplay Public Works Manual are the financial responsibility of the subdivider, subject to the provisions of the Town of Fairplay Public Works Manual, unless specifically exempted through written agreement with the Board of Trustees. All streets and alleys proposed for dedication to the public shall be laid out, graded and paved from curb to curb, and painted to the specifications of the Town. Curb and gutter and sidewalks shall be installed on all streets unless special circumstances warrant the Board of Trustees to specifically waive installation in writing. In cases where a previously existing street which has not been brought up to Town specifications is located within a subdivision, such street shall be paved with curb and gutter; sidewalk and other improvements shall be installed in order to meet Town specifications. If any subdivision is located adjacent to any existing street right-of-way, the subdivider shall provide such street with improvements as required to bring such street up to Town specifications. The subdivider shall provide and install street signs to all street intersections and also traffic control signs as requested by the Board of Trustees through their designated representatives, or shall reimburse the Town for their initial installation. Permanent reference monuments and monument boxes shall be installed by the subdivider to Town specifications, as shall bicycle paths where they are required by Town regulations. Streetlights when required by Town regulations shall be installed.

4.06 CURBS, GUTTERS, SIDEWALKS AND CROSSPANS

All curbs, gutters, sidewalks and crosspans shall conform to the Town of Fairplay Standard Drawings. Standard combination curb, gutter, and sidewalk sections shall be six and a half foot (6'6") wide in locations noted as follows:

- A. On individual streets where the obsolete section exists intermittently along 50% of the total frontage of both sides of the street, or where it is reasonable and practical to continue the obsolete section as determined by the Town Engineer. (Intermittently shall be interpreted to mean at least three (3) different sections with at least one (1) section on each side of the street).

- B. Where obsolete sections exist to boundary of earlier subdivision, this section shall be continued in new subdivision to first radius point.
- C. Where existing obsolete section is being replaced.
- D. Sidewalks are required on both sides of all streets and shall be at least four feet (4') wide in residential areas and eight feet (8') wide in commercial areas. All streets shall have vertical curb and gutter and attached sidewalk. The design of streets in commercial and industrial areas shall be approved by the Board of Trustees.
 - 1. Construction of sidewalks shall be to specifications set by the Board of Trustees through their designated representatives.
 - 2. All sidewalks shall be ramped to meet ADA standards at all street intersections or other pedestrian crossing areas.

4.0.7 UTILITIES

All house service lines, main lines, etc., shall be installed according to Town of Fairplay Standard Specifications prior to paving of any street.

4.0.8 DRAINAGE

All streets shall be designed to provide continuous surface drainage directed to storm drain inlets and drainage courses. Grades shall permit flow without ponding. Five (5) feet concrete crossspans shall normally be installed across those streets at intersections carrying traffic, which must stop. Installation of pans between intersections or across streets carrying through traffic at intersections shall be avoided in all possible cases. A check shall be made to be sure of continuity of drainage design between the proposed construction and existing of future construction. In no case shall surface drainage be permitted to be disposed of overland except by approved storm drainage facilities.

Private driveways located within Town rights-of-way shall have minimum 18-inch diameter CMP or ADS culverts installed at flowline of street ditch. Driveway culverts shall be owned and maintained by the property owner or HOA.

Private driveways located outside Town rights-of-way shall have a minimum of 18-inch diameter CMP or ADS culverts, but diameter may be reduced with written approval of Town Public Works Director. Driveway culverts shall be owned and maintained by the property owner or HOA.

Storm drain culverts under public roads within Town rights-of-way shall be owned and maintained by the Town.

4.0.9 FLEXIBLE PAVEMENTS

Flexible pavement shall consist of deep strength asphaltic concrete or a combination of asphaltic concrete and granular base course. Pavement thickness shall be determined by use of underlying soil group index values. These values shall be determined by recognized soils testing laboratories under direction of professional engineers. Samples for group index value determinations shall be taken between gutter lip lines of proposed streets at 300-foot intervals for all new streets. Where the length of the proposed new street is less than 300 feet, two (2) group index determinations shall be made. Test results shall be interpreted in

such a manner as to insure adequate pavement thickness in all cases. Where testing indicates maximum average group index values less than 4.0, deep strength thickness shall be taken as six (6) inch minimum for collector and four inch (4") minimum for local streets. Minimum thickness of base and asphaltic pavement combinations shall be three (3) inch asphaltic concrete, twelve (12) inch pit run and six (6) inch road base for collector and local streets respectively. Where group index values exceed 4.0, pavement thickness shall be determined from standard drawing. Where appreciable changes in group index values occur for different streets throughout a subdivision, thickness may vary but thickness shall remain constant throughout each street.

END OF SECTION

SECTION 4.1

CONSTRUCTION MATERIALS AND METHODS

STREETS

4.1.1 GENERAL

Curb, gutter, crosspans, sidewalk, ramps, driveway access, street surfacing and/or rejuvenation of asphaltic surface in public right-of-way under the jurisdiction of the Town, shall be installed in accordance with approved engineered plans, these Specifications and the General Conditions of the Public Works Manual of the Town of Fairplay.

Requirements for site preparation, care of topsoil, excavation, embankment and treatment of cut areas are covered in Section 4.3 of these Standard Specifications.

The contractor shall obtain a street cut permit and notify the engineer in writing, twenty-four (24) hours before the planned construction is to commence or when work is to be resumed following a delay.

The Town shall perform all required asphalt paving of Town streets per ordinance 578.

4.1.2 MATERIALS

Materials that are to be manufactured, processed, furnished and installed in street subgrades and finished surfaces shall conform to the minimum standards hereinafter referred to.

Specifications for materials as set forth by the American Society for Testing Materials (ASTM), the American Association of State Highway Testing Officials (AASHTO) and the Colorado Department of Transportation (CDOT) are made a part of these specifications. Referenced standards are considered to be the latest edition and revisions thereof.

4.1.3 CONCRETE

Class "A" concrete, as set forth in Part 2 Section 9 of these Standard Specifications, shall be used in the construction of curbs, gutters, sidewalks and cross pans.

4.1.4 BORROW

Loose friable soil reasonably free of refuse, stumps, roots and rocks. The maximum dimension of any rocks placed in fills shall not exceed two-thirds of the depth of lift being placed or twelve (12) inches, whichever is the lesser.

4.1.5 AGGREGATES FOR SUBBASE, BASE COURSE AND SURFACE COURSES

Aggregate and soil aggregate meeting the gradation hereinafter specified which have a plastic index not to exceed six (6), when tested in accordance with AASHTO T89 and T90 respectively, shall conform to the quality requirements of AASHTO M-147 except as modified below.

A. SELECT SUBBASE

Sieve Designation	% by weight passing 2/3 (depth of lift) 100
Characteristics	Retained on #10-LA abrasion-(not applicable)
Characteristics	Passing #4 – L.L. 30 max.

B. BASE COURSE

<u>Sieve Designation</u>	<u>% by weight passing</u>	
	<u>Class 5</u>	<u>Class 6</u>
2 1/2"		
2"		
1 1/2"	100	
1"	95-100	
3/4"		100
#4	30-70	30-65
*8		25-55
#200	3-15	3-12
L.A. Abrasion	50 max	50 max
Liquid Limit	30 max	30 max
Plastic Index	6 max	6 max

Recycled concrete meeting the above requirements can be substituted.

A. HOT PLANT MIX; PAVEMENT AGGREGATE

<u>Sieve Designation</u>	<u>% by weight passing</u>		<u>Application</u>
	<u>Grading S (2)</u>	<u>Grading SX (2)</u>	
	<u>Surfacing</u>	<u>Overlay</u>	
1"	100		
3/4"	90-100		
1/2"		90-100	
3/8"			
#4	(1)	(1)	
#8	23-49	28-58	
#3			
#200	2-8	2-10	

1. 50% of the aggregate by weight retained on the #4 sieve shall have at least two (2) fractured faces when tested in accordance with Colorado Department of Transportation Procedure 45.
2. Aggregates shall have a percentage of wear, when tested in accordance with AASHTO T-96, of not more than forty-five (45).

4.1.6 CHIP SEAL COAT COVER AGGREGATES

Aggregates for cover coat material shall be 100% crushed stone, crushed slag, crushed gravel, or natural gravel conforming to the following requirements:

- A. % of wear, Los Angeles Test (AASHTO T-96), not more than 35.
- B. 100% of the gravel by weight retained on the No. 4 sieve shall have at least two (2) fractured faces.
- C. When tested in accordance with AASHTO T-182, aggregate shall have a retained bituminous film above 95%.
- D. Meet the following gradations:

<u>Sieve Designation</u>	% by weight passing		<u>Application lbs / sq.yd.</u>
	<u>Type II</u>	<u>Type III</u>	
1/2"	100	100	
5/8"	-	-	
#4	0-15	0-30	
#200	0-01	0-1	20-25

4.1.11 BITUMINOUS MATERIALS

Asphaltic cements shall conform to the requirements of AASHTO M 320 and liquid asphalt materials shall conform to the requirements of AASHTO M-81, M-82 and ASTM D-2026 for the designated types and grades

Emulsified asphalt shall conform to AASHTO M-140 and M-208 for the designated types and grade.

Asphalt rejuvenating agents shall be composed of a petroleum resin-oil base uniformly emulsified with water and shall conform to the quality requirements of the Colorado Department of Transportation.

- A. Prime Coat shall be MC-70 bitumen applied at the rate of 0.25 – 0.25 gal/sq.yd. of surface area.
- B. Cement shall be PG58-28, or as stated in the contract. incorporated with hot plant mix pavement aggregate at the rate determined by a Mix design prepared by a Professional Engineer meeting the requirements of Section 401 of the Colorado Department of Transportation Current Standard Specifications.
- C. Tack Coat shall consist of one (1) part Grade CSS-1h emulsion conforming to AASHTO M-208 and one (1) part water, applied at the rate of not more than 0.1 gal/sq.yd. of surface area.
- D. Seal Coat shall be a cationic rubberized or polymerized asphalt emulsion.
- E. CRS-2P or HFRS-100S when applied at the rate of 0.30 – 0.35 gal/sq.yd. of surface area are considered as meeting this specification.

4.1.12 GEOGRID

4.1.13 GEOTEXTILE FABRIC

Geotextile fabric to be in accordance with Section 712.08 of the latest revisions to the Colorado Division of Transportation Standard Specifications for Road and Bridge Construction.

4.1.14 CONSTRUCTION PRACTICES

All work in public rights-of-way shall be constructed to the lines and grades called for on Town approved plans. Stakes to control the work shall be set in the field by survey parties working under the supervision of a registered land surveyor. Town survey crews will establish the control for Town projects and controls established by developers are subject to checking by Town crews.

Bituminous materials and aggregates conforming to the material section of these specifications, shall be blended to the proportions of the job mix formula, spread, finished and compacted in place, utilizing equipment and procedure methods as set forth in Sections 401.01 through 401.20 of the Colorado Department of Transportation Standard Specifications and these specifications.

4.1.15 SITE PREPARATION, EXCAVATION, AND EMBANKMENT

(See Section 4.3 of this public works manual).

4.1.16 CURB, GUTTERS, SIDEWALKS AND CROSSPANS

All curbs, gutters, crosspans, sidewalks, walk ramps and driveways shall be cast in place to conform to the dimensions and contain the reinforcing called for by the Town of Fairplay Standard Detail Drawings. Preparation of subgrade shall be in accordance with the requirements of Section 4.3 of these Standard Specifications. Forming, concrete placing, finishing and cutting shall conform with the requirements set forth in Section 4.3.

Crosspans, curb return wings, driveways, walk ramps and sidewalks shall have a concrete thickness of not less than six (6) inches. Detached sidewalks that are not subjected to vehicular traffic shall have a minimum concrete thickness of four (4) inches. Crosspans and curb return wings shall be reinforced with #4 rebar at 2 foot centers in both directions as called for in the Standard Drawings.

Where curbs and gutters are adjacent to and constructed in conjunction with sidewalks, the concrete shall be placed simultaneously on a compacted subgrade. Monolithic concrete so placed, as in all slabs on grade, shall be divided into ten (10) foot sections by dummy joints formed with a jointing tool. Dummy joints shall extend into the concrete for a depth of not less than $\frac{1}{4}$ of the slab concrete depth and shall be approximately $\frac{1}{8}$ " in width.

Pre-molded expansion joint filler $\frac{1}{4}$ " to $\frac{1}{2}$ " in thickness that extends for the full depth of the concrete shall be installed between all, concrete sidewalks, driveways, and any fixed structures or appurtenances such as manholes, utility poles, etc.

Back of curbs and edges of sidewalks shall be backfilled and shaped to drain after the forms have been removed. Areas between Property lines and back of sidewalk or curbs shall be shaped and uniformly graded.

4.1.18 AGGREGATE BASE COURSE

Base course shall be placed and compacted in four (4) inch to six (6) inch layers on a prepared subgrade surface in conformity with the lines, grades and typical cross sections shown on the plans.

Each layer shall be densified to ninety-five (95) percent of the Modified Proctor when tested in accordance with AASHTO T-180. Water shall be uniformly applied during compaction so as to achieve proper consolidation.

The prepared surface, ready to receive the surface course shall be uniformly graded to design elevation so when tested with a ten (10) foot straight edge the variation above or below the testing edge, between any two (2) contact points with the surface, shall not exceed 1/2" for Class 1 or 1/4" for Class 5 or Class 6 base course. Areas that do not conform with these tolerances shall be reworked.

4.1.19 ASPHALTIC CONCRETE JOB MIX FORMULA

The job mix formula developed in conformance with by the Colorado Department of Transportation Standard Specifications on the aggregates to be incorporated in the asphaltic concrete surface must be submitted to the Town of Fairplay Public Works Director for approval prior to commencing the work.

Hot plant mix surfacing material using aggregates from sources that have not been tested, for the purpose of developing a job mix formula, within nine (9) months prior to the date of intended delivery will be rejected.

The job mix formula with allowable tolerances shall be within the master range specified in the material section of these specifications.

4.1.20 MANHOLE AND UTILITY BOX ADJUSTMENTS

Manholes, valve, and survey range boxes shall be adjusted to $\pm 3/8$ " of finish grade after the surface course of asphalt is placed. The contractor shall remove all foreign matter found or introduced into them in the performance of his work, and it shall be his responsibility to insure proper compaction around same after they have been adjusted.

On streets that are being sealed, the contractor shall cover the manhole and valve covers with a roofing paper or other suitable material prior to sealing. The covering shall be left in place for a minimum of forty-eight (48) hours after which it shall be removed and disposed of. All covers shall be clean when work is complete.

On streets that are being overlaid with asphaltic concrete the contractor shall adjust the valve boxes and manhole lids by adding riser rings.

4.1.21 BITUMINOUS PRIME OR TACK COATING

Compacted subbase material, in place and shaped to subgrade elevation, shall be primed or tacked to the limits specified in the Special Conditions or at the rates stated in Guidelines for Design and use of Asphalt Pavements for Colorado Roadways.

Bituminous materials shall be applied to the width of the section to be coated by means of pressure distributions in a uniform and continuous spread. Care shall be taken that the application of bituminous material at any point, especially at the junction of spreads, is not in excess of the specified amount. Coatings shall not be applied when the surface is wet or when the temperature is below fifty (50) degrees Fahrenheit.

Coatings shall be applied in such a manner as to offer the least inconvenience to traffic and to permit one-way traffic without pickup or tracking of the bituminous material.

4.1.22 BLOTTING

If after the application of the prime coat or rejuvenating agent, the bituminous material fails to penetrate or if chip and seal applications bleed, approved blotter material shall be spread in the amounts required to absorb any excess bituminous material.

4.1.23 FLEXIBLE PAVEMENT

Hot plant mix asphaltic concrete shall be prepared and mixed to the proportions of the Colorado Department of Transportation job mix formula for the aggregate source, in accordance with Section 401.13 through 401.15 of the CDOT Standard Specifications.

Hot plant mix asphaltic concrete shall be placed only on properly prepared or constructed and accepted subgrades that are free of water, snow or ice. Contact surfaces of curbs, gutters, manholes and other structures shall be tack coated with a thin uniform coating of RC of SS-IH bituminous material prior to placing asphaltic concrete adjacent thereto.

Asphaltic concrete, to provide in place compacted thickness of four (4) inches or less, shall be placed and struck off by means of bituminous pavers. Use of spreader boxes to place the bituminous mixtures shall be limited to asphaltic sidewalks or trails, trench patching and the bulbs of cul-de-sacs. Black base bituminous mixtures, whose in place compacted thickness is to be greater than four (4) inches and less than seven and one half (7 ½) inches, may be uniformly spread using a patrol. In areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable, the mixture shall be spread, raked and luted by hand tools. For such areas the mixture shall be dumped, spread and screeded to give the required compacted thickness.

Along the lip lines of gutters and crosspans sufficient bituminous material shall be deposited so that, after compacting, the wearing surface will remain not less than 1/4" nor more than 1/2" above the concrete when compacted to a catch curb. For median or spill curb wearing surface will be from 1/8" to 1/4" below concrete.

Longitudinal joints in the wearing surface layer shall be hand luted and provide a uniform transition, after compacting, between passes with the paving machine. They shall also be positioned such that they will overlay any sublayer longitudinal joint by six (6) inches. Longitudinal joints in the wearing surface shall be generally located as follows:

- A. For two lane roadways – at the center line of the pavement and at the outside edge of the traveled lanes.

- B. For roadways of more than two lanes – at the lane lines and at the outside edge of the travel lanes.

The bituminous mixtures shall be placed within the air temperatures limitation designated herein below and only with the weather conditions otherwise permit the pavement to be properly placed and finished.

PLACEMENT TEMPERATURE LIMITATIONS

<u>MINIMUM COMPACTED LAYER THICKNESS</u>	<u>WEARING SURFACE MINIMUM PLACEMENT AIR & SURFACE TEMPERATURE</u>	<u>BLACK BASE MINIMUM PLACEMENT AIR & SURFACE TEMPERATURE</u>
1" or less	60 degrees Fahrenheit	50 degrees Fahrenheit
>1" to 3"	50 degrees Fahrenheit	40 degrees Fahrenheit
>3"		30 degrees Fahrenheit

Asphaltic concrete shall be handled and placed on the prepared subgrade in such a manner as to minimize segregation. All segregated areas behind the pavers shall be removed immediately upon discovery and replaced at contractor's expense, with specification material before the initial rolling. If more than fifty (50) square feet of segregated material is ordered removed and replaced in any 500 linear feet of paver width laydown, paving operations shall be discontinued until the source of the segregation has been found and corrected.

After the asphaltic concrete has been spread, struck off and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. Rolling of the surface shall begin as soon after spreading as rolling will not cause undue displacement cracking or shoving of the mixture. Rolling shall start at the sides and proceed longitudinally parallel with the street center line, each trip overlapping one-half (1/2) of the roller width, gradually progressing to the crown of the street. Rolling shall be continued until all roller marks are eliminated and a minimum density of change to match CDOT specs for superpave mix designs of a laboratory specimen made in the proportions of the job mix formula has been obtained.

On lifts of asphaltic concrete three (3) inches or more in thickness breakdown rolling shall immediately follow the spreading sequence using rubber tired rollers, free of recapped tires, followed by steel wheel rolling. Field density determinations will be made in accordance with Colorado Procedure #44 and #81.

Variation between any two (2) contacts with the surface shall not exceed 3/16" in ten (10) feet. All lumps or depressions exceeding the specified tolerance shall be corrected by removing defective work and replacing it with new material as directed.

4.1.24 PARKING LOTS, TRAILS AND WALKWAYS

Subgrades for parking lots, bicycle trails and walkways shall have all vegetation removed, subgrade shaped, compacted and the soils then sterilized prior to installing base course and/or asphaltic concrete to prevent plant growth.

Asphaltic concrete Grading S or SX shall be placed and compacted to a minimum compacted thickness of four (4) inches for bicycle trails and walkways, and a density of match superpave mix requirements of a laboratory specimen made in proportion to the job

mix formula. Compaction shall be uniform and accomplished by means of Town approved power rollers and/or hand tamping. Only in areas inaccessible to rollers will hand tamping be permitted. Asphalt thickness for parking lots shall be as called for in the plans.

4.1.25 STREET PATCHING

Areas in streets designated to be patched shall have the broken asphalt and subgrade materials removed to a depth of six (6) inches and disposed of. The patch subgrade shall then be stabilized with 1.5 inch rock as directed or compacted and fine graded. The perimeter of the patch area shall be trued to vertical uniform line and then tack coated with a thin uniform coating of RC or SS-IH bituminous material prior to placing and compacting asphaltic concrete adjacent thereto and therein.

4.1.27 GEOGRID – SUBGRADE STABILIZATION

Subgrades to be geogrid stabilized shall be cleared of all vegetation or topsoil and then proof rolled to determine local soft spots, observe deflections, rutting and/or pumping. Areas so identified shall be excavated and the void thus created shall be refilled with approved granular material and again proof rolled and shaped, as directed in the field by the Town Representative.

Sections of specified geogrid shall then be rolled to cover the subgrade, cut and trimmed to clean manholes and valve boxes by one foot while providing a minimum roll overlap of one and one-half feet along the seams. On areas that cannot be covered and properly overlapped with two rolls of geogrid; installation shall commence along the perimeter edges and proceed towards the center of the area making sure the minimum overlap along seams is obtained. Seams between rolls shall be anchored or tied together with wire, polyethylene braid, or stakes driven through the apertures of overlap, on ten (10) foot centers.

Select granular fill materials shall then be end dumped adjacent to the exposed geogrid and then advanced to cover the geogrid in a minimum five (5) inch lift using a front end loader or dozer. At no time shall the equipment, advancing the fill cover, be in direct contact with the geogrid.

After the initial five (5") inch granular cover lift is placed, the entire lift shall be proof rolled. Rutted and settlements that develop shall be filled with additional select material. Proof rolling and adding of select materials shall continue until the entire geogrid is in tension, the area being stabilized is to the plan designated elevation of cover material, or as directed.

4.1.28 GEOTEXTILE FABRIC PAVEMENT SYSTEMS

Base course and soil subgrades shall be shaped and compacted to grade in preparation for placement of geotextile fabric. Previously asphalted surfaces shall have all holes and soft spots patched with Colorado Department of Transportation Grading C hot bituminous asphalt. Existing cracks narrower than 3/8 inch in width shall be filled with a liquid asphalt cement. Cracks larger than 3/8 inch shall be filled with an approved asphalt filler. After patching and filling the existing asphalt surface shall have all dirt, water and grease removed there from. When required, truing or leveling courses of asphalt shall be in place prior to installation of the fabric.

The approved surface to be overlaid shall then be given a tack coat of PG 58- 28 asphalt cement, applied at the rate of 0.20 to 0.25 gallons per square yard, and immediately covered thereafter with the geotextile fabric.

Laydown of the fabric shall be performed such that there are no wrinkles and the overlap between rolls is between two (2) and six (6) inches. Where wrinkles occur, the fabric shall be cut and laid flat. Corrected wrinkle areas and seams between rolls shall be retacked with asphalt cement to insure fabric saturation.

Fabric shall be installed to within zero (0) to six (6) inches of gutter lip lines or crossspans with a minimum of two inches (2") of asphalt. If pavement is not milled, fabric shall be installed to eighteen inches (18") within curb line. Around manholes, valve boxes, vaults, etc. the fabric shall be neat line trimmed and cut so as to clear the intrusion by one (1) foot.

Immediately after the fabric is in place, asphalt overlay paving shall commence. The minimum compacted thickness of asphalt overlay pavement, installed over a geotextile fabric, shall be 1 ½ inches. Use of fabric at locations where a potential for shoving exists, such as turning lanes and stopping intersections, is not recommended.

4.1.29 COLD MILLING, ASPHALT SURFACES

All valve boxes, manhole rings and covers within the area to be cold milled shall be lowered sufficiently to clear the milling operation, and then raised to within 3/8 inch of the resurfaced finished grade. Electric and phone vaults shall not be lowered but shall be protected from damage during the performance of the work.

Cold milling shall be performed using mechanical equipment capable of uniformly routing materials while providing a uniform milled level or tapered surface, varying between 6 ½ to 8 feet wide and zero to 2 ½ inches in depth, per pass. Milled edges shall be vertical and true with the alignment of each pass of the equipment.

Electric and phone manholes and vaults are to be left with gradual asphalt tapered approaches in alignment with traffic flow when resurfacing will not immediately follow the milling operation. Such approaches left to facilitate traffic adjacent to vaults, crossspans, utility manholes, structures, etc. shall be milled out or removed by other acceptable means, immediately preceding the resurfacing operation. Leaving of abrupt vertical edges that will impede traffic will not be allowed.

Where milling is required along and parallel with concrete gutters the router shall be set to provide a uniform tapered slope. The slope shall vary from two (2) inches below the gutter lip line to daylight with the existing asphalt surface, 6 ½ to 8 feet from and perpendicular to the gutter flow line.

Material recovered during the milling operation shall be disposed of by the contractor at his expense, unless otherwise directed.

Unless otherwise approved, milling and resurfacing shall be performed simultaneously such that both operations are completed during the same day.

4.1.30 OVERLAY SURFACE TREATMENT

Surfaces designated for asphaltic concrete overlay treatment shall have all soft areas removed and asphaltic concrete compacted in the void thus created. All cracks shall be sealed and low spots brought to grade with a leveling course of asphaltic concrete. The entire area shall be free of water and broom cleaned prior to commencing the leveling and/or overlay operation.

Cleaned areas to be leveled shall be tack coated, at the rate of 0.10 gallon per square yard with a 1:1 diluted CsS-1h emulsified asphalt. The tacked surface shall then be brought to grade by blade spreading or box laying and rolling therein, Colorado Department of Transportation Grading SX hot bituminous asphalt concrete.

Areas prepared for overlay shall be tack coated as specified above, for the leveling course. However, when a geotextile fabric is to be installed, the surface shall be tack coated with PG58-28 asphaltic concrete, applied at the rate recommended by the supplier.

Plant mix asphaltic concrete conforming to the Colorado Department of Transportation Grading SX shall be placed to an average compacted yield of 1 ½", or as directed over the tacked area. Plant mix asphaltic concrete shall be installed in accordance with the requirement set forth herein for flexible pavement. Except the compacted finished grade of asphaltic concrete at gutter lip line may not exceed the lip line elevation by more than one inch.

END OF SECTION

SECTION 4.2

CONSTRUCTION MATERIALS AND METHODS

CONCRETE

4.2.1 GENERAL

All concrete and reinforcing placed in structures that are considered as capital improvements to the Town of Fairplay shall conform to approved engineered plans and these specifications.

Specifications of the American Society for Testing Materials (ASTM), detailed recommendations for acceptable practices set forth by the American Concrete Institute (ACI) and the Concrete Reinforcing Steel Institute (CRSI) are made a part of these specifications.

The contractor, through his fabricator, shall prepare and submit shop drawings showing all dimensions for fabrication and placing of the reinforcing steel, form work and accessories for review and approval before fabrication, when called for in the Special Conditions.

4.2.2 MATERIALS

Materials that are to be incorporated in the structure shall conform to the minimum standards hereinafter referred to, unless otherwise approved.

4.2.3 CEMENT

- A. Portland Cement, conforming to the requirements of ASTM C-150 Type I or II.
- B. Chemcomp, expansive shrinkage compensating cement, as manufactured by Texas Industries, Inc., or equal product licensed by and conforming to the requirements of the Chemical Prestressed Concrete Corp. (CPCC).

Admixtures

- C. Air Entraining Agent conforming to the requirements of ASTM C-260, Protex R03300-3, or approved equal.
- D. Water Reducing Agent conforming to the requirements of ASTM C-494, Master Builders Pozzoloth, or approved equal. No accelerators or admixtures containing chlorides will be permitted.
- E. Retarding Agent conforming to the requirements of ASTM C-494, Type B, Master Builders MB-HC, or approved equal. If Type D is used, adjust mixture of water reducing agent.

Lignin type retarders will not be permitted.

- F. Coloring Agent, when called for in the Special Conditions, shall conform to:
 - 1. Dry Shake Type, W.R. Grace & Co. Colorundum, or approved equal. Master Builders Colorcron will not be permitted.

- 2. Mix Dry type, W.R. Grace & Co. Staybrite, Master Builders Colormix, or approved equal.
- G. Fibrous Concrete Reinforcement: 1.5 lbs/cy o 100% virgin polypropylene fibrillated fibers, as manufactured by Fibermesh Co., Chattanooga, Tennessee, or approved equal, shall be plant batched into the mix when called for in the Special Conditions.
 - 1. Water – Potable, nonalkaline water devoid of salts and other injurious elements for concrete mixing shall be used.

4.2.4 AGGREGATES

- A. General: All fine and course aggregates shall conform to the following specifications:

Concrete Aggregate	ASTM C-33
Unit Weight of Aggregates	ASTM C-29
Organic Impurities Colormetric	ASTM C-40
Soundness of Aggregate by Sodium Sulfate	ASTM C-88
Sieve Analysis	ASTM C-29

- B. Gradation: Fine and course aggregates are regarded as separate ingredients and each shall be well graded between the limits as shown in the following chart:

Percentage Passing Designated Sieves and Nominal Size Designation

<u>Sieve Size</u>	<u>#467</u> <u>1 1/2" to #4</u>	<u>COURSE</u> <u>#57</u> <u>1" to #4</u>	<u>#67</u> <u>3" to #4</u>	<u>FINE</u> <u>AASO-M6</u> <u>#4 to #100</u>
2"	100			
1 1/2"	95-100	100		
1"		95-100	100	
3/4"	35-70		90-100	
1/2"		25-60		
3/8"	10-30		20-55	100
#4	0-5	0-10	0-10	95-100
#16		0-5	0-5	45-80
#50				10-30
#100				2-10

4.2.5 REINFORCING STEEL

- A. Bar Steel shall be round bars conforming to ASTM A-615, Grade 60, except #5 or smaller bars may be Grade 40 or 60 as shown on drawings, and deformed in accordance with the requirements of ASTM A-305.
- B. Dowels for Slabs on Grade at joints where indicated shall be hot rolled merchant bars conforming to ASTM A-151, C-1020.
- C. Miscellaneous Reinforcement not covered above must conform with the requirements of ACI-315 and ACI-318.

4.2.6 JOINT MATERIALS

- A. Non-extruding and resilient non-bituminous type conforming to ASTM D1752 or resin-impregnated fiberboard having the Physical requirements of ASTM D-1752, in widths shown or 3/8" where not shown, shall be used where joint sealers are indicated. Materials shall be Darasel-U fiberboard filler as manufactured by W.R. Grace & Co. or equal. Filler material containing asphalt or tar will not be allowed.
- B. Non-extruding and resilient bituminous type conforming to ASTM D-1751 shall be used for concrete paving and structural construction where joint sealers are not called for.
- C. Portland cement concrete pavement joints shall be sealed in accordance with the Colorado Department of Transportation (CDOT) specifications.

4.2.7 CURING COMPOUNDS

Curing Compounds where allowed shall conform to ASTM C-309.

4.2.8 PROPORTIONING INGREDIENTS

Concrete ingredients shall be proportioned so as to provide concrete which is workable and homogeneous, yet when hardened it will provide the required strength, durability, resistance to deterioration, abrasion, watertightness, appearance and other specified properties.

4.2.9 CLASS "A" CONCRETE

Concrete shall have a maximum allowable water cement ratio of 0.50 by weight. The fine aggregate shall be between 345 and 38% by volume of the total aggregates and the end product shall have a minimum 28 day compressive strength of 4,000 psi when tested in accordance with ASTM C-31.

4.2.10 CLASS "C" CHEMCOMP CONCRETE

Concrete shall have a minimum of 6.0 sacks of expansive shrinkage compensating cement per cubic yard and a water reducing admixture, incorporated in strict conformance with the printed instruction of the cement manufacturers of the concrete, so as to produce a slump not to exceed six (6) inches and an end product having a minimum twenty-eight (28) day compressive strength of 4,300 psi, when tested in accordance with ASTM C-31.

4.2.11 CLASS "F" FLOW FILL CONCRETE

Concrete mix design for flow fill concrete, a substitute for Colorado Department of Transportation CL I & CL II Structural and Utility Trench Backfill shall be as follows:

<u>Mix Proportion</u>	<u>ASTM</u>	<u>Per CY of Concrete</u>	
Portland Cement	C-150	42	lbs.
Sand	C-33	1,845	lbs.
Aggregate #57	C-33	1,700	lbs.
AA	C-260	5	oz.
Water	C-94	325	lbs.

Compressive Strength: 28 day = 60 psi MAX

4.2.12 CONSTRUCTION

Application for the various combination of aggregate size, in combination with allowable air content and slump range, for the different classes of concrete are as shown below.

Nominal Max. Size Coarse Ag.	Air Content Range	Vib. Slump Range	Min. Cement Content	Concrete	Typical Application
In.	% by vol.	In.	Sks/CY	Class	
1 ½"	4-7	1-4	6.0	A	Columns, Slabs on Grade, Reinforced Walls
	4-7	1-3	6.0	A	Grade Beams, Caissons, Reinforced & Plain Footings
	4-7	2-3	6.0	A	Roadway Pavement
	4-7	2-4	5.0	A	Pipe Encasement, thrust blocks
	4-8	1.3	0.45	F	Structural backfill Utility Trenches V-ditches
1'	5-7	1-4	6.0	A	Columns, Slabs on Grade, Reinforced Walls
	5-7	1-3	6.0	A	Reinforced & plain footings, Grade Beams, Caissons, Columns
	5-7	2-4	5.0	A	Pipe Encasement, Thrust blocks
	5-7	4-6	5.5	C	Reinforced Slabs on grade
¾"	5-8	2-3	6.6	A	Bridge Deck
	5-8	1-3	6.0	A	Structural Slabs on Grade; Reinforced Columns, Footings, Beams and Walls

5-8

4-6

5.5

C

Reinforced Slabs
on grade

4.2.13 MIX DESIGNS

- A. Designs employing the same ingredients proposed for use and used successfully on a previous project under similar conditions to those anticipated on this project may be used. Provided the contractor requests and obtains Town approval on the following, all of which must be certified to by the supplier.
1. Concrete mix designs conforming to these specifications.
 2. ID sets of 7 and 28 day concrete strength tests made during the last 6 months on concrete conforming to the design in (1) above.
 3. Curve showing relationship of 7 and 28 day strengths in (2) above.
 4. Reports of compliance tests of fine and course aggregates made during the last six (6) months.

OR

- B. The contractor shall employ, at his expense an acceptable independent laboratory to design, proportion and select ingredients from the supplier's sources that will produce a concrete mix conforming to the requirements of these specifications, while providing proper placability, durability, strength and other required physical properties for the proposed application.

4.2.14 FORM WORK

Provide all forms, shores, cores, molds and similar items in sufficient quantity and quality to properly execute the work.

Lumber or plywood contact surfaces must be free from knots, warps, breaks, or other defects likely to cause irregular surfaces. Metal forms must be free from irregularities, dents and sags and suitable for concrete exposed to view in finished areas.

Do not reuse forms if there is any evidence of surface wear or tear which would impair the quality of the finish. Thoroughly clean and relubricate forms for reuse.

4.2.15 TOLERANCES

Construct forms so as to insure that concrete surfaces will conform to tolerances of Section 203.1 ACI 347.

4.2.16 REPARATION OF FORM SURFACES

Make forms sufficiently tight to prevent leakage of grout or cement paste. Seal wood surfaces against absorption of moisture from the concrete with an acceptable oil, sealer, or factory applied nonabsorptive liner.

Coat forms to prevent bond with concrete prior to placing of the reinforcing steel. Do not allow coating material to stand in puddles in forms nor to come in contact with concrete against which fresh concrete will be placed.

4.2.17 REMOVAL OF FORMS

- A. Form work that supports weight of concrete must remain in place until concrete has reached its specified 28 day strength, unless otherwise specified or permitted.
- B. Form work not supporting weight of concrete may be removed as soon as the concrete has hardened sufficiently to resist damage from removal operations.
- C. Whenever the form work is removed during the curing period, the exposed concrete shall be immediately cured by one of the methods herein specified.

4.2.18 FABRICATION AND PLACEMENT OF EMBEDDED REINFORCEMENT

4.2.19 FABRICATION TOLERANCE

- A. Sheared length and bends, $\pm 1"$.
- B. Depth of truss bars, stirrups, ties and spirals, $\pm 1/2"$.

4.2.20 PLACEMENT TOLERANCE

- A. Concrete cover to formed surface, minimum spacing between bars, top bars in slabs or beams and members to 8 inches deep, $\pm 1/4"$.
- B. Members between 8" to 24" deep, $\pm 1/2"$.
- C. Members more than 24" deep, $\pm 1"$.
- D. Crosswise of members spaced evenly within 2".
- E. Lengthwise of members, $\pm 2"$.

Movement of bars more than one diameter or in excess of above tolerances, to facilitate installation of embedded items, must be approved by the project engineer.

4.2.21 REINFORCEMENT PLACEMENT

Support and wire together all reinforcing bars to prevent displacement from external loading prior to and during concrete placement. On ground where necessary supporting concrete blocks may be used, otherwise use concrete, metal, plastic or other satisfactory bar chairs and spacers. Templates will be required for all column dowels.

At time of concrete placement all steel is to be free from loose, flaky rust, mud, oil or other coatings that may destroy or reduce bond.

Unless otherwise noted on the drawings, the steel shall be protected by concrete, after placement as follows:

- A. $3/4"$ for interior slabs.
- B. 1" for interior walls and formed exterior slabs.

- C. 1 ½" for beams, columns and concrete exposed to the weather or in contact with the ground.
- D. 3" for concrete deposited against the ground.

Smooth dowels to join existing concrete to new concrete shall be epoxied into drilled holes and extend into the old concrete a distance of 24 diameters.

4.2.22 JOINTS

Provide joints only where shown unless otherwise specifically permitted by written authorization from the project engineer.

4.2.23 CONSTRUCTION JOINTS

Continue all reinforcing steel and welded wire fabric across joints, unless otherwise indicated. Provide keys and inclined dowels as shown or as directed. Provide longitudinal keys at least 1 ½" deep in all joints in walls and between walls and slabs.

Thoroughly clean surfaces and remove all laitance on the surface of joints before next placement.

When required or directed, obtain bond between hardened concrete and new concrete by:

- A. Use of an epoxy bond in accordance with the applicable provision of ACI Journal, Proceedings V59 #9, September 1962, p. 1121-1142.
- B. Use of an acceptable chemical retarder.
- C. By roughening surface of old concrete in an acceptable manner such as sandblasting.
- D. Provide a continuous water stop as specified.

4.2.24 EXPANSION JOINTS

Install filler in expansion joints ¾" thick by ½" less than slab thickness. For floors place a ¾" x ½" tapered wood strip over the joint filler, flush with the top of the slab and finish the edges with an edging tool. After the concrete has hardened remove the wood strip and seal the joint flush with the surface.

4.2.25 CONTROL JOINTS

Joints shall be formed by use of acceptable sheet metal forms, or by insertion of hard-pressed fiberboard strips into the plastic concrete, or by sawing with carborundum or diamond-tipped blade after concrete has set. Joints shall be ¼" wide and approximately ¼ of the slab thickness in depth, unless otherwise indicated or directed.

When concrete is dry, clean out sawed or fiberboard joints and fill to wearing surface with joint sealer.

4.2.26 EMBEDDED ITEMS

Items to be embedded include, but are not limited to, water stops, anchor bolts, inserts, sleeves, curb angles, dovetail anchor slots, frames, etc. and shall be placed prior to concrete placement.

4.2.27 PLACING EMBEDDED ITEMS

Position accurately and support against expansion joint material, water stop and embedded items. Fill temporarily with readily removable material to prevent the entry of concrete into the voids in sleeves, inserts and anchor bolts.

4.2.28 WATER STOPS

Provide water stops in construction and expansion joints in the maximum practical length possible. Forming necessary splices and intersections shall conform to manufacturer's recommendations and directions.

4.2.29 CONCRETE MIXING

Concrete shall be mixed and transported to the job site in accordance with the requirements of ASTM C-94.

Delivery tickets for each batch delivered shall show the date, mix by number or sack content with maximum size aggregate, admixtures and amounts used per cubic yard, air content, slump and time of loading.

4.2.30 AGITATING, MIX AND DISCHARGE

Concrete shall be continuously agitated from the time water is added and then mixed for 2 ½ minutes just prior to discharge. The mix shall be discharged from the truck within one (1) hour after cement is batched, unless longer time is specifically authorized.

4.2.31 WATER

Indiscriminate addition of water to increase slump is prohibited.

4.2.32 ADMIXTURES

- A. Liquid admixtures shall be charged into the mixer by means of an approved metering device.
- B. Powder admixtures shall be weighted or measured by volume in accordance with manufacturer's recommendation.
- C. When two or more admixtures are to be incorporated in the mix, they shall be added separately during batching sequence.

4.2.33 RETEMPERING

Mix concrete only in quantities for immediate use.

Concrete arriving at the project with slump below that suitable for placing may have water added only if neither:

- A. The maximum permissible water-cement ratio has not been exceeded.
- B. Maximum slump has not been exceeded.

Any addition of water above that permitted by limitation on water-cement ratio must be accompanied by a quantity of cement sufficient to maintain proper cement ratio and a mixing time of 1 ½ minutes. No such additions will be permitted unless specifically authorized in writing by a Town representative.

4.2.34 WEATHER

Perform work in conformance with detailed recommendations in ACI 306 for cold and ACI 305 for hot weather concrete placement.

4.2.35 BATCH TEMPERANCE

As mixed temperature of concrete shall be maintained above 55 degrees F and below 80 degrees F, even though the mean temperature falls below 40 degrees F.

4.2.36 PROTECTION

Provide adequate protection against rain, sleet, snow, cold and other weather conditions.

Protect exposed surfaces from rain water and from 40 degrees F and below temperatures with suitable covering, and equipment to maintain a minimum temperature of 50 degrees F for a period of 72 hours after the concrete has been placed.

4.2.37 PLACING

4.2.38 PREPARATION OF SURFACES

Preparation for placing shall include, but is not limited to, form construction, setting of reinforcing steel and embedded items, securing and alignment of forms, cleaning thoroughly all surfaces that will be in contact with concrete and keeping them free of debris, ice, rust, scale, grease or other coatings during placement of the concrete.

4.2.39 EQUIPMENT AND LABOR

Assemble and provide sufficient labor and equipment for proper mixing, transporting, placement and protection of concrete until accepted by the Town.

4.2.40 CONVEYING

Truck mixers, agitators, and non-agitating units, including their manner of operation, must conform to the applicable requirements of ASTM C-94. Aluminum tubing or pipe for conveying concrete will not be allowed.

Concrete shall be conveyed to place of final deposit by methods which will prevent segregation or loss of ingredients and insure the required quality of the concrete is obtained. A hopper or tremie will be required at the end of metal chutes having a slope greater than 1:2 or less than 1:3 vertical to horizontal; or chutes in excess of 20 feet in length.

Use of horizontal belt conveyors discharging into a hopper and pumping or pneumatic conveying equipment such that the loss in slump does not exceed 1 ½" shall be subject to approval.

4.2.41 DEPOSITING

Deposit concrete continuously, or in layers of such thickness that no concrete is deposited on concrete which is hardened sufficiently to cause formation of seams or planes of weakness within the section. Deposit concrete as nearly as practicable in its final position to avoid segregation due to re-handling or flowing.

Depositing of concrete in general shall conform with the applicable detailed recommendation of ACI 304.

4.2.42 CONSOLIDATION

Perform consolidation in conformance with applicable detailed recommendation of ACI 309.

Consolidate all concrete by internal and external vibrators, spading, rodding or forking so that concrete is thoroughly worked around reinforcement, embedded items and into form corners, eliminating all air or stone pockets which may cause honeycombing, pitting or planes of weakness. Thoroughly consolidate concrete in slabs and floors with vibrating bridge screeds, roller pipe screeds or other acceptable means. Only mechanical vibrators having a minimum frequency 7000 RPM and operated by competent workmen shall be employed.

Over vibration and transporting concrete within the form by vibration will not be allowed.

4.2.43 UNDERWATER CONCRETING

Placing of concrete under water will not be allowed unless specifically approved method and authorization in writing has been obtained.

Where concrete is authorized to be placed under water, the cement content shall be increased 25% at contractor's expense, to compensate for losses due to water.

4.2.44 TIE HOLES

Patch all tie holes, after being cleaned and thoroughly dampened, by filling solid with patching mortar immediately after form removal.

4.2.45 DEFECTIVE AREAS

Repair all honeycombed and other defective concrete down to sound concrete.

Dampen area to be patched and area six (6) inches wide surrounding it. Brush into surface a bonding grout (1 part cement to 1 part sand passing a #30 sieve) mixed to a consistency of thick cream. Immediately after breaking in grout, patch the defective area with a mortar (1 part cement to 2 ½ parts sand by damp loose volume) using no more water than necessary for handling and placing.

4.2.46 SELECTION OF FINISHES

Unless otherwise shown or called for in the Special Conditions, the following finishes shall be provided.

<u>Type Finish</u>	<u>Type of Surface Intended</u>
Scratch	To receive bonded applied cementitious application
Floated	To receive water proofing membranes or terrazzo
Troweled	Walking surfaces or for reception of floor covering
Broom or Belt	Sidewalks, garage floors and ramps
Non-slip	Exterior platforms, steps, athletic courts, landings and ramps
Board Form	Concrete surfaces not exposed
Smooth Rubbed	Interior vertical and other exterior surfaces
Exposed Aggregate	Scrubbed, sandblast and tooled finishes as specified in the Special Conditions

4.2.47 TOLERANCES OF FINISH

<u>Finish Class</u>	<u>Application</u>	<u>Minimum Slope</u>
"A"	Roads Slopes to Drains Floors	1/8" in 10 ft. using a 10 ft. straight edge
"B"	Ramps Sidewalks	¼" in 10 ft. using a 10 ft. straight edge
"C"	Athletic Courts	¼" in 15 ft. using a 15 ft. straight edge

4.2.48 FLOATED FINISH SLABS

After concrete has been placed, struck off, consolidated, leveled and allowed to set to the point where water sheen has disappeared or where mix has stiffened sufficiently to permit proper working, being consolidation of the surface with power driven machines. Hand float with wood or cork-faced floats in locations inaccessible to power driven machines. Recheck trueness of surface at this state with applicable straight edge applied at not less than two different angles. Cut down all high spots and fill all low spots during this procedure to a Class "B" tolerance, then refloat the slab immediately to a uniform, smooth, granular texture.

4.2.49 TROWELED FINISH SLAB

Perform first power troweling immediately after power floating to produce a smooth surface which is relatively free of defects but which may still contain some trowel marks. Perform

additional troweling and consolidation of the surface by hand until a ringing sound is produced as the trowel is moved over the surfaces.

To resist slip the finish surface may show trowel marks which are uniform in texture and appearance, otherwise it shall be free of all trowel marks. In either case, the surface shall be to a Class "B" tolerance.

4.2.50 TYPE II BROOM FINISH

Sidewalk slabs and other slabs so specified shall have a coarse traverse sawed texture obtained by drawing a broom or burlap belt across the surface immediately after floating.

4.2.51 CURING

Freshly deposited concrete shall be protected from premature drying and excessively hot or cold temperatures and maintained with minimal moisture loss at a relatively constant temperature for the time required for hydration of cement and proper hardening of the concrete.

4.2.52 INITIAL CURING

Immediately following finishing the contractor shall provide methods to keep the concrete continuously moist at least overnight unless otherwise specified by:

- A. Ponding or continuous sprinkling
- B. Absorptive mat or fabric kept continuously wet
- C. Sand or other covering kept continuously wet
- D. Steam vapor mist bath at a temperature not to exceed 150 degrees F.
- E. Curing compounds conforming to ASTM C-309 applied according to manufacturer's recommendations, providing the surface to be cured is not to be bonded to other cementitious materials.

4.2.53 DURATION OF CURING

Continue curing until the cumulative number of days, or fraction thereof, not necessarily consecutive, during which the air temperature in contact with the concrete is above 50 degrees F, has totaled seven (7) days.

4.2.54 Cold Weather Curing

Curing shall conform to all applicable detail recommendations in ACI-306. Temperature of concrete shall be maintained between 50 degrees - 70 degrees F for the required curing period when the mean daily atmospheric temperature is less than 40 degrees F. Sufficient equipment and materials required to comply with this specification shall be at the site prior to placing concrete.

4.2.55 HOT WEATHER CURING

Curing shall conform to all applicable detail recommendations, in ACI-305. As quickly as concrete hardening and finishing will allow, the contractor shall install such protective measures, such as, but not limited to, windbreaks, shading, fog spraying, sprinkling, ponding or wet covering as may be required.

4.2.56 PROTECTION FROM DAMAGE

Especially during the curing period and until the work is accepted, the contractor shall protect the concrete from damage by vehicular or mechanical equipment, foreign materials and by rain or by running water.

4.2.57 TESTING

Technical services performing routine preliminary testing of materials of proposed mix designs and resulting concrete for compliance with the specifications will be provided by the Town, at no expense to the contractor.

4.2.58 TESTS FOR CHANGES AND NON-COMPLIANCE

Testing required because of changes in materials or proportions of the mix requested by the contractor, as well as any extra testing of concrete, field cured cylinder, or materials occasioned by failure to meet specification requirements, shall be at the contractor's expense.

4.2.59 TESTING PROVIDED BY THE TOWN

- A. Test contractor's proposed material for compliance.
- B. Review and check test contractor's proposed mix design.
- C. Prepare and cure complete set of concrete cylinders, test and report results of 7 and 28 day compressive strength, in accordance with ASTM C-39, for each placement up to 50 cubic yards.
- D. Determine slump range of concrete as delivered in accordance with ASTM C-143.
- E. Determine air content of standard weight concrete with either ASTM method.
- F. Check batching and mixing operations.

4.2.60 CONTRACTOR RESPONSIBILITIES

4.2.61 PRELIMINARY MATERIAL SAMPLES AND MIX DESIGN

Deliver to Town preliminary representative samples of all the materials, mix designs and other materials contractor proposed to use on the project which require testing, with request for acceptance.

4.2.62 CASUAL LABOR

Furnish such labor as is necessary to handle samples at the project or at the material source.

4.2.63 STORAGE FACILITIES

Provide and maintain adequate facilities on the site for safe storage and proper curing of concrete test cylinder for the first 24 hours, as required by ASTM C-31.

4.2.64 CERTIFICATES OF COMPLIANCE

Submit the following in duplicate for each shipment, with applicable ASTM Specifications:

- A. Cement – Mill Test Certificate of Conformance.
- B. Aggregate – Certified Test Report.
- C. Reinforcing Steel – Mill Test Certificate of Conformance.
- D. Air Entraining Admixture – Certificate of Conformance.
- E. Water – Reducing Admixture – Certificate of Conformance.

4.2.65 DEFECTIVE CONCRETE

If concrete is found defective from testing, placing, curing or for other causes, and if the contractor is so directed, he must remove the concrete at no cost to the Town.

END OF SECTION

SECTION 4.3

CONSTRUCTION MATERIALS AND METHODS

DEMOLITION, SITE PREPARATION, EXCAVATION AND EMBANKMENT

4.3.1 GENERAL

The work to be performed shall include the demolition and removal from the site of all designated: buildings, slabs on grade, retaining walls, steps, asphalt, rubbish, stumps, trees, shrubs, fencing, buried tanks, pipe, etc.; on site wells shall be sealed; depressed areas are to be filled and graded to drain.

In public right-of-ways, wherein the Town will assume the maintenance of materials installed, the work to be performed shall also include: top soil removal and replacement, unclassified excavation, placing and compacting embankment, shaping and compacting subgrades, etc.; for drainage ways, parks, concrete slabs on grade, etc.

4.3.2 LOCAL LAWS, ORDINANCES AND CODE

The contractor shall be licensed with and bonded to the Town of Fairplay and shall comply with all current federal, state and local laws, codes and ordinances pertaining to demolition, wrecking, clearing and grubbing operations.

4.3.3 PROTECTION OF PUBLIC IMPROVEMENTS

The contractor will be held responsible to insure the protection of all existing public improvements such as fire hydrants, street lights, traffic lights, parking meters, traffic signs, catch basins, manholes, valves, survey monuments, overhead utility lines and poles, and any existing underground sprinkler or utility lines which may be damaged during the execution of the contract. It will be the contractor's responsibility to replace all public improvements so damaged at his own expense. Existing manhole rings and covers, valve boxes and sprinkler heads found defective shall be replaced, as directed by the Town representative.

The contractor shall take proper precautions for the protection of and replacement or restoration of driveway culverts, street intersection culverts or aprons, storm drains or inlets, fences, irrigation ditches, crossings and diversion boxes, mailboxes, shrubbery, flowers, ornamental trees, driveway approaches and all other public or private installations that may be encountered during the performance of the work. He shall provide each property with access at all times during construction. Existing driveways shall be cut, filled and graded as required or as directed by the Town representative to provide permanent access. Existing driveways shall be resurfaced with the then existing type of surfacing, whenever surfaces are destroyed.

Work shall include saw cutting or proper preparation of remaining materials, which are to be reconstructed. Materials left in place shall be protected from damage during construction. Contractor shall be responsible to maintain or repair materials left in place.

4.3.4 DISCONNECTION OF EXISTING UTILITIES

Before starting demolition of the structure, the contractor shall arrange for the disconnection of all utility service connections; such as water, sewer, cable T.V., telephone, gas and electrical power connected thereto. Disconnects and marking shall be made in accordance with the regulations of the utility that controls the supply of service involved.

Underground services are to be cut, capped and marked at point of disconnect to facilitate future location of the line. Caps of underground storm and sanitary sewer shall consist of a plug being placed in the line and the opening then sealed with concrete. Markings of the end of the line shall consist of a 4 x 4 wooden stake or metal fence post driven into the ground and then tagged to note the type of facility.

The county, district, or Town Public Works Department will provide a representative to be on site to observe and approve the contractor's disconnect of the water and sewer services at the main line. It shall also be the responsibility of the contractor to backfill all holes to finish grade and install concrete or asphalt surfacing when the holes excavated are in streets or paved areas. The contractor will be given written approval and acceptance for disconnects that are proper. The contractor shall correct any unsatisfactory disconnects.

4.3.5 EQUIPMENT OPERATED ON STREETS

The contractor shall be permitted to operate only pneumatic-tired equipment over any paved surface and shall be responsible for any damage to street surface resulting from his operations.

4.3.6 PROTECTION OF SURVEY MONUMENTS

Prior to start of demolition or construction, any public survey monument or range box that may be disturbed during construction shall be referenced to a minimum of two points outside the limits of construction by a Colorado Professional Land Surveyor. Any public survey monument or range box disturbed as a result of construction shall be replaced by a Colorado Professional Land Surveyor in accordance to the current Colorado Revised Statutes.

Non-pneumatic-tired equipment shall be allowed if the paved area in question is flagged off from public use for the duration of construction and will not be re-opened to public use until sufficient repair/replacement of paving surface is complete. Repair/replacement of paving surface shall be determined to the Town Engineer or Town Representative for the project.

4.3.7 DEMOLITION, CLEARING AND GRUBBING

The contractor shall remove from the site, or within the limits of construction, all obstructions specified in the special conditions or noted on the plans.

4.3.8 FENCES

Where existing fence or corner markers are to be removed, site corners shall be marked by ½" rebar, 18" long, firmly implanted at ground level by the contractor.

4.3.9 TREES AND SHRUBS

Trees not impeding demolition of structures or performance of the work will not be removed except as designated. Trees and shrubbery designated for removal will include stumps and roots to an elevation of two (2) feet below existing or finished grade, whichever is lower. Downed trees, brush and rubble shall be removed from the site.

Trees scheduled to remain shall be carefully protected from damage during performance of the work. Any damage due to the contractor's operations shall be repaired by suitable tree surgery methods. Damaged trees shall be replaced, as approved by the Town at the contractor's expense.

4.3.10 BURIED FUEL AND SEPTIC TANKS

Tanks that may exist on the site shall be completely removed and contaminated soils remediated. The void created shall be filled by the contractor to finished grade.

Underground motor fuel storage tanks shall be excavated and removed under the direction and in the presence of a representative from the Town of Fairplay. The contractor shall notify the fire district twenty-four-(24) hours in advance of the time he proposes to start excavation in the vicinity of the tanks.

4.3.11 WELLS

On site wells and well casings shall be sealed to prevent contamination of ground water aquifers in accordance with Section 5: Abandonment Regulations, State Board of Examiners, Rules and Regulations and Water Well and Pump Installation Contractors Law, State of Colorado Division of Water Resources. All abandonment activities shall be approved by the utility that services the location, and the state engineer. There may be instances where the well will not be plugged, but merely capped with a steel, lockable cover plate.

4.3.12 BUILDINGS

The demolition of buildings shall include the removal from the site of all roofs, walls, chimneys, basement walls, supporting walls, footings, footing post, caissons, basement floors, including all pipes, conduits and similar appurtenances lying therein or beneath for a depth of two (2) feet below grade.

4.3.13 SLABS ON GRADE

All concrete and asphalt slabs on grade shall be removed from the site. This shall include, but is not limited to, floor slabs, driveway and garage slabs, sidewalks, curbs, cross pans, gutters, etc.

4.3.14 WALLS

Retaining walls and their footing shall be removed in their entirety, from the site.

4.3.15 SALVAGE

Unless otherwise specified in the Special Conditions; all materials, salvageable or otherwise, to be removed from the site is considered as being the property of the contractor performing the work.

4.3.16 FILLING AND GRADING

Depressions resulting from the removal of structures, basement walls, footings, buried tanks, etc. shall be filled and compacted with clean fill materials so as to eliminate hazards of cave-in, accumulation and ponding of water. Under no circumstances shall organic building material, broken concrete or asphalt be considered as approved fill material.

Immediately following demolition and removal of rubbish from the site, the contractor shall grade the entire contract area by filling, compacting, and leveling the site to existing adjacent grades. Grading and cleanup of the site must be complete and acceptable before any consideration will be given to making final payment for the work.

4.3.17 TOPSOIL

The contractor shall salvage within the project limits, or acquire when needed, loose friable loam reasonably free of admixtures of subsoil, refuse, stumps, rocks, roots, brush, weeds or other material which would be detrimental to the proper development of vegetative growth for use as topsoil.

Topsoil shall be placed and spread at locations and to the thickness shown on the plans, after the areas to be covered have been properly prepared and grading operations in the area have been completed and accepted. Soil so placed shall be keyed to the underlying subgrade by the use of harrows, rollers or other equipment suitable for the purpose, followed by applying water in a fine spray by nozzles or spray bars in such a manner and extent that wash or eroding will not occur.

4.3.18 DISPOSAL

Unusable material may be disposed of outside the limits of view from the project with written permission of the property owner on whose property the material is placed. Copies of all agreements with property owners are to be furnished to the Town Engineer.

Where portions of structures are to be removed, the remaining portions shall be prepared to fit new construction. The work shall be done in accordance with the development drawings and in such manner that materials to be left in place shall be protected from damage; all damage to portions of structures to remain in place shall be repaired by the Developer at his expense. Reinforcing steel projecting from the remaining structure shall be cleaned and aligned to provide bond with new extension.

4.3.19 EXCAVATION

Excavation will be unclassified and shall consist of the excavation of all material of whatever character encountered within the limits of the project, including but not limited to surface boulders, muck, rock, concrete foundations, slabs, stripping, excavation for ditches or channels, borrow, etc.

Excavation operations shall be conducted so that material outside the limits of slopes will not be disturbed, and to provide adequate drainage at all times. Insofar as practicable, all suitable materials shall be used in the formation of embankments and backfilling. Materials that are considered unsuitable or surplus by the Town representative shall be disposed of by the contractor at his expense.

All excavations shall be made to subgrade elevations and shall be true to grade. Material below subgrade elevation in cuts shall not be loosened by plowing or other methods during the progress of the work except with the approval of the project engineer. No excavation shall be made below subgrade elevation except to remove spongy material, vegetable matter or other undesirable materials. In the event the contractor over excavates an area, he shall replace the excavated materials with satisfactory material and thoroughly compact same at his own expense.

Whenever excavation below subgrade elevation to remove spongy material, vegetable matter, or other material is ordered by the engineer, the contractor shall remove the same to the satisfaction of the engineer and shall replace it with satisfactory material in layers not to exceed six (6) inches in thickness and thoroughly compact each layer before the next layer is placed. The volume of material ordered to be removed shall be paid for at the unit price for excavation. When such excavations are backfilled with suitable material from other excavations in the project, no separate payment will be made. In the event the engineer orders such excavations to be filled with material from borrow, the contractor will be paid at the unit price for "Select Subgrade Material" when called for in the proposal.

The contractors shall not deposit surplus or undesirable materials on private property without first securing the written consent of the property owner and filing a copy of said consent with the Town representative. When approved, disposal of surplus material on Town property shall be kept below the grade designated by the engineer.

4.3.20 EMBANKMENT

Areas to receive embankment and the top of cut areas shall first be stripped of all vegetation, organic material and materials unsuitable for use in embankments. Topsoil shall be stockpiled for reuse and unsuitable material disposed of.

Within the limits of the embankment and cut area the subgrade shall be scarified to a depth of six (6) inches and the moisture content increased or reduced as necessary to bring the moisture within ∇ 2% of optimum. This scarified layer shall then be rolled and compacted to the relative compaction specified for the type of soil. The remainder of the embankment volume shall then be constructed in six (6) inch lifts of suitable material, containing ∇ 2% of optimum moisture content and compacted to the relative compaction specified. Rollers shall be of a tamping type conforming to CDOT standards.

In connection with his normal grading operations, the contractor shall use his trucks, tractors, bulldozers and other pieces of equipment in the most effective manner by routing the equipment over the entire embankment or roadway width.

4.3.21 COMPACTION

Maximum dry densities of all soil types encountered or to be used will be determined in accordance with AASHTO T-99 or T-180 Methods C-D. The percent of relative compaction

required will be equal to or greater than minimum values as hereinafter shown for the various classes of soil and type of compactions.

<u>Soil Classification (AASHO M-145)</u>	<u>AASHO T-99 Minimum Relative Compaction</u>	<u>AASHO T-180 Minimum Relative Compaction</u>
A-1	100	95
A-3	100	95
A-2-4	100	95
A-2-5	100	95
All Others	95	90

Compacted subgrade ready to receive sub-base material shall conform to the lines, grades and cross-section called for on the plans. Subgrade is to be established by survey.

4.3.22 SUBGRADE FOR SLABS ON GRADE AND PAVING

Subgrade areas to be occupied by curbs, gutters and sidewalks base course or asphaltic concrete shall be excavated, backfilled and compacted to establish grade. This work shall be done with particular care in accordance with all requirements herein.

Proof rolling may be required to determine whether certain areas of subgrade meet compaction requirements. Proof roll designated areas with heavy rubber-tired roller having a minimum weight of 50 tons, or single axle water truck loaded to provide equivalent wheel loading. Areas found to be weak or fail the test shall be ripped, scarified, wetted if necessary, and re-compacted to requirements for density and moisture at contractor's expense.

Surface of ground between curb or sidewalk line and property line shall be sloped as staked or as directed by the project engineer and rounded into existing lawn or ground surface.

4.3.23 WETTING AND COMPACTING

Embankments, bases of cuts, natural foundations, base courses and surface courses shall be wetted and rolled to obtain the densities required by the specifications. The contractor shall use his equipment to consolidate each layer of embankment in the most effective manner. Each layer shall be compacted by routing the loaded hauling equipment over the entire width, and spreading equipment shall be operated so as to produce a dense, stable fill. Successive layers of material shall not be placed until the layer under construction has been thoroughly compacted. Where methods in use do not consolidate materials to required densities, rollers or mechanical tamping units of the type ordered by the project engineer shall be used.

Concurrently with the rolling or tamping operations, the materials shall be wetted by uniformly sprinkling each layer or course of material being placed, to ∇ 2% of optimum. Sprinkling shall be done in such a manner that areas of dry material alternated with areas of saturated material and pools of water will be avoided.

Where mechanical tampers are used as ordered by the engineer, they shall be operated at all times with an air pressure not less than eighty (80) psi at the tamper. Successive blows with the tamper shall overlap at least one-fourth the width of the tamper foot.

4.3.24 HOUSEKEEPING, RESTORATION AND CLEANUP

4.3.25 SURPLUS EXCAVATION

All surplus excavated material shall be removed from the job site by and to locations provided by the contractor. Written permission shall be obtained by the contractor, before disposal of excess material on private property, and a copy of said emission shall be furnished to the project engineer. The Town relinquishes all right and title to the surplus material unless otherwise specified in the Special Conditions.

Excess material shall not be wasted on any public ROW without written permission from the Town engineer.

4.3.26 CONCRETE CURB, GUTTER AND VALLEY PANS

The contractor shall replace in like kind all curb and gutter and valley pans that are damaged during construction. The replacement shall be of equal or better quality than found.

4.3.27 REPAIR OF TREE DAMAGE

Any trees along the alignment of the conduit damaged by the contractor shall be repaired and treated accordingly. All broken limbs shall be sawed off evenly and cut faces painted with an approved compound. All repairs and treatment shall be done in accordance with the forestry regulations of the authority having jurisdiction and at contractor's expense.

4.3.28 SURFACE RESTORATION

The contractor will secure all street cut and ROW permits required for the prosecution of the work. The contractor shall assume full responsibility for the consequences of such cutting or damaging and shall comply with all requirements contained therein.

The replacement of excavated base course, permanent paving and damaged curb and gutter shall be done in accordance with the Public Works Manual and requirements contained in the permits.

Damaged driveways shall be replaced in like kind by the contractor to an equal or better condition than existed prior to construction. All cuts necessary for the replacement of damaged concrete shall be made using a concrete saw. Drainage and ditch facilities shall be maintained in operating condition at all times during construction.

- A. **Unsurfaced Areas:** The general grade and condition of all unsurfaced areas shall be restored to nearly as practicable to the grade and condition immediately prior to construction. Topsoil shall be removed, saved and replace in cultivated and agricultural areas; and any excess earth shall be removed from the ROW at no additional expense to the Town. All grassed

areas shall be reseeded or re-sodded, and the contractor shall be responsible for caring for the grass until its growth is established.

- B. **Surfaced Areas:** Roadway surface cuts shall be made in a vertical plane and in a straight line. All roadway surfacing between the surface cuts on each side of the excavations shall be removed and replaced with base coarse material and/or hot mix bituminous or concrete surfacing. In the event that the trench must be paved before hot mix bituminous material can be acquired, the contractor, at the discretion of the project engineer, shall install and maintain temporary cold mix bituminous paving. When hot mix bituminous material becomes available, the contractor shall remove the temporary cold mix material, add the compact base course material, if necessary, and install the permanent hot mix bituminous surfacing.
- C. **Cleanup:** Upon completion of the work, the contractor shall remove from the job site all rubbish, unused materials, concrete forms and other like material. Also, at all times during construction, the contractor shall maintain the site, partially finished structures, material stockpiles and other like areas in a reasonable state of order and cleanliness.
- D. In the event of the contractor's failure to perform the above work, the Work may be performed by the Town at the expense of the contractor.

END OF SECTION

SECTION 4.4

CONSTRUCTION MATERIALS AND METHODS

SPRINKLER IRRIGATION SYSTEMS

4.4.1 GENERAL

All sprinkler irrigation systems installed as Capital Improvements within the Town of Fairplay shall conform to approved design plans and these specifications.

The Contractor shall insure and guarantee complete coverage of the areas shown on the drawings to be irrigated. The Contractor shall verify actual job site conditions and available water pressure as needed for the coverage guarantee. It shall be the Contractor's responsibility to report to the Town Engineer any deviations between the drawings, specifications and the site. Any inconsistencies shall be noted by the Town Engineer and a written copy of the corrections shall be given to the Contractor.

When the Contractor is satisfied that the system is operating properly, that it is balanced and adjusted and that all work and cleanup is completed, he shall notify the Town Engineer for final inspection with date and time given, at least seventy-two hours in advance.

4.4.2 DRAWINGS

The specifications and drawings are intended to specify an efficient and complete sprinkler irrigation system. Use of the sprinkler irrigation system will follow the manufacturer's recommendations and meet the Town's approval without further cost to the Town.

All plot dimensions are approximate. Before beginning any phase of work, the Contractor shall check all dimensions on the drawings, verify the accuracy of each dimension and notify the Town of any discrepancies between the drawings and the site.

All work noted on the drawings or details shall be furnished and installed by the Contractor whether or not the work is mentioned in the specifications.

Omissions from the specifications or drawings or any mis-description of detail work which is absolutely necessary to carry out the intentions of the drawings or specifications shall not relieve the Contractor from performing such omitted detail work. The detail work shall be executed by the Contractor as if fully set forth and described in the specifications and drawings.

The Contractor will supply the Town with four sets of drawings and specifications. The drawings and specifications will indicate the work related to this contract. The Contractor shall record all changes in the work which constitutes departures from the original contract drawings, on one set called the Record Drawings. These Record Drawings (or As-Built Drawings) will become the property of the Town at the time of acceptance. Contractor shall supply to the Town Engineer two 24" x 36" hard copy drawings of the as-built and an electronic copy in both PDF and ACAD of the final as-built drawings

The Contractor shall dimension from two permanent reference points (such as sidewalks, road intersections, manholes, abutment walls, etc.) the location of the following items:

1. Connections to existing water lines.
2. Public Service electric supply connections.
3. Sprinkler control valves.

The Contractor shall deliver, on or before the date of final inspection, the corrected and completed Record Drawings to the Town or Town Engineer. Delivery of the Record Drawings will not relieve the Contractor's responsibility to provide location information during the two-year warranty period.

4.4.3 RULES AND REGULATIONS

- A. Work and materials shall be in accordance with the latest edition of the National Electric Code, the Uniform Plumbing Code as published by the Western Plumbing officials Association, and applicable laws and regulations of the governing authorities.
- B. When the contract documents call for materials or construction of a better quality or larger size than required by the above-mentioned rules and regulations, provide the quality and size required by the contract documents.
- C. If quantities are provided either in these specifications or on the drawings, these quantities are provided for information only. It is the Contractor's responsibility to determine the actual quantities of all material, equipment and supplies required by the project and to complete an independent estimate of quantities and wastage.

4.4.5 DEMOLITION

- A. Remove existing sprinklers, valves, automatic controllers and other existing irrigation components indicated on the drawings. Remove items in a manner that minimizes damage to the components. Deliver only salvageable items to Town's Representative. All other items shall be disposed of by the Contractor.
- B. Existing pipelines shall be abandoned in place. If an existing pipeline is encountered during the installation of a new pipeline, a section of the existing pipeline shall be cut and removed. Remove two (2) feet of the existing pipeline on either side of the new pipeline.
- C. Removal and disposal of existing asbestos-concrete (transite) pipelines shall be in accordance with the General Conditions, Special Conditions and the environmental Protection Agency rules and regulations.

4.4.6 TESTING

- A. Notify the Town's Representative three days in advance of testing.
- B. Pipelines jointed with rubber gaskets or threaded connections may be subjected to a pressure test at any time after partial completion of backfill. Pipelines jointed with solvent-welded PVC joints shall be allowed to cure at least 24 hours before testing.
- C. Subsections of mainline pipe may be tested independently, subject to the review of the Town's Representative.

- D. Furnish clean, clear water, pumps, labor, fittings and equipment necessary to conduct tests or retests.
- E. Hydrostatic Pressure Test:
1. Subject mainline pipe to a hydrostatic pressure equal to 120 psi for two hours. Test with mainline components installed.
 2. Backfill to prevent pipe from moving under pressure. Expose couplings and fittings.
 3. Leakage will be detected by inspection. Replace defective pipe, fitting, joint, valve or appurtenance. Repeat the test until the pipe passes test.
 4. Cement or caulking to seal leaks is prohibited.
- F. Hydrostatic Pressure Test (Gasketed Pipe):
1. Close tightly all isolation gate valves and sprinkler lateral isolation gate valves on mainline for tests. Backfill trenches with enough material to prevent pipe from moving under pressure.
 2. Test each section of pipe between isolation gates valves on the mainline pipe separately.
 3. Purge all air from the pipeline before test. Attach pressure gauge to pipeline in test section. Attaching pressure gauge to quick coupling valve between mainline isolation gate valves in the test section is acceptable.
 4. Subject mainline pipe to the anticipated operating pressure of 165 psi for two hours. Observe pressure loss on pressure gauge. If pressure loss is greater than 2 psi, identify reason for pressure loss. Replace defective pipe, fitting, joint, valve or appurtenance. Repeat the test until the pressure loss is equal to or less than 2 psi.
 5. Cement or caulking to seal leaks is prohibited.
- A. Operational Test:
- Activate each remote control valve in sequence from controller. The Town's Representative will visually observe operation, water application patterns and leakage.
1. Replace defective remote control valve, solenoid, wiring or appurtenance to correct operational deficiencies.
 2. Replace, adjust or move water emission devices to correct operational or coverage deficiencies.
 3. Replace defective pipe, fitting, joint, valve, sprinkler or appurtenance to correct leakage problems. Cementing or caulking to seal leaks is prohibited.
 4. Repeat test(s) until each lateral passes all tests. Repeat tests, replace components and correct deficiencies at no additional cost to the Town.
- B. Control System Acceptance Test:
1. Upon completion of construction, a System Acceptance Test must be passed.
 2. Following construction completion and a Review by the Engineer, an evaluation period will begin. After 30 days of continuous service without major system problems, the system will be accepted and the guarantee/warranty period will begin. If at any time during the 30-day evaluation period, a major system problem occurs, the source of the problem will be determined and corrected and the 30-day evaluation period will start again. Equipment will not be accepted until such time as the System Acceptance Test is passed.
 3. If successful completion of the System Acceptance Test is not attained within 90 days following commencement of the evaluation period, the Town's Representative has the option to request replacement of equipment, terminate the order, or portions

- thereof, or continue with the System Acceptance Test. These options will remain in effect until such time as a successful completion of the System Acceptance Test.
4. Final payment will be made after successful completion of the System Acceptance Test.
- C. Control System Grounding:
1. Test for proper grounding control system per manufacturer's recommendations. Test results must meet or exceed manufacturer's guidelines for acceptance.
 2. Replace defective wire, grounding rod or appurtenances. Repeat the test until the manufacturer's guidelines are met.

4.4.7 CONSTRUCTION REVIEW:

- A. The purpose of on-site reviews by the Town's Representative is to periodically observe the work in progress, the Contractor's interpretation of the construction documents and to address questions with regard to the installation.
- B. Scheduled reviews such as those for irrigation system layout or testing must be scheduled with the Town's Representative as required by these specifications.
- C. Impromptu reviews may occur at any time during the project.
- D. A review will occur at the completion of the irrigation system installation and Project Record (As-Built) Drawing submittal.

4.4.8 WARRANTY AND REPLACEMENT:

The purpose of this warranty is to ensure that the Town receives irrigation materials of prime quality, installed and maintained in a thorough and careful manner.

- A. For a period of two years from commencement of the formal maintenance period, guarantee/warranty irrigation materials, equipment, and workmanship against defects. Fill and repair depressions. Restore landscape or structural features damaged by the settlement of irrigation trenches or excavations. Repair damage to the premises caused by a defective item. Make repairs within seven days of notification from the Town's Representative.
- B. Contract documents govern replacements identically as the new work. Make replacements at no additional cost to the contract price.
- C. Warranty applies to originally installed materials and equipment and replacements made during the warranty period.

4.4.9 MATERIALS

4.4.10 QUALITY

Use materials which are new and without flaws or defects of any type and which are the best of their class and kind.

4.4.11 SUBSTITUTIONS:

- A. Acceptable sprinkler equipment manufacturers are Rain Bird, Hunter, Weather-Matic and others indicated on irrigation plans, details and special conditions. Alternative equipment must be approved in writing by the Engineer prior to bidding. The Contractor is responsible for making any changes to the design to accommodate alternative equipment.
- B. Pipe sizes referenced in the construction documents are minimum sizes and may be increased at the option of the Contractor.

4.4.12 SLEEVING:

- A. Install separate sleeve beneath hardscape areas to route each run of irrigation pipe or wiring bundle.
- B. Sleeving material beneath drives, streets and pedestrian pavements shall be PVC Class 200 pipe with solvent welded joints.
- C. Sleeving diameter shall be as indicated on the drawings and installation details or equal to a minimum of twice that of the pipe or wiring bundle.

4.4.13 PIPE AND FITTINGS:

A. Mainline Pipe and Fittings:

1. Use rigid, unplasticized polyvinyl chloride (PVC) 1120, 1220 National Sanitation Foundation (NSF) approved pipe, extruded from material meeting the requirements of Cell Classification 12454-A or 12454-13, ASTM Standard D1784, with an integral belled end.
2. Use Class 200, SDR-21, rated at 200 psi, conforming to the dimensions and tolerances established by ASTM Standard D2241. Use PVC pipe rated at higher pressures than Class 200 in the case of small nominal diameters which are not manufactured in Class 200.
3. Use rubber-gasketed pipe equipped with factory installed reinforced gaskets for mainline pipe with a nominal diameter greater than or equal to 3 inches. Gasketed pipe joints must conform to the "Laboratory Qualifying Tests" section of ASTM D3139. Gasket material must conform to ASTM F477. Use rubber gasketed deep bell ductile iron fittings conforming to ASTM A-536 and ASTM F-477. Use lubricant approved by the pipe manufacturer.
4. Use solvent weld pipe for mainline pipe with a nominal diameter less than 3 inches or where a pipe connection occurs in a sleeve. Use Schedule 40, Type 1, PVC solvent weld fittings conforming to ASTM Standards D2466 and D1 784. Use primer approved by the pipe manufacturer. Solvent cement to conform to ASTM Standard D2564.
5. No plowing/pulling of mainline accepted.
6. One inch meter is required on all irrigation systems.
7. All systems will require a backflow preventer as detailed in section 3 of the PWM.

B. Lateral Pipe and Fittings:

1. Use rigid, unplasticized polyvinyl chloride (PVC) 1120, 1120 National Sanitation Foundation (NSF) approved pipe, extruded from material meeting the requirements

- of Cell Classification 12454-A or 12454-13, ASTM Standard D1784, with an integral belled end suitable for solvent welding.
2. Use Class 160, SDR-26, rated at 160 psi, conforming to the dimensions and tolerances established by ASTM Standard D2241. Use solvent weld pipe for lateral pipe.
 - a. Use Schedule 40, Type 1, PVC solvent weld fittings conforming to ASTM Standards D2466 and D1 784 for PVC pipe. Use primer approved by the pipe manufacturer. Solvent cement to conform to ASTM Standard D2564, of a type approved by the pipe manufacturer.
 3. For drip irrigation laterals downstream of riser connections, use $\frac{3}{4}$ inch UV radiation resistant Netafim Techline polyethylene pipe with self-flushing, pressure-compensating bubblers with the following: 1) shrubs – 1 bubbler; 2) 2" trees – 2 bubblers; 3) trees over 2" – 3 bubblers.
 4. No plowing or pulling of lateral lines accepted.

C. Specialized Pipe and Fittings:

1. Low Density Polyethylene Hose:
 - a. Use pipe specifically intended for use as a flexible swing joint.
Inside diameter: 0.490+0.010 inch
Wall thickness: 0.100+0.010 inch
Color: Black
 - b. Use spiral barb fittings compatible with the nominal size of the hose.
2. Assemblies calling for threaded pipe connections shall utilize PVC Schedule 80 nipples and PVC Schedule 40 or 80 threaded fittings.
3. Joint sealant: Use only Teflon-type tape or Teflon based paste pipe joint sealant on plastic threads. Use nonhardening, nontoxic pipe joint sealant formulated for use on water-carrying pipes on metal threaded connections.

D. Thrust Blocks:

1. All thrust blocks shall comply with Town's water standards as detailed in section 3 of PWM.
2. Use thrust blocks for fittings on pipe greater than or equal to 3 inch diameter or any diameter rubber gasketed pipe.
3. Use 4,000 psi concrete.
4. Use 2 mil plastic.
5. use No. 4 Rebar wrapped or painted with asphalt tar based mastic coating

E. Joint Restraint Harness:

1. Use a joint restraint harness wherever joints are not positively restrained by flanged fittings, threaded fittings, and/or thrust blocks.
2. Use a joint restraint harness with transition fittings between metal and PVC pipe, where weak trench banks do not allow the use of thrust blocks, or where extra support is required to retain a fitting or joint.
3. Use bolts, nuts, retaining clamps, all-thread or other joint restraint harness materials which are zinc plated or galvanized.
4. Use on pipe greater than or equal to 3 inch diameter or any diameter rubber gasketed pipe.

4.4.14 MAINLINE COMPONENTS

- A. Main System Shutoff Valve as per local practice and in compliance with local code.
- B. Winterization Assembly: Remove backflow preventer and blow lines out with air at this location.
- C. Master Valve Assembly: as presented in the installation details.
- D. Isolation Gate Valve Assembly with square key: as presented in the installation details. Install a separate valve box over a 3 inch depth of $\frac{3}{4}$ inch gravel for each assembly with a 2 inch operator.
- E. Quick Coupling Valve Assembly: double swing joint arrangement as presented in the installation details.

4.4.15 SPRINKLER IRRIGATION COMPONENTS

- A. Remote Control Valve (RCV) Assembly for Sprinkler Laterals: Provide Rainbird GB Series brass valves as presented in the installation details. Use wire connectors and waterproofing sealant to join control wires to solenoid valves. Use standard Christy I.D. tags with hot-stamped black letters on a yellow background. Install a separate valve box over a 3 inch depth of $\frac{3}{4}$ inch gravel for each assembly.
- B. Sprinkler Assembly: Provide Rainbirdalcon models F4-FC-SS-HS and F4-PC-SS-HS as presented in the drawings and installation details. Use the sprinkler manufacturer's pressure compensating screens (Rainbird PCS) to achieve 30 psi operating conditions on each sprinkler and to control excessive operating pressures.

4.4.16 DRIP IRRIGATION COMPONENTS

- A. Remote Control Valve (RCV) Assembly for Drip Laterals: as presented in the installation details. Use wire connectors and waterproofing sealant to join control wires to solenoid valves. Use standard Christy I.D. tags with hot-stamped black letters on a yellow background. Install a separate valve box over a 3-inch depth of $\frac{3}{4}$ inch gravel for each assembly.
- B. Combination Pressure Regulator / Filter Assembly: as presented in the installation details. Install a separate valve box over a 3-inch depth of $\frac{3}{4}$ inch gravel for each assembly.
- C. Zone Control Valve Assembly: as presented in the installation details. Install a separate box over a 3-inch depth of $\frac{3}{4}$ inch gravel for each assembly.
- D. Air/Vacuum Relief Valve Assembly: as presented in the installation details. Install at finish grade at high point of each Techline grid layout.
- E. Line Flushing Valve Assembly: as presented in the installation details. Install a separate box over a 3-inch depth of $\frac{3}{4}$ inch gravel for each assembly.

4.4.17 CONTROL SYSTEM COMPONENTS

A. Irrigation Controller Unit:

1. As presented in the drawing specifications and installation details.
2. Lighting protection: Provide 8-foot copper-clad grounding rod at controller location. Use American Wire Gauge No. 6 bare copper wire between the controller and grounding rod assembly.
3. Wire Markers: Pre-numbered or labeled with indelible non-fading ink, made of permanent, non-fading material.
4. Switch/Outlet: Use 120 VAC, 15 amp combination switch / GFCI outlet.

B. Control Wire:

1. Use American Wire Gauge (AWG) No. 14-1 solid copper, Type UF or PE cable, UL approved for direct underground burial for individual control wires and spare wires from the controller unit to each remote control valve or stub-out location. Use American Wire Gauge (AWG) No. 12-1 solid copper, Type UF or PE cable, UL approved for direct underground burial for common ground wire from the controller unit to each remote control valve or stub-out location. Contractor will run electrical power to irrigation controller from the nearest approved power source.
2. Contractor will pour concrete pad that provides a minimum collar of concrete around the irrigation controller at least 6 inches wide and set irrigation controller in the center of the concrete pad.
3. Color: Wire color shall be continuous over its entire length. Install low voltage wires using the following color coding:

Controller "A" control Wires	Red
Controller "A" common wire	White/Red stripe
Controller "B" control wires	Orange
Controller "B" common wire	White/Orange stripe
Spare wires from master valve locations to future stub-out locations	Green
Spare control wires along wire routing from each controller	Yellow
Spare common wires along wire routing from each controller	Yellow / Blue stripe

Splices: Use wire connector with waterproof sealant. 3M DBY. Contractor will label valve wires:

Valve wires	Red
Common wires	White
Spare wires	Yellow
Master valve wire	Blue
Flow meter wire	Orange

4. Mark wire routing not located near PVC irrigation pipe with warning tape as described in these specifications. Contractor will hook valve wires to controller. Four spare wires are needed to run from barmaid master valve to Controller "B". These four wires need to be two different colors. Contractor must numerically label all valve wires.

5. Warning tape: Inert plastic film highly resistant to alkalis, acids or other destructive chemical components likely to be encountered in soils. Three inches wide, colored red, and imprinted with "CAUTION: BURIED ELECTRIC LINE BELOW."
- C. Existing Control Wire: It is assumed that existing low voltage control wire between existing controller and solenoid valves is in workable condition. Field verify quantity, location and proper operation prior to construction. Any concerns are to be brought to the attention of the Owner's Representative prior to installation of the replacement controller.
- D. Controller Enclosure:
1. As presented conceptually in the installation details or noted in the special conditions.
 2. Constructed of stainless steel with free-flow ventilation. The key system is to be common to all enclosures made part of this project.
 3. Prepare shop drawings to show the exact placement of all components housed in the enclosure.
 4. Electrical conduit: Use PVC Schedule 40 conforming to the dimensions and tolerances established by ASTM Standard D-1 785.
 5. Lightning protection: Provide 8-foot copper-clad grounding rod at each controller location.
 6. Wire markers: Pre-numbered or labeled with indelible non-fading ink, made of permanent, non-fading material.
- E. Power Wire:
1. Electric wire from the power source to controller shall be solid or stranded copper, Type UF single conductor cable or multi-conductor with ground cable, UL approved for direct underground burial. Power wires shall be black, white and green in color. Size as presented in the drawings. The Contractor is responsible for verifying that the power wire sizes shown on the drawings are compatible and adequate for the control system being used.
 2. Splices: UL approved connectors.
 3. Conduit: PVC Schedule 40.
 4. Warning tape: Inert plastic film highly resistant to alkalis, acids or other destructive chemical components likely to be encountered in soils. Three inches wide, colored red and imprinted with "CAUTION: BURIED ELECTRIC LINE BELOW."

4.4.18 OTHER COMPONENTS AND MATERIALS:

- A. Tools and Spare Parts: Provide operating keys, servicing tools, test equipment, spare parts and other items indicated in the General Notes of the drawings.
- B. Sod and Fertilizer: Provide sod and fertilizer as required by the Town of Fairplay and as described in these specifications.
- C. Other Materials: Provide other materials or equipment shown on the drawings or installation details which are part of the irrigation system, even though such items may not have been referenced in these specifications.

4.4.19 EXECUTION

4.4.20 INSPECTIONS AND REVIEWS:

- A. Site Inspections:
 - 1. Verify construction site conditions and note irregularities affecting work of this section. Report irregularities to the Owner's Representative prior to beginning work.
 - 2. Beginning work of this section implies acceptance of existing conditions.
- B. Utility Locates ("Call Before You Dig")
 - 1. Coordinate with Parks Representatives and all appropriate local authorities to arrange for the location and marking of all underground utilities.
 - 2. Repair any underground utilities damaged during construction. Make repairs at no additional cost to the contract price.
- C. Irrigation System Layout Review: Irrigation system layout review will occur after the staking of sprinkler head locations and Techline grid alignments have been completed. Notify the Owner's Representative one week in advance of review. Modifications will be identified by the Town's Representative at this review.

4.4.21 LAYOUT OF WORK:

- A. Stake out the irrigation system. Items staked include: sprinklers, Techline grid alignment, sleeving, mainline and lateral line pipes, control valves, line flushing valves, air/vacuum relief valves, controllers, and isolation valves.
- B. Install all mainline pipe and mainline components inside of project property lines.

4.4.22 EXCAVATION, TRENCHING, BACKFILLING AND SOD REPLACEMENT:

- A. Excavate to permit the pipes to be laid at the intended elevations and to permit work space for installing connections and fittings.
- B. Minimum cover (distance from top of pipe or control wire to finish grade):
 - 1. 36" over mainline pipe and over electrical conduit.
 - 2. 36" over control wire.
 - 3. 15" over lateral pipe to sprinklers and over supply header lateral pipe to drip system riser connections.
 - 4. Netafin Techline dripperline grids shall be installed directly on the soil surface and secured to grade with approved stakes.
- C. Backfill only after lines have been reviewed and tested.
- D. Excavated material is generally satisfactory for backfill. Backfill shall be free from rubbish, vegetation matter, frozen materials and stones larger than 2-inches in maximum dimensions. Remove material not suitable for backfill. Backfill placed next to pipe shall be free of sharp objects which may damage the pipe.
- E. Backfill unsleeved pipe and sleeves in either of the following manners:

1. Backfill and puddle the lower half of the trench. Allow to dry 24 hours. Backfill the remainder of the trench in 6-inch layers. Compact to density of surrounding soil.
 2. Backfill the trench by depositing the backfill material equally on both sides of the pipe in 6-inch layers. Compact to density of surrounding soil.
- F. Enclose pipe and wiring beneath roadways, walks, curbs and other hardscape conditions in sleeves. Minimum compaction of backfill for sleeves shall be 95% Standard Proctor Density, ASTM D698-78. Use of water for compaction around sleeves, "puddling", will not be permitted.
- G. Dress backfilled areas to original grade. Dispose of excess backfill off site.
- H. Where utilities conflict with irrigation trenching and pipe work, contact the Town's Representative for trench depth adjustments.
- I. Any and all turf grass areas disturbed during the construction process shall be repaired as follows:
1. At any location where it is necessary to cross over a sidewalk or any other concrete or asphalt areas, every effort shall be made to protect said concrete and/or asphalt from damage. In the event that any concrete or asphalt does become damaged, it is the responsibility of the Contractor to repair or replace the damage.
 2. All affected areas will have sod removed, with a sod cutter or other appropriate equipment to provide a uniform edge for sod replacement. All stripped sod shall be removed from the site and properly disposed of.
 3. Fill soil added to raise the soil level in any area shall be placed in no greater than six inch (6") lifts and then compacted to eliminate future settling.
 4. These areas will then be rough graded. Clear the prepared area of clods, stones, wood, rubbish and all debris that will not pass through the tines of a garden rake, final approval by the Town of Fairplay.
 5. The area should then be rolled to reduce future settling.
 6. The prepared areas should then be fertilized at the rate of twenty pounds per 1,000 square feet of 5-20-5 fertilizer. Submit manufacturer's analysis.
 7. Notify the Town of Fairplay 24 hours prior to sodding to obtain approval of grade and sod bed prior to sodding. To avoid ponding, no tolerance in sod area grading is permitted. If determined by the Town of Fairplay to be necessary the area will be regarded and/or fill dirt added to provide a smooth, even, uniform transition from the undisturbed areas to the disturbed areas.
 8. Sod shall be Colorado grown, 100% certified blended Kentucky Bluegrass of 3 to 4 types, or a mixture approved by the Town of Fairplay, complying with applicable Colorado and Federal regulations, having a healthy root system, regularly fertilized, watered, mowed, sprayed and free from objectionable weeds and/or grasses. Sod strips shall have from 5/8" minimum to 1" maximum thickness of soil adhering to the root system, cut into strips 18" maximum width by 24" minimum length. Sod which has dried out, or sod with adhering soil which breaks, tears or crumbles away will not be accepted. Sod cut for more than twenty-four (24) hours will not be accepted. Sod rolls shall be kept moist, protected from sun, heat and wind, and properly protected in transport. The sod source shall be made known to and approved by the Town of Fairplay after contract signing.

- 9. Sodding dates must be approved by the Town of Fairplay.
- J. No plowing or pulling of pipe will be allowed.

4.4.23 SLEEVING AND BORING:

- A. Install sleeving at a depth which permits the encased pipe or wiring to remain at the specified burial depth.
- B. Extend sleeve ends six inches beyond the edge of the paved surface. Cover pipe ends and mark with stakes.
- C. Bore for sleeves under obstructions which cannot be removed. Employ equipment and methods designed for horizontal boring. At locations where pavers are installed and set in sand base, remove the pavers and sand for surface trenching of sleeving and conduit crossings. Reset sand and pavers after backfilling sleeve or conduit to original condition as directed by Town's Representative.

4.4.24 ASSEMBLING PIPE AND FITTINGS:

- A. General:
 - 1. Keep pipe free from dirt and pipe scale. Cut pipe ends square and debur. Clean pipe ends.
 - 2. Keep ends of assembled pipe capped. Remove caps only when necessary to continue assembly.
 - 3. Trenches may be curved to change direction or avoid obstructions within the limits of the curvature of the pipe. Minimum radius of curvature and offset per 20 foot length of pipe by pipe size are shown in the following table. All curvature results from the bending of pipe lengths. No deflection will be allowed at a pipe joint.

RADIUS	OFFSET PER 20' LENGTH
25'	7' – 8"
25'	7' – 8"
100'	1' – 11"
100'	1' – 11"
100'	1' – 11"

B. Mainline Pipe and Fittings:

1. Use only strap-type friction wrenches for threaded plastic pipe.
2. PVC Solvent Weld Pipe:
 - a. Use primer and solvent cement. Join pipe in a manner recommended by the manufacturer and in accordance with accepted industry practices.
 - b. Cure for 30 minutes before handling and 24 hours before allowing water in pipe.
 - c. Snake pipe from side to side within the trench.
3. Fittings: The use of cross type fittings is not permitted.

C. Lateral Pipe and Fittings:

1. Use only strap-type friction wrenches for threaded plastic pipe.
2. PVC Solvent Weld Pipe:
 - a. Use primer and solvent cement. Join pipe in the manner recommended by the manufacturer and in accordance with accepted industry practices.
 - b. Cure for 30 minutes before handling and 24 hours before allowing water in the pipe.
 - c. Snake pipe from side to side within the trench.
3. Techline Dripline Pipe:
 - a. Join pipe in the manner recommended by manufacturer and in accordance with accepted industry practices.
 - b. Hold in place with tubing stakes or landscape fabric staples spaced every four feet. Pipe is not to be compressed or crimped by the stake or staple or other construction activity.
4. Fittings: The use of cross type fittings is not permitted.

D. Specialized Pipe and Fittings:

1. Low Density Polyethylene Hose: Install per manufacturer's recommendations.
2. No galvanized pipe will be allowed.
3. PVC Threaded Connections:
 - a. Use only factory-formed threads. Field-cut threads are not permitted.
 - b. Use only Teflon-type tape or Teflon based paste.
 - c. When connection is plastic-to-metal, the plastic component shall have male threads and the metal component shall have female threads.
5. Make metal-to-metal, threaded connections with Teflon-type tape or pipe joint compound applied to the male threads only.

E. Thrust Blocks:

1. Use cast-in-place concrete bearing against undisturbed soil.
2. Size, orientation and placement shall be as shown on the installation details.

3. Wrap fitting with plastic to protect bolts, joint and fitting from concrete.
 4. Install rebar with mastic coating as shown on the installation details.
- F. Joint Restraint Harness: Install harness in the manner recommended by the manufacturer and in accordance with accepted industry practices.

4.4.25 INSTALLATION OF MAINLINE COMPONENTS:

- A. Main System Shut Off Valve: Install where indicated on the drawings.
- B. Winterization Assembly: Install where indicated on the drawings.
- C. Master Valve Assembly: Install where indicated on the drawings.
- D. Isolation Gate Valve Assembly:
1. Install where indicated on the drawings.
 2. Locate at least 12-inches from and align with adjacent walls or edges of paved areas.
- E. Quick Coupling Valve Assembly: Install where indicated on the drawings.

4.4.26 INSTALLATION OF SPRINKLER IRRIGATION COMPONENTS:

- A. Remote Control Valve (RCV) Assembly for Sprinkler Laterals:
1. Flush mainline before installation of RCV assembly.
 2. Install where indicated on the drawings. Wire connectors and waterproof sealant shall be used to connect control wires to remote control valve wires. Install connectors and sealant per the manufacturer's recommendations.
 3. Install a ball valve in front of each valve. Install only one RCV to a valve box. Locate valve box at least 12-inches from and align with nearby walls or edges of paved areas. Group RCV assemblies together where practical. Arrange grouped valve boxes in rectangular patterns. Allow at least 12-inches between valve boxes.
 4. Adjust RCV to regulate the downstream operating pressure.
 5. Attach ID tag with controller station number to control wiring.
 6. Brand all valve box lids with an approved number in a sequence that corresponds to the controller layout.
- B. Sprinkler Assembly:
1. Flush lateral pipe before installing sprinkler assembly.
 2. Install per the installation details at locations shown on the drawings.
 3. Locate rotary sprinklers 6-inches from adjacent walls, fences or edges of paved areas.
 4. Locate spray sprinklers 3-inches from adjacent walls, fences or edges of paved areas.
 5. Install sprinklers perpendicular to the finish grade.
 6. Supply appropriate nozzle or adjust arc of coverage of each sprinkler for best performance.
 7. Adjust the radius of throw of each sprinkler for best performance.

4.4.27 INSTALLATION OF DRIP IRRIGATION COMPONENTS:

- A. Remote Control Valve (RCV) Assembly for Drip Laterals:
 1. Flush mainline pipe before installing RCV assembly.
 2. Locate as shown on the drawings. Wire connectors and waterproof sealant shall be used to connect control wires to remote control valve wires. Connectors and sealant shall be installed as per the manufacturer's recommendations.
 3. Install only one RCV to valve box. Locate at least 12-inches from and align with nearby walls or edges of paved areas. Group RCV assemblies together where practical.
 4. Arrange grouped valve boxes in rectangular patterns.
- B. Zone Control Valve Assembly: Install at locations shown on the drawings.
- C. Techline Emitter Grid Layout:
 1. Locate as shown on the drawings and installation details.
 2. Flush lateral supply header pipe before installing Techline grid.
 3. Use tools and techniques recommended by the manufacturer.
- D. Air/Vacuum Relief Valve Assembly: Install at the high point of each Techline grid layout as shown on the installation details.
- E. Line Flushing Valve Assembly: Install at the end of each Techline grid layout as shown on the installation details.

4.4.28 INSTALLATION OF CONTROL SYSTEM COMPONENTS:

- A. Irrigation Controller Unit:
 1. The location of the controller unit as depicted on the drawings is approximate; the Town's Representative will determine the exact site location upon commencement of contract.
 2. Lightning protection: Provide grounding components such as ground rod assembly, grounding wire, etc., in accordance with manufacturer's recommendations. Drive 8-foot copper-clad grounding rod into the soil. If rock prevents driving, bury at least four feet deep. Use one ground rod assembly for each controller. Connect controller to grounding rod with AWG No. 6 solid conductor copper wire. Secure wire to grounding rod with approved Calweld Brand Connectors or approved equal.
 3. Install primary surge protection arrestors on incoming power lines.
 4. Identifying wire and valve box lids numbering will be in sequential order of our Motorola system furnished by the Town and given to the Contractor prior to installation. Contractor will pour pad for Motorola controller and strong box for backflow device. Template will be supplied by the Town.
 5. Attach wire markers to the ends of control wires inside the controller unit housing. Label wires with the identification number (see drawings) of the remote control valve to which the control wire is connected.
 6. Install combination switch / GFCI outlet inside the controller enclosure.
 7. Connect control wires to the corresponding controller terminal.
- B. Control Wire:

1. Bundle control wires where two or more are in the same trench. Bundle with pipe wrapping tape spaced at 10-foot intervals. Do not tape wire together where contained within sleeving or conduit.
2. Provide a 24-inch excess length of wire in an 8-inch diameter loop at each 90 degree change of direction, at both ends of sleeves and at 100-foot intervals along continuous runs of wiring. Do not tie wiring loop. Coil 30-inch length of wire within each remote control valve box.
3. Install common ground wire and one control wire for each remote control valve. Multiple valves on a single control wire are not permitted.
4. If a control wire must be spliced, make splice with wire connectors and waterproof sealant, installed per the manufacturer's recommendations. Locate splice in a valve box which contains an irrigation valve assembly, or in a separate 10-inch round valve box. Use same procedure for connection to valves as for in-line splices.
5. Unless noted on plans, install wire parallel with and below PVC mainline pipe.
6. Protect wire not installed with PVC mainline pipe with a continuous run of warning tape placed in the backfill six inches about the wiring.

C. Power Wire:

1. Route power wire as directed on plans. Install with a minimum number of field splices. If a power wire must be spliced, make splice with recommended connector, installed per manufacturer's recommendations. Locate all splices in a junction box in accordance with local codes. Contractor will set Motorola controller on concrete pad and supply 11 electrical power to controller from the nearest approved power source.
2. All power wire shall be laid in trenches. The use of a vibratory plow is not permitted.
3. Green wire shall be used as the common ground wire from power source to all satellites.
4. Carefully backfill around power wire to avoid damage to wire insulation or wire connectors.
5. Encase power wire in electrical conduit with a continuous run of warning tape placed in the backfill, 6-inches above the wiring.

4.4.29 INSTALLATION OF OTHER COMPONENTS:

- A. Tools and Spare Parts: Prior to the review at completion of construction, supply to the Owner operating keys, servicing tools, spare parts and any other items indicated in the General Notes on the drawings.
- B. Other Materials: Install other materials or equipment shown on the drawings or installation details which are part of the irrigation system, even though such items may not have been referenced in these specifications.

4.4.30 PROJECT RECORD (AS-BUILT) DRAWINGS:

- A. The Contractor is responsible for documenting changes to the design. Maintain on-site and separate from documents used for construction, one complete set of contract documents as Project Documents (Record Drawings). Keep documents current. Do not permanently cover work until as-built information is recorded.

- B. Record pipe and wiring network alterations. Record work which is installed differently than shown on the construction drawings. Record accurate reference dimensions, measured from at least two permanent reference points, of each irrigation system valve, each controller or control unit, each sleeve end, each stub-out for future pipe or wiring connections and other irrigation components enclosed within a valve box.
- C. Prior to acceptance, Record drawings shall be provided to the Town Engineer in electronic format including PDF, ACAD and GIS.

4.4.31 WINTERIZATION AND SPRING START-UP:

Winterize the irrigation system in the fall and start-up the irrigation system in the spring of the first year following final approval of construction. Repair any damage caused by improper winterization at no additional cost to the Town. Coordinate the winterization and start-up with the landscape maintenance personnel.

4.4.32 MAINTENANCE:

- A. Upon completion of construction and review by the Town's Representative, maintain irrigation system for a duration of 30 calendar days. Make periodic examinations and adjustments to irrigation system components so as to achieve the most desirable application of water.
- B. Following completion of the Contractor's maintenance period, the Town will be responsible for maintaining the system in working order during the remainder of the guarantee warranty period, for performing necessary minor maintenance, for trimming around sprinklers, for protecting against vandalism, and for preventing damage after the landscape maintenance operation.

4.4.33 CLEANUP:

Upon completion of work, remove from the site all machinery, tools, excess materials, and rubbish.

END OF SECTION

SECTION 4.5

CONSTRUCTION MATERIALS AND METHODS

PLANT LANDSCAPING

4.5.1 GENERAL

Fertilizing, seeding, mulching, sodding, planting or transplanting of trees, shrubs, or other plants required to provide landscaped areas for the Town shall be supplied and installed using current approved horticultural practices, these specifications and the contract documents.

4.5.2 MATERIALS

Materials to be incorporated into the landscaped areas shall conform to the minimum standards hereinafter referred to in the following (or approved equals).

4.5.3 SHRUBS, TREES AND OTHER PLANTS

All plants shall be nursery grown, for a minimum of one year, in U.S. Department of Agriculture recognized hardiness zones two, three, four and five only; conform to the requirements of the USDA Standards, AAN Standardized Specifications, and the Colorado State Nursery Act of 1965. Plants imported shall comply with all nursery inspection and quarantine regulations of the state of origin and destination, as well as all federal regulations governing interstate shipment of nursery stock.

Plants shall be healthy representatives of the specified species or variety with well-developed branch and root systems that are free of all objectionable features, diseases and insect pests. The minimum sizes and/or heights of all plants will be specified in the bid documents. Plant materials shall be measured as indicated in the plans by container size, height, and/or caliper. Caliper is the measured diameter of the tree at a six inch height above the root ball. In trees above three inches in diameter the caliper measurement is made at a height of twelve inches above the root ball of the tree.

The contractor shall be responsible for and furnish the Town a certificate of inspection for all materials, as required by federal, state or other authorities. A certificate of inspection will be supplied for each package, box, bale shipped or otherwise delivered. Contractor will provide a Grower's Certificate showing the origin of each plant. Each plant shall have a grower's label affixed to the plant which identifies the plant with the necessary dates to conform to these specifications.

The contractor's successful procurement arrangements for all plant material shall be evidenced by his/her act of submitting a Bid Proposal.

- A. Planting Pit Backfill – Backfill for each planting pit will be an improved soil consisting of three parts on-site topsoil and one part sphagnum peat, thoroughly blended and free of inorganic foreign substances.

- B. Tree Wrap – The contractor will wrap each tree in crepe nursery wrap, spirally applied with one (1) inch overlap and double wrapped at top and bottom, as manufactured by Kraft of 3M. Waterproof tape will be used to hold the wrap in place.
- C. Plant Anchorage – Trees will be anchored by the use of double strands of twelve gauge galvanized steel wire anchored to the plant through new or non-fractured garden hose. This wire will be attached to metal tee-posts. The number of stakes or posts and the specific methods of anchorage will be indicated in the plans or specifications.
- D. Soil Conditioners For Trees And Shrubs – The desired soil conditioner and fertilizer will vary per project. Consult plans and project specifications for specific application of mulches and soil mixes desired.
 - 1. Agriform planting tablets (twenty-one grams/tablet) containing a 20-10-5 NPK ratio, as manufactured by the Sierra Chemical Company.
 - 2. Liquid commercial fertilizer containing a 20-30-10 NPK ratio and chelated iron applied in accordance with the Colorado Nurseryman’s Association’s recommendation on trees three (3) inches and larger in caliper.
 - 3. Sphagnum peat certified to have a pH less than five and containing ninety-five percent organic matter when supplied to six to seven and one half cubic feet compressed bales.
 - 4. Mountain peat shall have a pH less than six and one-half and contain a minimum of 50 percent organic matter, subject to specific testing and approval by the project manager prior to delivery.
 - 5. Miracle Compost as manufactured by Majestic Mushroom Company, Golden, Colorado.

4.5.4 PLANTING PIT MULCH AND COVER.

- A. Tree pits shall be covered with an approved four (4) inch thick chipper chip, or designated mulch material, in seeded areas and sodded areas. Edging, if included, will be shown on the drawings.
- B. Shrub beds shall be covered with a four (4) inch compressed thickness of two to three inch long chipper chip or designated mulch material placed directly on the dirt around the plants. Edging, if included, will be shown on the drawings.
- C. Weed Barrier, a layer of approved filter fabric (Mirafi, Typar, Trevira) will be used in shrub beds or tree pits if designated on the drawings.

4.5.5 GRASS MATERIALS.

All bluegrass seed shall be eighty percent “Baron” bluegrass and 20 percent “Pennfine” rye grass unless otherwise indicated in the plans, drawings or specifications. Other blends will not be allowed unless specifically called for in the special conditions.

- A. Seed – Seed shall be furnished in containers that are labeled in conformance with applicable state and federal regulations and showing at least the name and address of supplier, seed name, lot number, net weight, percent of seed content, guaranteed percent of purity and percent of germination. All seed furnished shall be free from noxious weed seeds. Containers whose contents become wet, moldy or otherwise

damaged will not be acceptable. All seed labels will be received by the project manager prior to acceptance of the seeding. Final or finish grade will be accepted by the project manager prior to seeding.

- B. Sod – Sod produced from the type of seed previously described shall be live nursery-grown grass actively growing or capable of renewing growth after dormancy. Sod shall be free of all undesirable perennial or annual grasses, plants, stones or any other material detrimental to growth or future maintenance. Grass shall be mowed to a height of two inches in the field. The sod will be machine cut in rectangular sections having a minimum soil thickness of five-eighths of an inch and sized to allow lifting and rolling without breaking. No netting or other material can be used to lift new sod.
- C. Soil Conditioner for Grass or Sod. A commercial fertilizer certified as to containing an NPK ratio of 20-10-5 unless otherwise specified in the Special Conditions.
- D. Mulch for Seeded Grasses – Dyed wood cellulose fiber that is free of any substance which will inhibit germination or grass growth, will evenly disperse and suspend when agitated in water, will absorb water while allowing infiltration and when air dry will contain less than ten percent moisture especially at the time of delivery.

Cellulose fiber shall be supplied in packages, having a gross weight of 100 pounds or less and marked to show the air dry weight content.
- E. Topsoil – Loose, friable loam that is free from admixtures of subsoil, refuse, stumps, rocks, roots, brush, weeds or other material which would be detrimental to the proper development of vegetative growth.

4.5.6 TREE, SHRUB AND PLANT LANDSCAPING

Final or finish grade must be approved by the project manager prior to planting.

4.5.7 TRANSPLANTING OF PLANTS

Handling plants shall be done according to recognized standard practices at all times. Plants shall be properly dug, pruned, inspected and tagged. The root system will be kept moist and the plant protected from all adverse conditions until planting is complete.

Plants may be furnished in non-biodegradable containers, which must be removed prior to planting or with the root system balled and burlapped. Balling and burlapping must conform to the “American Standard for Nursery Stock” specifications. The plant ball shall be natural, not man-made, and used for handling the plant at all times. Plants having a trunk loosened from the root ball or a broken ball will be rejected.

All plants will be inspected and approved by the project manager on site before they are planted. The project manager or a designated representative will select and reject plants at the nursery, if possible. Leaders on central trunks will be healthy. All plants that are found to be stressed damaged, drying out, insect infested, diseased or otherwise failing to meet the specifications or which appear incapable of normal growth will be rejected. All trees and shrubs will be tagged for genus and species. Plants not tagged will be rejected.

Deciduous tree trunks shall be wrapped from the top of the ball to the first branch, after pruning, then tape with waterproof tape securely at top and bottom.

Locally grown trees not to exceed a six caliper inch trunk diameter will be machine transplanted. However, the lapsed time between digging and placing in the tree pit shall not exceed twelve hours.

4.5.8 PRUNING

All pruning will conform to currently approved horticultural practices. Pruning evergreens shall be limited to the removal of damaged or dead foliage. Other plants shall have all damaged or dead roots or branches pruned to slightly above the nearest healthy side bud, at an angle not to exceed 45 degrees from the remaining portion. Leaders shall not be pruned. Other pruning, as required by the project manager, may be required.

Within ten days prior to transplanting, locally grown deciduous trees and shrubs shall be pruned to reduce their foliage spread by one-third unless otherwise directed.

4.5.9 EXCAVATING FOR PLANTING PITS

Planting pits shall be flat bottomed, circular in outline and excavated with vertical sides. No glazed smooth holes will be accepted. The contractor will, at the request of the project manager, roughen the surfaces of the plant pits. Pits shall have a diameter eighteen (18) inches greater than the earth ball diameter for trees and twelve (12) inches greater than the earth ball diameter of bare root or container shrubs. A minimum layer of select backfill will be placed below the bottom of the earth ball or root system. The backfill will be at least nine (9) inches deep under trees and six (6) inches deep under shrubs. Areas to be planted with ground cover shall be suitable furrowed using select backfill to a depth of six (6) inches. Pits shall be free of underground obstructions such as pipes, wires, rock formation, debris or contaminants.

The contractor shall protect and maintain in service all existing underground utilities, sprinkler system equipment, piping and amenities or structures, whether or not shown on the drawings during the performance of the work. He/she shall adequately barricade any pit or hole which is to remain open in excess of four hours.

4.5.10 PLANTING TREES AND SHRUBS

Planting of trees, shrubs and other plants shall be done at a time of year that is favorable to plant growth and in accordance with good horticultural practice.

Excavation for planting shall not commence until the project manager has staked all planting pits or shrub beds. Under no circumstances shall plant material be installed which interferes with the operation or coverage of the sprinkler system equipment or which will be damaged by the irrigation spray.

Following excavation of the planting pit, the contractor shall place the specified depth of improved planting mix into the hole before setting any tree or shrub. Upright plants shall be set plumb. Prostrate plants shall be set at the same depth to the ground surface as originally grown. The ball of each tree shall be set so that the top of the ball is parallel to the slope of the plant bed.

In irrigated areas all deciduous trees will be planted two (2) inches above finished grade, evergreen trees will be placed with the top of the ball three (3) inches above finished grade. In non-irrigated areas, the top of the ball shall be surrounded by a saucer, the diameter of the plant pit, that will hold water; and the top of the ball will be set one (1) inch above ground level. All wire baskets or any synthetic material must be totally removed from the root ball of all plants. Remove all cord and peel burlap back from the top one third of the root ball. The wire and cord removed from each tree will be set to the side of the newly planted tree for inspection by the project manager.

During the setting of the plant, the contractor shall partially backfill the pit to within six (6) inches of finish grade by carefully placing and compacting as specified planting pit backfill around the ball of the plant. The plant shall then be fertilized by meeting Agriform tablets, equally spaced, eight (8) inches below finish grade. Four tablets shall be placed in the pits for each tree with a caliper three (3) inches and larger; three (3) tablets shall be placed in the pits for each tree with a one and one-half (1/2) to two and one-half (2 1/2) inch caliper. Shrubs shall have two (2) tablets each placed 180 degrees apart in the pit.

Following fertilization, the placement and gentle compaction of planting pit backfill around the ball shall continue until the hole is completely backfilled. Water shall then be placed in the pit by means of a water lance so that the hole is irrigated from the bottom upward.

When water has disappeared, the pit shall be filled with more Planting pit backfill until stabilized to the desired finish grade.

Trees shall then be anchored by means of stakes and wire. Stakes shall be metal tee-posts placed in u undisturbed soil outside the pits; and guy wires shall be anchored to above the first and second limb crotch of the tree. The guy wire will be threaded through rubber hose so that no wire contacts the tree. The wire shall then be tightened sufficiently by twisting the wire to anchor the tree in a true vertical plumb, allowing the plant one inch play in each direction. Two guy wires 180 degrees apart in an east-west orientation will be used for each tree two (2) inches in caliper or smaller.

4.5.11 MULCHING PLANT PITS

All single trees, clusters of trees and/or shrubs, including row patterns, shall be mulched with chipper chip shredded wood or designated mulch material. Mulch shall cover the tree pit around each tree and shrub. Shrub and ground cover beds shall be mulched unless otherwise stated or shown on the drawings.

4.5.12 GRASS LANDSCAPING

Prior to seeding or sodding and in accordance with the requirements of the applicable section of the Town Standard Specifications, the area to be landscaped shall be cleaned, grubbed and graded to within one-half inch of finish grade.

All irregularities in the ground surface, except the saucers for trees and shrubs in rough grass seeding areas, shall be removed. Special measures shall be taken to eliminate all low spots and pockets that would trap water and to clear the area of one to one and one-half inch and larger rocks or other debris.

4.5.13 SEASON FOR PLANTING GRASS SEED

Seeding seasons in any calendar year shall be limited to those periods of time favoring a healthy growth of grass by accepted horticultural practices. Unless otherwise approved by the project manager, seeding shall be accomplished within the following time periods:

<u>Grass Area</u>	<u>Early Season</u>	<u>Late Season</u>
Sprinkler Irrigated	May 1 to June 15	September 1 to October 1
Non-Irrigated	May 1 to June 15	-----

Seeding shall not be performed during windy weather or when the ground is frozen or otherwise untiltable. Seeding portions of the designated areas may be permitted before construction is complete in order to take advantage of the

4.5.14 BED PREPARATION FOR SEEDING OR SOD PLACEMENT

Commercial fertilizer (18-46-0 NPK) at the rate of 300 pounds per acre shall be applied and then be spread and tilled into the top two inches of the soil. The ground surface shall be graded and worked by hand, if necessary to within one-half inch of finish grade to prepare for seeding or sod placement. Areas to be seeded or sodded which are contiguous with curbs, sidewalks or other architectural structures shall be sloped and graded to a level growing season, with prior approval of the project manager. one inch lower than the structural surface grade, on the uphill side of the paved surface. On the downhill side of the structured surface, the finish grade, after seeding or sodding, will be flush with the top of the paved surface.

All areas that have set for any period of time after fertilizing, which become firm or leaked over for whatever reason, shall be retiled to a depth of one inch prior to seeding.

4.5.15 SEED PLANTING RATE

Seed shall be sown to provide the coverage of "Pure Live Seed" (PLS) mixture, as determined in accordance with the following formula:

$$\underline{\text{Lbs. (PLS) = lbs. seed x \% Purity x \% Germination}}$$

4.5.16 PLANTING SEED

The contractor will seed over fertilized ground using approved mechanical power-drawn drills followed by packer wheels.

Fertilizer type and method of application may vary with each project. Consult the project plans and specifications for any modifications in the fertilization or bed preparation process.

The power-drawn drill shall be set to maintain a seed planting depth of one-fourth (1/4) inch. Seed sown by broadcast type seeders or by hand shall be "raked in" or otherwise covered with soil to a depth of one-quarter (1/4) inch. The hand-broadcasting method of seeding shall be limited to those areas not accessible by machine methods.

4.5.17 MULCHING SEEDED AREAS

Mulching seeded areas shall be accomplished by the hydraulic method using wood cellulose fiber mulch. Hydraulic mulching in slurry form shall be applied to all seeded areas. Proportionate quantities of water and other approved materials shall first be placed in the slurry tank and mix. Cellulose fiber mulch shall be added and mixing continued until the slurry is homogeneous. The slurry mixture shall then be uniformly spray applied at the rate of 1,400 pounds/acre over the designated area, using the color of the mulch as a metering agent. Hydraulic mulching shall not be performed in the presence of free surface water. Seed shall not be included in the hydraulic mulch. Mulch shall be Weyerhaeuser Silva-Fiore or approved equal.

Areas not properly mulched or damaged due to contractor's negligence, shall be repaired and re-mulched in an acceptable manner at the contractor's expense. Mulch removed by wind or water erosion prior to acceptance shall be reseeded and re-mulched by the contractor at his expense.

4.5.18 PLACING SOD

Sod placement may start after the sod bed or finished grade has been fertilized and prepared as previously specified. Special care shall be taken to prepare the surface to the specified elevations and to neatly rake the finished grade near fences, curbs, sidewalks, buildings, etc. Sod shall be transplanted within twenty-four hours after lifting, unless weather conditions prohibit normal operations. Sod shall be laid smoothly, edge to edge, perpendicular to slope, with staggered joints and pressed firmly into contact with the sod bed by tamping. All holes in the sod, frayed edges and missing strip corners shall be trimmed to straight lines and patches to completely fill all voids in the surface. Sod laid in slopes of 3:1 or greater will be secured with six (6) inch long wood stakes, as needed, until growth is established.

Once in place, the sodded area shall be lightly watered and rolled to insure full contact with the soil. After rolling, water shall continue until the added moisture penetrates the subsoil to a depth of not less than two inches.

Sod that becomes withered, moldy or yellow from heating, or has been allowed to dry out or freeze, will be rejected.

4.5.19 CARE AND MAINTENANCE

All trees, shrubs, other plant materials and seeded or sodded areas shall be cared for, watered, maintained and if necessary, barricaded and protected from damage from whatever cause until their acceptance. By the time of final inspection for acceptance, plant grower tags shall be removed. The landscaping shall be finally accepted for warranty and guaranteed by the contractor, after the following conditions have been met.

4.5.20 TREES, SHRUBS AND OTHER PLANTS

All plants shall be cared for, watered and maintained by the contractor until final project acceptance. The contractor shall not request an acceptance inspection until all plants that are dead or damaged due to his operation or vandalism or any other reason are replaced with like size and species.

4.5.21 SEEDED GRASS AREAS

Seeded areas shall be mowed to a two inch height at least once by the contractor. The contractor will otherwise maintain seed until there is an acceptable uniform plant growth. Areas that are not producing a uniform plant growth within five weeks following seeding shall be reseeded.

Unacceptable uniform plant growth shall be defined as scattered bare spots, greater than one square foot, exceeding three percent of the seeded area. However, for seeded areas under irrigation it shall also include producing a uniform plant growth to a height of two inches. Irrigated areas that are seeded late in the fall planting season which are not producing an acceptable uniform plant growth, as previously defined, shall be reseeded during the following spring planting season. If such a condition exists and the contractor has diligently pursued the performance of his work, the Town, at its option, may extend the contract completion date and reduce the contract retainage. Retainage may be reduced to less than five percent of the total contract amount but shall be at least double the estimated or contracted cost of obtaining the required growth in the indicated areas, plus those areas which are susceptible to damage by winter kill, washout or other causes.

4.5.22 SODDED AREAS

Sodded grass areas shall be watered as needed and mowed at least once, and otherwise maintained for a period of thirty days after transplanting the sod.

Any areas that fail to sustain a healthy growth of grass during this period or appear susceptible to negative drainage shall be reworked and re-sodded before acceptance by the contractor.

4.5.23 GUARANTEE AND WARRANTY OF PLANTS

The contractor will replace all plants which die during the two-year warranty. Exceptions will be made for plants which die during this period due to vandalism or neglect. Replacement will be limited to one time only. Replacement materials will be identical in size and species to the original plants specified. Replacement materials will be high quality. The project manager reserves the right to reject any replacement materials not meeting Town or Fairplay standards.

The contractor agrees to replace dead plants within two weeks after notification by the project manager. The project manager will maintain an accurate copy of the planting plan indicating which specimens were removed and/or replaced.

SECTION 4.6

STREET CLASSIFICATION GUIDE

PART 1 FUNCTIONAL CLASSIFICATION

- A. The width, street configuration, alignment, and design speed of a street is related to its functional classification. For the purpose of these guidelines, the following functional classifications shall apply.
1. Alley: A roadway, usually unnamed, which primarily provides secondary vehicle access to the rear entrance of abutting property
 - 2.. Bikeway: A street that incorporates designated bicycle lanes within the roadway to allow for commuter bicycle circulation.
 3. Collector Street: A street that primarily provides movement between local streets and streets of higher classification and, secondarily, provides access to abutting property. It accommodates low-to-moderate vehicular movement, low to heavy pedestrian movement, moderate to heavy bicycle movement, and low to moderate transit movement. It has on-street parking, street trees, traffic safety street lighting, and sidewalks. It may also include landscaping, and pedestrian-scale lighting.
 4. Local Residential Street: A street that provides direct access to abutting residential property. It carries low vehicular movement, low to heavy pedestrian movement, and low to moderate bicycle movement. On street parking, street trees, and sidewalks should be provided. Traffic safety street lighting may be appropriate at intersection and pedestrian crossings.
 5. Industrial Street: An industrial street provides direct access to abutting properties where the dominate land use is light industrial or industrial based mixed uses. Traffic includes a higher than normal amount of truck movement. Street widths are wider to accommodate a range of vehicle sizes.
 6. Private Streets: A street that provides only direct access to abutting property and carries low vehicular movement. It may also provide for low to heavy pedestrian movement, and low to moderate bicycle movement. It has the same overall standards, design and construction as a public street, with the exception that the responsibility for maintenance is private.
 7. Rural Collector Road: A road in an agricultural or open space setting that primarily provides movement between rural local and collector roads and roads or streets of higher classification. It secondarily provides access to abutting property. It carries low to moderate vehicular movement, low pedestrian movement, and low to moderate bicycle movement. It may include traffic safety street lighting and underground utilities.
 8. Transitway: A street that provides for moderate to heavy transit movement and moderate to heavy pedestrian movement, along with traffic for other land uses including commercial retail and mixed uses. Passenger amenities, including way finding signs and shelters, should be provided. It has wide sidewalks, street trees, traffic safety measures, and street lighting.

PART 2 STREET IMPROVEMENT POLICIES AND STANDARDS

1. The design standards provided in this Public Works Manual are intended to:
 - a. accommodate traffic volumes at reasonable speed and

- b. minimize the short and long term expense associated with street maintenance and construction.
2. All new streets in Fairplay, whether public or private, shall comply with the street design standards in the Municipal Code Section 16-17-30(D).
3. When an existing street that does not comply with the design standards in the Public Works Manual will be substantially improved or rebuilt, efforts should be made to bring the street into compliance with the applicable standards in this Manual.
4. When various dimensions are referenced in this manual that can be applied to a new or existing street, the Town shall determine the specific dimension that shall be used based on the volume of traffic anticipated, the type of vehicles that will likely use the street, and the intensity of the adjacent land use.
5. All streets shall include a 20-foot minimum drivable surface to accommodate fire apparatus and emergency vehicles.
6. Notwithstanding the standards in this manual, the total unobstructed road section width adjacent to buildings exceeding 30 feet in height shall be a minimum of 28 feet to accommodate aerial fire apparatus.
7. Each intersection design radius shall allow for a minimum of a 33 foot inside turn radius and a 45-foot outside radius to accommodate fire apparatus. Other radii may be required if the intersections are on a bus or truck route within the community.
8. Transitions from the Park County minimum lane width to Fairplay streets shall require a design solution that successfully transition to the reduced Town standards provided in this manual. The Town shall determine the most appropriate means to make the transition.
9. Diagonal on street parking shall increase the parking dimension from 8 feet to 19 feet.

DIVISION 5



TECHNICAL SPECIFICATIONS



Division 5 Technical Specifications

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TECHNICAL SPECIFICATIONS

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SECTION 01300**SUBMITTALS****PART I - GENERAL****1.01 REQUIREMENTS INCLUDED**

The CONTRACTOR shall submit to the ENGINEER for approval all submittals required by the General Conditions and these Specification sections. Submittal shall be submitted on form 1300-A.

1.02 INSURANCE CERTIFICATES

Refer to General Conditions for submittal requirements. Submit updated certificates as necessary to verify current coverage.

1.03 SCHEDULE OF VALUES

Refer to General Conditions for requirements. On bid items to be paid as lump sum that may extend beyond a single pay estimate, a schedule of values shall be submitted to OWNER a minimum of 10 days prior to work on that item. Adequate detail shall be given to allow a value to be placed on work completed during any given pay estimate. Where payment is to be based on unit bid prices, correlate schedule of values with Divisions and Sections of Specifications unless otherwise approved by the ENGINEER. If separate payment is to be requested for materials suitably stored but not installed, segregate delivered costs from installation costs, including overhead and profit.

1.04 CONSTRUCTION SCHEDULE

(See Section 01310 for Construction Schedule Submittal details).

1.05 SHOP DRAWINGS

(See Section 01340 for Shop Drawing Submittal details).

1.06 PROJECT RECORD DOCUMENTS

(See Section 01700, Contract Closeout, for project record document details).

END OF SECTION

SECTION 0310**CONSTRUCTION SCHEDULES****PART 1 GENERAL****1.01 SUMMARY**

- A. Within ten (10) days after effective date of agreement or by the pre-construction conference, the Contractor shall submit a critical path project schedule covering the duration of the project, beginning with the Notice to Proceed and indicating Substantial Completion and "Contract Completion". The purpose of the Project Schedule shall be to:
1. Assure adequate planning, scheduling and reporting during the execution of the Work by the Contractor.
 2. Assure coordination of the Work of the Contractor and various Subcontractors at all tiers.
 3. Establish a critical path for the completion of the Work to assist the Contractor, Owner, and Engineer in monitoring the progress of the Work and evaluating proposed changes to the Contract Duration and the Project Schedules resulting from changes in the Work and/or potential weather delays.
 4. Assist in the coordination of construction activities so as to complete the Work within the Contract Time.
- B. The Project Schedule shall be based upon the Critical Path Method (CPM) for planning, scheduling and progress reporting of the Work.
- C. The Project Schedule shall include a graphic network prepared by the Contractor. The Contractor shall transmit all schedule submissions to the Owner or his representative as both a printed or plotted pure logic diagram and a bar chart with an accompanying computer disk of the schedule. The computer disk shall be in a file format published by Primavera Project Planner (Windows versions), Primavera Sure Trak, or Microsoft Projects.
- D. The Contractor shall provide a Network, which shall be a reasonable representation of how the Work is planned to be performed and shall be used to monitor the progress of the work of the Contract. All costs associated with the development and maintenance of the schedule shall be borne by the Contractor Description.

1.01 SCHEDULING

- A. The Contractor shall submit a preliminary Project Schedule as stated above. The Owner or his representative shall review the preliminary Project Schedule and return comments to the Contractor within ten (10) working days after receipt. The Contractor then shall have five (5) working days to review the schedule and return it to the Owner or his representative for review. The five (5) working day review and review cycles shall continue until an acceptable schedule is received by the Owner. The owner's review of the project schedule is for compliance with this article and other contractor requirements. Acceptance by the owner of the contractor's project schedules does not relieve the contractor of any of his responsibility whatsoever for the accuracy or feasibility of the project schedule, or of the contractor's ability to meet the contract completion date, nor does such acceptance expressly or impliedly warrant, acknowledge or admit the reasonableness of the activities, logic, duration or, when

included, cost loading of the contractor's project schedule. An approved schedule shall be required prior to submission of the first progress payment in accordance with the Contract Documents. The following guidelines must be met:

1. The Project Schedule shall contain a sufficient number of activities to allow effective monitoring of the progress of the work.
2. Each activity shall contain only the work of a single trade or subcontractor.
3. Each activity shall be less than fifteen (15) working days in duration. Procurement and material delivery, surveying and shop drawing approvals may exceed fifteen (15) working days in duration. Activities exceeding fifteen (15) working days in duration shall be separated into two or more individual activities of less than sixteen (16) working days by area, type of work, etc. to allow for effective monitoring of the Work.
4. Each activity shall include a description of the work, original duration, contractor or subcontractor performing the work, the equipment and manpower required to do the work, all specific area, phasing or milestone classifications and the activity's relationship to other activities (contained in the Methods Statement).
5. The Project Schedule shall begin with the Notice to Proceed and end with Contract completion activities. A critical path (zero float path) through Contract completion must be generated.
6. Normally anticipated weather conditions shall be included in the Project Schedule.
7. Anticipated utility relocation activities must be shown in the schedule as they affect the contractor's activities.
8. Failure by the Contractor to include any element of work required for performance of the Contract shall not excuse the Contractor from completing all work within the Contract Time.
9. Work times shall be included showing number of days per week, shifts per day and hours per shift.
10. The Project Schedule shall contain activities for the anticipated submittal cycle of equipment or materials that could affect timely completion of the project.
11. The schedule shall include activities for anticipated procurement and delivery of material or equipment with lead times greater than three (3) weeks.
12. The progress schedule shall include all activities for all work on the project, including subcontracted work, delivery dates for critical material, submittal and review periods, milestone requirements and no work periods. Where the project has specific phases, each phase shall be described separately for each salient feature.

1.03 METHODS STATEMENT

- A Methods Statement shall be included for all work items that fall on the critical path of the construction schedule. This Methods Statement shall be a detailed narrative describing each feature and all work necessary to complete the feature. The Methods Statement shall be submitted with the Construction Schedule. The following format is required.
1. Feature: name of the feature.
 2. Responsibility: Contractor, subcontractor, supplier, utility, etc. responsible of the feature.
 3. Procedures: procedures to be used to complete the work. The procedure to be used shall include general information regarding methods such as forming, excavation, placing, heating, curing, backfill and embankment, trenching, protecting the work, etc. When separate or different procedures are to be employed by the Contractor due to seasonal or project phasing requirements, such differing procedures shall be described in the procedure statement.
 4. Production Rates: the planned quantity of work per day for each feature

5. Labor Force: the labor force planned to do the work.
6. Equipment: the number, types, and capacities of equipment planned to do the work.
7. Work Times: the planned time for the work to include:
 - a. Number of work days per week.
 - b. Number of shifts per day.
 - c. Number of hours per shift.

- B. At the Owner's request, the Contractor shall update the Methods Statement, or any part thereof, and submit it with the next monthly schedule update.

1.04 PROJECT SCHEDULE UPDATES

- A. The Project Schedule updating shall be done on a monthly basis. The revision shall indicate actual progress to date, changes resulting from change orders, and planned changes necessary to complete the Work in accordance with the Contract Documents.
- B. Should the Project Schedule update indicate that the project is more than ten (10) days behind schedule it shall be revised to indicate the means which the Contractor shall use to regain the Contract Completion Date.
- C. Updating the Project Schedule to reflect actual progress made up to the date of a schedule update shall not be considered revisions to the Project Schedule.
- D. Failure by the Contractor to update the schedule shall result in a material breach of contract and will also result in the withholding of progress payments until an acceptable update is submitted by the Contractor and accepted by the Owner.

1.05 TIME IMPACT ANALYSIS FOR CHANGE ORDERS, DELAYS & CONTRACTOR REQUESTS

- A. When Change Orders are initiated or delays are experienced a Time Impact Analysis shall be completed to determine the effect on the Contract Completion Date. The durations of effected activities shall be altered as mutually agreed upon and the schedule recalculated. The Contract Completion Date will not be extended unless the schedule recalculation indicates a completion date beyond the current Contract Completion Date. A delay must impact the critical path of the Project Schedule as a condition to extending the Contract Completion Date.
- B. Delays caused by weather shall be reviewed at the monthly update meetings. Seasonal weather conditions shall be considered and included in the planning and scheduling of all work influenced by high or low ambient temperatures, wind, and/or precipitation to ensure completion of all work within the Contract Time. Seasonable weather conditions shall be determined by an assessment of average historical climatic conditions.
- C. Float is not for the exclusive use or benefit of either the Owner or the Contractor. Extension of the Contract Time will be granted only to the extent the equitable time adjustments to the activity or activities affected by the Change Order or delay exceeds the total (positive or zero) float of a critical activity (or path) and extends the Contract Time as set forth in the Contract.

1.06 SUBMITTALS

- A. The number of opaque reproductions required by the CONTRACTOR plus four (4) copies which will be retained or distributed by the OWNER/ENGINEER.
Do not submit fewer than five (5) copies.

- B. Distribution
 - 1. After review, ENGINEER will distribute copies of schedules to:
 - a. Two (2) copies to OWNER.
 - b. One (1) copy to Resident Project Representative.
 - c. One (1) copy to be retained in ENGINEER's file.
 - d. One (1) copy to CONTRACTOR to be kept on file at CONTRACTOR's field office.
 - e. Remainder to CONTRACTOR for his distribution following modifications if required.

- C. Schedule recipients will report promptly to ENGINEER and CONTRACTOR, in writing, any problems anticipated by the projections shown on the schedules.

END OF SECTION

SECTION 01340**SHOP DRAWINGS****PART 1 GENERAL****1.01 REQUIREMENTS INCLUDED**

- A. The CONTRACTOR shall submit to the ENGINEER for approval all shop drawings required by the specification sections.

1.02 SHOP DRAWINGS

- A. Shop drawings shall be prepared by a qualified detailer for CONTRACTOR, subcontractor, supplier, or manufacturer, and shall illustrate some portion of the work, showing fabrication, layout, setting, or erection details.
- B. Identify details by reference to sheet and detail numbers shown on Contract Drawings. Use same symbols used on Contract Drawings to identify shop drawing details wherever practicable.

1.03 PRODUCT DATA

- A. Submit manufacturer's standard schematic drawings:
 - 1. Modify drawings to delete information that is not applicable to the project.
 - 2. Supplement standard information to provide additional information applicable to project.
- B. Submit manufacturer's catalog sheets, brochures, diagrams, schedules, performance charts, illustrations, and other standard descriptive data.
 - 1. Clearly mark each copy to identify pertinent materials, products or models.
 - 2. Show dimensions and clearances required, performance characteristics and capabilities, wiring diagrams and controls, and any other pertinent data applicable to the project.
- C. Submit manufacturer's certificate of compliance certifying to compliance with specification requirements, applicable reference standards and test data requirements. Include reference to the specification section and paragraph with which the product or materials is intended to comply.

1.04 CONTRACTOR RESPONSIBILITIES

- A. CONTRACTOR shall submit quantities specified in Section 01000 General Requirements.
- B. Submittals shall be made by CONTRACTOR to the ENGINEER with a transmittal form or letter and not by subcontractors, suppliers or manufacturers. CONTRACTOR shall review, stamp with his approval, and submit in orderly sequence all submittals required by the specifications. By approving and submitting items, CONTRACTOR represents that he has verified all field measurements, field construction criteria, materials, catalog numbers, and similar data, and has coordinated each shop drawing with requirements of the project.

- C. The CONTRACTOR shall not begin work that requires submittals until the ENGINEER reviews and approves submittals. The ENGINEER will return an approved copy of the submittal to the CONTRACTOR.
- D. CONTRACTOR'S responsibility for errors and omissions in submittals, or for deviations in submittals from requirements of the Contract Documents, shall not be relieved by review of submittals unless ENGINEER gives written acceptance of specific deviations. The CONTRACTOR shall notify ENGINEER in writing at time of submission of deviations in submittals from requirements of the Contract Documents.

END OF SECTION

SECTION 01570**DETOURING/TRAFFIC CONTROL****PART 1 GENERAL****1.01 SCOPE**

This work shall consist of furnishing, installing, moving, maintaining and removing temporary traffic signs, advance warning signs, barricades, channelizing devices, delineators, and flagmen as required by the latest revision of the "Manual on Uniform Traffic Control Devices for Streets and Highways" and the latest revisions of the Colorado Supplement thereto, in accordance with the Drawings and these Specifications.

1.02 RELATED WORK SPECIFIED ELSEWHERE

All Sections.

1.03 REFERENCE STANDARDS

- A. Colorado Department of Transportation, Standard Specifications for Road and Bridge Construction 1999; Subsection 107.10 and Section 630.
- B. Colorado Department of Transportation, Standard Plans Oct 2000; S Standards.
- C. Federal Highway Administration; Manual on Uniform Traffic Control Devices.

1.04 SUBMITTALS

- A. Traffic Control Plan. Traffic control, both vehicular and pedestrian, through the construction areas is the responsibility of the Contractor. The Contractor shall prepare a Traffic Control Plan (TCP) to be submitted with the return of the signed agreement. The TCP shall include a schedule of traffic control devices to be used on the project, general layout of devices, situations that may require use of flaggers and/or pilot cars, and methods of notifying public of impending traffic changes. The TCP must be prepared by a certified traffic control supervisor and approved by the Town prior to commencement of work.
- B. Methods of Handling Traffic (MHT). The Contractor shall control traffic in accordance with the Traffic Control Plan (TCP), as shown in the contract. To implement the TCP, the Contractor shall develop and submit a method for handling traffic (MHT) for each different phase of construction which shows the Contractor's proposed construction phasing and proposed traffic control devices consistent with the TCP. If at any time the Contractor desires to change the MHT, it shall be considered a different phase requiring a new MHT.

Each proposed MHT shall be approved in writing by the Town before the corresponding phase of construction will be allowed to begin. The initial MHT shall be submitted a minimum of 10 days prior to the start of work on the project. All successive MHT's shall be submitted to allow reasonable time for review.

The proposed MHT shall include detailed information as contained in the Manual of Uniform Traffic Control Devices.

Approval of the proposed method of handling traffic shall constitute authorization to furnish the devices on the schedule. If, at any time, it is determined that unnecessary units are on the schedule or that additional units are required, the Town will request the Contractor to revise the MHT and the devices shall be added or removed as approved.

The Contractor shall continually review their methods of handling traffic. If revisions are needed for the safe movement of traffic through or around the work areas, the Contractor shall immediately notify the Town. The Contractor may implement temporary revisions to the MHT if, in absence of the Town, failure to make the revision could compromise the safety of the public.

Changes in the plan or the methods of handling traffic shall be approved by the Town. Approval of the traffic control plan and the proposed methods of handling traffic in no way shall relieve the Contractor of liability specifically provided for in the Contract.

PART 2 MATERIALS

2.01 GENERAL

All materials shall conform to the applicable portions of the Reference Standards.

2.02 BARRICADES

Shall conform to the MUTCD Minimum 8' wide on movable skirts.

PART 3 METHODS AND PROCEDURES

3.01 DETOURS

None as anticipated.

3.02 ROAD RESTRICTIONS

As stated on Drawings.

3.03 FLAGMEN

Provide as needed, as directed by Town or as stated on Drawings to control traffic encroaching in construction zone.

3.04 BARRICADES, CHANNELIZING DEVICES, FLASHING WARNING LIGHTS

Provide for all work areas, open trenches, lane closures, equipment and material storage, etc., and as called for on the Drawings and located within limits of construction. Protection to be in place 24 hours per day and device inspection shall be seven days per week.

3.05 TRAFFIC CONTROL MANAGEMENT

Provided by a certified traffic control supervisor on a 24-hours-per-day basis. An after hours contact shall be provided for every calendar day from the first placement of traffic control

devices until all devices are removed. Any changes to this contact shall be submitted to the Town.

END OF SECTION

SECTION 02255**DUST SUPPRESSION****PART 1 GENERAL****1.01 SCOPE**

Work under this Section shall include furnishing all materials, labor, equipment and miscellaneous items necessary to provide dust control over the entire project site.

1.02 RELATED WORK SPECIFIED ELSEWHERE.

All *Division 2* Sections

1.03 SUBMITTALS.

- A. Chemical Products Descriptive literature defining chemical constituents.

PART 2 MATERIALS**2.01 MAGNESIUM CHLORIDE.**

<u>Constituents</u>	<u>Percentage by Weight</u>
Magnesium Chloride	Approximately 28%-36%
Sulphate	2.5%
Potassium, sodium, calcium	Less than 1%
Nitrate	-0-

PART 3 METHODS AND PROCEDURES**3.01 DUST CONTROL**

Dust control to be considered an integral part of the Work. Control shall be provided from the start of construction until the Work is complete. Fugitive dust as a result of construction shall be controlled at all times.

3.02 WATERING

For road construction, the Contractor shall have a water truck on site at all times for dust control. Wetting shall be done at the direction of the Town as required until the final wearing surface is completed.

For utility construction, dust control may be accomplished by water truck or spray system from an on-site water system if approved. Contractor shall be prepared to provide dust control until the final acceptance of project.

The Contractor shall provide a water meter for metering any water taken from the municipal water system whether from fire hydrants or private taps.

3.03 CHEMICAL CONTROL

Where required by the Town, dust control shall be provided by the use of magnesium chloride chemical spray to the road surface.

After the surface has been prepared, the road shall be pre-wet to a very damp condition. The product shall be applied using a watering truck with spray applicator, providing an even distribution across the surface. Application rate shall be 1/3 - 1/2 gallon per square yard. The surface shall be re-sprayed until complete coverage is attained.

END OF SECTION

SECTION 02271**RIPRAP****PART 1 GENERAL****1.01 DESCRIPTION**

- A. Work shall consist of furnishing and placing of riprap according to the location shown on the Drawings.
- B. Work shall conform to the relevant provisions of Section 506 "Riprap" of the Standard Specifications for Road and Bridge Construction, State Department of Highways, Division of Highways, State of Colorado, 1981 Edition, except as modified.

PART 2 PRODUCTS**2.01 RIPRAP**

- A. Riprap shall consist of hard, dense rough fractured rock as nearly cubical as possible. Thin slab, flaking rock and sandstone shall not be used. The rock shall have a minimum specific gravity of 2.25. Removed concrete may not be substituted for rock. Round river rock shall not be used as riprap unless approved by Engineer.
- B. The average diameter of rock shall be as shown on Drawings.

PART 3 CONSTRUCTION METHODS**3.01 SLOPE PREPARATION**

Areas on which the riprap is to be placed will be trimmed and dressed to conform to cross sections shown on the Drawings within an allowable tolerance of plus or minus two inches (2") from the theoretical slope lines and grades. Where such areas are below the allowable minus tolerance limit, they shall be brought to grade by filling with material similar to the adjacent material and well compacted with no additional compensation to be allowed to the Contractor for any extra materials thus required.

3.02 FILTER CLOTH

Provide Mirafi 140-N filter fabric under riprap, or equal. Fabric to be installed per Standard Erosion Control Details with anchor trenches, overlaps and staples.

3.03 BEDDING BLANKET.

To be six inches (6") thick placed on top of prepared slope and under riprap where called for on Drawings.

<u>Sieve Measure</u>	<u>% By Weight Passing Square Mesh Sieves</u>
3"	100
3/4"	20 - 90
#4	0 - 20
#200	0 - 3

3.04 RIPRAP PLACEMENT

Stone for riprap will be placed on the prepared slope in such a manner as to produce a reasonably well-graded mass of rock with the minimum practicable percentage of voids, and will be constructed within tolerances specified herein and to the slopes, lines and grades shown on the Drawings or as otherwise approved by Engineer in the field.

A tolerance of plus or minus three inches (3") from the slope lines and grades shown on the Drawings shall be allowed in the finished surface of the riprap. Placement of stones at the outlet of drainage structures shall allow positive flow in the direction intended with no stone placed to constrict or reduce flows (also see Section 506.03).

Riprap will be placed to its full course of thickness in one operation. The placing shall progress upwards on the slopes. The riprap will be carefully placed on the prepared slope in such a manner that adjacent stones are in close contact and, in general, have their greatest dimensions across or perpendicular to the slope. Through stones will be well distributed throughout the mass.

As used herein, a "through stone" is defined as a stone whose dimension as normal to the surface being riprapped is not less than the full depth of riprap. The finished riprap will be free from objectionable pockets of small stone clusters of larger stones. Placing riprap in layers will not be permitted.

END OF SECTION

SECTION 02520**DRAINAGE PIPE****PART 1 GENERAL****1.01 SCOPE**

- A. Work under this section includes furnishing, installing, cleaning and testing drainage pipe (including culverts) underdrains, trench drains, bands, collars, inlet section, outlet sections and all other items appurtenant to drainage pipe.

1.02 RELATED WORK SPECIFIED ELSEWHERE.

Section 02200 - Excavation and Embankment
Section 02201 - Excavation and Backfill For Structures
Section 02222 - Embedment and Base Course Aggregate

1.03 REFERENCE STANDARDS.

Colorado State Department of Transportation Standards
Specifications for Road and Bridge Construction Section 707 and M-Standards

1.04 SUBMITTALS

Product data including catalogue cut sheets and descriptive literature.

1.05 PROTECTION OF WORK

All pipe and appurtenances shall be carefully handled, stored and protected in such a manner as to prevent damage to materials and protective coatings and linings. At no time shall such materials be dropped or dumped into trench.

Precaution shall be taken to prevent foreign matter from entering the pipe and appurtenances prior to and during installation. Place no debris, tools, clothing or other materials in the pipe during installation.

PART 2 MATERIALS

This item covers the types of material that will be required for the construction and installation of drainage pipe. All materials used shall be new and the best quality available. All material used shall be in accordance with applicable standards of the American National Standards Institute (ANSI), the American Standards Association (ASA), the American Society of Testing and Materials (ASTM) and the American Association of State Highway Transportation Officials (AASHTO).

2.01 CORRUGATED GALVANIZED STEEL PIPE AND PIPE ARCHES.

- A. Pipe and Bands
1. Conform to Section 707.02 and applicable section of AASHTO M-36.

2. Size, length and shape as shown on Drawings.
3. Corrugations to be 2-2/3" x 1/2" or 3" x 1" unless shown otherwise.
4. Gauge to be minimum 16 gauge (.064").
5. Bands to be "Hugger" type with forged steel bars secured to connecting bar with tension straps.
6. Gasket use rubber O-ring, two for each joint.
7. Pipe seams shall be continuous weld type.

B. End Sections

1. Conform to M-603-CA.

2.02 CORRUGATED ALUMINUM PIPE.

A. Pipe and Bands.

1. Conform to Section 707.06 and AASHTO M-196.
2. Size, length and shape as shown on Drawings.
3. Corrugations to be 2-2/3" x 1/2" unless shown otherwise.
4. Thickness to be minimum 0.060".
5. Bands to be "Hugger" type with forged steel bars secured to connecting bar with tension straps.
6. Gasket use rubber O-ring, two for each joint.
7. Pipe seams shall be continuous weld type.

B. End Sections.

1. Conform to M-603-CA.

2.03 CORRUGATED POLYETHYLENE PIPE.

A. Pipe, bands and fittings.

1. Conform to the following applicable specifications:
 ASTM F405, standard specification for corrugated polyethylene tubing and fittings.
 ASTM F667, standard specifications for large diameter corrugated polyethylene tubing and fittings.
 AASHTO M252, standard specification for polyethylene corrugated drainage tubing.
2. Size, length and shape as shown on Drawings.
3. Provide perforated tubing in locations shown on Drawings and in accordance with these Specifications.
4. Couplings shall be screw-on type or as approved.
5. Perforation Dimensional Requirements:

Nominal I.D. Inch	Number of Perforations Per Foot	Maximum Width (inch)	Maximum Length (inch)	Inlet Area Minimum Sq.in./ft.
4	106	0.125	1.25	1.0
6	106	0.125	1.50	1.0
8	18	0.125	1.50	1.0
10	12	0.125	1.75	1.0
12	36	0.125	1.75	1.0

2.04 SMOOTH INTERIOR CORRUGATED POLYETHYLENE PIPE.

- A. Pipe. This specification applies to high-density polyethylene corrugated pipe with an integrally formed smooth waterway. (Hancor Hi-Q or ADS N-12).

Nominal Sizes: 4" to 10" diameter
 12" to 60" diameter (AASHTO M259, Type S)

Pipe to have a full circular cross-section, with an outer corrugated pipe wall and an essentially smooth inner wall (waterway). Corrugations for sizes listed may be either annular or spiral. Corrugation type must compliment the bands and fittings supplied with the pipe.

Pipe manufactured for this specification shall comply with the requirements for test methods, dimensions, and markings found in AASHTO Designations M252 and M294.

Pipe and fittings shall be made from virgin PE compounds which conform with the requirements of cell class 324420C as defined and described in ASTM D3350.

Minimum parallel plate stiffness values when tested in accordance with ASTM D2412 shall be as follows:

<u>Diameter</u>	<u>Pipe Stiffness</u>	<u>Diameter</u>	<u>Pipe Stiffness</u>
4"	50 psi	18"	40 psi
6"	50 psi	24"	34 psi
8"	50 psi	30"	28 psi
10"	50 psi	36"	22psi
12"	50 psi	42"	19 psi
15"	42 psi	48"	17psi

- B. Fittings.

The fittings shall not reduce or impair the overall integrity or function of the pipe. Fittings may be either molded or fabricated. Common corrugated fittings include inline joint fittings, such as couplers and reducers, and branch or complimentary assembly fittings such as tees, wyes, and end caps. These fittings may be installed by various methods, such as snap-on, screw-on, bell and spigot, and wrap around. Couplings shall provide sufficient longitudinal strength to preserve pipe alignment and prevent separation at the joints. Only fittings supplied or recommended by the pipe manufacturer shall be used. Where designated on the plans, a neoprene or rubber gasket shall be supplied.

- C. Installation.

Installation of the pipe specified above shall be in accordance with ASTM Recommended Practice D2321 as covered elsewhere in these specifications.

2.05 PERFORATED ASTM 2729 LEACH FIELD PIPE.

- A. Pipe couplings and fittings.
 - 1. Conform to requirements of ASTM 2729.
 - 2. Size, length and shape as shown on the Drawings.

2.06 FILTER WRAPPED POLYETHYLENE PIPE.

- A. Pipe and bands.
 - 1. Conform to Section 2.03 above.
- B. Filter material.
 - 1. Conform to properties equal to or better than those found with Mirafi 140N drainage fabric.
 - 2. Size, length and location as shown on Drawings.

PART 3 METHODS AND PROCEDURES

3.01 CLEANING AND INSPECTION

Clean all pipe and appurtenances thoroughly of all foreign material and inspect for cracks, flaws or other defects prior to installation. Mark all defective, damaged or unsound materials with bright marking crayon or paint and remove from job site.

3.02 PIPE INSTALLATION

Pipe shall be laid in straight sections except as noted on the plans. Jointing of the pipe shall be made in accordance with the directions of the manufacturer of the pipe and the manufacturer of the coupling and shall have rubber gaskets or joint sealing compound as approved. All pipe to be installed with minimum cover of 12 inches.

3.03 PIPE EMBEDMENT

Pipe shall be embedded according to applicable details on the Drawings.

3.04 METAL APRON ENDWALLS

Metal apron endwalls (end sections) shall be constructed at the ends of all drainage pipe as shown on the plans. All entrance endwalls shall have toe plates. Excavation for endwalls shall be such that the endwall rests on undisturbed soil in its final position. Excavation for toe plates shall be such that the inside of the toe plate rests on undisturbed soil in its final position. Backfill shall be done as in Part 3.03 of this section.

PART 4 QUALITY CONTROL - FIELD

4.01 INSPECTION AND TESTING

Inspection and testing to be performed at direction of the Engineer. Contractor to cooperate fully with all testing procedures.

Any pipe section which has been damaged in any way which, in the opinion of the Engineer, may affect the structural integrity of the pipe or reduce the expected corrosion resistance of the pipe, shall be removed and replaced. At the option of the Engineer, re-coating of minor

dents and deformities with an approved fluid applied galvanized material may be allowed.

END OF SECTION

SECTION 02612**HOT BITUMINOUS PAVING****PART 1 GENERAL****1.01 Scope**

Work to be performed under this section shall include all labor, equipment, materials and miscellaneous items necessary to furnish and install one or more courses of bituminous mixture constructed on a prepared surface in accordance with the Specifications or as shown on the Drawings. The finished product shall be in close conformity with the lines, grades, thickness, and typical cross sections shown on the Drawings or as established in the field.

1.02 RELATED WORK SPECIFIED ELSEWHERE

Section 02222 - Embedment and Base Course Aggregate

1.03 REFERENCE STANDARDS

All work is to be performed in accordance with Section 4.

1.04 SUBMITTALS.

- A. Mix Design. Provide complete mix design by independent testing laboratory, including certifications of all material compliance.
- B. Prime Coat. Certification of material.
- C. Tack Coat. Certification of material.

1.05 COORDINATION

It shall be the responsibility of the Contractor under this section to coordinate this work with all other trades involved in the project. No paving work shall be started until the work of others has progressed to a point that a definable area can be paved; patching, blending, butting, etc. of work under this section will not be allowed except as required as part of the normal paving operation.

PART 2 MATERIALS**2.01 COMPOSITION OF MIXTURE. REFERENCE SECTION 4.0**

- A. Use Grading SX (Reference Section 703.04); aggregate gradation per Table 703-3.
- B. Asphalt Cement to be PG 58-22.
- C. The design mix for Hot Bituminous Pavement shall conform to the following:

Marshall Design -- 50 blow	
Marshall Stability	1200 (min.)
Flow, 0.01"	8-16
Air Void in Mix	3-5
VMA, % min.	See Table 403-2
Grade of Asphalt Cement	PG 58-22
Accelerated Moisture Susceptibility Tensile Strength (Lottman)	See Table 401-2
Voids filled with Asphalt	65-78

TABLE 403-2

Nominal Maximum Size*		Design Air Voids**		
Inches	(mm)	3.0%	4.0%	5.0%
3/4	19.0	12.0	13.0	14.0
1/2	12.5	13.0	14.0	15.0
3/8	9.5	14.0	15.0	16.0

* The nominal size is defined as one sieve larger than the first sieve to retain more than 10%.

** Minimum VMA must pass at 4% design air voids.

The Contractor shall prepare a quality control plan outlining the steps to be taken to minimize segregation of HBP. This plan shall be submitted to the Engineer prior to beginning the paving operations. When the Engineer determines that segregation is unacceptable, the paving shall stop and the cause of segregation corrected before paving operations will be allowed to resume.

- D. Contractor to provide to the Engineer, a job mix composition meeting this section. Submittal shall include testing results sufficient to show compliance. Testing shall be under the certification of an independent testing laboratory acceptable to the Engineer. The mix design shall have been completed within the preceding 12 months.
- E. Contractor may use an anti-stripping additive from the current CDOT approved list of additives.

2.02 PRIME COAT. REFERENCE SECTION 702.02.

- A. Prime coat shall be MC-70 (ASTM D2026)

2.03 TACK COAT. REFERENCE SECTION 702.03.

- A. Tack Coat to be SS-1h (ASTM D977) or CSS-1h (AASHTO M208).

2.04 PAVEMENT MARKING. REFERENCE SECTION 708.05

- A. Glass beads are required and shall conform to CDOT Standard Specifications for Road and Bridge Construction – Sections 106, 627, and 713.

PART 3 METHODS AND PROCEDURES

Reference Section 403.03 (further reference 401.07 through 401.20) and Section 407.04 through 407.08.

- A. Maximum compacted pavement depth per pass to be 3".
- B. Prime not required unless indicated on Drawings. Prepared base course or subgrade surfaces receiving pavement courses shall be primed at Contractor's expense if the surface has deteriorated, due to traffic, weather or time lapse between surface preparation and placement of bituminous materials, such that in the opinion of the Engineer, use of prime coat is required.
- C. Tack coat required between lifts, on all abutting old pavement surfaces and for overlays on existing pavements unless waived by Engineer. Application rate shall be 0.05 to 0.10 gallons per square yard diluted.

Dilution shall be one part tack emulsion to one part water.

All cut asphalt surfaces that are to butt new pavement sections shall be tacked with a liberal application of tack coat prior to paving.

3.01 COMPACTION

The plant mix bituminous pavement shall be compacted by rolling. The number, weight and type of rollers furnished shall be that which is sufficient to obtain the required density while the mixture is in a workable condition. Compaction shall begin immediately after the mixture is placed and be continuous until the required density is obtained. When the mixture surface temperature falls below 185 degrees F, no further compaction effort will be permitted unless approved.

All roller marks shall be removed with the finish rolling. Use of vibratory rollers with the vibrator on will not be permitted during surface course final rolling and will not be permitted on any rolling on bridge decks covered with waterproofing membrane.

Pavement shall be compacted to a density of 92 percent to 96 percent of the maximum theoretical density, determined according to AASHTO T209. Field density determinations will be made in accordance with Colorado Procedure 44 or 81.

Along forms, curbs, headers, walls and all other places not accessible to the rollers, the mixture shall be thoroughly compacted with mechanical tampers.

Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective, shall be immediately removed and replaced with fresh hot mixture, and compacted to conform with the surrounding area.

3.02 SURFACE TOLERANCES Section 401.20.

The variations between any two contacts with the surface shall not exceed 3/16 inch in 10 feet. Irregularities exceeding the specified tolerance shall be corrected at the Contractor's expense. No skin patching will be allowed.

3.03 PAVEMENT MARKING REFERENCE Section 627.06.

Centerline marking shall be double yellow line, 4" wide each stripe. Parking stall marking shall be single white line, 4" wide stripe. Crosswalk marking shall be white panels, 12" wide by 8' long with 12" clear spacing the width of the roadway. Cross-hatching to be white, 8" wide, spaced at maximum 4' intervals. Symbols, letters and arrows to conform to 'Standard Alphabets for Highway Signs and Pavement Marking', adopted by the Federal Highway Administration.

PART 4 FIELD QUALITY CONTROL**4.01 INSPECTION AND TESTING**

Inspection and testing to be performed at the direction of the Engineer. Contractor to cooperate fully with all persons engaged in testing.

4.02 DENSITY TESTING AND CONTROL

- A. See Section 3.01, Compaction, above.
- B. Field Testing. Testing for density during compaction operations to be done using nuclear density methods.
- C. Frequency of Testing. Minimum of one (1) test every 10,000 square feet or as directed by Engineer. Testing to be paid for by Owner.
- D. Retesting. In the event of failure to meet compaction criteria, Contractor shall re-compact and/or replace defective work at direction of Engineer. All retesting to be paid for by Contractor and to be performed by testing firm approved by the Engineer.

END OF SECTION

SECTION 02626**CONCRETE CURB AND GUTTER, SIDEWALK, CURBWALK AND DRIVEWAY****PART 1 GENERAL****1.01 SCOPE.**

This Work shall include furnishing all materials, labor, equipment and miscellaneous items necessary for the construction of concrete curb, gutter, sidewalk, sidewalk ramps, driveway or any combination thereof, all in accordance with these Specifications and in close conformity with the lines, grades, and typical sections as shown on the Construction Drawings or established in the field. Sidewalks and sidewalk ramps shall meet Federal ADA Accessibility Guidelines.

1.02 RELATED WORK

Specified Elsewhere.

Section 02222 - Embedment and Base Course Aggregate

1.03 REFERENCE STANDARDS.

Federal Standards for Accessible Design – Rules and Regulations Americans with Disabilities Act - Accessibility Guidelines

PART 2 MATERIALS

The materials shall conform to the requirements specified in the following:

Section 02222 - Embedment and Base Course Aggregate

2.01 JOINT FILLER.

Pre-molded, preformed conforming to AASHTO M213 to the full depth of the section.

2.02 STRUCTURAL CONCRETE

28-day compressive strength of 4,000 psi. See Section 03300 for complete Specification.

2.03 FIBERMESH

Fibermesh only to be used with approval from Town Engineer. Fibermesh additive at the rate of 1½ pounds/cubic yard shall be used with all concrete. Use shall be in accordance with manufacturer's recommendations.

PART 3 METHODS AND PROCEDURES

3.01 EXCAVATION

Excavation shall be made to the required depth and width to permit the installation and bracing of the forms. The foundations shall be shaped and compacted to a firm even surface conforming to the section shown on the Construction Drawings. Material determined to be unsuitable or non-compact by the Engineer will be removed and replaced.

3.02 FORMS

Forms shall be wood or metal and shall extend for the full depth of the concrete. All forms shall be straight, free from warp and of sufficient strength to resist the pressure of the concrete without springing. Bracing and staking of forms shall be such that the forms remain in alignment both horizontally and vertically until removal. Satisfactory slip forms may be used when approved. Use of curbing machine will be permitted providing line and grade tolerances can be met. Steel plates that can be shaped to the desired radius shall be used on all short radii. Open joints shall be formed with a steel separator plate conforming to the section being installed.

Oil and clean all forms prior to placement of concrete.

3.03 MIXING AND PLACING

The foundations shall be thoroughly moistened immediately prior to the placing of the concrete. Compaction of the concrete shall have thorough consolidation achieved by tamping, spading, vibrating or other acceptable methods. Forms shall be left in place until the concrete has set sufficiently to prevent deformation due to removal. Upon removal of the forms, the curb face shall be immediately finished to a uniform surface. In the case of matching existing concrete finishes, an approved method shall be used.

3.04 FINISHING

The surface shall be floated with a wood or magnesium float and given a broom finish. No plastering of the surface will be permitted. All outside edges of slabs and joints shall be rounded to a ¼ inch radius. Broom marks to be perpendicular to traffic or pedestrian flow for installation of sidewalk or concrete flatwork. Broom marks to be parallel to traffic flow for installation of curb and gutter.

3.05 JOINTS.

Expansion joints shall be made using ½" pre-molded expansion joint. Construction joints, using ½" pre-molded joint filler, shall be placed at the end of a day's run or during a day's work if there is more than a 30 minute delay in concrete delivery.

Construction joints shall be formed around all appurtenances such as manholes,

utility poles, adjacent structures, etc., extending into or abutting the Work. Pre-molded expansion joint filler ¼" thick shall be installed in these joints. Expansion joint filler shall be installed between concrete sidewalks and any fixed structure.

Dummy joints (contraction joints) shall be made by a forming tool to a depth of ¼ of the section with a width of ⅛" to ¼". Open joints shall be made with a separator plate, ⅛" to ¼" in width. Dummy joints in lieu of open joints will be permitted with use of curbing machine.

Joint spacing shall be located as follows:

- A. Expansion joints: Every 100' on center; at end of corner radius; at driveway sections; as shown on Construction Drawings.
- B. Construction joints: As required during construction; at appurtenances and structures through or abutting Work.
- C. Dummy or open joints: Every 10' on center for curb and gutter and curbwalk; equal to width of sidewalk for sidewalk; as shown on Construction Drawings.

3.06 CURING

Immediately upon completion of the finishing, concrete shall be moistened and kept moist for a minimum of 72 hours. In lieu of wetting, use of a membrane curing compound, at the direction of the Engineer, will be permitted.

3.07 BACKFILLING.

After the concrete has set sufficiently, the areas behind the curb shall be backfilled to the required elevations and shall be thoroughly compacted in accordance with Section 02200 - Earthwork.

PART 4 FIELD QUALITY CONTROL

4.01 TOLERANCES

All vertical surfaces shall not vary more than ¼" in 10' in the horizontal direction. Surface deviation shall not exceed ¼" when measured with a 16' straight edge.

4.02 CONCRETE STRENGTH.

The Geo-technical Engineer may take field samples for purposes of testing concrete strength. All substandard strength concrete shall be removed and replaced at Contractor's expense.

END OF SECTION

SECTION 02720

METAL GUARDRAIL

PART 1 GENERAL

1.01 SCOPE

Work under this section shall consist of furnishing all materials, labor, equipment and miscellaneous items necessary to furnish and install metal guardrail as shown on the Drawings.

1.02 REFERENCE STANDARDS

All Work and materials shall be in compliance with applicable standards of the Colorado Department of Transportation.

PART 2 MATERIALS

2.01 GENERAL

All materials shall conform to M-606-2, Guardrail for Local Roads and Type 3 Bridge Rail, CDOT Design and Construction of Bridges and Roads.

2.02 "W" BEAM RAIL

The types of guardrail are designated as follows:
Type 3 Guardrail "W" Beam

The rail elements shall be corrugated sheet steel beams conforming to the requirements of AASHTO M 180 of the designated class and type. The beams and metal offset devices shall be galvanized.

2.03 GUARDRAIL POSTS

Railing posts shall be of wood.

- A. Wood posts shall be fabricated from an approved or specified timber species and shall be of the quality, diameter or section, and length as specified or as shown on the Drawings. When treated posts are specified, they shall be fabricated or framed before treatment. Timber preservatives shall conform to the requirements of AASHTO M 133. Preservative treatment shall conform to the requirements for "Preservative Treatments for Timber" of the AASHTO Standard Specifications for Highway Bridges.

2.04 GUARDRAIL HARDWARE

Splices and end connections shall be of the type and design specified or shown on the Drawings, and shall be of such strength as to develop the full design strength of the rail elements.

End anchor rods and accessories shall be as specified or as shown on the Drawings and shall

be of such size and strength as to develop the full design strength of the rail elements.

Bolts, nuts and washers shall be galvanized in accordance with AASHTO M 232, Class 6, or AASHTO M 298, Class 50, Type 1. All other fittings shall be galvanized in accordance with AASHTO M 111. Bolts, Nuts and washers for corrosion resistant guardrail shall be of corrosion resistant material and conform to or exceed the requirements of ASTM A 307.

2.05 STRUCTURAL STEEL

Steel shall be of the self-rusting type or "Corten".

2.06. PAINTING SYSTEM

Not Applicable

PART 3 METHODS AND PROCEDURES

3.01 POST AND RAIL ELEMENTS.

- A. Posts shall be set firm and aligned with a tolerance of $\pm 1/4$ " from plumb, grades and lines as staked. All fittings and metal plates shall be placed securely in position to conform to designated dimensions and requirements.

Posts shall be set as required in Drawings by one of the following methods:

1. Driven in place.
2. Set in dug holes.
3. Set in concrete base.
4. Posts on bridges shall be as shown on Drawings.

Driving of posts shall be accomplished with approved methods and equipment that will leave the posts in their final position free from any distortion, burring or any other damage.

Excavated post holes shall have a firm bottom and be backfilled with acceptable material placed in layers and thoroughly compacted.

When required, posts shall be spliced with breakaway plates as shown on the Drawings.

Dissimilar metal-to-metal or aluminum-to-concrete posts or rail installations shall have contact surfaces separated by an approved protective coating.

Wood posts cut in the field shall have the cut surfaces protected with two coats of hot creosote or a 5% pentachlorophenol-in-oil solution. When the cut surface is above ground, the treating solution to be used shall be the same type as was used in the original treatment.

- B. Rail elements shall be erected in a manner resulting in a smooth, continuous installation. All bolts in the finished rail shall be drawn tight. Bolts shall be of sufficient length to extend beyond the nuts. Rail shall be shop bent for installations on horizontal curves having a radius of 150 feet or less.

3.02 PAINTING. Not applicable.

PART 4 FIELD QUALITY CONTROL

4.01 INSPECTION AND TESTING

Inspection and testing to be performed at the direction of the Engineer. Contractor to cooperate fully with all persons engaged in testing.

PART 5 MEASUREMENTS AND BASIS OF PAYMENT

See Bid Schedule

END OF SECTION

SECTION 02751**UNDERGROUND SPRINKLER SYSTEM****PART 1 GENERAL****1.01 SCOPE**

Work to be performed under this section shall include all labor, materials, and equipment required to complete underground sprinkler system.

1.02 RELATED WORK SPECIFIED ELSEWHERE

Section 02830 - Trees, Plants and Ground Cover
Section 02821 - Revegetation - Seeding, Sodding & Hydroseeding

1.03 QUALITY ASSURANCE

Installer shall have satisfactorily installed acceptable underground sprinkler systems on at least three other comparable projects.

1.04 SUBMITTALS**A. Shop Drawings****B. Design:**

Any deviations in layout (equipment usage or trenching) from the proposed sprinkler design must be approved by the Engineer prior to construction. Submit three (3) copies of any design deviation for approval by Engineer before commencing any Work. Design shall be based on head, valve, and piping locations provided as shown. Sleeving to accommodate sprinkler pipe shall be installed prior to paving operation as set forth herein and as indicated on the Drawings. Zones and stationing shall conform to those indicated on the Drawings. Contractor shall determine water pressure at supply line for system pressure availability. Minimum water coverage for planted area shall be 85%.

C. Operation and Maintenance Date:

Submit written operating instruction including winterization procedures. Submit a controller programming schedule indicating length of time each zone is to be operated. Coordinate controller/watering operations with Owner's maintenance personnel.

D. Maintenance Materials: In addition to installed systems, provide Owner with:

1. Two sprinkler heads of each size and type.
2. Two valve keys for operating manual valves (two drain valve keys two gate valve keys).
3. Two keys for each type of valve cover.
4. Two wrenches for removing and installing each type of head.

1.05 DELIVERY, STORAGE AND HANDLING

Prevent damage to system components during loading, transporting and unloading. Deliver all components in original containers and store in a clean, dry location.

1.06 Warranty.

Warrant irrigation system for a period of two (2) years after completion and acceptance of all work against material defects and craftsmanship. The warranty shall be for 100% of the installed price. This warranty does not cover any defects resulting from neglect by Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond the irrigation system installer's control.

1.07 RECORD DRAWINGS

Contract set of drawings for all phases of the work shall be maintained at the site, with all changes or deviations from the original drawings marked thereon in contrasting color. This shall be a separate set of drawings, not used for construction purposes, which will be kept up to date as the job progresses and be made available to the Engineer for inspection at all times. the sprinkler contractor shall revise his drawings to indicate all changes made during installation. Upon completion of the work, three sets of revised prints shall be delivered to the Owner.

PART 2 MATERIALS

2.01 PIPE AND PIPE FITTINGS.

- A. Pressure Pipe: PVC Class 200 for all pressure pipe.
- B. Conduit Pipe (downstream from circuit valves): Conform to Commercial Standard 80 NSF Polyethylene Pipe.
- C. Pipe Fittings: For PVC plastic pipe, ASTM D2466 socket fittings with ASTM A 2564 solvent cement.
- D. Sleeving: Class 160 PVC with primed and solvent (gray blue) welded joints.

2.02 VALVES AND VALVE BOXES.

- A. Valves: Electric automatic valves.
- B. Strainers: Y strainers on each valve.
- C. Backflow Preventer: Provide anti-siphon device to meet local code.
- D. Valve Box: Plastic
- E. Valve Cover and Frame: Plastic with provision for locking.

2.03 SPRINKLER HEADS

Manufacturer's standard unit designed to provide uniform coverage over entire area of spray shown on drawings at available water pressure, as follows:

- A. Pop-up Spray (PUSp): Fixed pattern with screw-type flow adjustment.
- B. Flush Surface (FLSrf): Fixed pattern with screw-type flow adjustment.

- C. Shrubbery (Shrub): Fixed pattern with screw-type flow adjustment.

2.04 DRAINAGE BACKFILL

Cleaned gravel or crushed stone, graded from 3" maximum to 3/4" minimum.

- A. General: Furnish a low voltage system manufactured expressly for control of automatic circuit valves of landscape irrigation systems. Provide unit capacity to suit number of circuits as indicated. Wall-mount station controller.
- B. Transformer: To convert building service voltage to control voltage of 24 volts.
- C. Circuit Control: Each circuit variable from approximately 5 to 60 minutes. Include switch for manual or automatic operation of each circuit.
- D. Timing Device: Adjustable, 24 hour and 7 to 14 day, clocks to operate any time of day and skip any day in a 7 day or 14 day period. Allow for manual or semi-automatic operation without disturbing present automatic operation.
- E. Wire: Size must meet local codes and be in accordance with manufacturer's recommendations.

PART 3 METHODS AND PROCEDURES

3.01 INSPECTION

Installer must examine the areas and conditions under which landscape irrigation system is to be installed and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 TRENCHING AND BACKFILL.

- A. Excavation: All pipelines shall be installed in open cut trenches (machine trenched where accessible, otherwise manually excavated). The width of the trench in the pipe will be placed shall be sufficient to allow thorough tamping of suitable backfill material under and over the pipe. Boring will be permitted only where the pipe must pass under an existing obstruction which cannot be removed. In backfilling the bore, the final density of the backfill must match that of the surrounding soil. All other under pavement pipe laying shall be installed in sleeving material prior to placement of flatwork or other obstructions. Any trench deeper than 6' shall be adequately shored and/or braced for safety considerations. Trenches shall be dug to depths outlined under pipe and wire depth and shall be compacted by tamping to a minimum density of 95% Standard Proctor. No after-settling shall occur when finish grade has been re-established. (Verify established finished grades in planter areas before proceeding with the pipe installation).

The Contractor shall be responsible for investigating the type of soil and conditions in which these lines are to be installed and shall allow for same in his proposal. No extra will be allowed due to difficulty in trenching.

- B. Backfilling: Puddling or jetting compaction will not be allowed. Hand or machine tamp trenches are required for compaction.

Excavated trenching material will generally be considered satisfactory for backfill purposes. All backfill material shall be free from rubbish, vegetative matter, frozen materials, or stones larger than 2" in maximum dimension. Any material not suitable for backfill shall be hauled away.

Backfill shall not be done in freezing weather except with written approval from the Engineer.

- C. Pipe and Wiring Depth:
1. Mainline Pressure Piping: 36" from top of pipe.
 2. Lateral Lines: 15" from top of pipe.
 3. Control Wiring: 36" from finish grade along mainline pipe.

3.03 INSTALLATION.

- A. General: Unless otherwise indicated, comply with requirements of the Uniform Plumbing Code.
- B. Backflow Preventer: Provide unions on upstream or downstream sides. Only two types of devices will be acceptable; the reduced pressure device or the pressure vacuum breaker device. The pressure vacuum breaker device will only be allowed if it can be mounted a minimum of twelve inches (12") above the highest discharge point on the system. If this cannot be done, a reduced pressure device will be used. A minimum of twelve inches (12") clearance above the floor or grade will be maintained to ensure an air gap between the device and any water discharged. Care shall be taken to ensure proper drainage from backflow device. In no case shall the device be allowed to be submerged.
- C. Circuit Valves: Install in valve box, arranged for easy adjustment and removal. Provide union on downstream side.

Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.

- D. Piping: Lay pipe on solid subbase, uniformly sloped without humps or depressions.

For circuit piping, slope to drain valve at least ½" in 10' of run.

Install PVC pipe in dry weather when temperature is above 40°F in strict accordance with manufacturer's instructions. Allow joints to cure at least 24 hours at temperatures above 40 degrees F before testing, unless otherwise recommended by manufacturer.

- E. Drain Pockets: Excavate to size indicated. Backfill with acceptable drain material to 12" below grade. Cover drain material with a sheet of 30 lb. asphalt saturated felt and backfill remainder with excavated material.
- F. Sprinkler Heads: Flush circuit lines with full head of water and install heads after hydrostatic test is completed.

Install lawn heads at manufacturer's recommended heights.

Install shrubbery heads at heights indicated. Locate part-circle heads to maintain a minimum distance of 4" from walls and 2" from other boundaries, unless otherwise indicated.

- G. Sleeves Under Pavement: Install 3" PVC for sleeving under all paved areas in which the irrigation system crosses.

PART 4 QUALITY CONTROL

- A. General: Notify Owner in writing when testing will be conducted. Conduct test in the presence of Owner.
- B. Hydrostatic Test: Test water piping and valves, before backfilling trenches, to a hydrostatic pressure of not less than 100 psi for 3 hours, unless otherwise indicated. Piping may be tested in sections to expedite the work. Remove and repair piping, connections, valves which do not pass the hydrostatic testing.
- C. Operational Testing: Perform operational testing after hydrostatic testing.

Demonstrate to the Owner that the system meets coverage requirements and that automatic controls function properly.

Coverage requirements are based on operations of one circuit at a time.

END OF SECTION

SECTION 02821**REVEGETATION - SEEDING, SODDING, HYDROSEEDING****PART 1 GENERAL**

1.01 Scope

- A. Furnish labor, materials, equipment and services to complete the following work which shall include but not necessarily be limited to:
1. Soil Preparation and Scarification
 2. Topsoil Placement
 3. Seeding, hydroseeding or sodding
 4. Fertilizing
 5. Mulching
 6. Installing erosion blanket
 7. Maintaining areas

1.02 RELATED WORK SPECIFIED ELSEWHERE

Section 02200 - Excavation and Embankment

Section 02201 - Excavation and Backfill for Structures

1.03 SUBMITTALS:

- B. Seed mixture certifications stating botanical & common name, percentage by weight, and percentage of purity, germination, and weed seed of each grass species.
- C. Certification for mulch as "weed free".
- D. Certificates of compliance for fertilizer and tackifier.

PART 2 MATERIALS

2.01 SEED MIX

Seed shall be at least 95% pure and shall have a minimum germination percentage of 85%. Seed shall be furnished separately or in mixtures in standard containers with the same seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the Engineer duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within 6 months of date of delivery. This statement shall include: Name and address of laboratory, date of test, lot number of each kind of seed, and the results of tests as to name, percentage of weed content for each kind of seed furnished, and in case of a mixture, the proportions of each kind of seed.

A. Recommended Dryland Seed Mix % of Total/
(below 9000 feet) 1000 Sq. Ft.

Western Wheat Grass/Slender Wheat Grass (50% split or as available)	50%
Green Needle Grass	6¼%
Candy or Upland Bluegrass	3¼%
Hard Fescue	9½%
Creeping Red Fescue	9½%
Kentucky Bluegrass "Troy"	9%
Lupine (Wildflower substitutes are acceptable)	12½%
Globe Mallow	
Scarlet Gilia	
Flax	
Aspen Daisy	

B. Recommended Seed Mixture
(9,000-10,500 feet)

Lincoln Smooth Brome	25%
Orchard Grass (Pot Omac)	20%
Nord Crest Wheat	20%
Slender Wheat Grass	20%
Russian Wild Rye	15%

C. Recommended Seed Mixture
(10,500 feet and above)

Kentucky Blue Grass	25%
Timothy	25%
Chewing Fescue	10%
Pennlawn Red Fescue	10%
Meadow Foxtail	10%
Manchar Smooth Brome	10%
Alsike Clover	10%

Note: As an addition to the basic above, add oats, barley or winter wheat as a seasonal cover crop.

2.02 FERTILIZER

Fertilize all seeded areas with a commercial type 15-40-5 mixture of similar ratio. Fertilizer shall be standard commercial fertilizers supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid, and water-soluble potash. They shall be applied at the rate specified in these Specifications and shall meet the specified requirements of the applicable Federal and State laws. They shall be furnished in standard containers with name, weight and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

2.03 TOPSOIL

Material stripped from site consisting of loose friable loam reasonably free of admixtures of subsoil, refuse, stumps, rocks, brush, weeds or other material detrimental to proper development of vegetative growth. Topsoil shall be a minimum depth of four inches (4").

2.04 STRAW MULCH

Mulch all seeded and hydroseeded areas with straw mulch. Material for straw mulching shall consist of straw or oats, barley, wheat or rye and shall be certified as weed free. A copy of the certification shall be submitted to the Engineer prior to placement of any materials. Clean field hay may be substituted for straw when approved by the Engineer. Straw or hay in such an advanced stage of decomposition as to smother or retard the normal growth of grass will not be accepted.

2.05 TACIFIER

Straw mulch shall be secured by TerraTack or approved equal.

2.06 EROSION BLANKET

Erosion Blanket shall be as specified on Drawings. The blanket shall be smolder resistant, not toxic to vegetation or germination of seed and shall not be toxic or injurious to humans.

PART 3 EXECUTION

3.01 TIME OF YEAR TO SEED AND HYDROSEED.

Spring Seeding

Spring thaw to July 1st

Fall Seeding

Oct. 15th until consistent ground freeze

- A. "Spring thaw" shall be defined as the earliest date in a new calendar year in which seed can be buried ½-inch into the surface soil (topsoil) through normal drill seeding methods.
- B. "Consistent ground freeze" shall be defined as that time during the fall months in which the surface soil (topsoil) due to freeze conditions, prevents burying the seed ½-inch through normal drill seeding operations. At no time shall seed be sown, drilled or otherwise planted when the surface soil or topsoil is in a frozen or crusted state.
- C. Seeding at any time other than within the above seasons shall be allowed only when the Contractor submits a written request for permission to do so and permission is granted. In the request, the Contractor must agree to apply the specified seed at a rate of not less than 25 percent greater per unit area than the rates specified for use within the seeding season. The additional materials shall be furnished and placed at the Contractor's expense. The Contractor must also agree to reseed, re-mulch and repair any areas seeded out-of-season which fail to wind, erosion, lack of germination and/or disturbance by the Contractor.
- D. Where out-of-season seeding is ordered, the cost of additional material, if required, will be paid for, and in this event, the Contractor will not be held responsible for damage or failure beyond his control due to out-of-season seeding.

3.02 TOPSOIL EXCAVATION

Remove all sod, topsoil, organic earth, stockpile topsoil as designated on Drawings or as directed by Engineer.

3.03 TOPSOIL PLACEMENT

- A. General: When job site has been shaped and ready for placement of topsoil, cover all cut-fill areas and construction scars with topsoil to depth of 6". Contour all surfaces to approximate grade and blend with existing adjacent terrain in accordance with detail drawings.
- B. Slope Rounding: Round top and bottom of slopes and feather into undisturbed natural terrain. Avoid abrupt grade changes, making smooth transitions from slopes to more level areas.
- C. Slope Molding: Avoid long continuous slope faces by molding face of slope to accent existing adjacent terrain. Steepened slope faces near ridges and bluffs, laid back to link to natural draws, creating an undulating face.
- D. Surface Roughing: Gouge slope surfaces of 2:1 or steeper with horizontal ridges and trenches to depth of 6" minimum, creating roughened surface to lessen erosion, improve moisture percolation and soil layer binding. Trenches or ridges shall not be longer than 30' to prevent water accumulation and flowing water to cause rivulets.

3.04 PREPARATION FOR PLANTING OF LAWNS

- A. Grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll and rake and remove ridges and fill depressions as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.
- B. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
- C. Restore lawn areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.
- D. Preparation of Unchanged Grades. Where lawns are to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for lawn planting as follows: Till to a depth of not less than six inches, apply soil amendments and initial fertilizers as specified; remove high areas and fill depressions; till soils to a homogeneous mixture of fine texture free of lumps, cods, stones, roots and other extraneous matter.

3.05 FERTILIZING. APPLY FERTILIZER AT THE RATE OF 100 LBS. PER ACRE.

3.06 SEEDING AND SODDING

- A. Hydroseeding
 - 1. Seed and fertilizer shall be applied by spraying them on slopes of 3:1 or greater gradient in the form of an aqueous mixture and by using the methods and equipment described herein.

2. Spraying Equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons per minute at a pressure of 100 pounds per square inch. The pump shall be mounted in a line which will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipelines shall be capable of providing clearance for 5/8" solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supported stand in such a manner that it can be rotated through 360° horizontally and inclined vertically from at least 20° below to at least 60° above the horizontal.

There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over a distance varying from 20 feet to 100 feet. One shall be a close-range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet in length shall be provided to which the nozzles may be connected

3. Mixtures. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds of these combined solids shall be added to and mixed with each 100 gallons of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time. The Contractor shall identify to the Engineer all sources of water at least 2 weeks prior to use. The Engineer may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source which is determined to be unsuitable by the Engineer following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within 2 hours from the time they were mixed or they shall be wasted and disposed of at locations acceptable to the Engineer.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds. The mixture shall be applied by means of a high-pressure spray, which shall always be directed upward into the air so that the mixtures will fall to the ground

like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with Specifications shall be used to cover specified sections of known area. Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

Seeding shall be at 1.5 lbs. per 1000 sq. ft. or 65 lbs. per acre.

B. Dryland Seeding

1. Do not use wet seed or seed which is moldy or otherwise is damaged in transit or storage.
2. Sow seed using a spreader, seeding machine or drill seeder. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing equal quantity in 2 directions at right angles to each other.
3. Sow not less than 1.5 lbs. per 1000 sq. ft.
4. Rake seed lightly into top 1/8" of soil, roll lightly, and water with a fine spray.

C. Sodding New Lawns

1. Lay sod within 24 hours from time of stripping. Do not plant dormant sod or if ground is frozen.
2. Lay sod to form a solid mass of with tightly fitted joints. Butt ends and sides of sod strips; do not overlap. Stagger strips to offset joints in adjacent courses. Work from boards to avoid damage to subgrade or sod. Tamp or roll lightly to ensure contact with subgrade. Work sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering or adjacent grass.
3. Secure sod on slopes with wood pegs to prevent slippage. Water sod thoroughly with a fine spray immediately after planting.
4. Maintain sodded lawns by watering, fertilizing, weeding, mowing, trimming and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas until project is accepted by the Owner.

3.07 MULCHING. STRAW MULCHING

All seeded areas shall be mulched, as a separate process, with straw at a rate of 1½ tons/acre. Straw shall be applied in a uniform manner using standard straw blowing equipment. Areas not accessible, by reach, to straw blowing equipment shall be mulched by hand.

Areas not properly mulched or damaged shall be repaired and re-mulched in an acceptable manner, at Contractor's expense. Mulch removed by circumstances beyond the Contractor's control shall be repaired as ordered.

3.08 TACIFIER

Straw mulch not covered by erosion blanket shall be secured by TerraTack tackifier or approved equal. TerraTack shall be applied at a rate of 180 lbs/acre.

3.09 EROSION BLANKET

Areas requiring erosion blanket are designated on the Drawings and are generally on slopes of 1½:1 or greater. The blanket must be placed no later than 24 hours after seeding. The material shall be applied smoothly but loosely on the soil surface without stretching. The upslope end of each piece of blanket shall be buried in a narrow trench six inches deep. After the blanket is buried, the trench should be tamped firmly closed.

In cases where one roll of blanket ends and a second roll starts, the upslope piece should be brought over the buried end of the second roll so that there is a twelve (12) inch overlap to form a junction slot.

Overlaps of blanket which run down the slope, outside edges and center, shall be stapled on two foot intervals. Each width of jute mesh shall have a row of staples down the center as well as along the edge. Check slots and junction slots will be stapled across at six-inch intervals.

END OF SECTION

SECTION 02822

TEMPORARY EROSION CONTROL

PART 1 DESCRIPTION

- A. This work consists of furnishing and applying a soil binding slurry over disturbed slopes as a temporary soil erosion inhibitor. Disturbed slopes that will not be re-worked and finished slopes that are not scheduled revegetation for a period 21 days or more shall be treated as construction progresses. As construction progresses into the Fall season, all disturbed slopes that will not be re-worked before spring and finished slopes that are not scheduled for revegetation until spring shall be treated before the onset of winter and far enough in advance, in order for the treatment to be applied in accordance of the climatic requirements of this specification. Contractor shall furnish the equipment and labor necessary for performing the work.
- B. Soil binding agent shall be applied to all disturbed open slopes using standard mechanized hydraulic equipment used for broadcasting water based slurry products.
- C. The soil-binding agent shall be added to the proportionate quantity of water and thoroughly mixed per manufacturer's recommendations.
- D. This specification shall apply to all disturbed areas outside CDOT right-of-way.

PART 2 MATERIALS

- A. Soil binder shall be Soil Master WR or approved equal. Soil binder shall be non-toxic, non-flammable and conform to the following properties:

Copolymer of methacrylates/acrylates/acrylics/tripolycate	60%
Extgoxylated surfactants	2%
Silicates	2%
Inert ingredients	36%
pH	4 - 5.1
Color	Milky white
Lbs. per U.S. gallon	9 - 10 lbs.

- B. Wood cellulose fiber mulch shall be Mat-Fiber, or approved equal. Wood cellulose fiber mulch shall conform to the following requirements:

Moisture content (total weight basis)	12.0% +/- 3%
Organic matter (oven-dried weight basis, min.)	99.3%
Inorganic content (oven-dried weight basis, max.)	0.7%
pH at 3% consistency in water slurry (avg.)	4.9
Water holding capacity (min.)	1.2 gal./lb.
Color	Green

- C. Water used for establishing the proper dilution ratio shall be clean, free of sediment and other debris and pollutants.

PART 3 CONSTRUCTION REQUIREMENTS

- A. Liquefied soil binder (Soil Master WR) shall be thoroughly mixed with water and wood cellulose fiber mulch (Mat-Fiber) into a homogeneous mix and applied to the disturbed ground at the following rate per acre:

<u>Soil Binder/Acre</u>	<u>Cellulose Fiber/Acre</u>	<u>Water/Acre</u>
165 gallons	200 pounds	2,000 gallons

- B. The soil-binding product and cellulose fiber mulch shall be slowly poured into the slurry tank with agitators activated until homogeneous slurry is formed. The soil binding slurry shall be applied when the ground temperature is fifty degrees (50°F). or greater at time of application and sustained while the slurry solidifies and stabilizes for a forty-eight hour period.
- C. The soil binding slurry shall be sprayed uniformly over the disturbed areas. Application shall be in the form of a mist and avoid over saturation that result in the slurry running off the slope. Contractor may need to spray areas more than once to achieve the proper coverage and avoid over-saturation. The slurry shall be applied to a moistened ground, but not in the presence of freestanding surface water. Any areas not sealed with the soil binder properly or areas damaged due to the negligence of the Contractor shall be repair and retreated.
- D. The Engineer may order test sections be established for adjusting the equipment and assure proper application and conformance to the specification.

END OF SECTION

SECTION 02830**TREES, PLANTS AND GROUND COVER****PART 1 GENERAL****1.01 SCOPE OF WORK**

Work to be performed under this Section shall include all furnishing of plants and related materials, labor and equipment required to complete the installation of the exterior landscape work indicated on the Drawings.

1.02 RELATED WORK SPECIFIED ELSEWHERE

Section 02200 - Excavation and Embankment

Section 02201 - Excavation and Backfill for Structures

Section 02751 - Raw Water Irrigation Distribution and Underground Sprinkler System

1.03 QUALITY ASSURANCE.**A. Reference Standards.**

Plants shall be first class representatives of the specified species or variety, in healthy conditions with normal well developed branch root systems, free of all objectionable features, and shall conform to the requirements of the USDA Standard For Nursery Stock, 1969 Edition, AAN Standardized Specifications, The American Joint Committee on Horticulture (AJCH) [plant names should meet the standards of AJCH], The American National Standard Institute (ANSI) [nursery stock should meet ANSI Standard Specifications], and The Colorado State Nursery Act of 1965. Where standards may conflict, use the standard which requires the highest quality of performance.

B. Inspection and Approval.

Engineer reserves the right to reject, at any time or place prior to acceptance of, any and all materials and plants which, in his opinion, fails to meet specifications. Inspection of plants are primarily for quality, size and variety, but other requirements are not waived even though visual inspection results in approval. Plants may be inspected where growing, but inspection at the place of growth shall not preclude the right of rejection at the site. Rejected plants and other materials shall be promptly removed from the site and replaced with suitable specimens. All trees and shrubs shall be from a point or origin similar in altitude and climate as the construction site.

C. Acceptable Contractor

Landscape work shall be subcontracted to a single firm specializing in this type of work.

1.04 SOURCE QUALITY CONTROL.**A. Substitutes**

If specified landscape material is unobtainable, submit to Engineer proof of

unavailability and proposals for use of equivalent material. When authorized, adjustment of contract amount will be made.

B. Trees and Shrubs.

1. Provide trees and shrubs grown in a recognized nursery in accordance with good horticulture practice.
2. Provide healthy, vigorous stock free of disease, insects, eggs, larvae and defects such as knots, sun-scald, injuries, abrasions, or disfigurement.
3. Sizes. Provide trees and shrubs of sizes shown or specified. Trees and shrubs of larger size may be used if acceptable to Engineer, and if sizes or roots or balls are increased proportionately.

C. Inspection

Engineer reserves the right to inspect trees and shrubs at site before planting, for compliance with requirements for name, variety, size and quality.

1.05 SUBMITTALS.

- A. Certificates. All required state, federal or other inspection certificates shall accompany the invoice for plant materials, showing source of origin and shall be filed with the Engineer prior to acceptance of the material.
- B. Topsoil. Before delivery of topsoil, furnish Engineer with written statement giving locations of properties from which topsoil is to be obtained, names and addresses of owners, depth to be stripped and crops growing during past two years.
- C. Planting Schedule. Submit planting and seeding schedule to Engineer showing scheduled dates for each type of planting in each area of site.
- D. Maintenance Data. At completion of work, furnish three (3) copies of written maintenance instructions to Engineer for maintenance and care of installed individual plant types through their full grange season.
- E. Warranty. At completion of work, furnish written warranty to Engineer based upon requirements of Paragraph 1.08.

1.06 DELIVERY, STORAGE AND HANDLING

A. Delivery.

1. Deliver packaged landscape materials to site in original unopened containers bearing manufacturer's information (chemical analysis, name, trade name, trademark and conformance to state law.
2. Provide freshly dug trees and shrubs. Do not prune prior to delivery. Do not bend or bind-tie trees or shrubs in such a manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery.
3. Deliver trees and shrubs after preparations for planting have been completed and plant immediately. If planting is delayed more than six hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist.
4. Do not remove container-grown stock from container until planting time.

5. Each plant shall be identified by means of a grower's label affixed to the plant. The grower's label shall give the data necessary to indicate conformance to specifications. Use durable waterproof labels with water resistant ink which will remain legible for at least 60 days. Notify Engineer prior to delivery of plant materials to the site so that a pre-planting inspection may be made or indicate delivery schedule in advance so plant material may be inspected upon arrival at job site, whichever is more appropriate.
6. Removal unacceptable plant material immediately from job site.

B. Storage.

1. Deliver balled and burlapped stock directly from nursery and heel-in immediately if not being planted within the same day.
2. The Contractor will not be responsible for malicious destruction of plantings after installation. He shall be responsible for replacement of vandalized materials not yet installed. Report all cases of vandalism promptly to the Architect.

C. Handling.

1. Do not drop plants. Do not lift plants by the trunk, stems or foliage. The ball of the plant shall be natural, and the plant shall be handled by the ball at all times. No balled or burlapped plant shall be accepted if the ball is broken or the trunk is loose in the ball.
2. All plants shall be protected at all times from drying out or other injury. Minor broken or damaged roots shall be pruned before planting. Major damage shall be cause for rejections as determined by the Engineer.

1.07 JOB CONDITIONS

A. Existing Conditions.

1. Contractor shall determine location of utilities and perform work in a manner which will avoid possible damage. Hand excavate as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
2. The Contractor shall be responsible for proper repair of the sprinkler system and other underground pipe or electrical wiring damaged by operations under this section. Repairs will be made by contractors designated by the Engineer with cost being charged to this Contractor.
3. If a new tree or shrub is necessary due to interference with utility boxes or pits and underground piping or wiring, the Contractor shall notify the Engineer and receive approval of a new location. The Engineer must approve the precise location of all plants prior to pit excavation and installation.
4. When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Engineer before planting.

B. Protection

The Contractor shall inform the Owner in writing if special tree protection and traffic control must be installed to protect the planting from damage after the Owner assumes responsibility for maintenance. Planting Schedule

1. Sequencing/Scheduling. Proceed with the complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required.

2. Plant and install materials during normal planting seasons for each type of landscape work required. Correlate planting with specified maintenance periods to provide maintenance from date of substantial completion.
3. Prepare a proposed planting schedule and submit to Engineer. Schedule dates for each type of landscape work during normal seasons for such work in area or site. Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.

1.08 WARRANTY

A. Plant Material Guarantee

All plants shall be guaranteed to remain alive and healthy for two (2) full winters. A final inspection will be done by the Engineer at that time. Replacements shall be guaranteed an additional twelve (12) months. Inspection of the planting work, to determine its completion for beginning the guarantee period will be made by the Engineer upon notice requesting such inspection by the Contractor. All planting must be alive and healthy in order to be considered complete.

B. Final Inspection and Replacements.

Inspection of the planting to determine its final acceptance will be made at the conclusion of the guarantee period by the Engineer representative. No plants will be accepted unless they are alive and healthy. The Contractor shall replace any plants which are dead, or in the opinion of the Engineer, are in an unhealthy or unsightly condition, and/or have lost their natural shape due to dead branches. The cost of such replacement(s) shall be borne by the Contractor and shall be included in his bid price for this section of the Work.

C. Guarantee for Seeded Areas.

Areas failing to show an adequate germination of grass shall be replanted according to the instructions in Section 3.00 of the Specifications.

PART 2 MATERIALS

2.01 TOPSOIL.

- A. Topsoil will be stockpiled for re-use in landscape work. If quantity of stockpiled topsoil is insufficient, provide additional topsoil as required to complete landscape work.
- B. Provide new topsoil for soil mix for backfill of trees and shrubs which is fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay lumps, brush, weds and other litter, and free of roots, stumps, stones larger than 23" in any dimension, and other extraneous or toxic matter harmful to plant growth.

Obtain topsoil from local sources or from areas having similar soil characteristics to that found at project site. Obtain topsoil only from naturally, well-drained sites where topsoil occurs in a depth of not less than four inches; do not obtain from bogs or marshes.

2.02 SOIL AMENDMENTS

- A. Commercial Fertilizer. Complete fertilizer of neutral character, with some elements derived from organic sources and containing the following plant nutrient ratio: 20-20-5. Fertilizer shall be delivered to the site in unopened containers bearing the manufacturer's guaranteed analysis.
- B. Foliar Fertilizer. All tree and shrubs shall be foliar fertilized with "Rapidgro" or similar fertilizer. Dilute and apply fertilizer according to manufacturer's specifications. Foliar fertilization must be complete within two weeks of planting.

2.03 SOIL MIXTURES

- A. Plant pits: Soil Mixture containing one part Colorado Mountain Peat to three parts topsoil. These materials must be thoroughly mixed so there is no visible segregation of materials.

2.04 PLANT MATERIALS

- A. Quality. Provide trees, shrubs and other plants complying with recommendations and requirements of ANSI Z60.1 "Standard for Nursery Stock" and as specified in Section 1.03.
- B. Plant List. A complete list of plants including names, quantities, sizes and other requirements is shown on the Drawings. The plan shall have precedence over the plant list.
- C. Deciduous Trees. Provide trees of height and caliper listed or shown and with branching configurations recommended by ANSI Z60.1 for type and species required. Provide single stem trees except where special forms are shown or listed.
- D. Deciduous Shrubs. Provide shrubs of the height shown or listed and with not less than minimum number of canes required by ANSI Z60.1 for type and height of shrub required.
- E. Ground Cover. Provide plants established and well rooted in removable containers or integral peat pots and with not less than minimum number and length of runners required by ANSI Z60.1 for the pot size required.
- F. Seed.
 - 1. Seed shall be at least 95% pure and shall have a minimum germination rate of 85%. All seed shall be furnished in bags or containers clearly labeled to show the name and address of the supplier, the seed name, lot number, net weight, the percent of week seed content and the guaranteed percentage of purity and germination. Seed and seed labels shall conform to all current state and federal regulations and will be subject to the testing provisions of the Association of Official Seed Analysis.
 - 2. All seed mixes shall be free from such noxious weeds as Canadian Thistle, Coarse Fescue, European Bindweed, Johnson Grass and Leafy Spurge. The landscape contractor shall furnish to the Engineer a signed statement certifying that the seed furnished is from a lot that has been tested by a recognized laboratory. Seed which has become wet, moldy or in any other way damaged in transit or storage, will not be accepted.
 - 3. Bluegrass Seed. Bluegrass seed shall be "Quicklawn" mix or approved equal by John Ericson, Ericson Enterprises, 481 Grand Valley Drive, Grand Junction, Colorado 81514, (303) 434-3339.

- G. Sod
Provide strongly-rooted sod, not less than two years old and free of weeds and undesirable native grasses. Provide only sod capable of growth and development when planted (viable, not dormant). Provide sod composed principally of the following: 90% Kentucky Bluegrass (*Poa pratensis*).

2.05 MISCELLANEOUS LANDSCAPE MATERIALS.

- A. Mulch. Mulch all planted areas with shredded bark or approved equal.
- B. Stakes and Guys. Provide six-foot steel drive-in "T" posts. No. 125 for all tree staking. Provide wire ties and guys of two-strand, twisted, pliable galvanized iron wire not lighter than 12 gauge with zinc-coated turnbuckles. Provide not less than 1-inch hose, cut to required lengths, to protect tree trunks from damage by wires.
- C. Fiber Mulch. Mulch shall be "Conweb Hydro-Mulch" 2000 (Conweb Corporation, Fibers Division, Box 43237, St. Paul, MN 55164) or suitable approved substitute.

PART 3 METHODS AND PROCEDURES

3.01 INSPECTION

Installer must examine subgrade, verify elevations, observe conditions under which work is to be performed, and notify contractor of unsatisfactory conditions have been corrected in a manner acceptable to installer.

3.02 PREPARATION

- A. Layout
Layout individual trees and shrub locations by size and areas for multiple plantings. Stake locations and outline areas and secure Architect's acceptance before start of planting work. Make minor adjustments as may be requested. Prior to the excavation of planting areas or plant pits or placing tree stakes, the Contractor shall ascertain the location of all utility lines, electric cable, sprinkling system conduits so that proper precautions maybe taken not to disturb or damage any subsurface improvements.
- B. Preparation for Planting Beds.
 1. Loosen subgrade of planting bed areas to a minimum depth of eight inches using a cultimulcher or similar equipment. Remove stone over 1 inch in any dimension, and stick, stones, rubbish and other extraneous matter.
 2. Spread planting soil mixture to a 4-inch depth required to meet lines, grades and elevations shown, after light rolling and natural settlement. Place approximately one-half of total amount of planting soil required. Work into top of loosened subgrade to create a transition layer, and then place remainder of the planting soil.
- C. Excavation for Trees and Shrubs.
 1. Excavate pits, beds and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Loosen hard subsoil in bottom of excavation.

2. For balled and burlapped (B&B) trees and shrubs, make excavation at least half again as wide as the ball diameter and equal to the ball depth, plus following allowance for setting of ball on a layer of compacted backfill.
 3. Allow for six-inch setting layer of planting soil mix.
 4. For container grown stock, excavate as specified for balled and burlapped stock, adjusted to size of container width and depth.
- D. Preparation for Planting Lawns.
1. Grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll and rake and remove ridges and fill depressions as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.
 2. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
 3. Restore lawn areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.
 4. Preparation of Unchanged Grades. Where lawns are to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for lawn planting as follows:
- E. Till to a depth of not less than six inches, apply soil amendments and initial fertilizers as specified; remove high areas and fill depressions; till soils to a homogeneous mixture of fine texture free of lumps, cods, stones, roots and other extraneous matter.

3.03 PLANTING

- A. Planting Trees and Shrubs.
1. Set B&B stock on layer of compacted planting soil mixture, plumb and in center of pit or trench with top of ball at same elevation as adjacent finished landscape grades. Remove burlap from sides of balls; retain on bottoms. When set, place additional backfill around base and sides of ball, and work each layer to settle backfill and eliminate voids and air pockets.
 2. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill.
 3. Set container grown stock as specified for balled and burlapped stock, except cut cans on two sides with an approved can cutter; remove bottoms or wooden bases after partial backfilling so as not to damage root balls. 4. Dish top of backfill to create a plant saucer with a four-inch lip.
 5. Mulch around all plants with a two-inch layer of shredded bark. The boundaries of the mulched areas shall be the rim of the planting saucer or in shrub beds, the edge of the planting bed.
 6. Staking and Guying. Stake and guy trees immediately after planting, as indicated by planting detail on Drawings.
 7. Prune, thin out and shape trees and shrubs in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by the Architect, do not cut tree leaders, and remove only injured or dead branches from flowing trees, if any. Prune shrubs to retain natural character and accomplish their use in landscape design.
- B. Sodding New Lawns

1. Lay sod within 24 hours from time of stripping. Do not plant dormant sod or if ground is frozen.
 2. Lay sod to form a solid mass with tightly-fitted joints. Butt ends and sides of sod strips; do not overlap. Stagger strips to offset joints in adjacent courses. Work from boards to avoid damage to subgrade or sod. Tamp or roll lightly to ensure contact with subgrade. Work sifted soil into minor cracks between pieces of sod; remove excess to avoid smothering or adjacent grass.
 3. Secure sod on slopes with wood pegs to prevent slippage. Water sod thoroughly with a fine spray immediately after planting.
- C. Seeding.
1. Seeding rate: Bluegrass Seed Mix, 6000 lbs/1000 sq.ft.
 2. Application. Seed shall be broadcast and uniformly raked to incorporate into the soil. Seeded areas shall be lightly mulched with clean straw.
 3. Watering of Seeded Areas. Immediately after seeding and mulching of bluegrass areas, the Contractor shall water the seeded areas lightly and sufficiently to a depth of two inches, but with care so that erosion takes place and no gullies are formed. Damage and erosion from over-watering shall be repaired by or paid for by the Contractor.
- D. Hydroseeding.
1. Seed. All seed shall be delivered to the site tagged and labeled in accordance with the Colorado Agricultural Code and shall be acceptable to the County Agricultural Commissioner. Seed shall be of a quality which as a minimum pure live seed content of 70% (% purity x \$ germination), and weed seed shall not exceed 0.5% of the aggregate of pure live seed and other materials or a as standard for specific seed. The germination rate shall be 85%.
 2. Fertilizer. A commercial fertilizer shall be ammonium phosphate and contain a minimum of 60 lbs. actual available nitrogen, 50 lbs. actual available phosphoric acid and 25 lbs. actual available potash, uniform in composition, dry solvable, pelleted or granular.
All fertilizer shall be delivered in unbroken and unopened containers, labeled in accordance with applicable State regulations and bearing the warranty of the producer for grade finished.
 3. Mulch. (Wood Cellulose) shall be manufactured from Aspen, Alder or Hemlock (no waste paper, dairy waste fiber, ground straw, rice hulls, etc., can be used - only "virgin wood fiber", i.e. "Conweb or Silva Fiber".

The mulch shall be colored with a non-toxic water-soluble green dye to provide a proper visual gauge for metering of material over ground surfaces. It shall be manufactured in such a manner that after addition and agitation in slurry tanks with fertilizer, seed, water, and other approved additives, the fibers in the material will become uniformly suspended to form a homogeneous slurry;; and that when hydraulically sprayed on the ground, the material will form a blotter-like ground cover impregnated uniformly with seed; and which, after application, will allow the absorption of moisture and allow the rainfall to percolate to the underlying soil.

Cellulose shall be certified to indicate that laboratory and field-testing of the product has been accomplished and that it meets all of the foregoing requirements based on testing. Weight specifications of this material from suppliers and for all application shall refer only to air dry weight of the fiber material.

- Absolute air dry weight is based on the normal; standards of the Technical Association of The Pulp and Paper Industry for wood cellulose and is considered equivalent to 10% moisture.
4. Water. Water shall be clean, potable and added to the slurry mixture in sufficient amount to spread uniformly and required quantity of hydro-mulch solids (approximately 3000 - 4000 gallons per acre).
 5. Organic Seeding Additive. Use "Ecology Control M-Binder" as per manufacturer's recommendations (apply at rate of 120 lbs/acre).
 6. Seeding Requirements.
 - a. Application of Seed: The Contractor shall obtain approval prior to application of the hydro-mulch seed.
 - b. Seedbed Preparation: The area to be seeded shall have a firm seedbed which has been previously roughened by scarifying with the use of harrowing, cat tracks or other methods. Work to a depth of two inches to three inches. No implement shall be used that will create an excessive amount of down-movement of soil or clods on sloping areas. Seedbed preparation shall be suspended when soil moisture conditions are not suitable for the preparation of a satisfactory seedbed. This will be determined by the Project Inspector.
 - c. Fertilizing: The fertilizer shall be mixed and applied hydraulically in the form of a slurry. It shall be applied uniformly over the seedbed (i.e., 20-20-9 at 300 lbs.).
 - d. Seeding: Seed shall be distributed uniformly over the seedbed. The seed shall be added to the slurry mixture just before it is to be applied hydraulically to the seedbed and it shall not remain in the seeder longer than one hour. Seed source: Mile High Seed Company, 520 South 9th Street, P.O. Box 1988, Grand Junction, CO 81502) unless otherwise approved.

Seed

Wester Wheat Grass (50% split or as Slender Wheat Grass available)	50%
Green Needle Grass	6-1/4%
Candy or Upland Bluegrass	3-1/8%
Hard Fescue	9-3/8%
Creeping Red Fescue	9-3/8%
Kentucky Bluegrass "Troy"	3-1/8%
Mt. Sage (10% purity with 70% germination)	6-1/4%
Lupine	
Globe Mallow	
Scarlet Gilia (wildflower mix may vary)	
Phlox	
Aspen Daisy	<u>6-1/4%</u>

1/5 lbs. PLS/1000

Contractor shall commence seeding immediately upon completion of grading and seedbed preparation. Additional spot seeding may be needed if area is disturbed.

All seeding shall be completed by July 1 (spring seeding) or October 15 (fall seeding) or as otherwise approved.

Mulching: The wood fiber mulch shall be applied uniformly with a hydraulic seeder at the rate of 2000 lbs/acre.

Equipment: Hydroseeder - Hydraulic equipment used for the application of the fertilizer, seed and slurry of prepared wood pump shall be of the type as approved by the Owner. This equipment shall have a built-in agitation system and operating capacity sufficient to agitate, suspend and homogeneously mix a slurry containing up to 40 lbs. of fiber plus combined total of 70 lbs. fertilizer solids for each 100 gallons of water. The slurry distribution lines shall be large enough to prevent sloppage. This discharge line shall be equipped with a set of hydraulic spray nozzles which will provide a continuous non-fluctuating discharge and delivery of the slurry in the prescribed quantities uniformly without misses, waste or erosion. The slurry tank shall have a minimum capacity of 500 gallons and shall be mounted on a traveling unit which will place the slurry tank and spray nozzles within sufficient proximity to the areas to be seeded so as to provide uniform distribution. The Owner may authorize equipment with smaller uniform distribution.

The Owner may authorize equipment with smaller tank capacity provided that the equipment has the necessary agitation system and sufficient pump capacity to spray the slurry in a uniform coat.

3.04 MAINTENANCE

- A. Begin maintenance immediately after planting. Maintain trees, shrubs and other plants until final acceptance but in no case less than 90 days after substantial completion of planting except as provided below for seeded areas. Maintain trees, shrubs and other plants by pruning, cultivating and weeding as required for healthy growth. Restore planting saucers. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free of insect and disease.
- B. At the completion of the maintenance period, the Contractor shall:
 - 1. All plants that die or are in a badly impaired condition shall be removed and replaced.
 - 2. Replacement stock shall be subject to all requirements specified for the original material.
 - 3. Replacement stock shall be planted in accordance with the standard specifications. Maintenance requirements shall be specified below.
 - 4. Acceptability of the plant material furnished and planted shall be determined after all replacement plant material is planted. The Contractor shall as necessary, employ all possible means to preserve the plants in a healthy and vigorous growing condition to ensure their successful establishment.

3.05 CLEAN-UP AND PROTECTION

During landscape work, keep pavement clean and work areas in an orderly condition.

3.06 INSPECTION AND ACCEPTANCE

- A. When landscape work is completed, including maintenance, Engineer will, upon request, make an inspection to determine acceptability. Landscape work may be inspected for acceptance in parts agreeable to Engineer, provided work offered for inspection is complete, including maintenance.
- B. Where inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected by Engineer and found to be acceptable. Remove all rejected plants and materials promptly from project site.

END OF SECTION

SECTION 03100**CONCRETE FORMWORK****PART 1 GENERAL****1.01 SCOPE**

The work in this section consists of the design, furnishing, erecting and removing of forms for cast-in-place concrete.

1.02 RELATED WORK SPECIFIED ELSEWHERE.

Section 03200 - Concrete Reinforcement

Section 03300 - Cast-in-Place Concrete

1.03 QUALITY ASSURANCE.

- A. Reference Standards - American Concrete Institute Standards (ACI).
301 Specifications for Structural Concrete for Buildings, Chapter 4, Formwork. ACI 347, Recommended Practice for Concrete Formwork (Chapters 1 through 5) as modified herein.
- B. Design Criteria - Design formwork for the loads, lateral pressure and allowable stresses outlined in Chapter 1 of ACI 347.
- C. Maximum Allowable Tolerances
 - 1. Variation from plumb:
 - a. Lines and surfaces of columns and walls in any ten feet of length, 1/4-inch; in 40 feet or more, 1/2-inch.
 - b. Control joint grooves, and other conspicuous lines. In any 20 feet of length, 1/4-inch; in 40 feet or more, 1/2-inch.
 - 2. Variation from level or specified grade in slabs. In any 10 feet of length; 1/4-inch; in 40 feet or more, 1/2-inch.
 - 3. Variation of the linear building lines from established position in plan and related position of columns and walls, in any bay, 1/2-inch; in any 20 feet of length, 1/2-inch; in 40 feet or more, 1 inch.
 - 4. Refer to ACI 301, Table 4.3.1 for additional requirements.

PART 2 MATERIALS**2.01 GENERAL**

Where "Smooth Form Finish", or "Grout Cleaned Finish" is specified, use prefabricated plywood panel forms, job-built plywood forms, forms lined with plywood, or steel forms. For reservoir walls, use two-foot wide form material to form the circular portion of the reservoir. The forms may be steel or plywood

2.02 STEEL FORMS

Symons "Steel-Ply", Simplex "Industrial Steel Frame Forms", Universal "Uniform". Forms shall be clean, straight and true, without surface defects.

2.03 PLYWOOD FORMS

Product Standard PS-1, waterproof, resin-bonded exterior type. Forms shall be clean, straight and true, without surface defects.

- 2.04 LUMBER
Straight, uniform width and thickness, clean and free from offsets, holes, dents and other surface defects.
- 2.05 CHAMFER STRIPS
Clear white pine, surface against concrete planed.
- 2.06 FORM TIES
Permanently embedded one-inch break-back cone ties with water seal washers. Ties shall have a neoprene seal integral to the tie. Provide sufficient strength and rigidity to maintain forms in proper location without use of auxiliary spreaders. Form ties shall be uniformly spaced and aligned in vertical and horizontal rows.
- 2.07 JOINTS.
Joints in circular reservoir shall be formed as shown on the Drawings.
- 2.08 POLYETHYLENE FILM
Product Standard PS-17; 6 mil. See Drawings for application at the top of the reservoir wall.
- 2.09 FORM BOND BREAKING AGENT
Shall be non-staining agent that will allow the removal of forms without damaging or discoloring concrete.

PART 3 EXECUTION

3.01 GENERAL

Erect forms substantially tight to prevent leakage of mortar and braced or tied to maintain the desired position, shape and alignment before, during and after concrete placement. At vertical wall joints where forms overlay existing concrete, a mortar-tight joint shall be required. Use a bead of silicone caulking or foam joint filler against concrete before placing form.

Provide temporary openings at the bottom of column and wall forms and at other locations where necessary to facilitate cleaning and inspection.

Temporary openings in wall or column forms used to limit the free fall of concrete to a maximum of four feet shall be located to facilitate placing and compaction of the concrete. Such openings in walls shall not exceed 10 feet laterally to avoid moving concrete laterally more than five feet.

If tremies of proper length are used for depositing concrete in walls or columns, temporary openings for concrete placement will not be required.

Whenever the top of a wall will be exposed to weathering, do not extend the forms on one side above the top wall; bring to true line and grade.

At other locations, bring forms to a true line and grade, or provide a wooden guide strip at the proper location on the forms so that the top surface can be finished with a screed or template for concrete which is to have a specified elevation, slope or contour.

Flat segmental forms not more than 24 inches wide may be used for forming curved surfaces

25 feet in diameter or larger.

Where concrete is placed against rock, remove all loose pieces of rock and clean the exposed surface with a high-pressure hose.

The circular ring wall footing for the reservoir shall have a smooth steel troweled finish within the limits described on the Drawings.

3.02 EMBEDDED ITEMS

Anchor bolts, casting, steel shapes, conduits, sleeves and other materials that are to be embedded in the concrete shall be accurately positioned in the forms and securely anchored. Do not embed conduits, sleeves or other materials in the reservoir wall unless specifically shown on the Drawings.

Conduits shall not be installed in tank walls or slabs.

Assure embedments are clean when installed.

At pipe penetrations where a steel weep ring is not called for, provide a watertight seal between the pipe and wall using "Ramneck" butyl sealant.

3.03 PREPARATION OF FORM SURFACES. REMOVE MORTAR, GROUT AND OTHER FOREIGN MATERIAL FROM FORM SURFACES.

Coat form surfaces with form release agent before either the reinforcing steel, post-tensioning materials or concrete are placed. Do not allow form coating to:

- a. Stand in puddles in the forms;
- b. come in contact with the reinforced steel; or
- c. come in contact with adjacent hardened concrete against which fresh concrete is to be placed.

3.04 EDGES AND CORNERS

Place chamfer strips in forms to bevel exposed edges and projected corners. Tool the top edges of walls and slabs not indicated on the Drawings to be beveled.

Form beveled edges for all vertical and horizontal corners of equipment bases unless indicated otherwise on the Drawings.

Chamfer strips shall be 3/4-inch, unless indicated otherwise on the Drawings.

3.05 REMOVAL

Carefully remove forms only after concrete is able to support all dead and live loads and curing requirements are met. Apply potable water safe curing compound to all formed surfaces immediately after form removal.

Determine the strength of concrete from site-cured cylinders, cured in the same manner as the formed concrete.

If job cured cylinder test reports are not available for formed concrete, the form supports shall remain in place for not less than the following periods of time. These periods represent

cumulative number of days or fractions thereof, not necessarily consecutive, during which temperature of the concrete is above 50 degrees Fahrenheit (50°F).

Walls and columns	48 hours
Reservoir top slab	Only after satisfactory post-tensioned. Re-shoring shall not be permitted.

After removal, ends of metal form ties shall be recessed a minimum of one inch from surfaces. Form tie holes shall be patched with high-strength, non-shrink grout in a manner as to be permanent.

END OF SECTION

SECTION 03200**CONCRETE REINFORCEMENT****PART 1 GENERAL****1.01 Scope**

The work in this section covers furnishing and installing steel bars and welded wire fabric for concrete reinforcement.

1.02 Related Work Specified Elsewhere.

Section 03100 - Concrete Formwork

Section 03300 - Cast-in-Place Concrete

1.03 Quality Assurance.**A. Reference Standards. American Concrete Institute Standards (ACI).**

301 - Specifications for Structural Concrete for Buildings.

315 - Manual of Standard Practice for Detailing Reinforced Concrete Structures.

318 - Building Code Requirements of Reinforced Concrete.

350R - Concrete Sanitary Engineered Structures.

344 - Design and Construction of Circular Prestressed Concrete Structures.

B. As modified herein or on the Drawings.**C. Allowable Tolerances. Fabrication Tolerances.**

1. Sheared length: + 1 inch

2. Depth of truss: + 0, -1/2 inch for concrete thickness 24 inches or less and + 0, -1/2 inch for concrete thickness over 24 inches.

3. Overall dimensions of stirrups, ties and spirals: + 0, 1/2-inch for concrete thickness 24 inches or less and + 0, -1/2 inch for concrete thickness over 24 inches.

4. All other bends: + 1 inch.

D. Welding.

Only A706 reinforcement may be welded and only with the approval of the Engineer.

1.04 SUBMITTAL OF SHOP DRAWINGS**A. Shop Drawings.**

1. Show sizes, quantity and dimensions for fabrication and placing of reinforced bars and bar supports.

2. Indicate bar schedules, stirrup spacing, and diagram of bent bars.

3. Reinforcement shop drawings shall be submitted on reproducible. Provide two sets of prints and reproducible. **B.**

Certificates. Mill test certificates identifying chemical and physical analysis of each load of reinforced steel delivered.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

Deliver to site in bundles marked with metal tags indicating bar size and length. Carefully handle and store on supports, which will keep the steel from coming in contact with the new ground.

1.06 JOB CONDITIONS

Do not burn or weld in the vicinity of tendons.

PART 2 PRODUCTS

2.01 REINFORCEMENT BARS

- A. BARS. STEEL REINFORCEMENT SHALL BE NEW, DEFORMED BILLET STEEL, MEETING ASTM STANDARD A615 OR A706; FOR REBARS NO. 4 AND LARGER, GRADE 60; FOR NO. 3 REBARS AND DESIGNATED REINFORCEMENT, GRADE 40 OR GRADE 60.
1. Bend Test: Meet 180 degree bend at 60 degrees F. minimum temperature without cracking when bent around pin diameter indicated.
 - a. Number 3, 4 and 5 bars around pin diameter equal to 4 times nominal bar diameter.
 - b. Number 6 through 11 bars around pin diameter equal to 5 times nominal bar diameter.
 2. Bend test for 14 and 18: Meet 90 degree bend at 60 degrees F. minimum temperature without cracking when bent around a pin diameter equal to 10 times nominal bar diameter.
- B. Tie Wire. Annealed steel, Fed. Spec. QQ-W-461, 16 gage minimum.
- C. Bar Supports.
1. Conform to "Bar support Specifications", CRSI Manual of Standard Practice.
 2. Where concrete surface will be exposed to fluids, view or weather, the supports or accessories shall be completely comprised of non-metallic material such as plastic or shall be completely plastic or epoxy coated.
- D. Splice Devices
Provide *Thermite* (Cadweld) welding process only when called for on the Drawings. Where mechanical splice devices are called for on the Drawings, provide *Lenton* (or equal approved by Engineer) "Formsaver" threaded reinforcement splices to match the reinforcement size that the splice is intended to extend. Splices shall meet ACI 318, Chapter 12 strength criteria of developing 125 percent of the specified yield strength of the reinforcement bar it replaces. Install per manufacturer's recommendations.
- E. Fabrication. In accordance with CRSI manual of Standard Practice, except for the allowable tolerances specified herein in Section 1.03 (C) of this specification.

2.02 WELDED WIRE FABRIC

ASTM A185 or A497.

PART 3 EXECUTION

3.01 PREPARATION

Remove all mud, oil, loose rust or mill scale and other foreign materials that may reduce bond.

Rust or mill scale which is "tight" will be permissible without cleaning or brushing, provided weights, dimensions, cross sectional area, and tensile properties meet requirements ASTM A615.

3.02 INSTALLATION.

- A. Bar Placement. Conform to CRSI-WCRSI "Placing Reinforcing Steel".
- B. Bar Supports.
1. Provide minimum number of supports as required by ACI 315.
 2. Do not use pebble, piece of broken stone, common or face brick, metal pipe or wood blocks to support reinforcement.
 3. On ground, where necessary, solid concrete bricks may be used to support wire chairs that, in turn, support the reinforcing steel in the slabs on grade. Small squares of 1/2" plywood may be used to support grade lab chair on the compacted subgrade.
- C. Placement Tolerances.
1. Clear distance to formed surface: See Section D. Concrete Cover below i) and ii).
 2. Spacing between bars: -1/4 inch
 3. Top bars in lab and beams: See Section D. Concrete Cover below i) and ii).
 4. Crosswise of members: Spaced evenly within 2 inches.
 5. Lengthwise of members: +2 inches.
 6. Maximum bar movement to avoid interference with other reinforcing steel, conduit or embedded items: One bar diameter.
 - a. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, the resulting arrangement of bars may be rejected by Engineer.
- D. Concrete Cover
1. Except as otherwise indicated on the Drawing, provide the following minimum concrete cover for reinforcement:
 2. Concrete cast against and permanently exposed to earth: 3"
 3. Concrete poured in form, but exposed to earth, weather or chlorinated water:

Bars larger than No. 5:	2"
Bars #5 or smaller:	1-1/2"
Beams:	2 ³ / ₄ "
Walls and slabs (not exposed a in 2 above):	3/4"
- E. Reinforcing Adjustment
1. Do not heat, bend or cut bars without Engineer' approval.
- F. Splices
1. Do not splice bars except at locations shown on the Drawings without Engineer' approval.
 2. Minimum lap distance shall be as shown on the Drawings. If not shown, splices shall be as specified in ACI 318.
 3. Tie splices securely to prevent displacement during placement of concrete.
 4. In horizontal wall reinforcement, alternate place vertically so that all splice are not in the same vertical plane.
- G. Welded Wire Fabric

1. Install in longest practicable length.
2. Lap adjoining pieces one full mesh plus 2 inches minimum.
3. Do not make lap midway between simple separated members or directly over support members of continuous structures.
4. Offset lap in adjacent widths to prevent continuous lap.
5. Extend fabric through contraction joints and construction joint unless otherwise indicated on the Drawings.

END OF SECTION

SECTION 03300**CAST-IN-PLACE CONCRETE****PART 1 GENERAL****1.01 SCOPE**

Work to be completed under this section shall include all labor, equipment, plant and materials necessary to furnish and install all poured-in-place concrete, together with all miscellaneous and appurtenant items, as shown on the Construction Drawings and as specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

Section 02201 - Excavation and Backfill for Structures

Section 02201 - Excavation and Backfill for Structures

1.03 REFERENC STANDARDS

Except as modified or supplemented herein, all Work shall conform to the following standards, latest edition. Refer to standards for detailed requirements.

ACI 318 - Building Code Requirement for Reinforced Concrete

ACI 301 - Specifications for Structural Concrete for Buildings

ACI 347 - Recommended Practice for Concrete Formwork

ACI 305 - Recommended Practice for Hot Weather Concreting

ACI 306 - Recommended Practice for Cold Weather Concreting

Publication SP-2, ACI Manual for Concrete Inspection

ASTM A 615 - Standard Specifications for Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

ASTM A 185 - Specifications for Welded Steel Fabric for Concrete Reinforcement.

ASTM C 618 - Standard Specification for Fly Ash and Raw or Calcined Natural Pozzolan for use as a Mineral Admixture in Portland Cement Concrete.

1.04 SUBMITTALS

The following shall be submitted to and approved by the Engineer prior to beginning any concrete work.

A. Lab Design Mix. Prior to the start of Work, Contractor to submit a statement of the proportions for the concrete mixture. Statement to include:

1. Location & identification of aggregate source.
2. Batch quantities for one (1) cubic yard of concrete, including:
 - a. Weight of fine aggregate in a saturated surface dry condition.
 - b. Weight of coarse aggregate in a saturated surface dry condition.
 - c. Weight or number of 94 pound bags of cement.
 - d. Weight or gallons of water.
 - e. Amount and description (including manufacturer, specific product name, and number) of all admixtures
3. Test results on trial batch concrete made from the proposed mix design, including:
 - a. Cement factor in bags per cubic yard based on yield tests.
 - b. Water-cement ratio.

- c. Percent of entrained air.
 - d. Consistency in inches of slump.
 - e. At least three 28-day compressive strength tests.
- 4. Brand, type and place of manufacture of cement.
- 5. Aggregate test results for grading, deleterious substances and physical properties using test procedures developed by ACI.

- B. Reinforcing Steel. Product data sheet and statement of manufacturer's compliance with applicable standards.

- C. Construction Joint Location. Location of all wall and slab construction joints.

- 1.05 RECORD OF THE WORK
Contractor to keep a record of time, date and location of each concrete pour and submit these records to the Engineer.

- 1.06 NOTICE OF INTENTION TO POUR
Contractor shall notify the Engineer at least 48 hours before an intended cast-in-place concrete pour. No structural cast-in-place concrete shall be poured until all reinforcing, forms and foundation soils have been inspected by the Engineer.

- 1.07 PROTECTION OF THE WORK
Contractor to be responsible for protection of all Work prior to acceptance. In place concrete shall not be subjected to loadings or stress prematurely.

- 1.08 STORAGE OF MATERIALS
Cement and aggregate shall be stored in such a manner as to prevent deterioration or intrusion of foreign matter. Any material which has deteriorated or which has been damaged shall not be used for concrete.
All reinforcing steel shall be stored in a dry location and protected from excessive accumulation of rust or scale.

PART 2 MATERIALS

- 2.01 CEMENT
All cement shall be Portland Cement Type II conforming to "Specifications for Portland Cement" (ASTM C 150-62). The same brand cement for all exposed cast-in-place concrete shall be used.

- 2.02 STONE AGGREGATE
Fine and course aggregate shall conform to "Specifications for Concrete Aggregates" (ASTM C33-61T). Fine aggregates shall be clean, hard, natural and free from all foreign matter. Course aggregate shall be sound, crushed rock or gravel, free from adherent coating, organic water or injurious amounts of flat or friable pieces.

- 2.03 WATER
Water used in mixing shall be potable, cleaned and free from deleterious amounts of oil, acids, alkalis and organic material.

- 2.04 ADMIXTURES
Protex" as manufactured by Protex Industries, Inc. and conforming to Specifications of Air-

Entraining Admixtures for Concrete (ASTM C260) is an approved air-entraining admixture. Other admixtures for retarding or accelerating concrete may be used in strict accordance with manufacturer's recommendations and ASTM Specifications upon approval of the Engineer.

2.05 FORM MATERIAL

For unexposed concrete surfaces, forms may be undressed lumber free from excessive knots. For exposed surfaces, use wood or metal forms as required to give finish as specified.

2.06 REINFORCING STEEL

Reinforcing steel shall be deformed bars conforming to "Standard Specifications for Deformed and Plain Billet Steel Bars for Concrete Reinforcement" (ASTM A615) and shall be Grade 60.

2.07 WELDED WIRE FABRIC

Welded wire fabric shall conform to "Specifications for Welded Steel Fabric for Concrete Reinforcement" (ASTM A185) and shall have a minimum wire yield strength of 60,000 psi.

PART 3 METHODS AND PROCEDURES

3.01 CONCRETE MIX.

- A. Proportions. Concrete is to be proportioned according to laboratory designed mixes using the type of aggregate specified and producing the minimum of twenty-eight (28) day ultimate compressive strength as noted on the Construction Documents. All concrete shall be made with stone aggregate unless specifically noted, and no concrete shall have a 28 day compressive strength of less than 4,000 psi.
- B. Cement and Water Content. The minimum quantity of cement used per cubic yard of concrete shall be 580 pounds. Water content shall not exceed 0.48 pounds water/pounds cement.
- C. Air Entrainment. An air-entraining agent shall be added to all stone concrete so as to entrain 5%-8% by volume. Air-entraining agents shall be in strict accordance with the recommendations of the manufacturer and the testing laboratory for the design mix to assure strength requirements are being fully met or exceeded.
- D. Mixing of Materials. The concrete shall be mixed until there is a uniform distribution of the materials and shall be discharged completely before the mixer is recharged. For job-mixed concrete, the mixer shall be rotated at the speed recommended by the manufacturer.

For stone concrete, mixing shall continue for at least one minute after all materials are in the mixer. Ready mixed concrete shall be mixed and delivered in accordance with "Standard Specifications for Ready Mixed Concrete" (ASTM C94-69).

Sufficient time shall be allowed for proper mixing on the concrete to provide uniformity throughout the batch. Long delays in concrete placement shall be avoided and any concrete which has not been placed within one (1) hour after water has been added to the mix shall be rejected. Over wet mixes shall be rejected and shall not be corrected by the addition of either aggregate or cement to the mixer. Mix not less than ten minutes in transit mix trucks after addition of the mixing water.

- E. Consistency. Slumps shall be minimum, consistent with placing requirements. Slump test shall be made in accordance with "Slump Test for Consistency of Portland Cement Concrete" (ASTM C143-58). Unless written approval is obtained from the Engineer, the maximum slump shall be three (3" ±1") inches and the maximum size aggregate shall be one and one-half (1 ½") inches.

3.02 CONCRETE FORMS.

- A. Forms shall conform to the shape, lines, grades and dimensions of the concrete as detailed on the Construction Drawings. All forms for exposed finished surfaces shall be built with the material needed to produce the form, texture and design specified in Concrete Finishes of this section.
- B. Design of Forms. Forms shall be sufficiently tight to prevent leakage of mortar and shall be properly braced or tied together so as to maintain the desired position. The formwork shall be designed for the loads outlined in Part 3, Section 102 of "Recommended Practice for Concrete Form Work" (ACI 347-78). The forms shall be oiled for ease of removal of forms after setting of concrete.
- C. Form Ties and Incidentals. Form ties shall be bolts and rods (adjustable for tightening) arranged so that no metal is within 3'4" of surface after removal of forms. Ordinary wire ties will be allowed with the specific approval of the Engineer. No ties through exposed concrete will be allowed. Set forms for all required anchors, bolt inserts, slots, sleeves, supports, etc., furnished under portions of this Specification and installed under this section.
- D. Removal of Forms. Forms shall not be disturbed until concrete has hardened sufficiently to permit their removal with safety. The removal of the forms shall be carried out in such a manner as to insure the safety of the structure. Unless otherwise permitted by the Engineer, forms shall not be removed until 24 hours after pouring.

3.03 CONSTRUCTION AND EXPANSION JOINTS

Expansion and control joints shall be constructed in accordance with Construction Drawings. Unless otherwise indicated on the Construction Drawings, install one inch (1") thick asphalt impregnated fiberboard expansion joint filler (ASTM D1752) wherever concrete slabs abut buildings or footings or as shown on the plan details. All expansion joint filler shall extend the full depth of the slab.

3.04 CONCRETE PLACEMENT.

- A. transporting concrete shall be cleaned and all debris and ice shall be removed from places to be occupied by concrete. Forms shall be properly treated and all reinforcement cleaned of ice and other coatings. Water shall be removed from place of deposit before concrete is placed.
- B. Conveying. Concrete shall be conveyed from the mixer to the place of final deposit by methods which will prevent the separation or loss of the materials. Equipment for chuting, pumping, or pneumatically conveying concrete shall be of such size and design as to insure a practically continuous flow of concrete at the delivery and without separation of the materials.

- C. Other Trades. Install by way of example, anchor bolts, reinforcing steel, pipe and conduit openings and sleeves, bearing plates, and knockouts as provided by other trades and as required by other trades. Provide minimum 7 days notice to Engineer, Owner, or other trades prior to requiring materials or detailing information. Installation to meet location, dimension and alignment requirements of other trades.
- D. Depositing. Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to re-handling or flowing. The concreting shall be carried on at such a rate that the concrete is at all times plastic and flows readily into the space between the bars. No concrete that has been partially hardened or been contaminated by foreign matter shall be deposited on the Work, nor shall re-tempered concrete be used. When concreting is once started, it shall be carried on as a continuous operation until the placing of the panel or section is completed. Place concrete in approximately horizontal layers avoiding displacement of reinforcement above fresh concrete and formation of seams and planes of weakness in sections. When construction joints are necessary, they shall be located as specified in this section under Construction Joints. For bonding fresh concrete, roughen and clean exposed surface and brush with neat cement grout. Place new concrete before grout takes initial set.
- E. Compaction. Place concrete in layers not over 24" deep; compact each layer by mechanical internal vibrating equipment supplemented by hand spading, rodding, tamping, as directed. Vibrators shall not be used to transport concrete inside forms. Limit vibration duration to the time necessary to produce satisfactory consolidation without causing objectionable segregation. Do not insert vibrator into lower courses that have begun to set.
- F. Weather Conditions. Unless adequate protection is provided and the Engineer's approval is obtained, concrete shall not be placed during rain, sleet, or snow. When the mean temperature falls below 40°F for 3 successive days, concreting shall conform to "Recommended Practice for Cold Weather Conditions: (ACE 306 R-78). Concrete placed in hot weather shall meet the standards of "Recommended Practice for Hot Weather Concreting (ACI 305R-77). Concrete is not to be placed under water. A suitable means shall be provided for lowering the water level below surfaces upon which concrete is to be placed. This may require excavating approximately 12 inches below the bottom of the concrete surface and refilling with gravel and compacting. The groundwater shall not be allowed to rise to the bottom of the concrete until 24 hours after the concrete has been completed. Water shall not be allowed to fall upon or run across the concrete during this period.
- G. Protection and Curing. Concrete protection and curing shall be in conformance with ACI 308-71. Immediately after placing or finishing, concrete surfaces not covered by forms shall be protected from loss of surface moisture. All concrete shall be kept in a moist condition for at least five (5) days after placement. Curing compounds may be used upon approval of the Engineer.

3.05 SLABS ON GRADE

All slabs on grade shall be poured directly on the vapor barrier and prepared gravel subgrade where shown on the Construction Drawings. Construction joints shall be placed such that no section of slab is greater than 25 feet on a side. Finishes, Expansion & Control Joints & Protection shall be as specified under other sections of this section.

Minimum six-inch (6") Class 6 aggregate base course shall be installed under the entire slab unless otherwise directed by the Engineer. The grading requirements as per Section 02222 for the aggregate course shall apply.

3.06 CONCRETE FINISHES

- A. Patching. Patching shall be done on all concrete surfaces immediately after stripping forms; all exposed surfaces shall have fins and other projections carefully removed, offsets leveled, and voids saturated with water and patched to a true and even surface with a wood float. Patch all holes left by the removal of the form ties or bolts. Patching material shall be a stiff mixture of sand and cement, the color of which matches the concrete being patched. Any major area of faulty or honeycombed concrete shall be completely removed and patched at the direction of the Engineer.
- B. Floor slabs. All concrete slabs shall be screened to levels or grades indicated and float finished monolithically completely free from humps or pits. Slabs shall not show surface deviation in excess of one-quarter inch (1/4") when tested with a 10 ft. straight-edge. Before the finish has set, the surface cement film shall be removed with a fine brush in order to have a fine-grained, smooth but sanded texture.
- C. Rubbed finish. All exposed concrete surfaces shall have a rubbed finish. After removal of forms, rubbing of all exterior surfaces shall be started as soon as its condition will permit. Immediately before starting this Work, the concrete shall be kept thoroughly saturated with water. Sufficient time shall have elapsed before the wetting down to allow the mortar used in the pointing to thoroughly set. Surfaces to be finished shall be rubbed with a medium course carborundum stone, using a small amount of mortar on its face. The mortar shall be composed of cement and fine sand mixed in the same proportions as the concrete being finished. Rubbing shall be continued until all form marks, projections and irregularities have been removed, all voids filled and a uniform surface has been obtained. The paste produced by this rubbing shall be left in place.

After all concrete above the surface being treated has been cast, the final finish shall be obtained by rubbing with a fine, carborundum stone and water. This rubbing shall be continued until the entire surface is of a smooth texture and uniform color.

After the final rubbing is completed and the surface has dried, it shall be rubbed with burlap to remove loose powder and objectionable marks.

- D. Chamfer. All exterior corners shall receive 3/4" chamfer.

3.07 REINFORCING.

- A. Placing Reinforcement. Reinforcing steel, at the time concrete is placed, shall be free from scale, rust or other coatings that will destroy or reduce bond. Reinforcement shall be accurately placed as shown on the Construction Drawings and shall be adequately secured in position by concrete or metal chairs and spacers.

Reinforcing shall be furnished in the full lengths indicated on the Construction Drawings unless otherwise authorized by the Engineer. Splicing of bars, except where shown on the Construction Drawings or specified, shall not be permitted without written approval by the Engineer. Reinforcement placed in any member shall be inspected before any concrete is

placed and the Engineer shall be notified 24 hours in advance before any concrete placement.

The placing, fastening, splicing and supporting of reinforcing steel and welded wire fabric shall be in accordance with the Construction Drawings and the latest edition of the CRSI "Recommended Practice for Placing Reinforcing Bars" and in accordance with ACI 318-77. Bars shall be placed around all corners to splice steel in adjacent walls, footers and slabs (such detailing may not be shown on Construction Drawings).

- B. Concrete Protection & Reinforcement. Where not otherwise indicated on the Construction Drawings, the minimum thickness of concrete over the reinforcement shall be as follows:
1. Concrete deposited against earth: 3"
 2. Slabs and walls not exposed to weather or earth: 1"
 3. All other concrete placed in forms:
 - For bars larger than #5: 2"
 - For bars #5 or smaller: 1-1/2"
- C. Bearing Plates, anchor bolts, etc.
Place all bearing plates, anchor bolts, reinforcing rods and other structural items furnished by other trades. Contractor to provide 7-day notice to all such trades prior to affected pour. Installation to be within tolerances required by other trades.

PART 4 FIELD QUALITY CONTROL

4.01 CONCRETE TESTS

6" x 12" cylinders shall be taken at the point of placing in the forms, shall be job cured and tested in accordance with ASTM Standards by the Engineer. For each strength of concrete used, one set of four (4) cylinders for each day's pour, but not less than one (1) set of cylinders for each 100 cubic yards poured shall be taken. Two (2) cylinders at seven (7) days and two (2) cylinders at twenty-eight (28) days shall be tested. In addition, when in the opinion of the Engineer there is a possibility of the surrounding air temperature falling below 40° F, additional specimens to be cured under job conditions may be required.

4.02 ENFORCEMENT OF STRENGTH REQUIREMENTS

Should the strengths shown by the test specimens fall below the specified values, the Engineer shall have the right to require changes in proportions to apply on the remainder of the Work.

If concrete fails to meet the strength requirements of this specification, the Engineer may order the Contractor to have a testing laboratory, acceptable to the Engineer, take and test core samples of questionable concrete. The Engineer may order all low-strength concrete removed and replaced if core strengths are below specified strengths. All costs connected with concrete coring and removal and replacement of low-strength concrete shall be borne by the Contractor.

Contractor shall repair all core holes at his expense.

4.03 SLUMP TESTS

Engineer to conduct slump tests on each day's pour and on individual trucks whenever concrete consistency varies. Test failure shall be grounds for rejection of individual or batch loads.

4.04 AIR CONTENT

Engineer to conduct air tests on each day's pour and on individual trucks as determined by the Engineer. Test failure shall be grounds for rejection of entire batch until satisfactory tests are obtained.

END OF SECTION

SECTION 04200**MASONRY****PART 1 GENERAL****1.01 Scope**

Work to be completed under this section shall include all labor, equipment, plant, and materials necessary to furnish and install all masonry units, together with all miscellaneous and appurtenant items required for installation and/or furnished by other trades, as shown on the Plans and as specified herein.

1.02 Related Work Specified Elsewhere.

Section 03300 - Cast-In-Place Concrete

1.03 Reference Standards.

ASTM C476 - Standard Specification for Mortar and Grout for Reinforced Masonry

ASTM C404 - Standard Specification for Aggregates for Masonry Grout

ASTM C144 - Standard Specification for Aggregates for Masonry Mortar

ASTM C55 - Standard Specification for Concrete Building Brick

International Masonry Industry, All-weather Board of Trustees, "Recommended Practices and Guide Specification for Cold Weather Masonry Construction".

1.04 Submittals

Descriptive literature and catalogue cuts on masonry units, reinforcing steel and insulation.

1.05 Protection of Work

Contractor responsible for protection of all work prior to acceptance. Exposed insulation or cells shall be covered to prevent moisture or dirt intrusion.

1.06 Storage of Materials

Materials shall be stored in a dry place and in a manner to prevent damage or intrusion of foreign matter. During freezing weather, all masonry units shall be protected with tarpaulin or other suitable material. Concrete masonry units shall be stored under covers that will permit circulation of air and prevent excessive moisture absorption. Cement, lime and air-settling mortars shall be stored in watertight sheds with elevated floors. Reinforcement shall be protected from the elements; immediately before placing, reinforcement shall be free from loose rust, ice or other foreign coatings that will destroy or reduce the bond. Concrete masonry units shall be protected against wetting prior to use. Deliver packaged material in original manufacturer's containers. Materials showing evidence of water or other damage are subject to rejection.

PART 2 MATERIALS**2.01 Concrete Masonry Units (CMU's)**

Units shall conform to ASTM C90 specifications. All units shall be Type I. Units below grade or exposed to weather shall be Grade N. Other units may be Grade S. Crushing strength, f'm

= 1350 psi.

Units shall be in modular sizes with standard 8" width or 4" width as required. Corner units shall have square external corners. Jamb units at windows, bond beam units and other special units shall match the approved samples for the type of construction and locations designated. Units shall not contain iron spots or other substances that will strain plaster or paint.

2.02 Joint Reinforcement

Steel reinforcement for use in horizontal bed joints of concrete masonry units and other locations as hereinafter specified shall be prefabricated truss design type formed of zinc-coated cold drawn steel wire conforming to ASTM A82 and A116 of Class 3 coating. Side wire shall be formed of 9-gauge rod; cross rods shall be of 9 gauge, smooth or deformed wire, butt welded to side wires in the same plan at contact points. Special formed pieces shall be provided at corners and wall intersections. Reinforcing shall be of proper widths for the wall thicknesses shown. Reinforcing shall be Standard Type Fur-O-Wall, Rewal or approved equal. Unless otherwise noted on the plans, reinforcement in masonry walls shall be installed in the first and second bed joints above lintels, below sill at openings and below bond beams around the entire top of the perimeter walls of the building. Elsewhere, reinforcing shall be installed in bed joints at 16" vertical intervals. Side rods shall be lapped horizontally a minimum of 6". Joint reinforcement embedded in horizontal mortar joints shall have not less than 5/8" mortar coverage from the exposed face.

2.03 Reinforcing Steel

See Section 03300, Part 2.07.

2.04 Mortar and Grout

Shall conform to the property requirements of ASTM C476. Proportion mix to meet strength and other requirements.

2.05 Portland Cement

See Section 03300, Part 2.01.

2.06 Loose Fill Insulation.

Zonolite, Permalite or approved equal water-repellent masonry fill insulation.

2.07 Masonry Cement. Cement shall conform to ASTM Specification C91. Cement shall be gray.

2.08 Lime

Hydrated lime shall be Type S conforming to ASTM Specification C207. Quicklime shall conform to ASTM Specification C5; it shall be slaked in accordance with the manufacturer's directions.

2.09 Lime Putty

Putty shall be a stiff mixture of lime and water. Keep putty moist until used. Putty made from quicklime shall be slaked and allowed to soak at least 24 hours before using. Putty made from Type S hydrated lime may be used immediately after mixing.

2.10 Sand

Sand shall conform to ASTM Specification C144 except that sand for mortar in 1/4 inch wide joints shall pass a No. 16 sieve.

2.11 Mixing Water
Water shall be clean and potable.

2.12 Coarse Aggregate for Masonry Grout
Aggregate shall conform to ASTM Specification C404.

PART 3 METHODS AND PROCEDURES

3.01 Mixing Mortar
Mix all cementitious materials and sand in a mechanical batch mixer for a minimum of 5 minutes. Adjust the consistency of the mortar to the satisfaction of the mason, but add only as much water as is compatible with convenience in using the mortar. If the mortar begins to stiffen from evaporation or from absorption of a part of the mixing water, re-temper the mortar immediately by adding water and remix the mortar. All mortar shall be used within 2 1/2 hours of the initial mixing. It shall not be used after it has begun to set.

3.02 Other Trades
Other trades shall be consulted and provisions made such that the installation of their work is permitted in a manner to avoid butting and patching. Install, by way of example, anchor bolts, bearing plates, pipe and conduit openings and sleeves, HVAC openings and other knockouts required by other trades. Provide minimum 7-day notice to Owner, Engineer and other trades prior to requiring materials or detailing information. Build in work specified under other sections, as necessary and as the work progresses in accordance with requirements or other trades. Masonry contractor not responsible for installation of materials running within walls such as concealed conduit and piping.

3.03 Laying Masonry Units
All units shall be set plumb and true to line. All units shall be laid with level horizontal joints. Units shall be laid in "running bond" unless otherwise shown.

All interior masonry partitions unless otherwise shown shall terminate 1/2 inch from structural ceilings and a 1/2-inch thick by 8-inch wide expansion joint material installed thereon.

Where electric conduit, outlet and switch boxes occur, units shall be ground and cut before building in service. Work shall be coordinated with electrical subcontractor. Cutting of all units exposed in finished work shall be done with an approved type of power saw. Work must also be coordinated with plumbing subcontractor where plumbing occurs in masonry partitions.

Masonry units shall be reinforced horizontally with continuous joint reinforcement placed not to exceed 16" on center vertically in exterior walls and in non-load bearing partitions.

Bond each course at corners in a masonry bond and at intersections with metal ties, anchors or joint reinforcement spaced as above.

Partitions of all units that abut exterior walls, columns and other partitions shall be bonded in or be anchored thereto once every 16 inches in height. Where anchors are used they shall be 1/8 x 1 1/2-inch zinc coated steel anchors with ends turned up 2 inches and extending 4 inches into wall and not less than 8 inches onto partitions; or anchors may be of type to fit the slats in concrete.

Interior joints of all masonry construction shall be "flush". Exterior joints of all masonry

construction shall be "concave".

3.04 Special Requirements

Masonry shall not be laid when the temperature of the outside air is below 40°F., unless suitable means as approved by the Engineer are provided to heat materials, protect work from cold and frost and ensure that mortar will harden without freezing. (No anti-freeze ingredient shall be used in the mortar).

The facing material shall be protected against staining and tops of walls kept covered with non-staining waterproof coverings when work is not in progress. When work is resumed, top surface of work shall be cleaned of all loose mortar and in drying weather thoroughly wet except for concrete masonry units.

Where fresh masonry joins masonry that is partially set or totally set, clean the exposed surface of the set masonry and wet it lightly so as to obtain the best possible bond with the new work. Remove all loose brick and mortar. If it is necessary to "stop off" a horizontal run of masonry, this shall be permitted only with the Engineer's approval. (Toothing will not be permitted).

All reinforced hollow unit masonry shall be built to preserve the unobstructed vertical continuity of the cells to be filled. Walls and webs forming such cells to be filled shall be full bedded in mortar to prevent leakage of grout. All head (or end) joints shall be solidly filled with mortar for a distance of the longitudinal face shells. Bond shall be provided by lapping units in successive vertical courses or by equivalent mechanical anchorage.

Vertical cells to be filled shall have vertical alignment sufficient to maintain a clear, unobstructed continuous vertical cell measuring not less than 2 inches by 3 inches.

All cells containing reinforcement shall be filled solidly with grout. Grout shall be poured in lifts of 8 feet maximum height. All grout shall be consolidated at time of pouring by puddling or vibrating and then reconsolidated by again vibrating.

When total grout pour exceeds 8 feet in height, the grout shall be placed in 4 foot lifts and special inspection during grout shall be required. Minimum cell dimension shall be 3 inches.

When the grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour of grout 1 inches below the top of the uppermost unit.

Steel in lintels shall be set in beds of mortar. Spaces around jambs and heads of metal door bucks and frames shall be filled solidly with mortar.

Bond beams or concrete caps along the top of the walls shall be provided with the necessary and required bearing plates, anchor bolts, expansion joint filler, etc. and welds and connections of the pre-cast concrete components to the walls shall be made by the contractor under this section.

3.05 Insulation

Loose fill insulation shall be poured directly from the bag. Block joints at columns or other vertical members shall be mortared in to prevent leakage. All block throughout the entire job is to be filled except interior partitions.

PART 4 FIELD QUALITY CONTROL

4.01 General

All mortar smears and mortar chucks shall be cleaned from all exposed surfaces or surfaces to receive paint. Point all joints as directed by Engineer removing joint material sufficient to allow uniform joint after repair. Receive approval of finished wall.

END OF SECTION

DIVISION 6

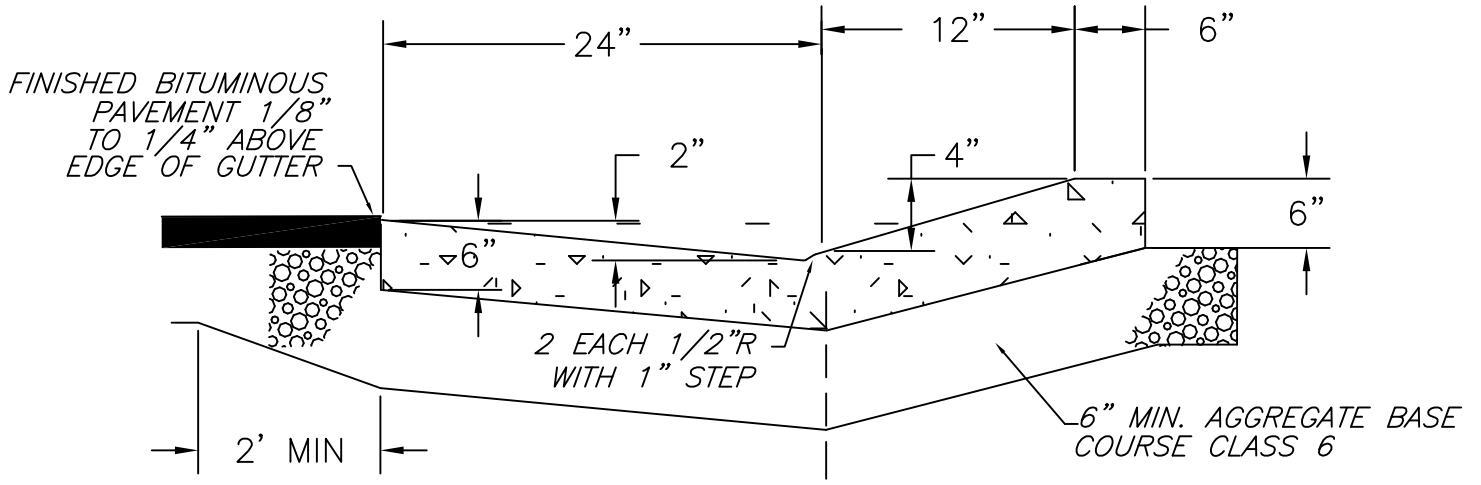


Division 6 Standard Details

INDEX

STANDARD DETAILS

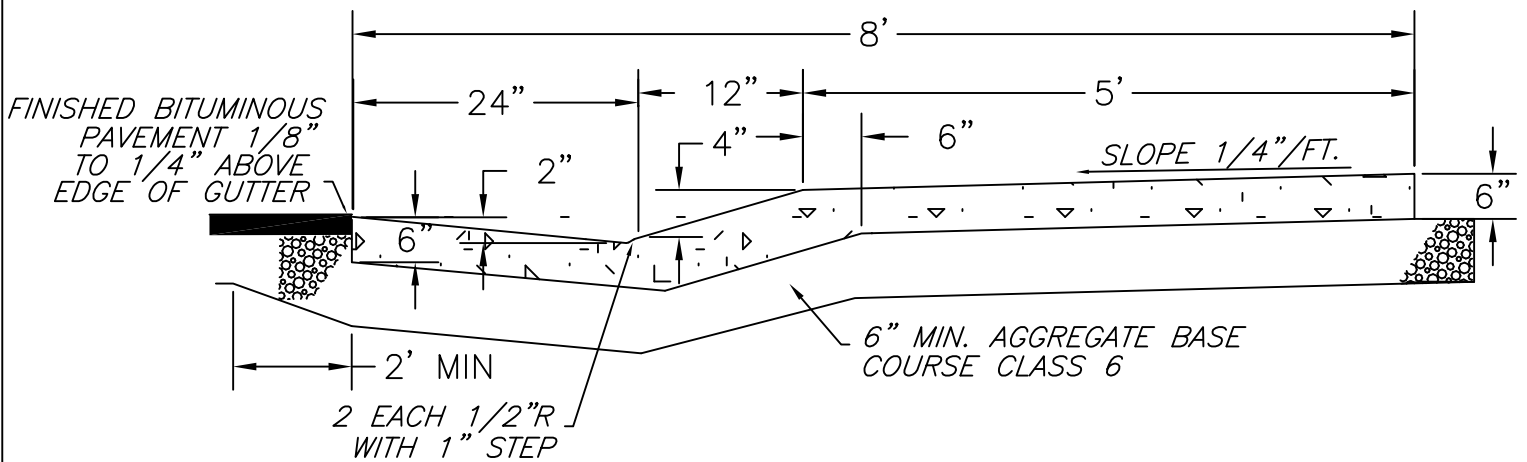
Street Details.....	DR1-DR11
Water Details	W1-W12
Road Details.....	R1-R4



DRIVE OVER CURB & GUTTER

N.T.S.

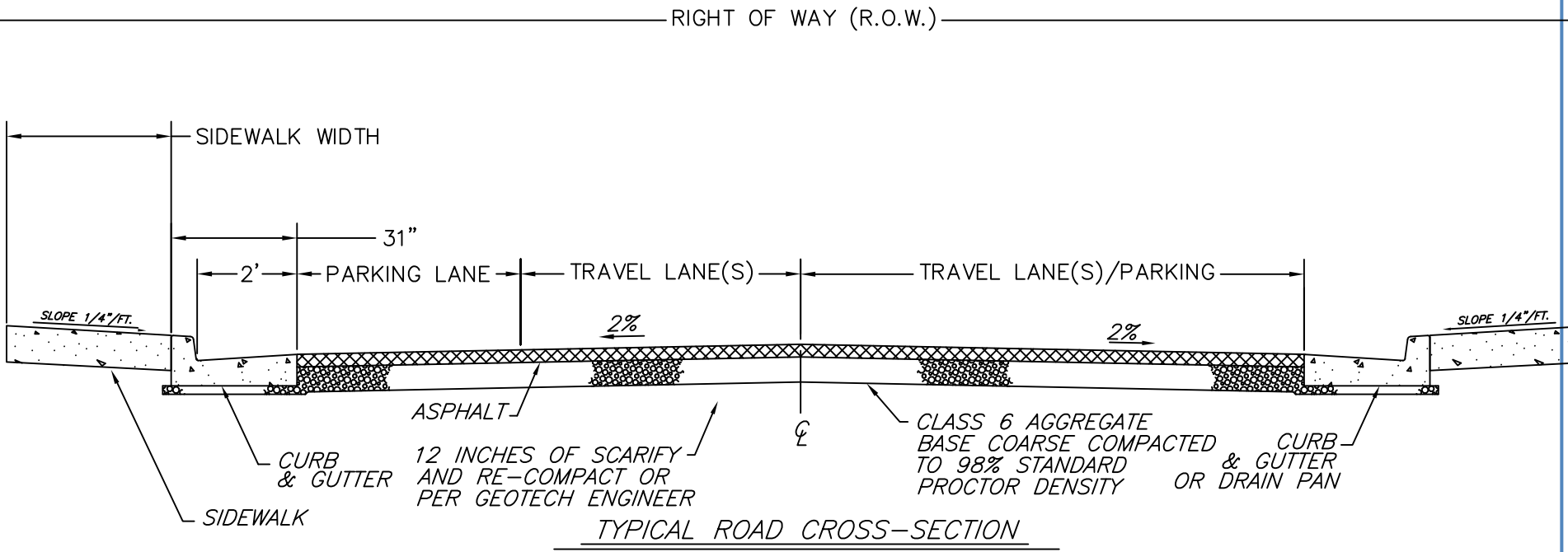
NOTE:
PROVIDE FIBERMESH REINFORCEMENT IN
CONCRETE MIX AT 1 1/2 # PER CU.YD.



DRIVE OVER CURB & GUTTER WITH ATTACHED SIDEWALK

N.T.S.

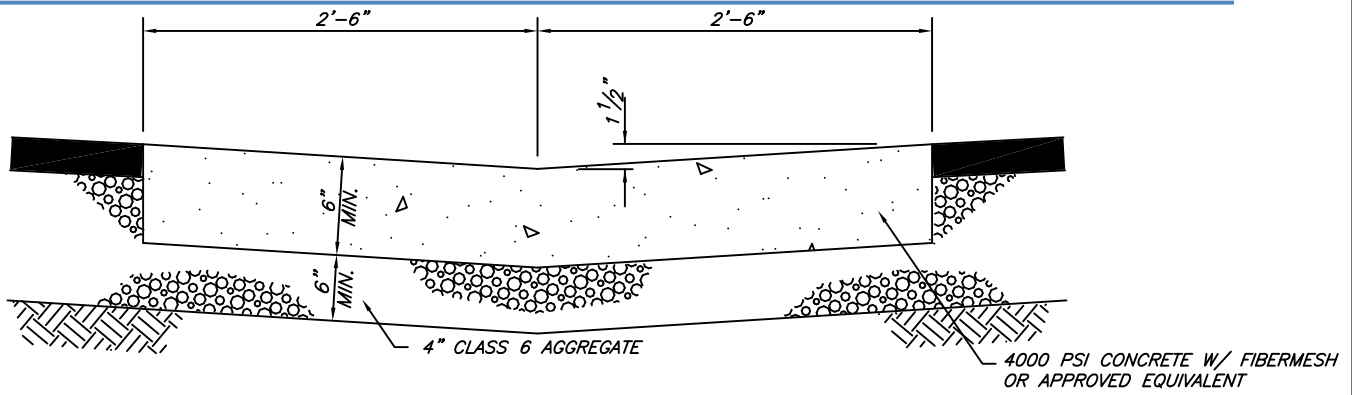
<i>DRIVE OVER CURB AND GUTTER DETAILS</i>	
<i>TOWN OF FAIRPLAY</i>	
<i>NOT TO SCALE</i>	<i>DWG. 199 DR-1</i>



ZONE DISTRICT	ROW WIDTH	PAVED SURFACE	CURB & GUTTER/ DRAIN PAN	SIDEWALK WIDTH	ASPHALT/ROADBASE THICKNESS (INCHES)
RESIDENTIAL	50 FEET	16 FEET	2 FEET 7 INCHES	4 FEET	4" ASPH / 6" BASE
ALL OTHER	60 FEET	21 FEET	2 FEET 7 INCHES	4 FEET	5" ASPH / 6" BASE

- NOTES:
- #1 ASPHALT AND BASE DEPTHS IDENTIFIED ARE MINIMUMS. PROVIDE DEPTHS AS DETERMINED BY SOILS REPORT AND ENGINEER'S DESIGN BASED UPON PROJECTED TRAFFIC CONDITIONS, LOADING AND SOIL STRENGTHS.
 - #2 LOCAL STREET OR CUL-DE-SAC WITHOUT ON-STREET PARKING MUST BE APPROVED BY THE TOWN BY VARIANCE REQUEST.

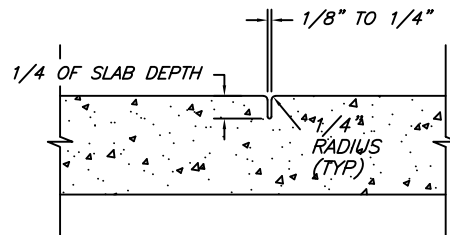
NOT TO SCALE
 TOWN OF FAIRPLAY
 TYPICAL ROADWAY SECTIONS
 DWG: DR-3



- 1) CONCRETE THICKNESS SHALL BE 6" UNDER STANDARD CIRCUMSTANCES.
- 1) CONCRETE THICKNESS SHALL BE 8" IN ALLEYS AND COMMERCIAL DRIVEWAYS.

VALLEY PAN DETAIL SECTION

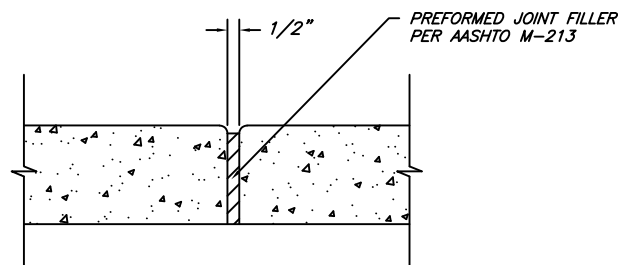
N.T.S.



NOTE: LOCATION OF CONTRACTION JOINTS TO BE AS DETAILED OR AS DETERMINED IN FIELD WITH AND APPROVED BY TOWN.

STANDARD CONTRACTION JOINT

N.T.S.



NOTE: EXPANSION JOINTS TO BE LOCATED ADJACENT TO ANY EXISTING CONCRETE OR FIXED STRUCTURE.

STANDARD EXPANSION JOINT

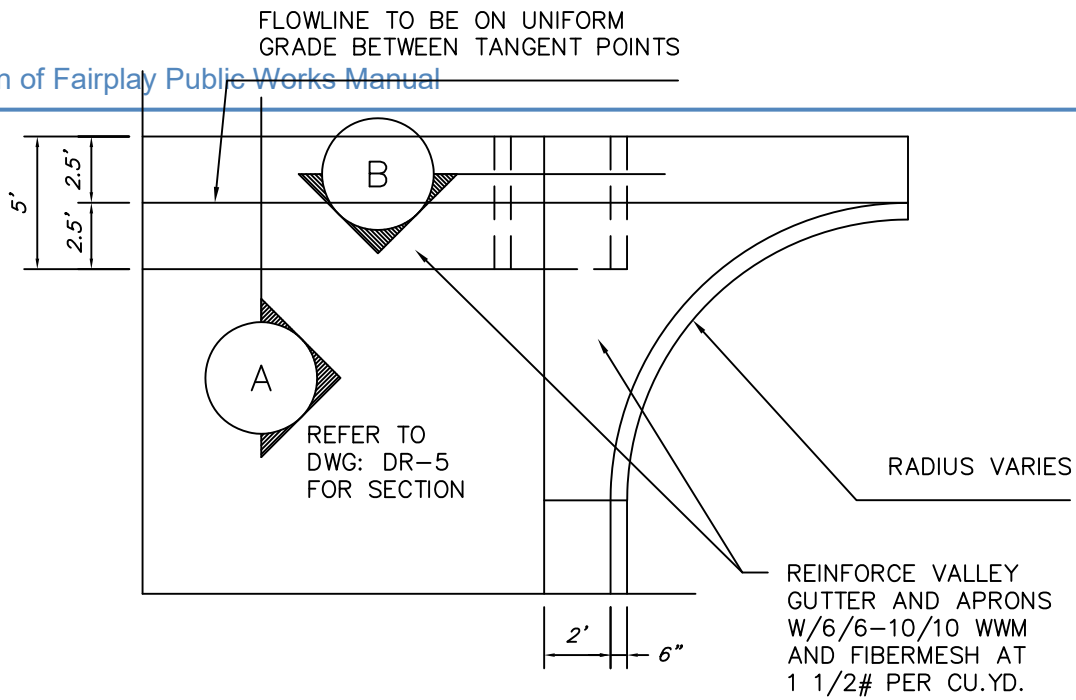
N.T.S.

VALLEY PAN DETAIL AND
EXPANSION AND CONTRACTION
JOINT DETAILS

TOWN OF FAIRPLAY
202

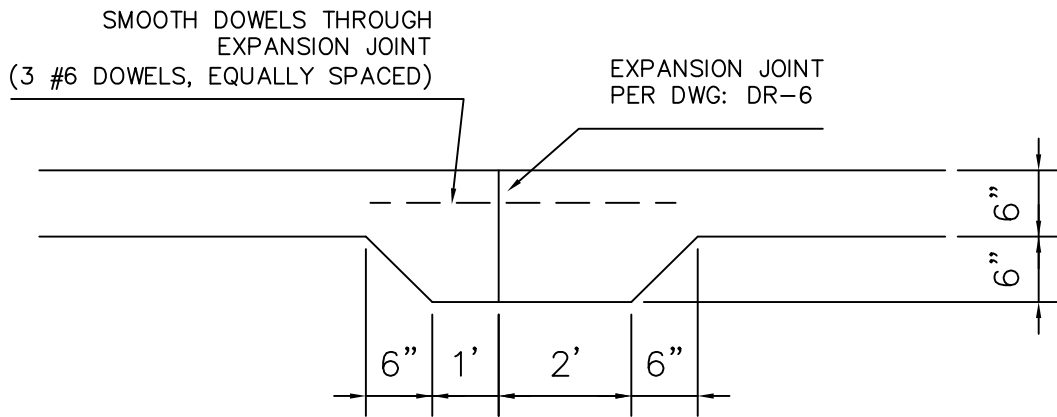
NOT TO SCALE

DWG: DR-4



PLAN VIEW

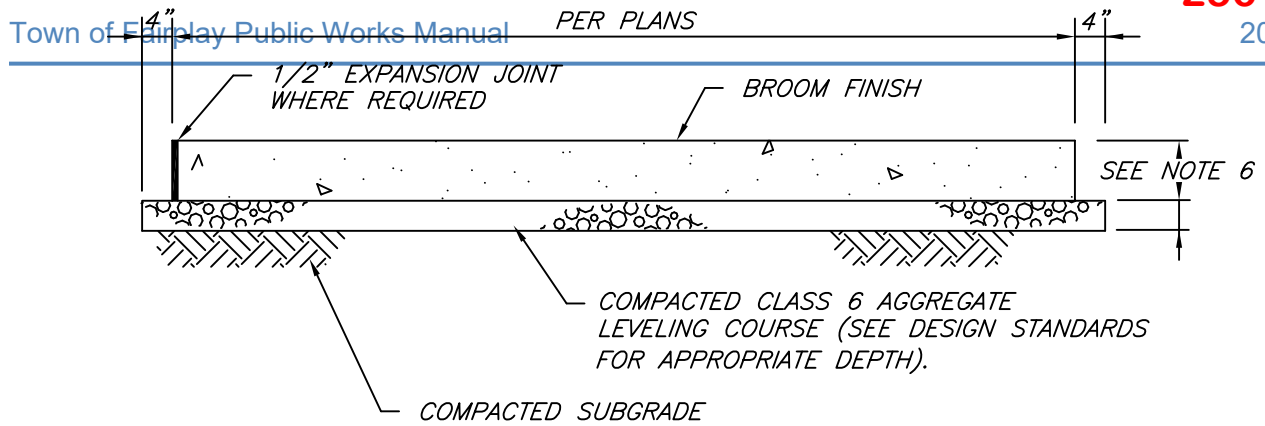
N.T.S.



SECTION

B

VALLEY PAN AT INTERSECTION	
TOWN OF FAIRPLAY	
NOT TO SCALE	DWG: DR-5

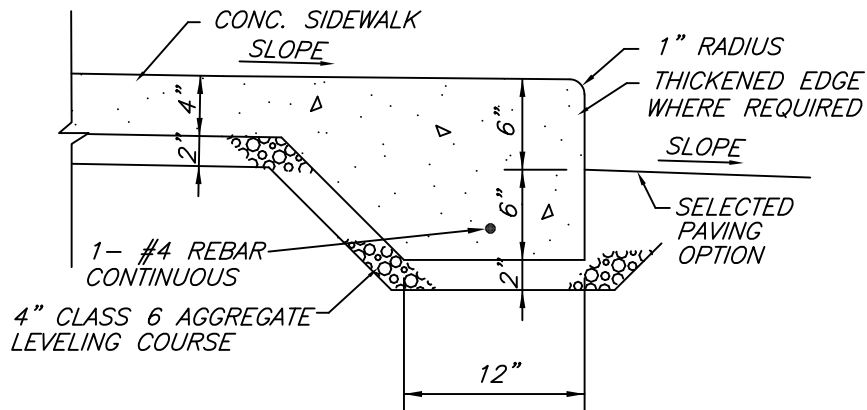


NOTES:

- 1) EXPANSION JOINTS: NO MORE THAN 100' ON CENTER AND AT DRIVEWAYS.
- 2) DUMMY JOINTS: 1" DEEP BY 1/8" - 1/4" WIDTH AT INTERVALS EQUAL TO
- 3) USE 1/4" RADIUS ON ALL EDGES.
- 4) USE 6" DEPTH OF CONCRETE.
- 5) CURE FOR 72 HOURS USING CURING COMPOUND, PLASTIC COVERING OR MOISTURE.
- 6) USE 3750 PSI CONCRETE WITH FIBERMESH ADDITIVE AT 1-1/2 LBS./C.Y. MAXIMUM SLUMP 4".
- 7) CONCRETE AND BASE THICKNESS PER TOWN OF FAIRPLAY TECHNICAL SPECIFICATIONS.

CONCRETE SIDEWALK

SCALE: 1" = 1'-0"



TYP. DETACHED SIDEWALK W/ THICKENED EDGE

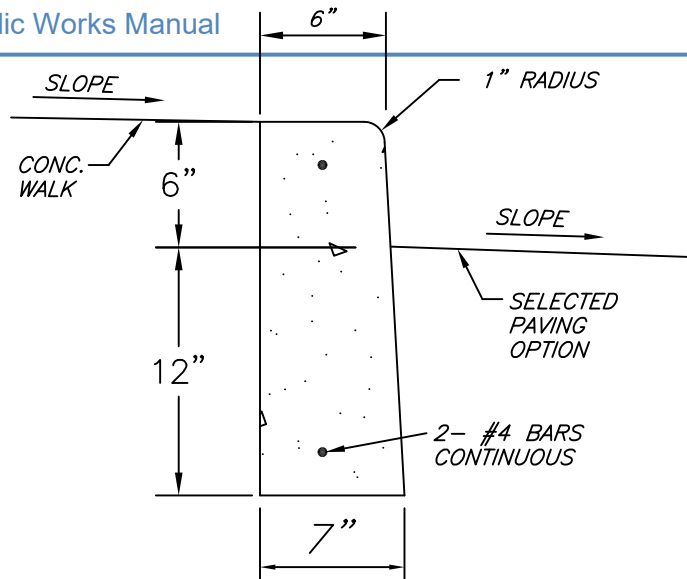
SCALE: 1" = 1'-0"

TYPICAL SIDEWALK AND
SIDEWALK W/THICKENED EDGE

TOWN OF FAIRPLAY
204

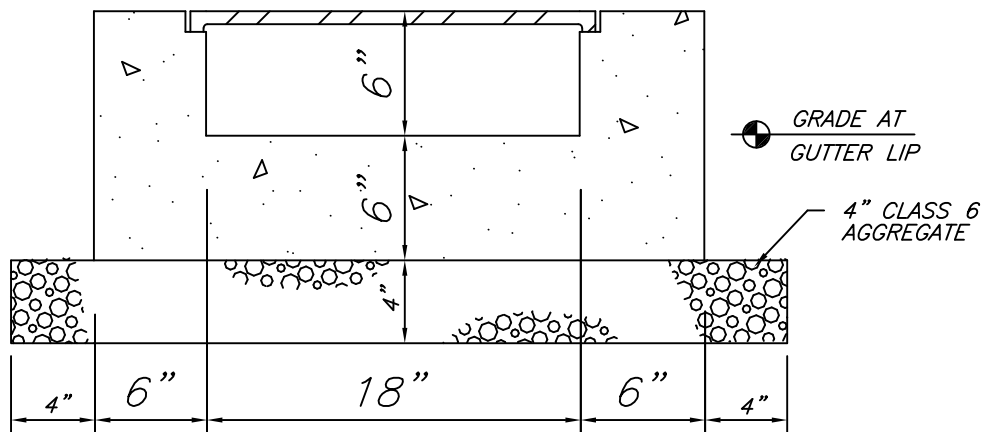
NOT TO SCALE

DWG: DR-6



CURB DETAIL

SCALE: 1 1/2" = 1'-0"



CONCRETE TRENCH DETAIL

SCALE: 1 1/2" = 1'-0"

NOTE: TRENCH WIDTH AND TRENCH FRAME AND COVER TO BE DETERMINED BASED UPON A DRAINAGE STUDY

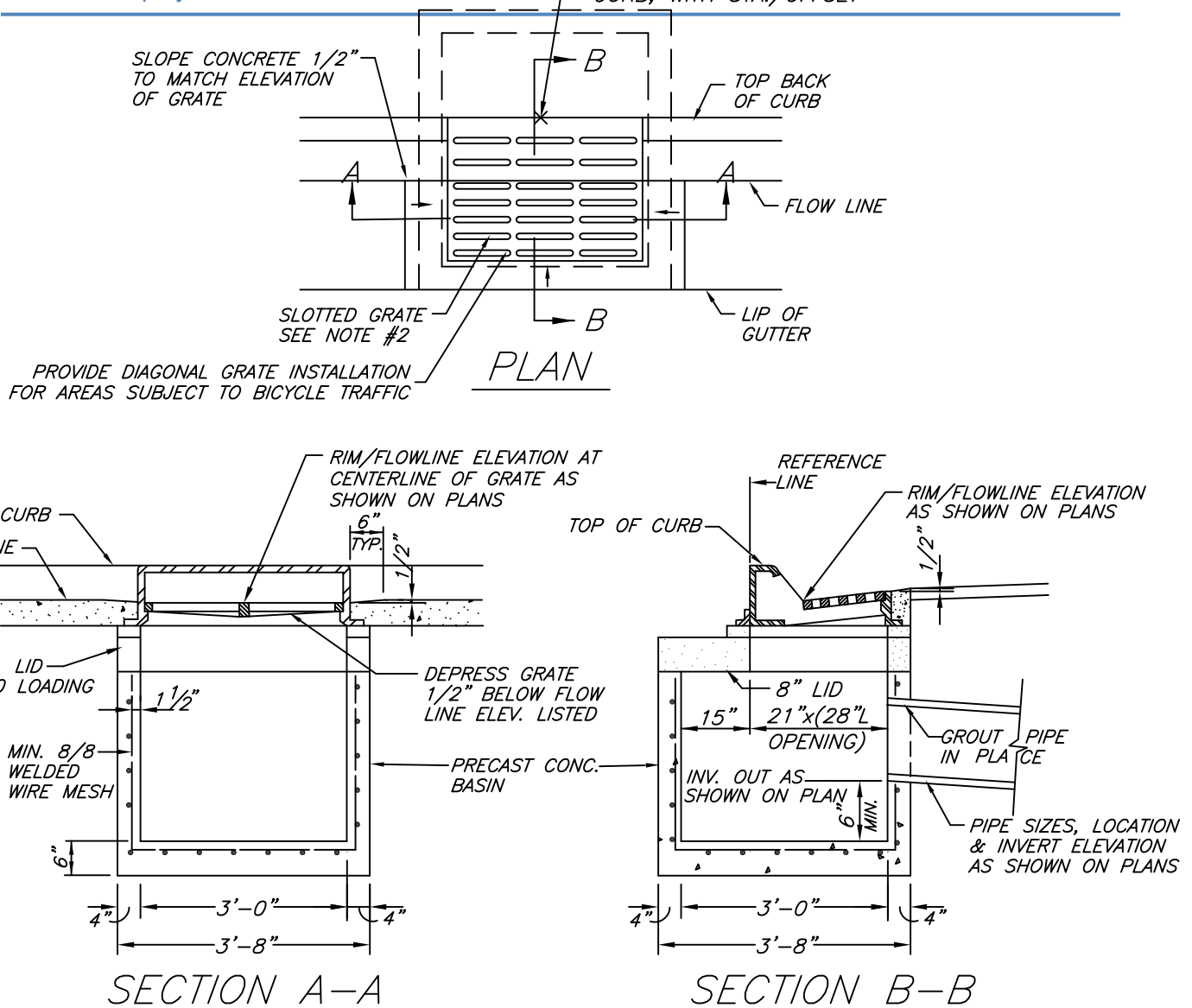
CURB AND TRENCH
DRAIN DETAILS

TOWN OF FAIRPLAY

205

NOT TO SCALE

DWG: DR-7



TYPE I DRAIN INLET DETAIL

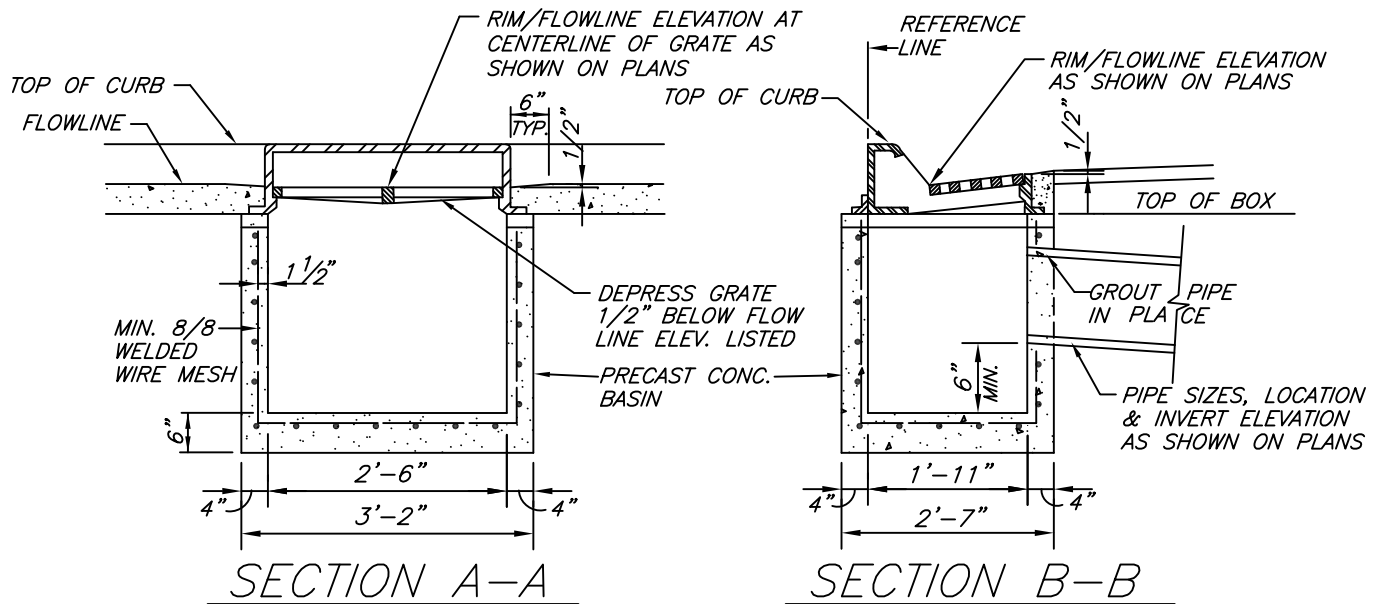
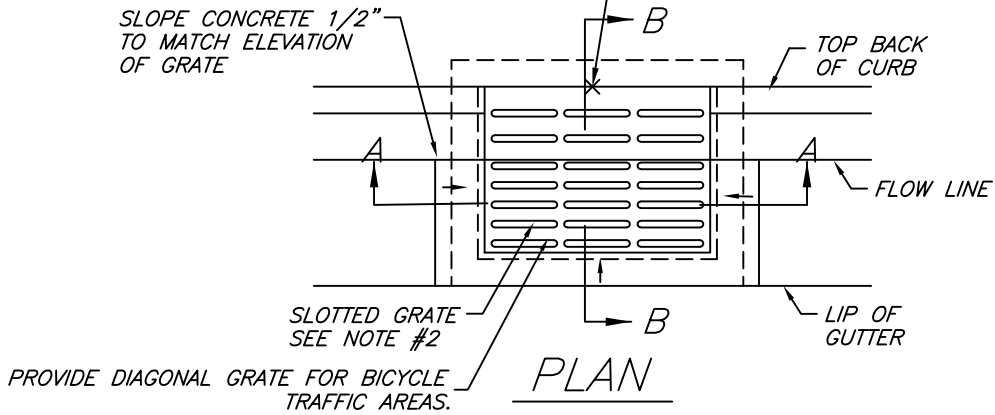
NOTES:

NOT TO SCALE

- 1) FRAME, GRATE & CURB INLET TO BE NEENAH R-3501-P OR APPROVED EQUAL. SEE BELOW.
- 2) DOUBLE INLET FRAME, GRATE & CURB INLET TO BE NEENAH R-3504-F OR APPROVED EQUAL. (ABUTTING SIDE FLANGES TO BE OMITTED TO FORM DOUBLE). THE CONCRETE BASIN FOR THE DOUBLE INLET SHALL BE THE SAME AS SHOWN, EXCEPT THAT THE OVERALL WIDTH OF SECTION A-A SHALL BE 6'-10" RATHER THAN 3'-8".
- 3) FRAME & GRATE SHALL BE ASPHALT PAINT-DIPPED BY MANUFACTURER.
- 4) PRECAST CONCRETE ADJUSTMENT RINGS (IF REQUIRED) SHALL BE GROUTED IN PLACE.
- 5) SET GRATE W/ CONC. LEVELING COURSE TO MATCH LONGITUDINAL SLOPE OF THE ROAD.
- 6) CAST IN PLACE INLET BOXES ARE AN ACCEPTABLE ALTERNATIVE TO PRE-CAST GIVEN WRITTEN APPROVAL FROM TOWN.
- 7) GRATE AND FRAME SPECIFIED ARE FOR MOUNTABLE CURB AND GUTTER INSTALLATIONS. PROVIDE NEENAH R-3227-D CURB INLET FRAME, DIAGONAL GRATE AND CURB BOX FOR VERTICAL CURB INSTALLATIONS.

DRAIN INLET TYPE 1	
TOWN OF FAIRPLAY 206	
NOT TO SCALE	DWG: DR-8

REFERENCE POINT ON PLAN VIEWS, CENTERLINE AT BACK CURB, WITH STA./OFFSET



TYPE II DRAIN INLET

N.T.S.

NOTES:

- 1) FRAME, GRATE & CURB INLET TO BE NEENAH R-3501-P OR APPROVED EQUAL.
- 2) DOUBLE INLET FRAME, GRATE & CURB INLET TO BE NEENAH R3504-F OR APPROVED EQUAL. (ABUTTING SIDE FLANGES TO BE OMITTED TO FORM DOUBLE). THE CONCRETE BASIN FOR THE DOUBLE INLET SHALL BE THE SAME AS SHOWN, EXCEPT THAT THE OVERALL WIDTH OF SECTION A-A SHALL BE 6'-10" RATHER THAN 3'-8".
- 3) FRAME & GRATE SHALL BE ASPHALT PAINT-DIPPED BY MANUFACTURER.
- 4) PRECAST CONCRETE ADJUSTMENT RINGS (IF REQUIRED) SHALL BE GROUTED IN PLACE.
- 5) SET GRATE W/ CONC. LEVELING COURSE TO MATCH LONGITUDINAL SLOPE OF THE ROAD.
- 6) INLET FRAME AND GRATE SHOWN ARE FOR MOUNTABLE CURB INSTALLATIONS. PROVIDE NEENAH R-3228-BD CURB INLET FRAME, DIAGONAL GRATE AND CURB BOX FOR VERTICAL CURB INSTALLATIONS.

DRAIN INLET TYPE 2	
TOWN OF FAIRPLAY 207	
NOT TO SCALE	DWG: DR-9

C.V. RING & COVER
NEENAH R-1706,
DEETER 1258, OR
EQUAL.

CONCRETE COLLAR TO BE INSTALLED BY CUTTING OUT ASPHALT, ADJUSTING MANHOLE DEPTH AND POURING CONCRETE AFTER PAVEMENT PLACEMENT. FINAL DEPTH OF RING AND COVER TO BE A MAXIMUM OF 1/4" BELOW SURFACE AND 0" ABOVE SURFACE.

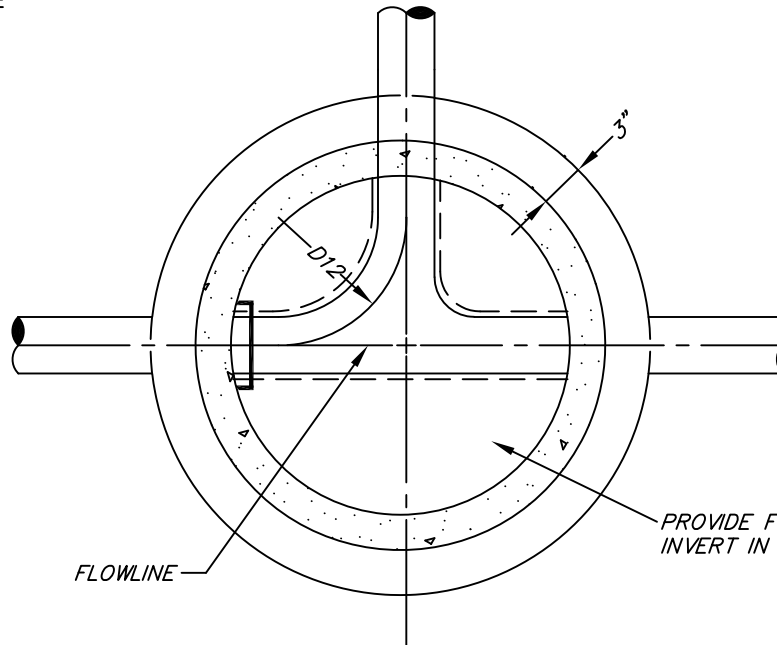
NOTE: FOR DEPTHS EXCEEDING 5'; PROVIDE ENGINEERED DESIGN FOR TOWN APPROVAL OF BARREL SECTION.

PRECAST MANHOLE BARREL PIPE LENGTH AS REQUIRED

PRE-CAST TOP

NOT TO EXCEED 5'

CONCRETE BASE CAST IN PLACE



REINFORCED CONCRETE GRADE RINGS FOR FINE GRADING AS REQUIRED (6" WALL)

CEMENT MORTAR JOINT

STEPS SPACED @ 15" C-C FOR MANHOLE DEPTH GREATER THAN 3'

PRECAST CONCRETE MANHOLE SECTIONS CONFORMING TO SPEC. ASTM C-478.

GROUT BETWEEN PIPE AND WALL

INVERT ELEV. ON PLANS

PROVIDE FORMED INVERT IN MANHOLE

FLOWLINE

NOTES:

1. Precast rings or metal riser ring course shall be utilized where required with 2 courses minimum and 6 courses maximum (1" minimum, 6" maximum height).
2. Where available from pipe manufacturer, use expandable water stop or special sleeve as per manufacturer's specifications.
3. All bases shall be cast in place or precast concrete; use #4 rebar on 12" c-c both ways in poured bases.
4. Set each ring in a full bed of mortar and grout all inside joints.

STORM DRAIN MANHOLE DETAIL

N.T.S.

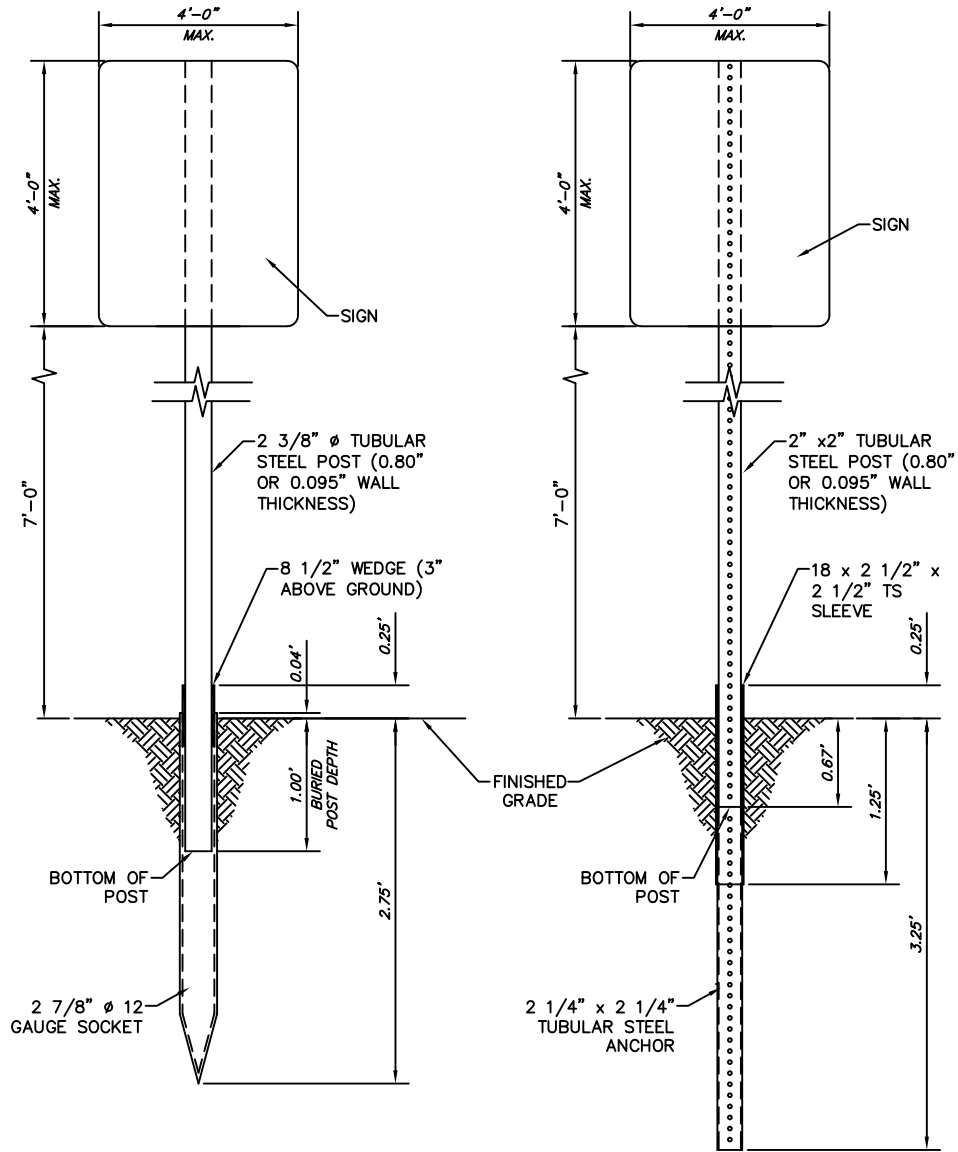
STORM DRAIN
MANHOLE

TOWN OF FAIRPLAY

208

NOT TO SCALE

DWG: DR-10

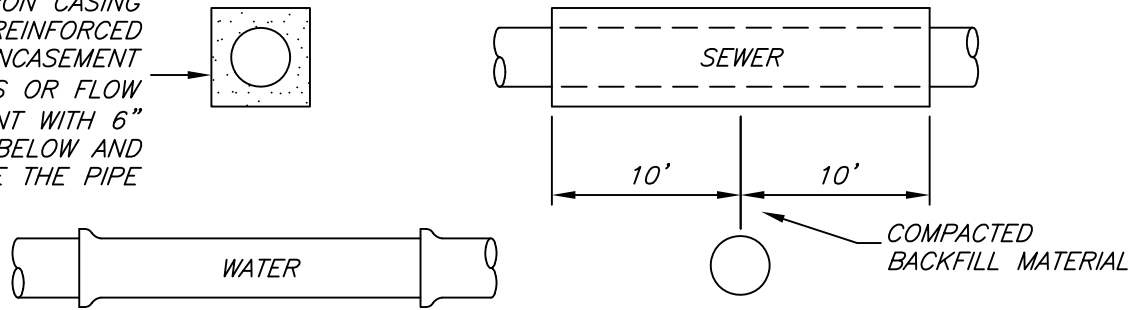


ROUND SIGN POST IN SOCKET DETAIL
NOT TO SCALE

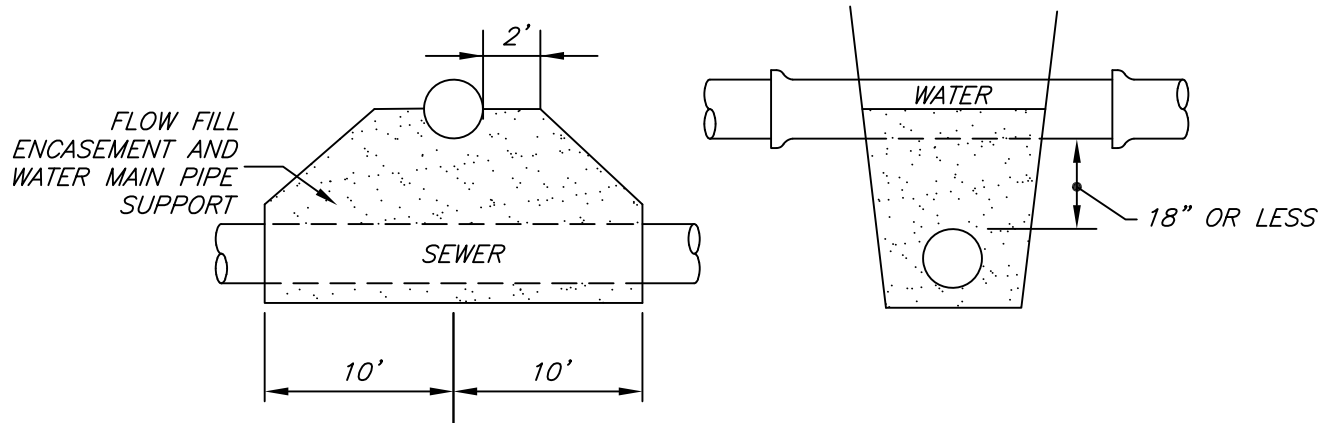
SQUARE SIGN POST IN SLEEVE DETAIL
NOT TO SCALE

SIGN POST DETAIL	
TOWN OF FAIRPLAY 209	
NOT TO SCALE	DWG: DR-11

SINGLE SECTION OF STEEL OR DUCTILE IRON CASING PIPE OR REINFORCED CONCRETE ENCASEMENT W/4-#4 BARS OR FLOW FILL ENCASEMENT WITH 6" THICKNESS BELOW AND ABOVE THE PIPE



CONDITION #1: NEW SEWER MAIN ABOVE EXIST. WATER MAIN



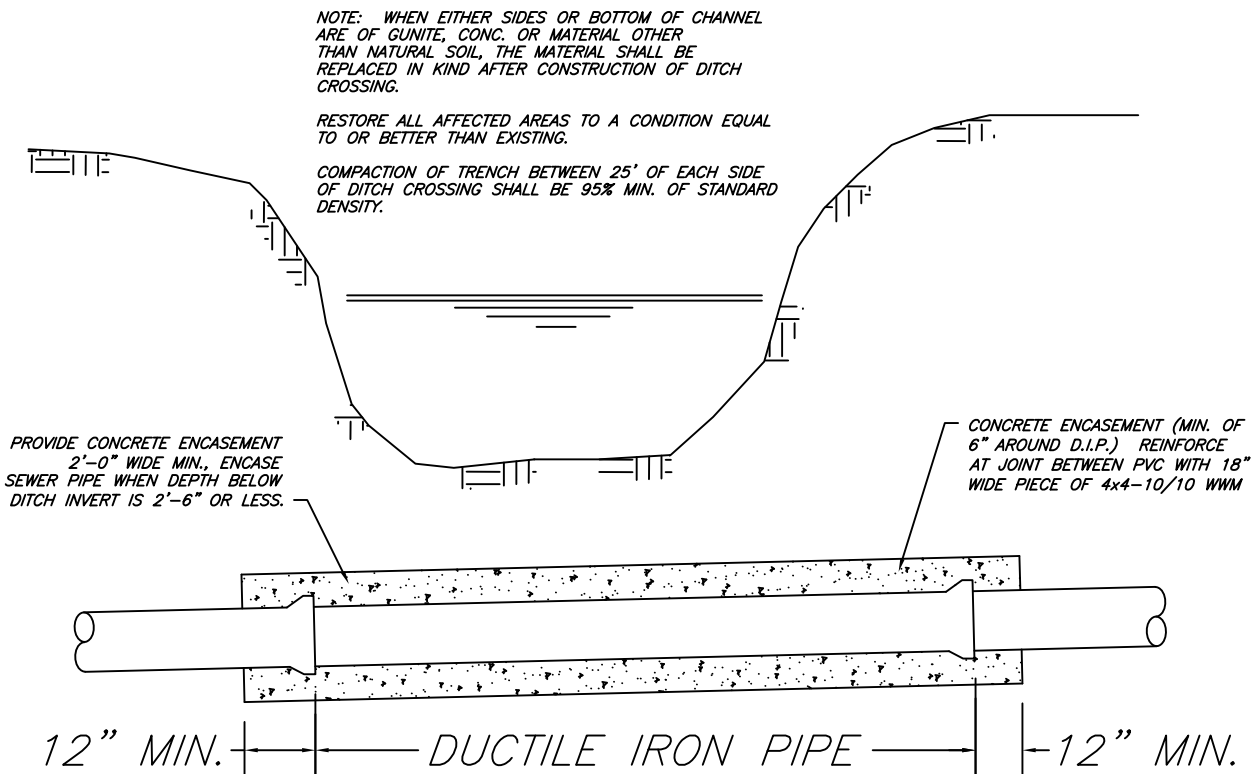
CONDITION #2: NEW SEWER MAIN BELOW EXIST. WATER MAIN WITH LESS THAN 18 INCHES OF CLEAR SPACE

NOTE:

1. PIPE MUST BE WRAPPED IN POLYETHYLENE ENCASEMENT (POLYWRAP) PRIOR TO CONCRETE OR FLOW FILL ENCASEMENT.
2. IF THE WATER MAIN IS GREATER THAN 5 FEET BELOW THE SEWER PIPE, SECONDARY CONTAINMENT IS NOT REQUIRED.

SEWER / WATER CROSSING DETAIL
NOT TO SCALE

WATER/SEWER CROSSING DETAIL	
TOWN OF FAIRPLAY 210	
NOT TO SCALE	DWG: W-1



DITCH CROSSING DETAIL

NO SCALE

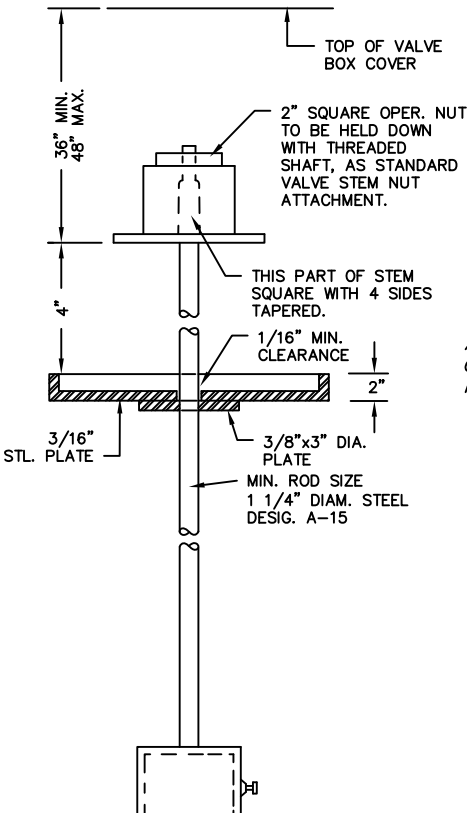
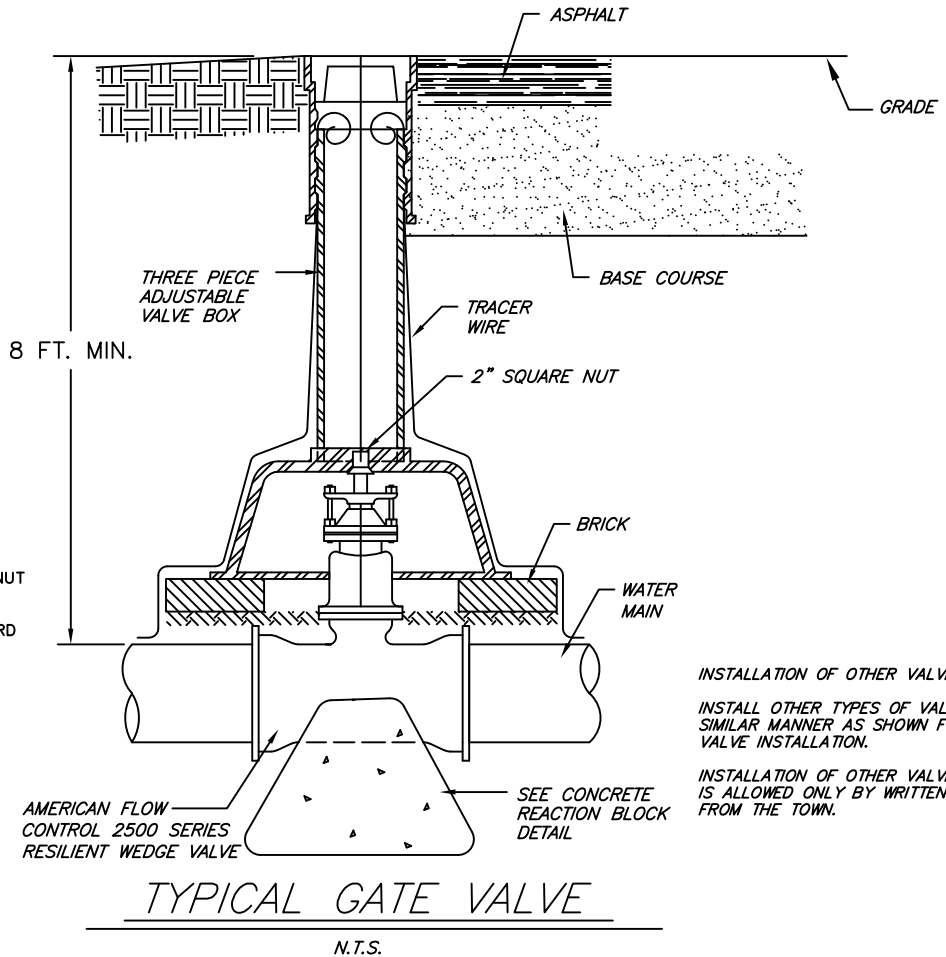
DITCH CROSSING DETAIL	
TOWN OF FAIRPLAY	
NOT TO SCALE	DWG: W-2

NOTE: IN UNPAVED AREAS, PROVIDE A SLIGHT GRADE FOR FINISH GRADE AWAY FROM TOP OF VALVE BOX.

NOTES:

1. ALL VALVES ADJACENT TO FITTING SHALL BE FLANGE x M.J. FITTING SHALL BE FLANGED NEXT TO VALVE. LINE VALVES TO BE MJ x MJ.
2. DESIGN LOCATIONS OF VALVES ARE OUTSIDE OF CONCRETE CURB/GUTTER AND VALLEY PANS. INSTALLED VALVES WHICH CONFLICT WITH CONCRETE AREAS SHALL BE RELOCATED AT THE CONTRACTOR'S EXPENSE.

NOTE: FOR WATERLINE DEPTHS IN EXCESS OF 6', SEE DEEP VALVE SETTING DETAIL.



INSTALLATION OF OTHER VALVE TYPES:
 INSTALL OTHER TYPES OF VALVES IN A SIMILAR MANNER AS SHOWN FOR THE GATE VALVE INSTALLATION.
 INSTALLATION OF OTHER VALVE TYPES IS ALLOWED ONLY BY WRITTEN APPROVAL FROM THE TOWN.

TYPICAL GATE VALVE

N.T.S.

DEEP VALVE SETTING

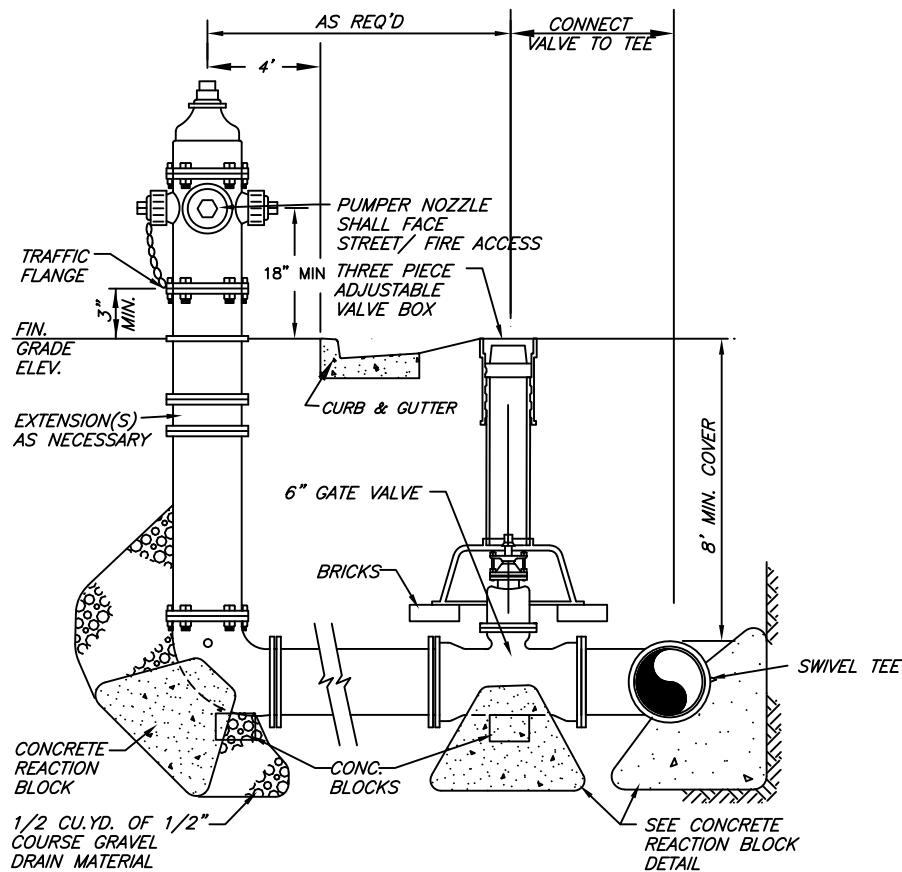
GATE VALVE & VALVE BOX DETAIL

TOWN OF FAIRPLAY

212

NOT TO SCALE

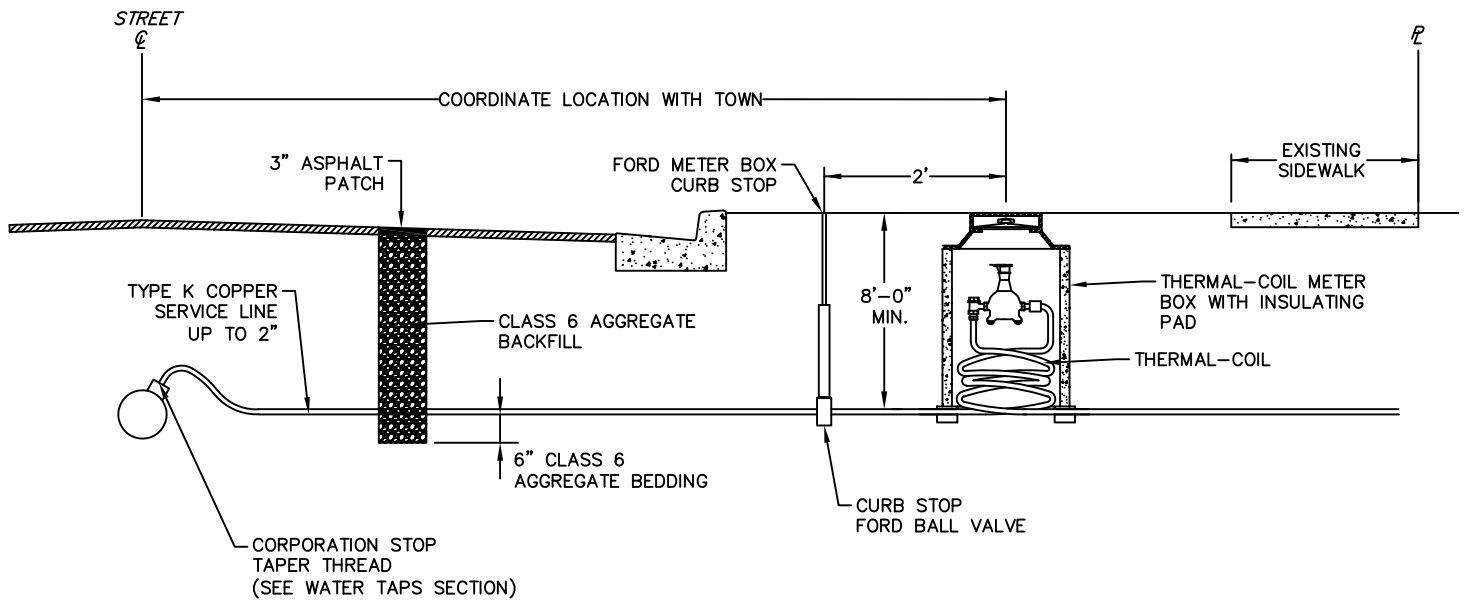
DWG: W-3



- NOTES: 1) MEGALUGS TO BE USED FOR ALL MECHANICAL JOINTS
 2) WATROUS HYDRANT, VALVE AND FITTINGS TO BE 250 P.S.I. RATED.
 3) POLYETHYENE WRAP SHALL COVER D.I.P. ASSEMBLY FROM HYDRANT BASE TO WATER MAIN IF CORROSIVE SOILS ARE PRESENT.
 4) ALL HYDRANT LEAD PIPING TO BE 6" D.I.P.
 5) CENTERLINE OF HYDRANT TO BE 4'-0" FROM BACK OF CURB UNLESS OTHERWISE NOTED.
 6) CARE SHOULD BE TAKEN TO ASSURE THAT WEEP HOLE REMAINS FREE DRAINING.

*FIRE HYDRANT ASSEMBLY
 INSTALLATION DETAIL*

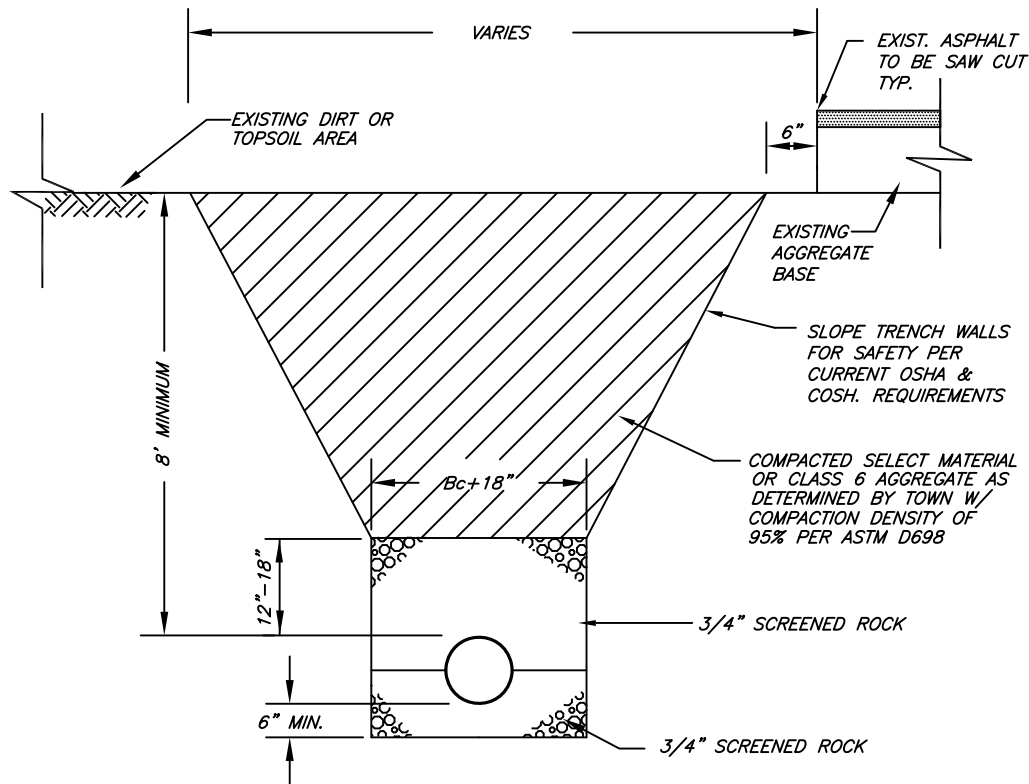
<i>FIRE HYDRANT SETTING DETAIL</i>	
<i>TOWN OF FAIRPLAY</i> 213	
<i>NOT TO SCALE</i>	<i>DWG: W-4</i>



NOTES:

1. WATER METERS SHALL BE INSTALLED WITHIN CONDITIONED SPACE. EXTERIOR METER INSTALLATIONS ALLOWED ONLY WITH ADVANCE APPROVAL OF PUBLIC WORKS DIRECTOR.
2. FOR METER INSTALLATIONS WITHIN CONDITIONED SPACE, METER SHALL BE SET WITH A COPPER METER YOKE WITH STRAIGHT LINE INLET AND OUTLET. METER YOKES SHALL INCLUDE AN ANSI/ASSE 1024 APPROVED DUAL CHECK VALVE CERTIFIED TO NSF ANSI 61 AND 372. YOKE AND DUAL CHECK MANUFACTURERS SHALL BE THE A.C. MCDONALD MFG. CO. OR THE MUELLER COMPANY.
3. WATER METERS TO BE SENSUS.

WATER SERVICE INSTALLATION DETAIL	
TOWN OF FAIRPLAY	
NOT TO SCALE	214 DWG: W-5



- 1) PAVEMENT REPLACEMENT SHALL MEET EXISTING THICKNESS AND KIND WITH THE FOLLOWING MINIMUMS: ASPHALT SURFACING = 3" MIN., AGGREGATE BASE COURSE = 6" MIN.
- 2) FOR UNPAVED SURFACES, BASE COURSE REPLACEMENT SHALL MEET EXISTING THICKNESS WITH THE FOLLOWING MINIMUMS: AGGREGATE BASE COURSE = 12" MIN.
- 3) DIRT / TOPSOIL PLACEMENT SHALL MEET EXISTING THICKNESS AND KIND WITH THE FOLLOWING MINIMUMS: 4" TOPSOIL.
- 4) SELECT MATERIAL AS FOLLOWS: 6" MAXIMUM SIZE IN TOP 12" OF BACKFILL
12" MAXIMUM SIZE IN REMAINDER OF BACKFILL
- 5) PROVIDE TRACER WIRE TAPED TO THE TOP OF PIPE FOR PVC INSTALLATIONS. (TYPE OF TAPE TO BE APPROVED BY THE TOWN.)
- 6) PROVIDE POLYETHYLENE WRAP AROUND DUCTILE IRON PIPE INSTALLATIONS IF CORROSIVE SOILS ARE PRESENT. A MINIMUM OF 12" LAPS WITH THE POLYETHYLENE WRAP. TAPE WRAP AS APPROVED.
- 7) DETAIL ABOVE FOR "DRY TRENCH" CONDITIONS. FOR UNSTABLE OR "WET TRENCH" CONDITIONS PROVIDE A MINIMUM OF 4" OF 1 1/2" SCREENED ROCK UNDER BEDDING MATERIAL WITH FILTER FABRIC PLACED BELOW AND ABOVE THE SCREENED ROCK.
- 8) ALL NEW WATER MAINS TO BE MINIMUM 8" DIAMETER.

TRENCH CROSS SECTION

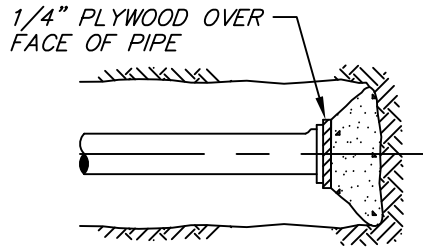
SCALE: 3/4" = 1'-0'

STANDARD WATER
MAIN TRENCH SECTION

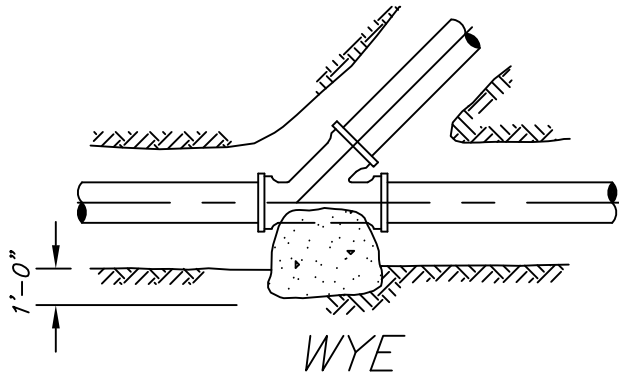
TOWN OF FAIRPLAY
215

NOT TO SCALE

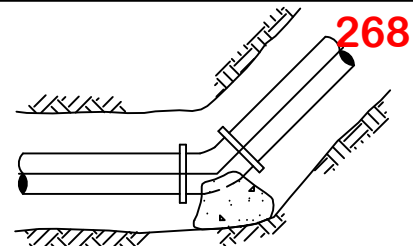
DWG: W-6



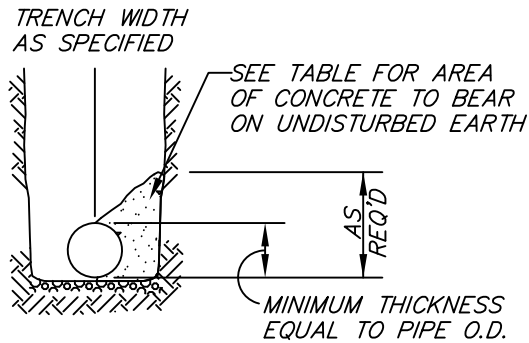
DEAD END



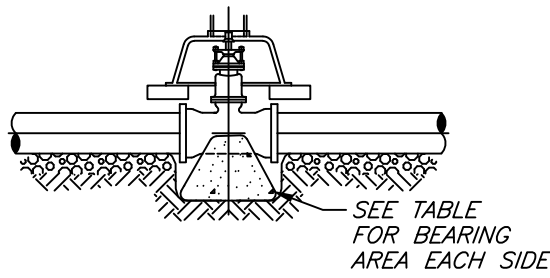
WYE



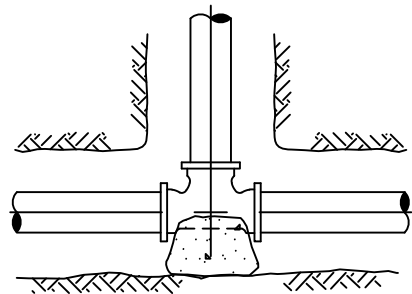
90°, 45°, 22.5°, OR 11.25°
ELBOW, HORIZONTAL OR
BOTTOM OF VERTICAL



SECTION



GATE VALVE



TEE

AREAS GIVEN IN TABLE ARE BASED UPON AN INTERNAL STATIC PRESSURE OF 100 P.S.I. AND A SOIL BEARING CAPACITY OF 1000 LBS. PER SQ. FT. BEARING AREAS FOR ANY PRESSURE AND SOIL BEARING CAPACITY MAY BE OBTAINED BY MULTIPLYING THE TABULATED VALUES BY A CORRECTION FACTOR "F".

$$F = \frac{\text{ACTUAL SPECIFIED TEST PRESSURE IN HUNDREDS OF LBS.}}{\text{ACTUAL SOIL BEARING CAPACITY IN THOUSANDS OF LBS. PER SQ. FT.}}$$

INSTALLATION OF THRUST BLOCKS ARE NOT ALLOWED FOR CONDITIONS OUTSIDE OF THOSE LISTED UNTIL SUBMITTAL OF CALCULATIONS FOR THE CORRECTION FACTOR ARE SUBMITTED TO AND REVIEWED BY THE TOWN AND WRITTEN APPROVAL BY THE TOWN IS GIVEN.

NOTES:

- 1) MEGALUGS ARE REQUIRED ON ALL MECHANICAL JOINTS
- 2) REACTION BLOCKS ARE REQUIRED ON ALL MECHANICAL JOINTS.

SIZE (INCHES)	ELBOWS				TEES & DEAD ENDS (SQ. FT.)	GATE VALVES (SQ. FT.)
	90° (SQ. FT.)	45° (SQ. FT.)	22.5° (SQ. FT.)	11.25° (SQ. FT.)		
4	1.8	1.0	0.5	0	1.3	0.5
6	4.0	2.2	1.1	0	2.8	0.7
8	7.1	3.8	2.0	1.0	5.0	2.4
10	11.1	6.0	3.0	1.5	7.8	4.5
12	16.0	8.6	4.4	2.2	11.3	7.3
14	21.7	11.8	6.0	3.0	15.4	11.0
16	28.4	15.3	8.0	4.0	20.0	16.6
18	36.0	19.4	10.0	5.0	25.4	24.9

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THRUST BLOCKING
DETAILS

TOWN OF FAIRPLAY

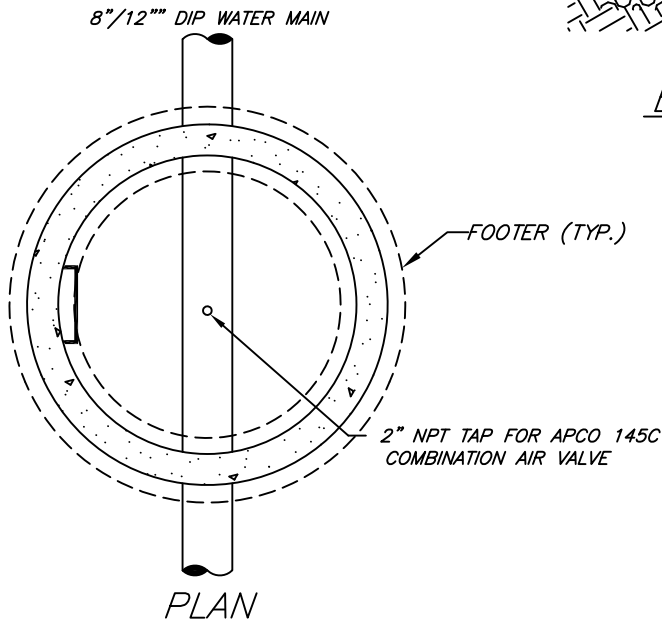
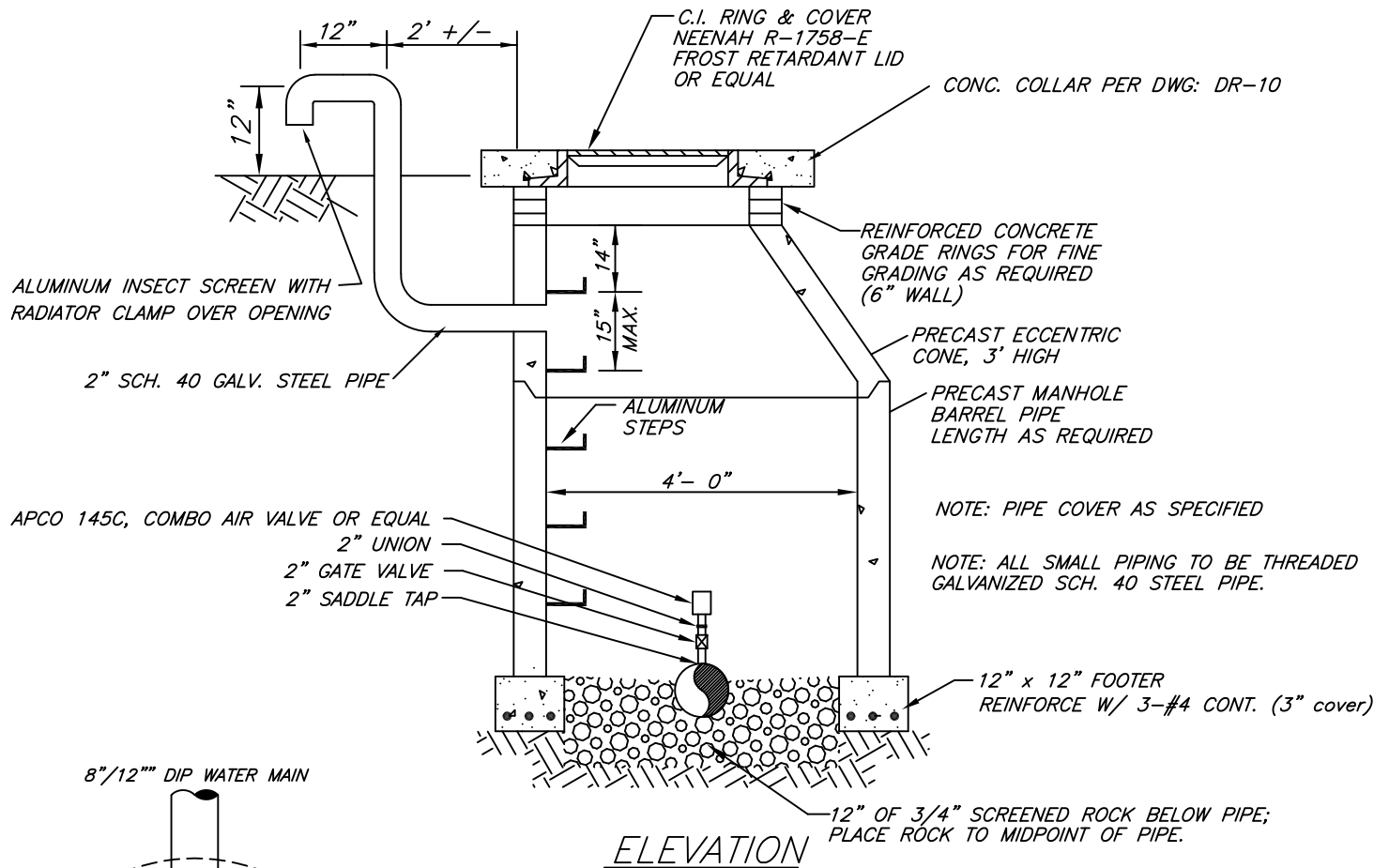
NOT TO SCALE
DWG: W-7

2024

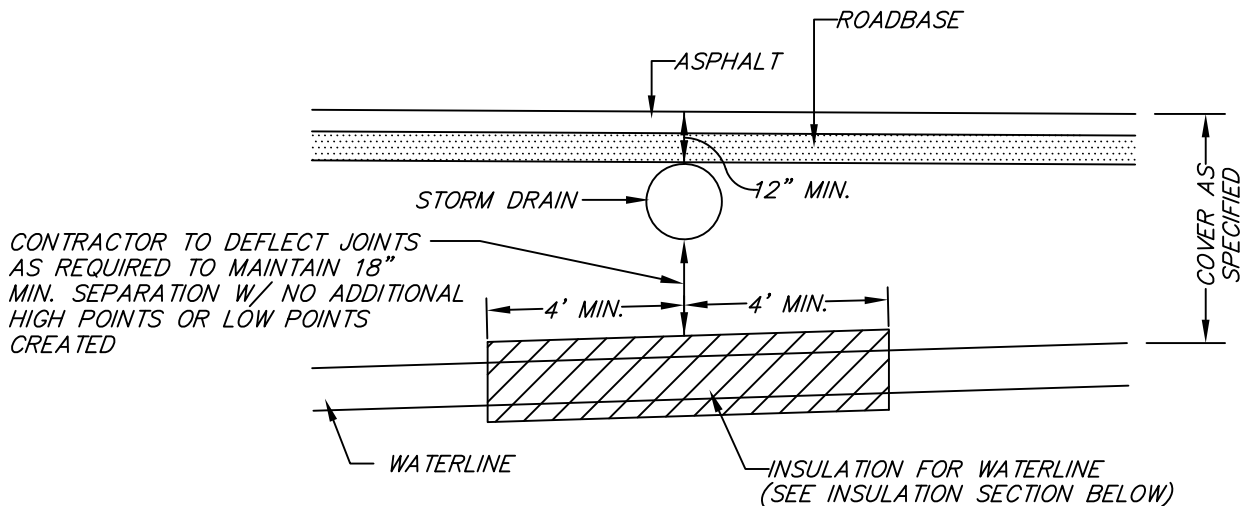
1. Use Rub-R-Nek preformed gasket (2 layers) or grout in place between all bottom section, barrel sections, concrete grade rings, and top castings.
2. Backfill within 24" of manhole: Class 2 aggregate or native materials with less than 3" size.
3. Precast rings or metal riser ring course shall be utilized where required with 2 courses minimum and 12 courses maximum (2 minimum, 12" maximum height).
4. Grade adjustment as follows: Greater than, or equal to, 1 foot, concrete barrel sections; less than 1 foot, concrete or metal grade rings.
5. Finish grade as follows: With asphalt or concrete pavements flush; with base course surface or dirt/topsoil -3" below grade.

COMBINATION AIR VALVE MANHOLE DETAIL

N.T.S.

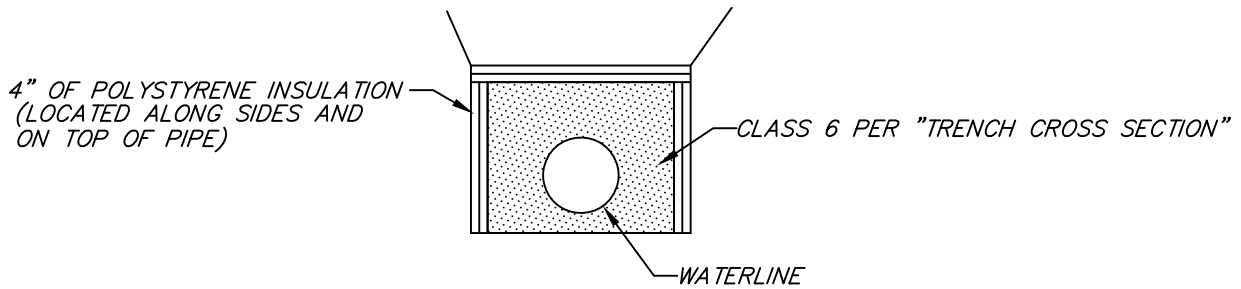


COMBINATION AIR VALVE MANHOLE	
TOWN OF FAIRPLAY	
217	
NOT TO SCALE	DWG: W-8



**ELEVATION
WATERLINE/CULVERT CROSSING**

NO SCALE



INSULATION SECTION

NO SCALE

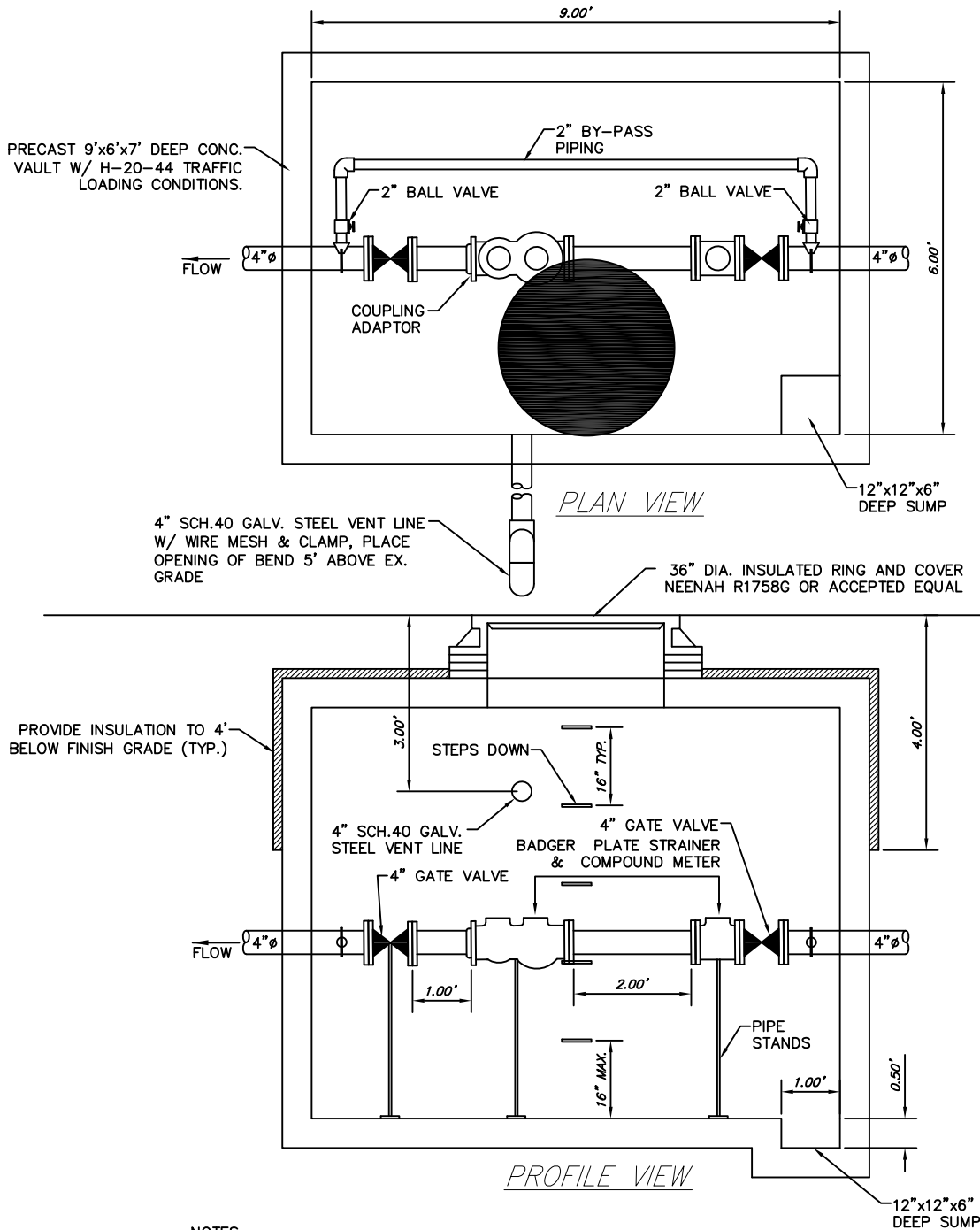
NOTE: AS DRAWN, THE INSULATION DETAIL ADDRESSES CULVERT CROSSINGS. PROVIDE THE SAME DETAIL FOR THOSE INSTANCES WHERE THE WATERLINE IS INSTALLED WITHIN 5' OF OPEN AIR.

WATERLINE INSULATION
DETAIL

TOWN OF FAIRPLAY
218

NOT TO SCALE

DWG: W-9



NOTES:

1. WHERE PIPES PENETRATE WALLS, USE LINK SEAL OR FILL ANNULAR SPACE WITH NON-SHRINK GROUT.
2. COAT ALL EXTERIOR VAULT SURFACES WITH BITUMINOUS DAMPROOFING.
3. ALL LOW FLOW PIPE SHALL BE BRASS. MAINLINE PIPE AND FITTINGS BEING FLANGED DUCTILE IRON.
4. MEGALUGS OR JOINT HARNESSSES REQUIRED ON EXTERIOR CONNECTIONS.
5. CONTRACTOR SHALL SUBMIT VAULT PIPING SCHEMATIC W/ VAULT DIMENSIONS PRIOR TO ORDERING.
6. IT SHALL BE THE OWNER'S RESPONSIBILITY TO VERIFY ALL METER APPURTENANCE SIZING.
7. PRV REQUIRED TO BE INSTALLED IN CONJUNCTION WITH THIS DETAIL - SEE W-11.

WATER METER VAULT DETAIL

SCALE: 1" = 2'

LARGE DIAMETER
WATER METER VAULT

TOWN OF FAIRPLAY

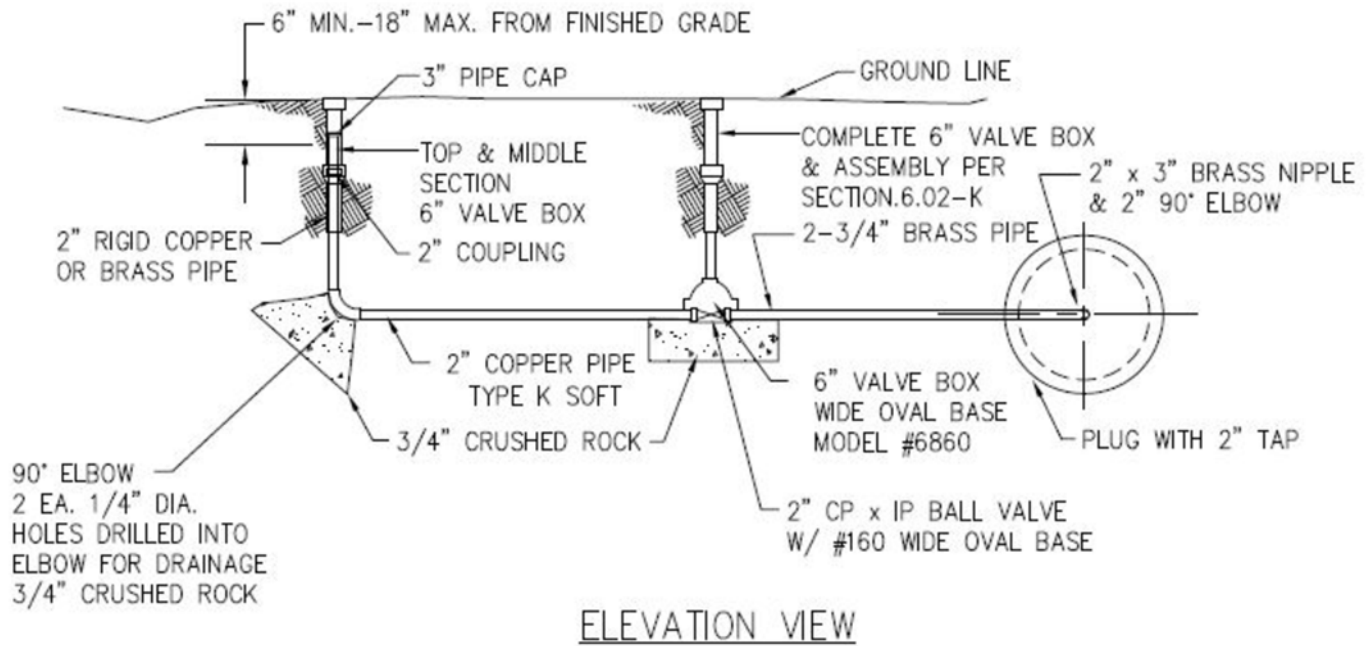
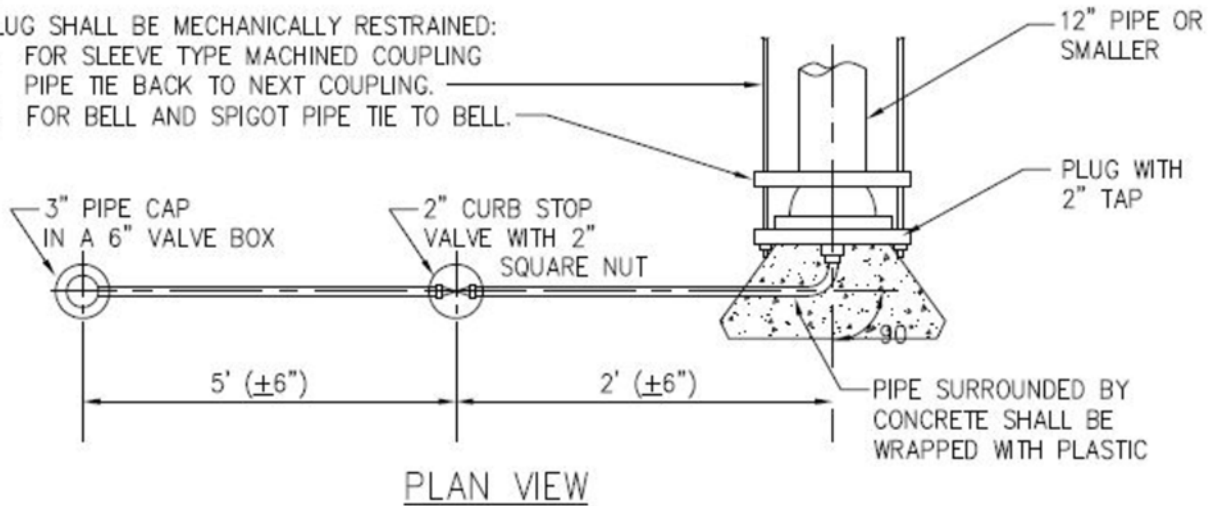
219

NOT TO SCALE

DWG: W-10

NOTE:

1. PLUG SHALL BE MECHANICALLY RESTRAINED:
 - A. FOR SLEEVE TYPE MACHINED COUPLING
PIPE TIE BACK TO NEXT COUPLING.
 - B. FOR BELL AND SPIGOT PIPE TIE TO BELL.



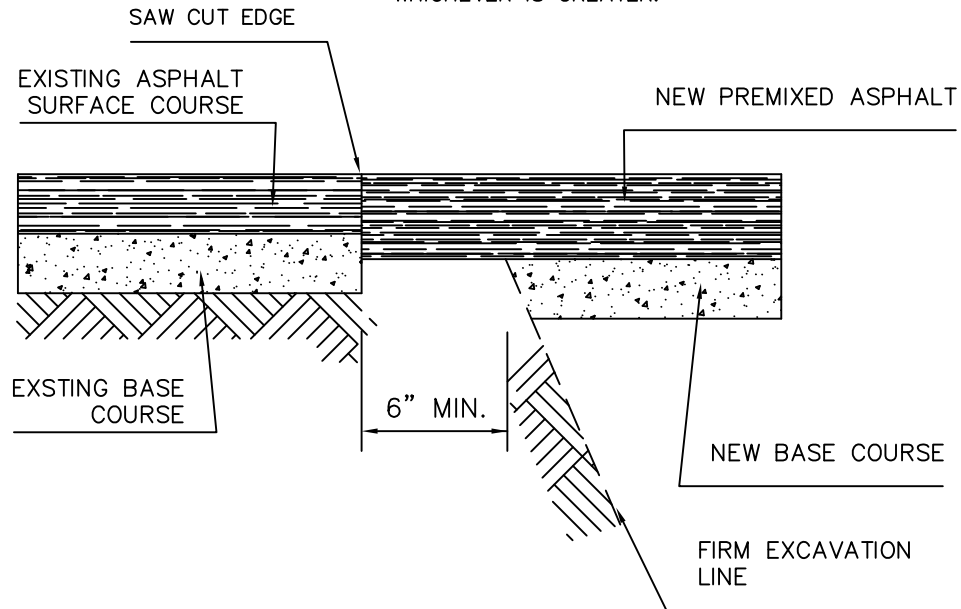
**STANDARD BLOW-OFF
VALVE INSTALLATION**

TOWN OF FAIRPLAY

NOT TO SCALE

DWG: W-12

MIN. THICKNESS OF NEW ASPHALT TO BE 3" OR MATCH EXISTING DEPTH, WHICHEVER IS GREATER. MIN. THICKNESS OF NEW BASE IS TO BE 8" OR MATCH EXISTING DEPTH, WHICHEVER IS GREATER.



NOTE: WHERE EXISTING PAVEMENT IS A SEAL COAT OR ROAD MIX ASPHALTIC SURFACE, A PREMIXED COLD APPLIED ASPHALTIC CONCRETE MAY BE USED.

WHERE EXIST. PAVEMENT IS A MACHINE PLACED HOT MIXED ASPHALTIC CONCRETE, A PREMIXED HOT APPLIED CONCRETE WILL BE USED.

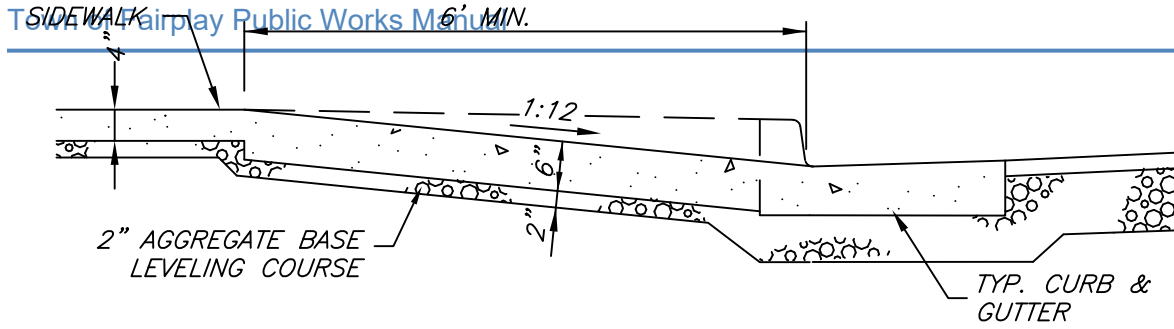
ALL REPLACEMENT MATERIAL SHALL BE COMPACTED TO A DENSITY OF 95% OPTIMUM DENSITY.

ASPHALT PAVEMENT
REPLACEMENT

TOWN OF FAIRPLAY

NOT TO SCALE

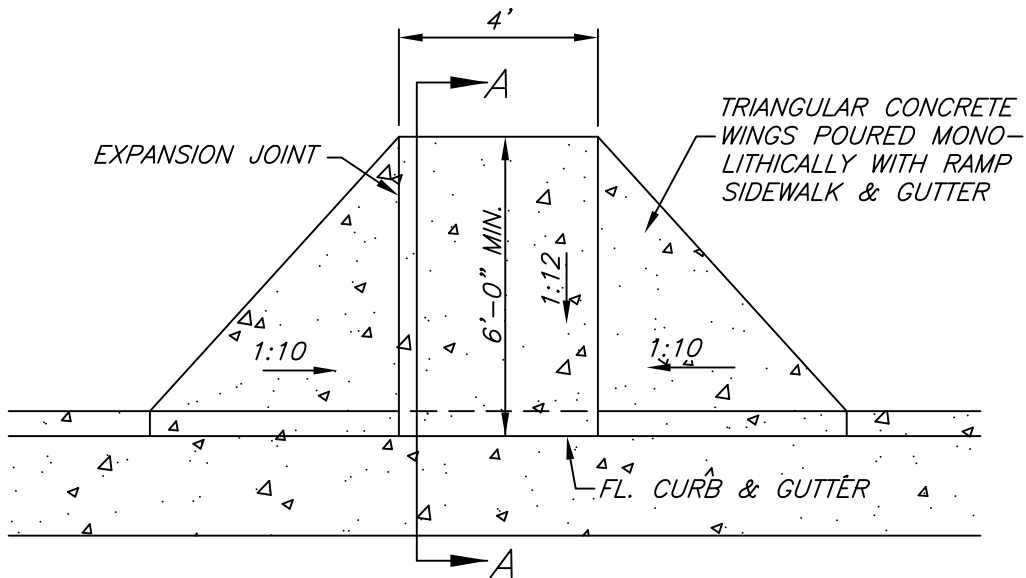
DWG: R1



NOTE:

HANDICAP RAMPS SHALL BE 6" THICK CONCRETE ALL OTHER CONCRETE FLATWORK SHALL BE 4" THICK. AGGREGATE BASE FOR 4" CONCRETE FLATWORK SHALL BE 2" COMPACTED CLASS 6 AGGREGATE.

SECTION A-A

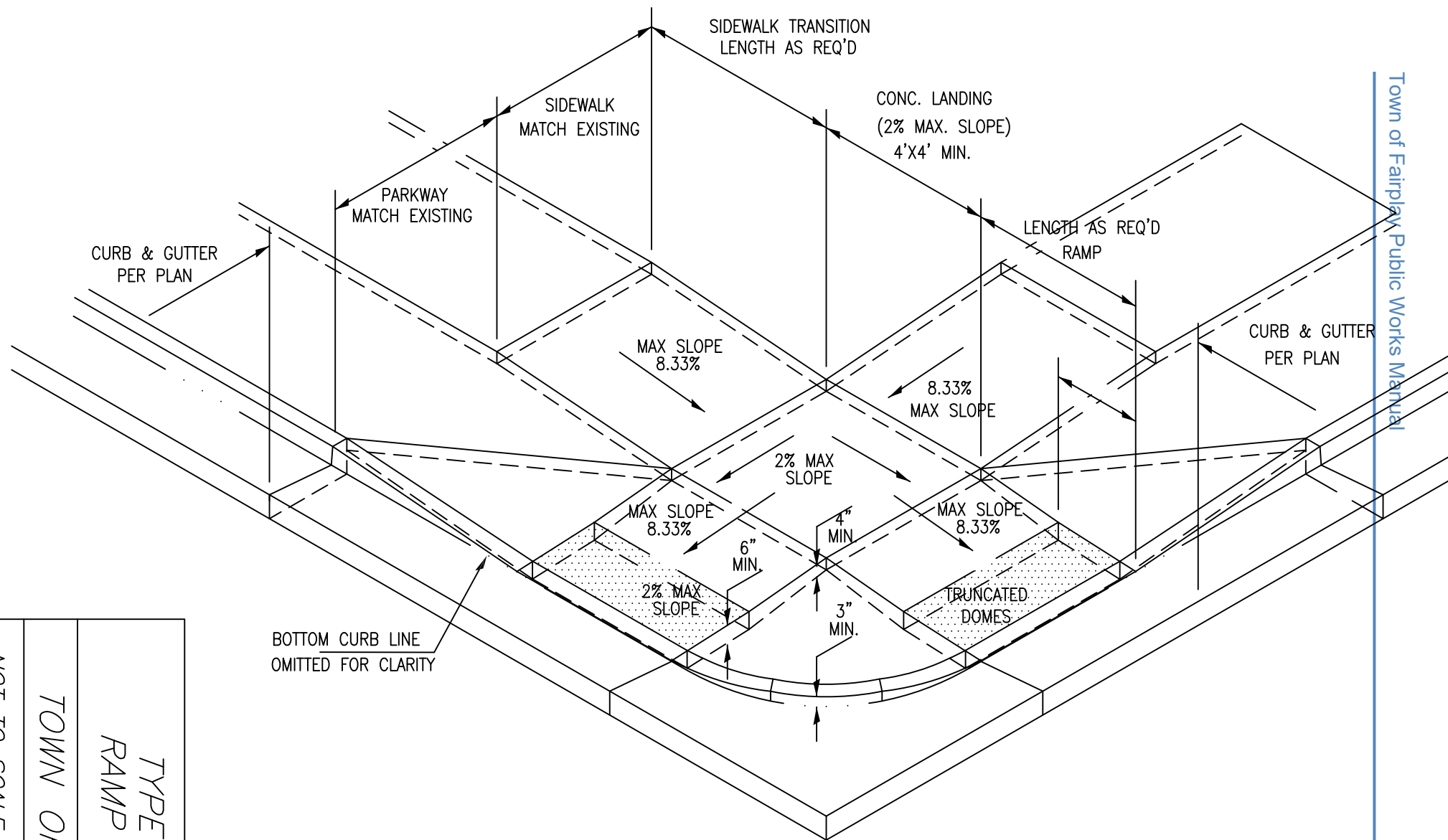


NOTES:

1. DIMENSIONS MAY BE ALTERED TO AVOID OBSTRUCTIONS WITH ENGINEER'S APPROVAL.
2. SURFACE OF RAMP TO HAVE COARSE BROOM FINISH.

HANDICAP RAMP

TYPE 1 ADA RAMP DETAILS	
TOWN OF FAIRPLAY 223	
NOT TO SCALE	DWG: R2



NOTES:

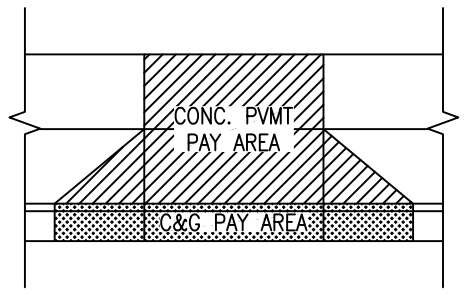
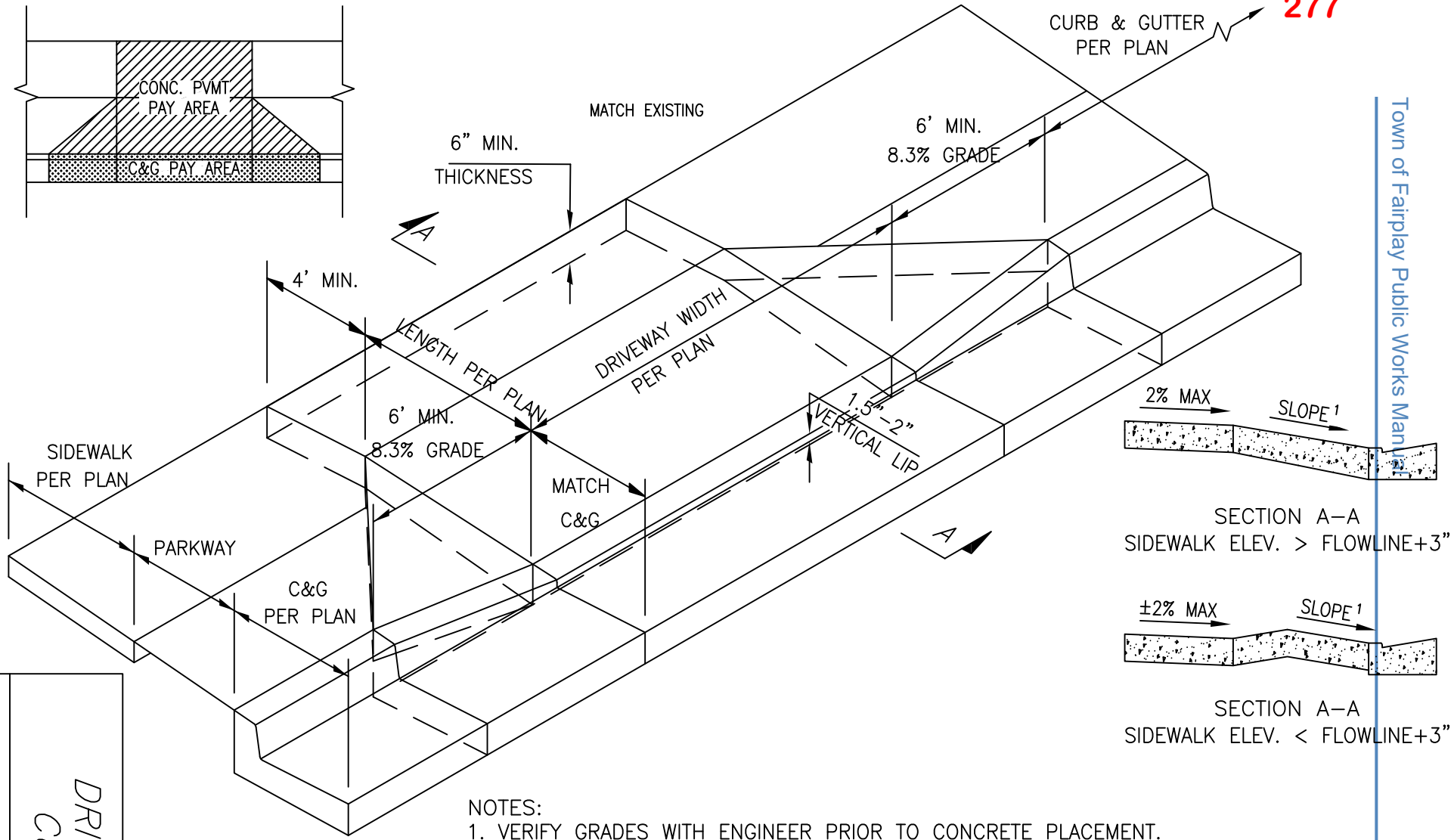
1. TRUNCATED DOMES SHALL BE 24 INCHES WIDE AND EXTEND THE FULL WIDTH OF THE ACCESS RAMP.
2. TRUNCATED DOMES SHALL BE EMBEDDED IN THE FRESH CONCRETE WITH NO AIR SPACE BETWEEN THE CONCRETE AND THE BOTTOM OF THE PLATE.
3. TRUNCATED DOMES SHALL BE CONSTRUCTED OF UNPAINTED CAST IRON CONFORMING TO ASTM A-48 CLASS 30B.

TYPE 2 ADA
RAMP DETAILS

TOWN OF FAIRPLAY

NOT TO SCALE

DWG: R3



NOTES:
 1. VERIFY GRADES WITH ENGINEER PRIOR TO CONCRETE PLACEMENT.

DRIVEWAY CURB
 CUT DETAILS
 TOWN OF FAIRPLAY
 NOT TO SCALE
 DWG: R4

DIVISION 7



Division 7 Construction Process/Project Acceptance

INDEX

CONSTRUCTION PROCESS/PROJECT ACCEPTANCE

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Submittal Requirements	8.6
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Utility Coordination	8.10
Periodic Recurring Meetings	8.11
Testing Requirements	8.12
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Punch List Preparation	8.15
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Final Acceptance	8.17
Record Drawings.....	8.18

8.01 INTRODUCTION

- A. This Section defines the standard of care and documentation necessary to ensure the Town inherits a quality project. It is applicable to all projects that have received approval through the Town's land use process and will be dedicating infrastructure to the Town.
- B. The following subsections consist of the major steps involved with a detailed description of each. The construction process and associated checklists include the minimum standards to be followed. Some items may be viewed as guidelines or recommendations and every item may not be applicable on a particular project. Mandatory requirements for acceptance should be apparent. Any uncertainties can be clarified by contacting the Town Engineer.
- C. Before the Town accepts the dedication of public infrastructure, project (Owners) representatives shall provide the required documentation discussed in this section necessary to ensure a satisfactory and complete project. This process is not meant to be burdensome. With the proper level of construction oversight, developers will find that these requirements can easily be met. Again, the intent here is QA/QC and to facilitate a timely project acceptance which benefits both the Town and the developer.

8.02 SUBDIVISION IMPROVEMENTS AGREEMENT (SIA) COMPLIANCE

The SIA lists general and project specific requirements and timeframes. This section discusses how the SIA will be integrated into the construction process.

1. Copies should be distributed to all affected parties at pre-construction meeting.
2. Follow procedure in SIA for Letter of Credit/Security reductions.
3. Review SIA at time of Initial/Preliminary Acceptance and at Final acceptance to verify all work in compliance with SIA.
4. Town has right to ask for a sample station.
5. Developers are required to turn any Water-Rights on acquired land over to the Town.

8.03 PRE-BID MEETING

This section provides a checklist of the items that are necessary to discuss during a pre-bid meeting. A pre-bid meeting shall be held when any infrastructure will be dedicated to the Town of Fairplay. The Owner's or Owner's Engineer shall take and distribute notes of the key items discussed during the pre-bid meeting.

- A. Agenda Checklist (use all that apply)
 1. Introductions
 2. Scope of project.
 3. Potential revisions.
 4. Bonding/retainage information.
 5. Special construction issues – supplied equipment.
 6. Elements of the contract.
 - a. Specifications
 - b. Plans
 - c. Addenda dates and cutoff dates
 - d. Public Works Manual
 7. Schedule and sequencing issues.
 8. Coordination with Town for meeting date/time, or notify 72 hours prior.
 - a. Soil and groundwater issues

- b. Permits.
- c. Grading.
- d. Dewatering.
- e. Building.
- f. Other?
 - i. Funding issues.
 - ii. State funds.
 - iii. Bonding.
 - iv. Staging & disposal.
 - v. Testing – who pays?
 - vi. Personnel & roles for review, payment, approval & construction.
 - vii. Documentation – Who, what?
 - viii. Video
 - ix. As-builts
 - x. Operation & maintenance construction management issues.
- a. On-site office for Town representative?
- b. Weekly meetings?
- c. Construction survey
 - i. What by whom?

Utilities to site – Contractor or Town/Owner?

Temporary utilities.

Power

Water

Toilets Important to have Contractor/Owner warranty track with Town/Owner warranty.

8.04 PRE-CONSTRUCTION MEETING

- A. This section provides a checklist of issues that should be discussed in a pre-construction meeting. A pre-construction meeting shall be held for any project that will involve the dedication of public infrastructure to the Town of Fairplay. The pre-construction meeting shall be held before any construction on public infrastructure starts and after a general contractor has been selected by the Owner. Representatives from the Town of Fairplay, Town's Engineer, Owner's Engineer, Owner, Contractor, major subcontractors, etc., as appropriate, shall be invited to the meeting. Either the Owner's Engineer or another person appointed by the Owner shall coordinate, take notes and distribute notes from the meeting. The pre-construction meeting minutes shall be one of the documentation requirements required from the Town before preliminary acceptance is granted.

Agenda Checklist (use all that apply)

1. Introduction and sign-in.
2. Project personnel.
3. Lines of communication – resolution ladder.
4. Final construction drawings.
5. Who will be keeper of updated drawings?
6. Who will track changes?
7. Construction surveying – request timelines.
8. Permits.
9. Testing requirements.
 - a. Observation requirements
 - b. Documentation requirements.

- c. Shallow utility issues.
- d. Utility locates & coordination.
- e. Discussion of work hours.
- f. Progress payments.
- g. Submittal requirements.
- h. Periodic construction meetings.
- i. Quality control requirements – Contractor/Owner.
- j. Project closeout procedures.
- k. Contractual insurance certificates.
- l. Contractor license.
- m. Construction schedule, sequence & phasing.
- n. Approval of baseline schedule.
- o. Attendees (as appropriate) Owner's representatives
 - a. Town representatives.
 - b. Utility personnel.
 - c. Street personnel.
 - d. Owner's Engineer.
 - e. Utility company representatives.

Meeting minutes

- i. Who take notes?
- ii. Note distribution.

8.05 CONSTRUCTION DRAWINGS

- A. This section provides requirements for construction level drawings. The requirements start when the final construction sets are issued at the startup of a project.
 - 1. Have drawings received final approvals?
 - 2. Have drawings been updated from Bid process?
 - 3. Construction drawing sets shall be submitted to the Town and Town Engineer, as appropriate.
 - 4. Construction drawings shall be stamped "FOR CONSTRUCTION" and each page shall have the stamp and signature of a professional engineer.
 - 5. Cover sheet shall be signed by the Town Administrator.
 - 6. Town Engineer shall be notified in advance of construction if substantial design changes are required. This can be a Request-for-Information (RFI) for record keeping purposes.
 - 7. Any design changes to the initial set of drawings shall be clearly delineated by showing the change and date in the revision block and by reflecting the change with a cloud mark.
 - 8. Either the Owner's Engineer or Contractor shall keep track of changes for record drawings.
 - 9. Keep record set of drawings on site.

8.06 SUBMITTAL REQUIREMENTS

- A. Submittals are required for all major materials for public infrastructure dedicated to the Town. The checklists in this section shall be followed. The procedures for submittals and the submittal logs should be set up and discussed during the pre-construction meeting.
 - 1. See Section 01300 of Technical Specifications in Public Works Manual.
 - 2. Owner's Engineer shall keep submittal logs.
 - 3. Copies of approved submittals and logs shall be sent to Town and Town's Engineer.

4. Owner's Engineer and Contractor shall both review and stamp acceptance on submittals.
5. Any submittal that includes design/build items, such as retaining walls, water tank structural drawings will require a P.E. stamp.

8.07 PERMITS

- A. During the pre-construction meeting the required permits shall be discussed. One of the leading causes of construction and project delays is due to lack of adequate permits necessary for the project.
Verify the following are in place, if needed:
 1. CDPS Stormwater Construction Permit.
 2. Army Corps of Engineers 404 Permit.
 3. Construction Dewatering Permit.
 4. CDOT Access, Utility, Surveying Permits, etc.
 5. Town Grading Permit
 6. Building Permit
 7. Street Cut Permit
 8. Floodplain Development Permit
 - a. Approval letters from:
 - b. Town of Fairplay
 - c. Verify that all rights-of-way and easements have been obtained to start and complete construction.
 - d. Excavation Permit for over ½ Acre
 - e. Re-vegetation Bond security
 - f. Water Tap Permit
 - g. ROW permit

8.08 CONSTRUCTION OBSERVATION

- A. This section discusses process that should be followed for Construction Observation, from who should be responsible for observation to the required documentation throughout construction. In order for projects to be accepted by the Town upon final completion, documentation of these procedures shall be required to demonstrate that project is complete and meets the quality standards of the Town.
- B. Owner's Engineer must regularly observe project and be able to write letter for security releases and at project completion certifying that construction was accomplished in "substantial compliance" with the approved drawings, and appurtenant specifications, rules, regulations, Fairplay Municipal Code and Public Works Manual requirements.
 1. Town's Engineer to make periodic visits to observe construction, evaluate Contractor's efforts, and ensure Owner's Engineer is properly monitoring construction.
 2. Utility department personnel to make periodic visits to observe utility installations.
 3. Owner's representatives, Engineer, Town Engineer and utility personnel to be present during pressure testing, etc. (as agreed upon in project meetings)
 4. Owner's representatives, Engineer, Town Engineer and utility personnel to be present during punch list walkthroughs.
 5. Owner's representatives to take job photos.
 6. Owner's Engineer to coordinate additional testing requirements.
 7. Take minutes of meetings at the periodic construction meetings.

8. Minutes should include unresolved issues.
9. Owner's Engineer to write substantial completion letter to Town and request Initial/Preliminary Acceptance.
10. Town Engineer will then perform comprehensive on-site observation to confirm Owner's Engineer's letter is necessary for preliminary and final acceptance.
11. Need to fill out Town of Fairplay Project Acceptance checklist as outlined in Section 7.18.

8.09 DOCUMENTATION REQUIRED

- A. At the beginning of the project, it is important that all parties involved in the construction process understand the documentation required for Town acceptance at the end of the project.
- B. The Owner and Owner's Engineer shall be responsible for furnishing the Town with a complete set of project records. Approved material submittals; should be transmitted prior to construction, meeting notes, inspection reports and test results should be furnished at regular intervals (bi-weekly or monthly as agreed upon). By the end of a project and before the Town accepts dedication of the infrastructure, all of the documentation discussed in this section should be provided to the Town.
 1. Bonding and insurance information.
 2. Pre-bid meeting notes.
 3. Pre-construction meeting notes.
 4. Periodic meeting notes.
 5. Site observation logs. (inspection reports).
 6. Testing records.
 7. Record drawings.
 8. Approved material info.
 9. Submittals and submittal logs.
 10. Job photos.
 11. Punch lists
 12. Owner's Engineer's Initial/ Preliminary Acceptance letter.
 13. Town Engineer's Initial/ Preliminary Acceptance letter.
 14. Board of Trustees Preliminary Acceptance setting the two-year warranty period.
 15. Owner's request for Final Acceptance at 23 months.
 16. Warranty item punch list.
 17. Town Engineer's Final acceptance letter
 18. Board of Trustees Final Acceptance.

8.10 UTILITY COORDINATION

- A. Shallow and deep utility coordination is extremely important to the outcome of the construction process. The Town strongly recommends that the final utility design be incorporated into the approved construction drawings (rather than relying on separate drawings produced by the respective utility). Lack of utility coordination is a leading cause of construction budget and schedule overruns. The checklists below should be discussed during the pre-construction meeting.
 1. Who shall be responsible for line locations?
 2. Verification of existing facilities.
 3. Point of contact for fieldwork.
 4. Coordination of utility supplied materials and work.

5. Notification process.
6. Disruption schedules (i.e., irrigation, water, water taps).

B. Shallow utility construction is often the source of numerous punchlist items and Town acceptance issues. The Owner is ultimately responsible for all work on the project, and appropriate coordination and inspection of shallow utility work is a must on every project.

8.11 PERIODIC RECURRING MEETINGS

A. Continual, recurring, and open communication between all parties is essential to a successful construction process. Recurring meetings between the parties throughout the construction phase is necessary to discuss and resolve issues before they become problems. The resolution of these issues should occur as soon as possible when they first arise - not at the end of a project. This section provides a checklist of issues related to periodic recurring meetings. Weekly meetings on site at the same time during the length of construction are preferable. Notes should be taken by the Owner's Engineer/representative and distributed to all parties.

1. Need to decide at pre-construction meeting where, who and how often construction meetings should occur.
2. Distribution of notes shall be decided at pre-construction meeting.
3. Discuss all design changes to construction documents.
4. Discuss all changed conditions to the construction contract.
5. Discuss project progress and schedule.
6. Discuss unresolved items.
7. Discuss all non-conforming work and the resolution to bring work into compliance.

8.12 TESTING REQUIREMENTS

A. The process of testing throughout the project for soils density testing, asphalt and concrete tests, etc., shall be set up before the project starts. Minimum requirements are listed in the Technical Specification and checklists contained in this manual. The pre-construction meeting and periodic recurring project meetings shall discuss the procedures, ongoing results and any corrective measures required as a result of the testing processes.

1. Who will
2. be responsible for the soils/concrete/asphalt testing?
3. Discuss and agree upon the frequency of tests. (To be in accordance with approved plans, specifications and this Public Works Manual.)
4. Documentation and test results to be submitted to Town.
5. Contract for testing shall be between Contractor/Owner.
6. Stringline inspection for curb and gutter sections important.
7. Proof roll subgrade.

8.13 PRE-PAVING/POUR MEETING

A. Both the paving and curb and gutter construction processes are extremely important to the longevity and functionality of public streets. Pre-paving/pour meetings shall be held with the paving or curb and gutter subcontractors to discuss procedures. This is particularly true of asphalt paving operations as it oftentimes occurs in the fall as cold weather sets in during conditions that may not be acceptable for Hot Bituminous Pavement quality control. The checklists in this section should be discussed during these meetings.

1. Schedule a pre-paving/pour meeting no later than one week before paving begins.

2. Paving/concrete subcontractor must attend.
3. Set up procedures for testing and quality control.
4. Must discuss weather issues, i.e., minimum/maximum temperatures, etc.
5. Discuss formwork/falsework inspection and rebar checks.
6. Must discuss subgrade and subbase testing procedures, i.e., geotechnical and proof rolling.
7. Must discuss road sections and maximum lift per course.
8. Stringline inspection for curb and gutter sections.

8.14 PROJECT INITIAL/PRELIMINARY ACCEPTANCE

- A. Initial/Preliminary Acceptance can occur after Substantial Completion of the project. Substantial Completion is defined as the point when “The Work (or a specified part thereof) has progressed to the point whereas, in the opinion of the Engineer, as evidenced by the Engineers definitive Certificate of Substantial Completion, it is sufficiently complete, in accordance with the Contract Documents, so that the Work (or specified part) can be utilized for the purposes for which it is intended.” Because Substantial Completion is a key concept in the acceptance of the Work, this section discusses the procedure that should be followed to establish Substantial Completion.
- B. Must be initiated by contractor who notifies Owner’s Engineer that he is substantially complete.
- C. Owner’s Engineer must confirm substantial completion; send letter and documentation listed below to Town recommending acceptance and requesting walkthrough with Town and other affected entities.
 1. Acceptance Request Letter
 2. Pre-final "As-built" Drawings
 3. Stamped certification letter from design engineer verifying all improvements were built to meet the requirements of the Town of Fairplay.
 4. Copies of all inspection reports, test results, construction docs. etc shall be included if not previously transmitted.
 5. Support documentation (installation and operation manuals) of those facilities and equipment constructed/installed as part of project.
 6. Submittal detailing any and all-specific requirements as listed below) and actions taken to meet these requirements.
 - a. Subdivision Improvement Regulations
 - b. Zone District Regulations
 - c. Commitments or Requirements made during Public Hearing
 - d. Contractual Agreements
 - e. Annexation Agreements
 - f. Any/All Other
 7. Town and other representatives to perform site walkthrough and develop punch list items to be rectified prior to Initial/Preliminary Acceptance.
 8. Town Engineer to send letter to Town to recommend Initial/ Preliminary acceptance after satisfactory completion of all punch list items and receipt of all documentation.
 9. Board of Trustees’s Initial/Preliminary acceptance triggers two-year warranty period.

8.15 PUNCH LIST PREPARATION

- A. This section provides the procedure to follow for the initial preparation and follow-through to completion of punch lists.
1. Owner's Engineer to prepare punch list.
 2. Must have items from utility companies, etc.
 3. Must have date initially added to list, date of completion for repairs, and date of signoff of originator of item.

8.16 WARRANTY PERIOD

- A. This section discusses the warranty period between the Town and the Owner (Owner) of the project and infrastructure being dedicated to the Town.
1. Warranty period shall be two years.
 2. Triggered by date of Board of Trustees's Initial/Preliminary acceptance. (Note: satisfactory tests results and partial security releases do not initiate the warranty period.)
 3. SIA typically reserves 10% of project cost for security during warranty.
 4. Owner's Engineer and reps shall keep track of scheduling a warranty period walkthrough at about 22 months. (Note: Security and warranty shall remain in effect if Owner fails to initiate walk-through and Final Acceptance procedures.)
 5. Important to have Contractor/Owner warranty track with Town/Owner warranty.

8.17 FINAL ACCEPTANCE

- A. This section includes a checklist of items that are required prior to final acceptance by the Town. These items should be understood at the start of the project and kept current throughout the construction.

Project Final Acceptance must include the following:

1. Letter from Owner's Engineer.
2. Letter from districts and Town Engineer recommending acceptance.
3. Record drawings.
4. Updated plat.
5. CADD files.
6. Hard copy drawings.
7. SIA Letter of Credit Reduction letters.
8. Project documentation.
9. Completion of punch list
10. Initial/ Preliminary Acceptance and establishment of warranty period.
11. Warranty work documentation and Owner's request for Final Acceptance
12. Final walk-through and completion of punch list
13. Town Engineer's recommendation of Final Acceptance
14. Board of Trustees ruling of Final Acceptance

8.18 RECORD DRAWINGS

- A. Record Drawings (commonly known as as-built drawings) are a requirement of Initial/Final Acceptance. C/O will be returned only after the town receives the as-built drawings. Use design drawings as base drawings. It is important to keep these drawings current throughout the project and not to wait until project completion to start them. This section provides a checklist of items to be included in the Record Drawings.

Drawings to show the following:

1. Swing ties to end of water and sewer service lines.
2. Rim and invert elevations of sanitary and storm sewer manholes and inlets.
3. Location of all major utilities.
4. Elevation at end of sewer service lines.
5. Show all plat information, i.e., rights-of-way and easements.
6. Show all phone and cable pedestals, electric transformers, etc.
7. Show all shallow utilities.
8. Show CMP's and all drainage features.
 - a. Water infrastructure, including fire hydrants, curb valves, main line valves, bends, fittings, etc.
 - 1) Swing ties to water valves and curb stops.
 - 2) Field/redline changes incorporated/annotated in electronic files.
 - b. Secondary irrigation infrastructure.
 - c. Stamp drawings as record drawings.
9. Provide electronic CADD files, electronic GIS, pdf, and a hard copy to the Town. CADD and GIS must be on Town's linetypes, coordinate system, inc.

END OF SECTION



Town of Fairplay – Monthly Board Memo

TO: Town of Fairplay: Mayor and Board of Trustees
FROM: Deron Dircksen, PE
DATE: April 15, 2024
SUBJECT: Board Memo – Town of Fairplay: Wastewater Design Criteria, Technical Specifications, and Construction Details & Town of Fairplay: Wastewater Rules and Regulations

Dear Board:

Background/Analysis:

The previous Fairplay Sanitation District had two documents:

1. Design Criteria, Technical Specifications, and Construction Standards adopted September 21, 2015.
2. Rules and Regulations adopted September 21, 2015.

SGM has been referencing these documents for wastewater design reviews and they have been very useful documents. Over the past few years, I have made a few notes/updates to be incorporated into the documents. These few notes/updates will provide clarity, reflect new laws and regulations, provide consistency, incorporate staff input, etc. This was not a full review of the previous Sewer District's Criteria, Technical Specifications and Construction Details and Rules and Regulations. These are working documents and should be updated every so often to reflect new regulations, policies, best practices, etc.

Updates:

Design Criteria, Technical Specifications and Construction Standards

1. Changed "Fairplay Sanitation District" to "Town of Fairplay".
2. Updated tracer wire language throughout document and details.
3. Section 2.04 – Easements (page 16): updated for clarity.
4. Section 2.6 – As Constructed Record Drawing. (page 17): updated to include GIS.
5. Section 3.06 - Depth of Cover (page 21): consistent with Municipal Code Section 16-16-20 #7
6. Section 4.9 Part 1 A (page 51): Clarified testing per contractor and 24-hour notice.
7. Detail S-3 – Changed external drop manhole to internal drop manhole. (page 63): updated for better product.

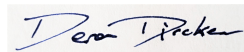
Rules and Regulations

Minimal updates such as

1. "District" to "Town".
2. "pluming" to "plumbing"

3. Warranty from 1-year to 2-years (page 11): Updated for consistency.

Sincerely,
SGM

A handwritten signature in black ink on a light gray rectangular background. The signature reads "Deron Dirksen" in a cursive script.

Deron Dirksen, P.E.
Senior Engineer 1

Town of Fairplay

Wastewater Design Criteria, Technical Specifications, and Construction Details

ADOPTED: May 6, 2024

Town of Fairplay, 901 Main Street, Fairplay, Colorado 80440

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DRAFT

SECTION 1 GENERAL REQUIREMENTS

1.1 SCOPE

- A. These Design Criteria, Technical Specifications, and Construction Details (Criteria) are adopted by the Town of Fairplay in accordance with the authority conferred by the Colorado's Special Town Act, Title 32, Article 1 of the Colorado Revised Statutes.
- B. The purpose of these Criteria are to provide for the control, management and operation of the wastewater treatment and collection systems of the Town of Fairplay, including additions, extensions and connections thereto.
- C. The Board of Trustees of the Town of Fairplay expressly declares that the adoption of these Criteria serves a public purpose and are necessary for the health, safety, security and general welfare of the Customers of the Town of Fairplay.
- D. These Criteria shall be treated and considered as new and comprehensive and shall supersede all prior Criteria of the Town. The Board of Trustees of the Town of Fairplay reserves the right to make rulings concerning matters not covered herein as and when appropriate, in the opinion of the Board.
- E. It is intended the Criteria shall be liberally construed to affect the general purpose set forth herein, and that each and every part thereof is separate and distinct from other parts. No omission or additional material set forth in these Criteria shall be construed as a waiver, alteration, or deviation from any grant of power, duty or responsibility, limitation or restriction, imposed or conferred, upon the Board of Trustees by virtue of statute now existing or subsequently amended, or under any contract or agreement existing between the Town and any other governmental entity. Nothing contained herein shall be so construed as to prejudice or affect the right of the Town to secure full benefit and protection of any law now enacted or which may subsequently be enacted by the Colorado General Assembly or as decided by the Appellate Courts of Colorado, pertaining to governmental or proprietary affairs of the Town or its Activity Enterprise.
- F. These Criteria may be amended, altered, repealed, or reenacted at any regular or special meeting of the Board and set forth, in writing, signed by the Mayor of the Board. Such action shall not be deemed as an amendment to the Criteria, unless expressly set forth in such writing. Prior notice of such amendments shall not be required to be provided by the Town.
- G. If any section, subsection, paragraph, clause, or other provisions of this Criteria shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such section, subsection, paragraph, clause, or other provision shall not affect any of the remaining provisions.

1.2 DEFINITIONS AND ABBREVIATIONS

- A. AASHTO – American Association of State Highway and Transportation Officials
- B. ACTUAL COST - All direct costs applicable to construction of given facilities including construction, engineering, inspection, plans, approval fees, required bonding, "as-built" drawings and other costs incurred necessary for completion.
- C. ACTIVITY ENTERPRISE – That water activity enterprise established pursuant to C.R.S. 37-45.1-101 et seq., which was created by the Town to operate the wastewater collection and treatment facilities of the Town; sometimes referred to as the "Enterprise."

- D. ADMINISTRATIVE ASSISTANT – Person responsible for daily management of the business affairs of the Town and Enterprise.
- E. APPLICANT – Any real property Owner, whether an individual or individuals, firm, corporation, partnership, association, government entity, association, or other entity requesting sewer service to be provided by the Town/Enterprise.
- F. APPROVED – Acceptable under specification or standards stated in the Criteria, as determined by the Board of Trustees or its designated representative.
- G. APPROVED TESTING AGENCY – Organization primarily established and certified for the purpose of testing to approved standards and approved by the Board.
- H. ASTM – American Society for Testing and Materials
- I. AS-CONSTRUCTED DRAWINGS – Drawings reflecting actual conditions and information after construction is complete. Also referred to as As-Built Drawings.
- J. AWWA – American Water Works Association
- K. BLEEDING – Continuous discharge of a potable water system of a household or building.
- L. BOARD – Board of Trustees
- M. BOARD OF TRUSTEES – Elected governing body of the Town of Fairplay.
- N. BUILDING DRAIN – That part of the lowest horizontal piping of any building's plumbing/drainage system from the stack or horizontal branch, exclusive of storm sewer, extending to a point not less than five (5) feet outside the building. This does not include any discharge from any roof or exterior collection system or internal sump system; these systems are strictly forbidden from discharging into any Service Line which discharges to the Town's wastewater collection system.
- O. BUILDING SEWER SERVICE SYSTEM – The building sewer line that is part of the horizontal piping of the building drainage system which extends from the end of the building drain, to the Service Line, and which receives the discharge of the building drain and conveys it to the Town's wastewater collection system.
- P. CDOT – Colorado Department of Transportation
- Q. COLLECTION MAIN – See Sewer Main.
- R. COLLECTION SYSTEM – See definition for Public Sewer.
- S. COMMERCIAL USE – The following uses shall be deemed "Commercial Use," including, but not limited to: hotel, motel, lodge, dormitory, condo-tel, rooming house, bed and breakfast, café, hospital, bar, private club, filling station, garage, laundry, restaurant, industrial building, office building, car wash, and any other User not providing permanent residential dwelling space.
- T. CONNECTION PERMIT – Written authorization by the Board of Trustees to connect to the Town's wastewater collection and treatment system in accordance with and for so long as the User complies with the Criteria of the Town.
- U. CONTRACTOR – A person, firm, corporation, partnership, association, or entity performing

work within the Town. Contractors must be licensed to perform the type of work to be undertaken.

- V. CRITERIA – The Town of Fairplay adopted “Design Criteria, Technical Specifications, and Construction Details.”
- W. CROSS CONNECTION – Connection or arrangement, physical or otherwise, between a potable water supply system and any building drain or building sewer carrying used or polluted water.
- X. CUSTOMER – Any real property Owner, whether an individual or individuals, firm, corporation, partnership, association, or other entity authorized to connect to the Town’s wastewater collection and treatment system pursuant to a revocable Connection Permit issued by the Board of Trustees. Also referred to as “User” or “Owner.”
- Y. DESIGN ENGINEER – The partnership, corporation, or individual who is registered as a Professional Engineer, according to Colorado statutes, who is hired by the Developer or Owner to conduct engineering design services and may be empowered by the Developer or Owner to act as his agent.
- Z. DEVELOPER – Shall mean any real property Owner, whether an individual or individuals, firm, corporation, partnership, association, governmental entity or other entity bearing the actual costs of construction of Sewer Line(s) on a particular property.
- AA. DIP – Ductile Iron Pipe
- BB. TOWN – The Town of Fairplay or its Activity Enterprise.
- CC. TOWN ENGINEER – Individual or representative of an engineering firm who is a Professional Engineer retained by the Town responsible for consultation with the Board of Trustees regarding feasibility studies, design and construction of sewer services, main line extensions, inclusions, and plant expansions.
- DD. TOWN FACILITIES – The Town’s sewer lines, treatment works, and all easements and appurtenances thereto. The term does not include Service Lines.
- EE. DOMESTIC – Refers to any water use by temporary or permanent residential use of property which is not a Commercial use, which results in wastewater discharge to the Public Sewer.
- FF. EASEMENT – An acquired legal right for the specific use of land owned by others.
- GG. ENTERPRISE – See definition for Activity Enterprise.
- HH. EQR – Equivalent Residential Unit
- II. FIXTURE UNIT – Any plumbing unit supplying wastewater to the Town’s collection system such as, but not limited to: sinks, toilets, dishwashers, urinals or water fountains, as described by the International Plumbing Code (IPC).
- JJ. GOVERNMENT/EXEMPT USER – A Customer or potential Customer of the Town, which pays regular service charges to the Town for use of the Town’s services, but is not subject to those property taxes which would otherwise provide revenues to the Town, which revenues are used only to defray Town expenses, as well as provide financial reserves for repair, replacement or mandatory future improvements.

- KK. GPCD – Gallons per capita per day
- LL. GRADE – The slope or fall of the line or pipe as measured from the point where the Service Line leaves the building to the point where it taps the Town’s wastewater collection system or in the case of Sewer Mains, the pipe slope between manholes.
- MM. GREASE TRAP/INTERCEPTOR – A plumbing appurtenance that is installed on a sanitary Sewer Service to intercept oily and greasy waste from wastewater discharge. Also referred to as a Grease Trap.
- NN. INSPECTOR – That person acting under the direction and authorization of the Board of Trustees, whose duties shall include inspection of all excavations, installation of, and repairs to any tap of a building’s Service Line or Sewer Mains.
- OO. IPC – International Plumbing Code
- PP. MANAGER – Person responsible for the daily operations of the Town’s wastewater collection and treatment facilities.
- QQ. OWNER – The record Owner of any property receiving, required to receive, or which will, upon some action (e.g., physical connection after payment of all fees and charges) receive wastewater collection, treatment, or related service from the Town. Although others may act on the Owner’s behalf, (e.g., one who applies for a Connection Permit or uses the Owner’s property, such as a tenant), the Owner is the party which is ultimately responsible for compliance with the Town’s Criteria, including payment of all fees and charges. May also be referred to as “Customer” or “User.”
- RR. PARTY – See definition for Person.
- SS. PERSON – Any individual or individuals, firm, company, corporation, partnership, association, governmental authority or agency, or other entity.
- TT. PROFESSIONAL ENGINEER – Engineer licensed in the State of Colorado according to State of Colorado statutes.
- UU. PUBLIC SEWER – Any sewer collector lines, mains, appurtenances or accessories owned by the Town.
- VV. PVC – Polyvinyl chloride pipe.
- WW. REAL PROPERTY – All lands or interest in lands to which title or the right of title has been acquired from the government of the United States or from sovereign authority ratified by treaties entered into by the United States or from the State of Colorado.
- XX. RULES AND REGULATIONS - The Town of Fairplay adopted “Rules and Regulations.”
- YY. SAND INTERCEPTOR - A plumbing appurtenance that is installed on a sanitary Sewer Service to intercept sand and grit from wastewater discharge. Also referred to as a Sand Trap.
- ZZ. SDR – Standard Dimension Ratio
- AAA. SERVICE LINE – That private sewer line extending from the building being served by the Town to the Sewer Main.

BBB. SEWER LINE – See Sewer Main.

CCC. SEWER MAIN – Any pipe or conduit for carrying wastewater, as so designated by the Town, to which the Town may allow the connection of Service Lines. Such sewer mains are part of the Public Sewer/Collection System.

DDD. SHALL – Means “mandatory.”

EEE. SPECIFICATIONS – The technical specifications, as adopted or accepted by the Town, for the design, installation and construction of sewer lines, services, and appurtenances.

FFF. STUB OUT – A portion of Service Line extending from the Sewer Main to the boundary of a property to be served or a portion of Sewer Main extending from a manhole, installed for the convenience of the Developer or property Owner.

GGG. SYSTEM INVESTMENT FEE (SIF) – A charge established and assessed by the Town upon each potential User, based upon the number of Equivalent Residential Units (EQRs) or portions thereof, which are charged to compensate the Town for any and all capital costs, including, without limitation, reserve funds, sinking funds and associated debt service costs of the Town’s treatment plant and collection system, associated with provision of new or expanded connection permits.

HHH. TAP – The physical connection between the private Service Line and the Town’s Sewer Main.

III. UNCC – Utility Notification Center of Colorado

JJJ. USER – Any real property Owner, whether an individual or individuals, firm, corporation, partnership, association governmental entity or other entity to whose property sewer service is supplied by the Town. Also referred to as “Customer” or “Owner.”

KKK. USER FEE – The monthly fee/charge paid by all Customers for the revocable privilege of using lines, equipment, and treatment services provided by the Town.

1.3 MINIMUM STANDARDS

- A. The Town’s review and acceptance will only be to determine if the plans and specifications conform to the Town’s requirements. The Town’s review and acceptance will not relieve the Developer, Design Engineer and Contractor from responsibility for any variation from the Town requirements or adequate design standards.
- B. The Town’s review and acceptance shall not constitute any assumption of responsibility or liability for the design or construction. It is the intent and purpose of these Criteria to obtain high quality construction throughout, with the completed work complying with the Town’s Criteria.

1.4 RELATIONSHIP TO OTHER STANDARDS

- A. Whenever a provision of these Criteria, and any other provision in any law, ordinance, resolution, rule, policy, or regulation of any kind contain any restrictions covering any subject matter within these Criteria, the most restrictive standard shall apply.
- B. The provisions of these Criteria are minimum requirements that do not preclude the use of more restrictive standards by the Design Engineer.

- C. Adherence to these Criteria does not remove the Developer's responsibility to investigate and obtain any other regulatory permits or approvals, from either local, regional, state, or federal agencies, that may be required for a particular project.

1.5 REVIEW AND ACCEPTANCE

- A. All construction drawings, specifications, and supporting documents submitted to the Town for review, comment, and acceptance shall be prepared by, or under the direct supervision of, a Professional Engineer registered in the State of Colorado. Said Professional Engineer shall be responsible for the design, preparation of the construction drawings and reports, determining material specifications as required, and reviewing the as-constructed field survey for accuracy.
- B. The construction drawings and specifications shall be reviewed by the Town for general compliance with these Criteria and the Town shall provide comments to the Developer or their agents regarding corrections, additions, and omissions.
- C. After final corrections are made and the plans are accepted, the plans set shall be signed by the Town. The signing of the plans will constitute acceptance. The acceptance is qualified in that the plans are reviewed and accepted for concept only and the plan acceptance does not imply responsibility by the Town for accuracy and correctness. The plans acceptance does not imply that quantities of items indicated on the plans are the final quantities required. The plans acceptance shall not be construed for any reason as acceptance of financial responsibility by the Town for additional items not shown that may be required during construction.
- D. If the Design Engineer responsible for the plans disagrees with any requested changes to the submitted plans that may be required by the Town for acceptance, such disagreement shall be brought to the attention of the Town, and if required by the Town, in writing.
- E. The Seal of the Design Engineer on plans so corrected and accepted for construction will signify that the Design Engineer has reviewed, approved, and authorized said corrected plans for construction.

SECTION 2 SUBMITTAL REQUIREMENTS

2.1 GENERAL

- A. The requirements provided in this section are the minimum for sanitary sewer system design and are not meant to be all-inclusive. Other requirements may be needed for a complete design.
- B. The Design Engineer shall consider operational and maintenance aspects of the sewer system as well as constructability in their design.

2.2 CONSTRUCTION DRAWINGS

- A. General
 - 1. All construction drawings shall be legible and submitted on 24" x 36" sheets.
 - 2. Construction drawings shall be prepared using the Colorado State Plane Coordinate System, 1983, Central.
 - 3. Furnish to the Town for review, an electronic copy (pdf) and three (3) full size, hardcopies of all plans, supplemental specifications, and supporting data for facilities to be installed under these Criteria. One (1) hardcopy will be returned to the Applicant with review comments.
- B. Cover Sheet
 - 1. Project name and location.
 - 2. A vicinity map specifying the project's geographical location with north arrow and adequate graphic scale and detail to be clear and uncluttered.
 - 3. A legend describing all line types, symbols, and abbreviations.
 - 4. Sheet index.
 - 5. Name of Owner/Developer.
 - 6. Name of the Design Engineer responsible for the design and preparation of the Construction Drawings and the Land Surveyor responsible for the project survey information.
 - 7. Project benchmark and two (2) horizontal control points to serve as the basis of the project horizontal control.
 - 8. Any additional information deemed necessary by the Design Engineer or Town.
 - 9. Construction notes from Appendix D.
- C. Utility Plan
 - 1. A general overview of the entire project including, but not limited to, streets (complete with names), alleys, lot and block numbers, all proposed and existing utilities on and within 100 feet of the project site, all existing and proposed

easement, rights-of-way on and adjacent to the project site, and stormwater facilities.

2. The entire project shall be shown on one (1) sheet unless the project is too large to show sufficient detail.
3. Proposed project phasing for utilities and structures.
4. Proposed point(s) of connection for sanitary sewer mains, to the existing system. All existing sanitary sewer lines shall show existing manholes, complete with rim and invert elevations, and pipe diameter.
5. Any other information deemed necessary by the Design Engineer or Town.

D. Construction Plan View

1. A key map shall be required on each sheet to aid in drawing orientation and locating the sheet construction in relation to the overall project.
2. Provide a north arrow and horizontal graphic scale.
3. Provide existing and proposed roads and alleys complete with names and label proposed lot and block numbers.
4. Provide existing wet and dry utilities.
5. Show and label proposed and existing easements, rights-of-way, and property lines.
6. List the name of adjacent developments or lots and their property Owners.
7. Provide linear stationing along the proposed sanitary sewer mains.
8. Provide match lines indicating references to adjacent sheet(s) of design.
9. Any other information deemed necessary by the Design Engineer or Town.

E. Construction Profile View

1. Show all existing and proposed utility crossings. Existing utility crossing locations and elevations shall be obtained from the current project design field survey. Existing utilities shall be potholed as required to perform complete and accurate design prior to construction plan acceptance. Field obtained elevations shall be provided on the Construction Drawings complete with when the field information was gathered, the exact location where it was collected, the firm that performed the potholing and surveying, and the date the survey was conducted.
2. Provide the diameter, type of pipe material, length of pipe between manholes, provide pipe slope, manhole inverts in and inverts out (main and service line), rim elevations, and manhole stationing for proposed sanitary sewer lines.
3. Vertical and horizontal grids showing the existing ground surface (dotted) and proposed surface (solid).
4. Provide match lines indicating references to adjacent sheet(s) of design.

5. Any other information deemed necessary by the Design Engineer or Town.

F. Standard Drawing Sheets

1. Include all project applicable Town Construction Details as part of the construction plans set. Construction Details are provided as part of these Criteria.
2. Where Standard Drawings are not applicable to the work, provide project specific construction details. These shall include construction details of critical connections, atypical crossings, special structures, and any other details deemed necessary by the Design Engineer or Town.

2.3 HYDRAULIC REPORT

A. General

1. A hydraulic analysis for the sanitary sewer collection system for a given project shall be submitted by the Town, as a report, for review and acceptance. The hydraulic analysis report shall be submitted with the Construction Drawings and will be reviewed by the Town in the same review and acceptance process provided in these Criteria.
2. Projects that move forward without an accepted sanitary sewer collection system hydraulic analysis report are subject to possible design changes, including but not limited to, pipe re-alignment, upsizing, extensions, and additional stub outs.

B. Title Page

1. Report title.
2. Project name and location.
3. The name, address, and phone number of the Owner, Developer and Design Engineer that prepared the report.
4. Report preparation date.

C. Engineer Certification Sheet

1. The report shall be prepared by or under the supervision of a Professional Engineer, licensed to practice in the State of Colorado, possessing adequate experience in the design of sanitary sewer collection systems. The report shall contain a certification sheet with the following statement to be signed and sealed by the Design Engineer:
2. "I understand that acceptance by the Town of Fairplay does not relieve the Design Engineer's responsibility for errors, omissions, or design deficiencies for which the Town of Fairplay is held harmless."

Registered Professional Engineer
(Affix Seal)

D. Table of Contents

E. Project Description and Location

1. Clearly state the location of the project. Provide a site vicinity map specifying the project's geographical location and the project area in acres.
2. State the land use zoning, estimated number of residential lots or living units and commercial square footages.
3. Indicate if the project will be phased. Elaborate on the anticipated timing for each project phase and the phase's associated building and infrastructure construction.
4. Identify the location of sewer system connections and the pipe diameter.

F. References and Appendices

1. Provide a page referencing all design criteria, resources, equations, and modeling software used in preparing the hydraulic report.
2. Provide appendices, as necessary, to include modeling result printouts, spreadsheet calculations, copies of demand assumption data, and hand calculations.

G. Analysis of Sanitary Sewer Systems

1. If the development is phased, the sanitary sewer system shall be analyzed for full build out. This evaluation shall include the development's sanitary sewer flows and anticipated offsite sanitary sewer flows impacting the sanitary sewer system within the development.
2. Evaluate the development's sanitary sewer sizing for capacity to convey offsite flows.
3. Undeveloped areas shall have sanitary sewer flows calculated based on the current or anticipated land use or zoning of the property.

H. Conclusions

1. Discuss analysis results for all pipe evaluations.
2. Confirm that acceptable pipe velocities and flow depth criteria are met.
3. If design constraints arise and pipe velocity, flow depth, minimum allowable slope per pipe diameter, or any other criteria requirements cannot be maintained, the Design Engineer shall provide the Town written explanation as to why the criteria is violated, why the non-standard sewer system design should be accepted, and request a variance.
4. Discuss any sanitary sewer main oversizing required by the Town over and above what is necessary for the development needs.
5. Discuss potential impacts that upstream developments may have on the sanitary sewer capacity through the proposed development. Explain the capacity issues within the development and the proposed solutions for resolving them.

- I. Supplemental Engineering Calculations
 - 1. These calculations shall include, but are not limited to, pipe restrained lengths, external pipe load analysis, traffic loadings, and casing pipe wall thickness.
 - 2. Any calculations deemed necessary by the Design Engineer or Town.

2.4 EASEMENTS

- A. When it is not feasible for sanitary sewer main installations to be in a dedicated public right-of-way, the installation shall be made within a dedicated easement.
- B. The minimum acceptable easement width shall be twenty (25) feet for water. Over-depth installations shall require wider easements. Electric, telephone, TV cable, gas, and future utilities shall be located completely within the right-of-way or easements approved by the respective utility provider.

Minimum Easement Width:

Calculate easement width as follows:

$$W = (\text{Depth to top of pipe} \times 2) + 3 \text{ feet (round up in 5-foot increments)}$$

Example:

$$10\text{-foot deep pipe} = (10 \times 2) + 3 = 23 \text{ feet}$$

W = 25-foot wide easement (rounded up)

WATER MAIN COVER DEPTH	MINIMUM EASEMENT WIDTH REQUIRED
9.5- FEET TO 11- FEET	25- FEET
11.1- FEET TO 13.5- FEET	30- FEET
13.6- FEET TO 16- FEET	35- FEET

- C. The mains within the easement shall be located in the middle of the easement or equal to the depth to the pipe invert, whichever is greater.
- D. There shall be no detention ponds, berms greater than three (3) feet, permanent structures, fences, trees, shrubs with mature height greater than three (3) feet, or other obstructions that will impede the ability of the Town to adequately maintain and service the main(s) located within the easement.
- E. Upon the discovery of any structure erected, constructed, installed or placed within an easement, the Town shall notify the Owner of such structure, in writing, and the Owner shall have ten (10) days to remove the offending structure at the Owner’s expense. Any structures not removed in ten (10) days shall be removed by the Town and the cost of such removal shall be assessed to the Owner of said structure. Failure to pay such costs within thirty (30) days shall result in a perpetual statutory lien for such costs being filed against the Owner’s property.
- F. Easements not dedicated with a plat, shall be dedicated by separate document and recorded prior to Town acceptance of the Construction Drawings. Easement dedication by separate document shall include:
 - 1. Easement Dedication Form. An easement dedication form shall be completed by the Developer. A standard easement dedication form is provided in Appendix E. The easement dedication form must be signed by the property Owner and notarized.

2. Exhibit Map. An exhibit map (8 ½" x 11") with sufficient description information to establish the legal boundary of the easement shall be provided. The exhibit map shall show and label all existing easements, property lines, and public rights-of-way. The Town may request additional information, not listed here, for the exhibit map.
3. A Written Legal Description of the dedicated easement boundary.

2.5 SUPPORTING DOCUMENTS

- A. Submit with the plans and specifications all necessary supporting documents required to fully construct the proposed project. This data shall include but not be limited to:
 1. Geotechnical Report
 - a. A geotechnical soils evaluation, prepared by or under the supervision of a Geotechnical Engineer, licensed in the State of Colorado, shall be submitted to the Town for review and shall be accepted by the Town prior to final Construction Drawing acceptance. The geotechnical soils report shall describe the classifications and characteristics of the soils encountered on the project and include recommended methods of backfilling and compaction.
 - b. The Geotechnical Engineer shall evaluate groundwater conditions for the site and provide recommendations for underdrains and sanitary sewer main groundwater barriers.
 2. A copy of the recorded plat of the subdivision in which the improvements are proposed to be installed.
 3. Copies of necessary permits from other governmental or private agencies having jurisdiction in the area of the proposed work.
 4. Grease trap/interceptor and/or sand/oil separator sizing and design calculations.
 5. Any other documents deemed necessary by the Design Engineer or Town.

2.6 AS-CONSTRUCTED RECORD DRAWING REQUIREMENTS

- A. The Contractor and Design Engineer shall be responsible for recording As-Constructed information on a set of Record Drawings kept at the construction site. A representative of the Developer shall monitor construction to assure that changes in construction (as approved in writing) and other pertinent details, such as horizontal location of manholes, manhole inverts and rim elevations, service tap locations, location of the end of a stub out, the location of the service line on the property, pipe sizes, depths, etc. are kept current on the As-Constructed Record Drawings.
- B. The As-Constructed Record Drawings shall show the original design information as well as the As-Constructed information. The original design information shall be shown as "lined through". The As-Constructed information shall be located in the same areas as the design information and shall be either "clouded" and/or made with a heavier line weight as the design information for clear differentiation. The month and year of the construction shall also be noted.
- C. Upon completion of construction and prior to acceptance by the Town, an electronic copy in AUTOCAD, GIS, and pdf formats, and three (3) full size paper copies of the As-Constructed Record Drawings, including profiles, shall be submitted to the Town for record.

- D. The As-Constructed drawings shall be complete with all “as-constructed” information, together with a certification, by the party responsible for construction, that all data thereon is accurate and represents actual “as constructed” conditions.
- E. As-Constructed drawings shall be prepared in the same coordinate system as the design drawings and be on Town coordinate system.

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SECTION 3 DESIGN CRITERIA

3.1 GENERAL

- A. The purpose of this section is to provide information for the design of a sanitary sewer collection system.
- B. This section is not intended to be inclusive of all situations. The Design Engineer may be required to use additional engineering judgment to meet the overall design intent for constructability, operations, and maintenance. **This Design Criteria typically applies to sanitary sewer mains fifteen-inches (15”) in diameter and smaller.** The Board reserves the right to make final determinations of the system design based on the best interest of the Town.

3.2 DESIGN FLOW

- A. The wastewater flows presented in this section are minimum criteria and the Town reserves the right to modify these criteria, at any time, for the design of specific projects.

Table 1 – Sanitary Sewer Design Flow

Use	Average Day Flow	Occupancy per Unit	EQR Equivalent (300 gpd)
Residential	100 gpcd	3.0 persons	1.0
Commercial	Based on EQR Equivalent, See Schedule of User Classifications and EQR Equivalents provided in the Rules and Regulations.		

- B. Peaking Factor
- A peak flow shall be based on Peak Flow Curve “G” from “ASCE Manual of Practice – No. 60.”

$$pF = \frac{18 + \sqrt{p}}{4 + \sqrt{p}}$$

P = Population in thousands
 - For determining commercial peaking factors, commercial average day flow based on an EQR Equivalent shall be converted to population using the residential EQR flow and the occupancy per unit.

3.3 INFILTRATION/INFLOW (I/I)

- A. Infiltration is groundwater entering the sewer system from defective joints, cracked pipes, and service connections.
- B. Inflow is surface water entering the sewer system from storm runoff, roof drains, and natural drainage.
- C. 100 gallons per day per inch-diameter per mile of pipe shall be added to the peak flow as

the allowance for I/I.

3.4 HYDRAULIC DESIGN

- A. Manning's Equation shall be used to determine required pipe size:

$$Q = VA = \left(\frac{1.49}{n} \right) AR^{\frac{2}{3}} \sqrt{S}$$

Where:

- Q = Flow (cfs)
 n = Manning's Coefficient of 0.013
 A = Flow Area (ft²)
 R = Hydraulic Radius (A/P)
 Where P = Wetted Perimeter
 S = Slope (ft/ft)

- B. All sewer pipes shall be designed to a maximum of half full ($d/D = 0.5$) where d = depth of flow and D = pipe diameter.
- C. All sewers shall be designed to transport average sewage flows at mean velocity of two feet per second (2 ft/s).

3.5 PIPE SIZE AND SLOPE

- A. No public sewer main shall be less than eight (8) inches in diameter.
- B. No building sewer service shall be less than four (4) inches in diameter.
- C. The slope between manholes shall be uniform. In no case shall the slope be less than the following for sewer mains and services.

Table 2 – Minimum Sanitary Sewer Main Slopes

Pipe Diameter (in)	Minimum Slope (%)
4"	2% or ¼ inch per foot
6"	1% or 1/8 inch per foot
8"	0.40%
10"	0.28%
12"	0.22%
15"	0.15%

- D. In the case where sewer slopes are over 15%, special provisions shall be made to prevent displacement. Such high velocity protection shall be shown on detailed drawings and approved by the Town.

3.6 DEPTH OF BURY

- A. In general, mains are to be sufficiently deep to receive wastewater from basements and to prevent freezing. The minimum cover above a main shall be nine and one half (9 1/2) feet deep measured from the top of the pipe. For every foot of cover that is out of compliance with minimum cover requirements, the Town will require insulation. The absolute minimum cover over a wastewater main is five and one half (5 1/2) feet deep measured from the top of the pipe.

3.7 LOCATION OF COLLECTION MAINS

- A. When possible, line extensions shall be installed in roads or streets which the Town of Fairplay, Park County, Colorado Department of Transportation, or other public agency, has dedicated for installation and maintenance as public right-of-way, in easements created for public utilities, or in easements granted to the Town.
- B. The standard location of sewer main, unless some major interference is present, is along the center line of the street, easement or right-of-way.
- C. Proposed sewer mains which may conflict with the placement of other underground facilities will require prior approval of the sewer placement location from the Town and by the controlling agencies whose facilities will be affected.

3.8 PHASED INSTALLATION AND STUB OUTS

- A. Sewer Main stub outs from manholes shall not exceed twenty (20) feet except lines which will be extended in the future.
- B. Whenever practical, designs to complete the manhole run shall be submitted for review to insure proper grade and alignment for future construction.
- C. Future extension of sewer main and service line stub outs shall be of like material using the same grade and alignment.
- D. Service Line stub outs from sewer mains shall be extended to each property at a point two (2) feet inside the property line and generally fifteen (15) feet upstream of the low lot corner.
- E. Service stub outs for flag lots shall be extended through the flag stem to the main body of the lot except where approved otherwise by the Town.
- F. Stub outs from the sewer main may be made to an unoccupied lot provided it is part of an officially platted and recorded subdivision. Such stub outs shall be extended to two (2) feet inside the property line and plugged with a watertight cap or plug insert.
- G. As-builts of the depth and locations of the end of the service stub out shall be recorded by the Town for future reference.
- H. Stub outs installed for developments approved in the past, may not be located in the proper place should the land uses change. The existing stub out may need to be replaced, at the property Owner's expense.
- I. Stub outs installed for developments approved in the past, may not be located in the proper place should the land uses change. The existing stub out may need to be replaced at the property Owner's expense.

3.9 PIPE MATERIAL

- A. Sanitary sewer collection mains (up to fifteen inch (15")) shall be polyvinyl chloride (PVC) SDR 35 pipe (Pipe Stiffness 46 psi) suitable for sanitary sewer flows.
- B. Alternative pipe materials shall only be used in the following situations with approval from the Town:
 - 1. If for any reason, sanitary sewer collection mains are installed less than four (4) feet measured from the finished ground elevation to the top of pipe, gravity sewer ductile-iron pipe shall be used.
 - 2. Where sanitary sewer collection mains are installed deeper than twenty (20) feet at the invert, polyvinyl chloride (PVC) SDR 26 shall be used.
 - a. For alternative pipe material installation situations, external load (earth and live load) analysis is required to verify that the minimum alternative pipe material is suitable for the specific project conditions. If the alternative pipe material is unsuitable, the Design Engineer shall specify an acceptable pipe material.
 - b. External pipe load calculations shall be submitted to the Town for review and acceptance.
 - 3. Changes between pipe materials are not permitted along a continuous sewer main. The alternative pipe material shall be installed from manhole to manhole.

3.10 MANHOLE LOCATION AND SIZE

- A. General
 - 1. Manholes shall be located so as to limit possible storm water entrance.
 - 2. Manholes shall be installed at the end of each sewer line, at all sewer line intersections, grade changes, alignment changes, or where sewer mains change diameter.
- B. Manhole Location
 - 1. All manholes shall be located within a dedicated street right-of-way or within a dedicated easement of appropriate width.
 - 2. Manholes must be located to allow unassisted, all weather access by the Town maintenance vehicles which range in size from ½ ton to 2½ tons. At a minimum, all-weather roads shall be ten (10) feet wide with four-inches (4") of compacted aggregate base course.
 - 3. If the all-weather road terminates at the manhole it provides access to and is longer than fifty (50) feet, an appropriately sized turn-around shall be provided.
 - 4. The Design Engineer shall design the all-weather road based on these requirements and for the specific project conditions.
 - 5. Manholes located in areas where access, in the opinion of the Town, is not possible, will not be approved for construction.
- C. Manhole Size and Spacing

1. The following table provides the diameter of standard manholes and the maximum manhole spacing for each sanitary sewer pipe diameter:

Table 3 – Standard Manhole Diameter and Spacing

Sewer Pipe Diameter (in)	Manhole Diameter (ft)	Manhole Spacing (ft)
Up to 12"	4 ft	400 ft
15"	5 ft	400 ft

2. External drop manholes will be permitted only in extreme and special conditions where approval is granted by the Town. The external drop sections must be totally encase in reinforced concrete and placed on an adequate foundation.

3.11 MANHOLE INVERTS

- A. All manhole inverts shall be designed with a 0.2 foot drop except where cast-in-place manholes are permitted by the Town to be installed over existing sanitary sewer mains. In such cases, the existing sanitary sewer pipe grade determines the elevation drop across the manhole by constructing the cast-in-place manhole over the existing straight sewer main and removing the upper half of the pipe.
- B. Changes in alignment in excess of thirty (30) degrees shall have a 0.3 foot drop in the invert through the manhole.
- C. Changes in direction at manhole intersections shall not be greater than ninety (90) degrees.
- D. Where a smaller sanitary sewer main joins a larger one, the smaller sanitary sewer main crown elevation shall match the crown elevation of the larger sanitary sewer main. This includes sanitary sewer Service Lines.
- E. Where the invert elevation difference between the invert in and invert out is twenty-four inches (24") or more, an internal drop manhole shall be provided.

3.12 GROUNDWATER BARRIERS

Groundwater barriers shall be installed across the sanitary sewer collection main, ten (10) feet upstream of every manhole, in areas where high groundwater is anticipated or where underdrains are installed.

3.13 SEWER MAIN AND SERVICE ENCASEMENTS

- A. No general statement can be made to cover all encasement conditions, therefore only typical encasement situations are addressed in this section. Encasement requirements shall ultimately be determined by the Town on a case-by-case basis.
- B. An encasement shall be considered the open trench installation of a casing pipe.
- C. Where sanitary sewer lines cross beneath potable water lines with less than eighteen-inches (18") clearance, sanitary sewer lines cross above potable water lines, or the ten (10) feet horizontal clearance between potable water lines and sanitary sewer lines cannot be maintained, pipe encasement shall be designed and constructed so as to protect the potable water line.
- D. The encasement pipe shall extend a minimum ten (10) feet on either side of the

crossing measured from the outside diameter of the crossed pipe. Longer casing pipes may be required depending on the encasement situation. C-900 is an acceptable replacement for concrete encasement.

- E. For any atypical encasement situations, the Design Engineer shall size the encasement pipe such that the inside clearance is at least one-inch (1") greater than the maximum outside diameter of the casing spacer runners.
- F. Encasements Required by Other Agencies
 - 1. For sewer mains crossing another agency's right of way or easement, the encasement requirements for that crossing shall be specified by the agency granting permission to cross.
 - a. Such crossings shall be subject to approval by the Town to avoid conflicts in requirements or standards between the Town and the agency granting permission to cross.
 - b. A letter, permit, or approved crossing application from the agency granting permission to cross, must be provided to the Town before the crossing is approved by the Town.
 - c. The Town shall not accept any crossings imposed with an annual User or crossing fee from the agency granting permission to cross. All crossing fees, if applicable, shall be paid by the Developer prior to installation of the encasement.

3.14 SEWER MAIN BORINGS

- A. Installation of sanitary sewer mains through another agency's right-of-way, easement, or other, may require a bored or jacked casing pipe to facilitate main installation. The type of bored casing material and its properties will be specified by the agency granting permission to cross. Such crossings shall be subject to approval by the Town to avoid conflicts in requirements or standards between the Town and the agency granting permission to cross.
 - 1. A letter, permit, or approved crossing application from the agency granting permission to cross, must be provided to the Town prior to the boring.
 - 2. The Town shall not accept any bored crossings imposed with an annual User or crossing fee from the agency granting permission to cross. All bored crossing fees, if applicable, shall be paid by the Developer prior to the boring.
 - 3. The minimum requirements for bored casings shall be in accordance with the technical specifications and must be accepted by the Town.
 - 4. The proposed boring method shall be submitted to the agency granting permission to cross and the Town for acceptance. The boring method shall allow for installation of the casing pipe to meet the line and grade requirements provided in these Criteria.
 - 5. The required bore length of casing pipe shall be determined by the agency granting permission to cross and the Town.
- B. If the bored casing must cross another utility line, the crossing shall have a minimum twenty-four inches (24") of vertical clearance from the outside diameter of the casing pipe to the outside diameter of the crossed utility line.

3.15 SEWER SERVICES

- A. Sanitary sewer services shall be polyvinyl chloride (PVC) SDR 35 pipe (Pipe Stiffness 46 psi).
- B. Four (4) inch diameter Service Lines shall have a maximum length of two hundred and fifty (250) feet.
- C. Service Lines projected to be longer than two hundred and fifty (250) feet in length shall have pipe six (6) inches in diameter or as otherwise required by the Town.
- D. A cleanout, the same diameter as the Service Line diameter, shall be installed on the Service Line at one hundred (100) foot intervals.
- E. For cleanout access, a prefabricated formed wye with a riser pipe shall be installed to the finished grade. Cleanout shall have a proper waterproof cap.
- F. A cleanout shall be installed near the building foundation (exterior) on all Service Lines.
- G. Sewer Service Lines shall not be installed in trenches with other conduit/utilities.
- H. Sewer Service Lines shall be located a minimum ten (10) feet downstream of water services, wherever feasible.
- I. No sanitary sewer Service Line shall cross property lines.

3.16 SEWER MAINS/SERVICES IN RELATION TO HIGHWAYS AND OTHER UTILITIES

- A. Sanitary sewer services and collections mains shall have a minimum ten (10) feet horizontal and eighteen inches (18") vertical separation from all utilities measured from outside diameter.
- B. Crossings
 - 1. Water mains crossing a non-potable pipe (e.g., gravity sanitary or storm sewers, raw surface water pipes, reclaimed water pipes, and liquid petroleum pipes) must be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the non-potable pipe (e.g., gravity sanitary or storm sewer, raw surface water pipe, reclaimed water pipe, and liquid petroleum pipe). This must be the case where the water main is either above or below the sewer with preference to the water main being located above the non-potable pipe.
 - 2. At crossings, one full length of water pipe must be located so both joints will be as far from the non-potable pipe as possible. Special structural support for the water and non-potable pipe may be required.
- C. Stream and Drainage Channel Crossings
 - 1. All sewer line crossings below stream and drainage channels shall, at a minimum, be restrained sewer ductile iron pipe or C900 within a steel encasement, where the steel encasement is further encased in reinforced concrete. Stream and drainage channel crossings shall require special design by the Design Engineer based on the crossing conditions. All details of the design shall be submitted to the Town for review and approval.

2. Where the sewer line crossing will be above the stream or drainage channel flow line, special design will be required by the Town. All details of the design shall be submitted to the Town for review and approval.

D. Highway Crossings

1. All work shall be accomplished in accordance with the appropriate permit issued by the responsible agency having jurisdiction over the work.
2. Crossings under highways shall consist of restrained sewer ductile iron pipe laid inside a steel casing, which is jacked or bored beneath the roadway.
3. Casing pipes shall be designed and installed in accordance with these Criteria.

3.17 GREASE TRAP/INTERCEPTORS, SAND AND OIL SEPARATORS

- A. A grease trap or interceptor is required for all food service establishments engaged in activities of preparing, serving, or otherwise making available for consumption foodstuffs that use one or more of the following preparation activities: cooking by frying (all methods), baking (all methods), grilling, sautéing, rotisserie cooking, broiling (all methods), boiling, blanching, roasting, toasting, or poaching, infrared heating, searing, barbequing, and any other food preparation or serving activity that produces a consumable food product in or on a receptacle requiring washing to be reused. A grease trap or interceptor shall be required to receive the drainage from fixtures and equipment including pot sinks, pre-rinse sinks, soup kettles or similar devices, work stations, or sinks into which kettles are drained, automatic hood wash units and dishwashers without pre-rinse sinks. A grease trap or interceptor will be required in non-cooking or other commercial establishments if they meet the definition of a Non-Cooking Establishment.
- B. Non-Cooking Establishments shall be defined as those establishments engaged in the preparation of pre-cooked foodstuffs that do not include any form of cooking on-site; but that may produce a consumable food product in or on reusable plates or utensils requiring washing to be reused.
- C. Any biological additive (s) placed into the grease trap or building discharge line including but not limited to enzymes, emulsifiers, de-emulsifiers, surface active agents, commercially available bacteria, or other additives designed to absorb, purge, consume, treat, liquefy, or otherwise eliminate fats, oils, and grease shall not be allowed. Chemical treatments such as drain cleaners, acid, or other chemical solvents designed to dissolve or remove grease shall not be allowed to enter the grease trap.
- D. Maintenance of Grease Traps and Grease Interceptors shall be done only by a business professionally normally engaged in the servicing of such plumbing fixtures. An individual property owner may be permitted to accomplish maintenance specified by the Regulation on a case-by-case basis with written permission from the Town. Written records of grease trap or interceptor maintenance will be maintained for three years. All such records will be available for inspection by the Town at all times. These records shall include:
 1. Facility name, address, contact person, phone number
 2. Company name, address, phone number, and contact person responsible for performing the maintenance, cleaning, pumping or repair of the grease trap or interceptor.
 3. Types of maintenance performed.
 4. Dates maintenance was performed
 5. Frequency of service

- 6. Approximate amount of grease removed
 - 7. Destination of grease removed
 - 8. The Town shall provide a customer and/or business with a form for recording Grease Trap/Grease Interceptor maintenance. The business or customer shall provide on copy of the completed form to the Town immediately following maintenance of any Grease Trap/Grease Interceptor within the Town.
- E. No grease trap shall be installed which has an approved rate of flow more than 55 gallons a minute. Flow control devices shall be so designed that the total flow through the grease trap is no greater than the rated capacity of the trap or interceptor. No flow control device having adjustable or removable parts shall be allowed. For the purpose of this section, the term fixture shall mean and include each plumbing fixture, appliance, apparatus or other equipment required to be connected to or discharge into a grease trap or interceptor. The minimum acceptable volume for a grease interceptor shall be not less than one thousand (1,000) gallons.
- F. When determining the minimum size of Grease traps required, the following shall be considered by the Town and the Town has the sole discretion to determine which sizing method is appropriate under the circumstances:
- 1. **Fixture Capacity Method:** The physical size of each fixture compartment to be connected to the grease trap shall be measured and the capacity determined. The drainage load in gallons shall then be computed assuming the drainage load to be equal to 0.75 times the total physical capacity. The sum of the drainage loads for each fixture compartment to be connected to a single Grease Trap will be the total divided by the drainage period for the fixture compartments connected to determine the flow rate to the Grease Trap in GPM. Multiply the Grease Trap flow rate thus determined, or the rated capacity of the flow control device, by the minimum retention time (15 minutes) to determine the required liquid capacity of Grease Trap to be installed.
 - 2. **Fixture Unit Method:** Under this method the fixture compartment outlet or trap arm size shall be utilized to determine the fixture compartment drainage load in GPM, assuming one (1) fixture unit equivalent produces a flow rate of 7.5 GPM. The sum of the drainage loads for each fixture compartment to be connected to a single Grease Trap or the rated capacity of the flow control device will be the total drainage load in GPM. Multiply this total drainage load in GPM by the minimum retention time (15 minutes) to determine the required liquid capacity of the Grease Trap to be installed. The following fixture unit equivalent values shall be utilized when sizing Grease Traps under the Fixture Unit Method:

Fixture Outlet Trap or Trap Arm size	Fixture Unit Equivalent Value
1-1/4"	1
1-1/2"	3
2"	4
2-1/2"	5
3"	6
4"	8

Maximum Number Of Fixtures Connected	Capacity of Fixtures in Gallons
1	110
3	335
4	450
5	560
6	675

- G. Grease traps and interceptors shall be cleaned, as a minimum according to the following schedule (this may be adjusted on a case-by-case basis by the Town):
- | | |
|--|----------------|
| Cleaning Frequency | |
| Up to 450 Gallons (small under sink stand-alone) | Every 4 months |
| 560 to 1000 Gallons | Every 6 months |
| 1500 Gallons | Every 9 months |
- H. Sand, Soil and Oil Interceptors: All carwashes, truck washes, garages, service stations, car and truck maintenance facilities, fabricators, utility equipment shops, properties on which occurs vehicle parking or storage, automotive service or repair, machine shops, and/or mechanics providing service to the general public, including but not limited to service stations, truck stops, gasoline stations, automotive/car care centers, auto body shops, automotive dealerships, motorcycle shops, machine shops, welding shops, tractor/farm implements dealerships, bus barns, or any facility that generates sand, grit and/or petroleum by-product waste that would discharge into the wastewater collection system and other facilities that have sources of sand, soil, and oil shall install a sand, soil and oil trap interceptor. The system shall be sized to effectively remove sand, soil and oil at the expected flow rates. The establishment will provide to the Town the manufacturer's cleaning recommendations for each sand/oil interceptor.
- I. Sand/Soil/Oil Interceptors shall be maintained by regularly scheduled removal of accumulated sand and oil so that they properly operate as intended to intercept sand and oil for the customer's wastewater and prevent discharge of sand and oil to the Town's collection system. Maintenance of sand/oil interceptors shall be done only by a business/professional normally engaged in the servicing of such plumbing fixtures. An individual property owner will not be permitted to accomplish maintenance specified by this Regulation.
- J. Maintenance shall be performed before the retention capacity of the interceptor is exceeded. Detailed and accurate records of maintenance shall be maintained on-site. The records shall include detailed information relating to the amount of sand and oil removed compared to the size of the Sand/Oil Interceptor and one copy of the completed form shall be provided by the customer to the Town immediately following completion of maintenance of any Sand/Oil Interceptor within the Town.
- K. A copy of the invoice from the business professional reporting the date the interceptor was cleaned, the amount of oil and/or sand removed and a recommendation of how frequently the interceptor should be cleaned must be sent to the Town after each cleaning. A copy of all Sand/Oil Interceptor cleaning invoices are to be on file at the business being served and available to the Town upon request.
- L. As a minimum, any Sand/Oil Interceptor in service in the Town shall be served every 120 days. A variance from this requirement may be obtained when the Affected Property owner can confirm that there is no normal use during any given 120 calendar day period. With written authorization from the Town, the maximum time variance between services is 365 calendar days.
- M. Biological treatment, emulsification of oil/or grease with enzyme treatments shall not be a substitute for servicing of Sand/Oil Interceptors at the frequency determined by the Town and is not allowed. The Town may inspect the Sand/Oil Interceptor monthly to determine the load on the fixture and the effectiveness of maintenance activities. These inspections may determine that more frequent maintenance than previously specified is required.

- N. The Town shall have the right to enter the premises of all establishments having grease traps, grease interceptors or Sand/Soil and Oil Interceptors for the purpose of inspecting the installation, operation, maintenance and records. Users shall provide documentation of grease trap cleaning within 30 days of notice by the Town. The Town will assess a 50 percent monthly service fee surcharge to all customers failing to provide documentation of grease trap, grease interceptor or sand/oil cleaning.
- O. Any extraordinary costs incurred by the Town due to interference, damage or special processing necessary in the treatment and/or collection system shall be paid by the business. The direct cost of labor, equipment and materials incurred in rectifying the interference or damage shall be billed directly to the business by the Town.

3.18 UNDERDRAINS

- A. Underdrain systems are not maintained by the Town. The Developer/Owner shall accept all liability and responsibility for underdrain installation.
- B. Underdrains shall not be connected to the sanitary sewer collection system. Underdrains shall only discharge into the storm drainage system or designed detention areas.

3.19 WASTEWATER PUMPING STATIONS (LIFT STATIONS)

- A. The design of wastewater pumping stations (lift stations) within the Town's collection system shall be accomplished on a case-by-case basis.
- B. Preliminary considerations and rationale for the need for the pump station shall be reviewed in detail with the Town's Board prior to proceeding with preliminary and final design.
- C. Lift stations design shall be prepared by or approved by the Town Engineer. The cost of engineering and construction shall be the responsibility of the entity requiring the facility.

SECTION 4 TECHNICAL SPECIFICATIONS

4.1 COORDINATION OF WORK

PART 1 - GENERAL

A. Description

This section generally describes the project coordination of work.

B. Interruption of Utility Service

1. Coordinate any interruption of utility services with the utility Owner.
2. Make connections to the existing system requiring the interruption of service during the time designated by the utility Owner.

C. Permits and Regulations

1. The Owner/Developer shall be responsible for obtaining all permits necessary to accomplish the work. This includes all permits by any Local, Regional, or State general purpose governing agency relative to excavation and construction within public right-of-way, permits required by the State of Colorado Water Quality Control Division, including necessary site approvals.
2. The Owner/Developer shall comply with all applicable regulations of the State, County, and Municipality, including all ordinances concerning subdivision development and excavation requirements.
3. All Criteria of the Town shall be applicable to all construction and operations of sanitary sewerage facilities within the boundaries of the Town of Fairplay and those which are proposed for acceptance by annexation to the Town. These Criteria shall be supplemented by all Rules and Regulations of the State of Colorado, Water Quality Control Division, insofar as they do not conflict with these Criteria. Any conflict shall be governed by interpretation and ruling by the Board whose decision shall be final.

D. Detours and Other Traffic Controls

1. When construction operations are located within streets make provisions at cross streets and walks for free passage of vehicles and pedestrians by bridging or other approved methods. Do not block streets or walks without prior approval.
2. Maintenance of access through the construction site by the traveling public shall be maintained by the Contractor unless a street closure is approved in writing by the local governing authority. Access to all abutting residences and properties shall be maintained to the maximum extent possible. It shall be the responsibility of the Contractor and/or Developer to coordinate access to all adjacent private properties with the respective Owners.
3. The Contractor shall furnish sufficient signs and other controls including flagman to facilitate the directing of traffic controls and shall be in accordance with the "Manual on Uniform Traffic Control Devices", latest edition; and the provisions of all local governing authorities including the Town of Fairplay, State of Colorado, and Park County.

E. Protection of Existing Facilities and Utilities

1. It is the Contractor's or Owner's responsibility to call for utility locates. Call UNCC by dialing 811.
2. Before commencing work, obtain information concerning location type, and extent of concealed existing utilities on the site and adjacent properties. Consult records and personnel of local utility companies, municipal utility department, and telephone company. File "Notice of Excavation" with these agencies prior to commencing work.
3. Protect from damage any underground pipes, utilities or structures encountered during construction. Restore any damaged underground obstructions to their original condition at no cost to the Town unless evidence of other arrangements satisfactory to all parties is presented to the Town.

F. Construction Inspection

1. All work to be accomplished shall be done under the review and inspection of the Town or its representative.
2. Notification to the Town shall be made by the Contractor and/or Developer indicating proposed schedules and times of work. Work accomplished without prior notification and review by the Town's representative may not be acceptable to the Town.
3. It shall be the responsibility of the Owner/Developer to adequately demonstrate to the Town of Fairplay that all facilities have been constructed in accordance with the Criteria of the Town. Any costs relative to testing and/or inspection of such facilities which are requested to be accepted by the Town but were not inspected by the Town representative at the time of construction, shall be borne by the Owner/Developer.

PART 2 – MATERIALS (Not Used)

PART 3 – EXECUTION (Not Used)

4.2 TRENCHING, BACKFILLING, AND COMPACTING

PART 1 - GENERAL

A. Description

This section covers excavation and trenching, including but not limited to dewatering, preparation of subgrade, pipe bedding, backfilling, compacting, groundwater barriers, materials testing, and finish grading for underground pipelines and appurtenances.

B. Construction Staking

1. All work shall be constructed in accordance with lines and grades shown on the drawings and as established by the Design Engineer and/or Town. These lines and grades may be modified by the Design Engineer only after re-approval by the Town.
2. Line and grade stakes shall be set for each manhole or other appurtenances and at each twenty-five (25) foot station along the pipeline proceeding upstream. The

Contractor shall check the elevation at each grade stake and at intervals between stakes from a string line placed between the grade stakes. Should a variance from the design elevation be found, the pipeline shall be removed to a point where vertical and horizontal alignment is satisfactory and reconstruct in accordance with these specifications.

3. All facilities, equipment and assistance shall be furnished by the Contractor and/or Developer to facilitate checking alignment and grade of the pipe by the Town's representative and workmen involved in the construction.

C. Job Conditions

1. Drainage and Groundwater

- a. Maintain the excavation and site free from water throughout the work. Remove any water encountered in the trench to the extent necessary to provide firm subgrade, to permit joints to be made dry at the final grade and to prevent entrance of water into the pipeline. Accomplish the foregoing with the use of sumps and gravel blankets, well points, and/or lines.
- b. All work must be done in a dry trench and no water will be permitted to discharge down the pipe previously laid.
- c. The discharge from groundwater pumping shall be released to an approved natural drainage channel or other location to prevent drainage into the sanitary sewer facilities and damage to public or private property.

2. Blasting

- a. Should the use of explosives be necessary, employ only competent, experienced personnel.
- b. Comply with all Local and State requirements.

PART 2 - MATERIALS

A. General

1. All material shall be free from frozen matter, stumps, roots, brush, other organic matter, cinders, corrosive material, debris, broken asphalt and concrete, and any other objectionable material that is not suitable in the opinion of the Town.
2. If job excavated material is not sufficient or suitable, suitable material shall be imported.

B. Stabilization Material

1. If the existing soil in the trench bottom is judged to be unsuitable by the Town or the Design Engineer, at a minimum, the top six inches (6") of the trench subgrade shall be removed and replaced with stabilization material.
2. Stabilization material shall be crusher-run rock, conforming to CDOT #357 (AASHTO M43).

Table 5 – Stabilization Material – CDOT #357

Sieve Size	Percent Passing by Weight (%)
2-1/2 inch	100
2 inch	95 -100
1 inch	35 – 70
½ inch	10 – 30
No. 4	0 – 4

3. Stabilization material shall be compacted to seventy percent (70%) relative density.

C. Geotextile (Filter) Fabric

1. Geotextile fabric shall be placed between foundation stabilization material and pipe bedding material.
2. Geotextile fabric shall conform to CDOT, Road and Bridge Construction Specifications, latest revision, section 712.08.

D. Bedding Zone Material

1. Embedment Method – Class B

Table 6 – Well-Graded Pipe Bedding Material

Sieve Size	Percent Passing by Weight (%)
3/8 inch	100
No. 4	70 – 100
No. 8	36 – 93
No. 16	20 – 80
No. 30	8 – 65
No. 50	2 – 30
No. 100	1 – 10
No. 200	0 - 3

Table 7 – Squeegee Pipe Bedding Material

Sieve Size	Percent Passing by Weight (%)
3/8 inch	100
No. 200	0 – 3

2. This material shall be compacted to seventy percent (70%) relative density.

E. Groundwater Barrier

1. Unified Soil Classification GC – clayey gravels, clayey sandy gravels
2. Unified Soil Classification SC – clayey sands, clayey gravelly sands
3. Unified Soil Classification CL – inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, clean clays.
4. Flowable Fill

F. Flowable Fill

1. Flowable fill (flowfill) shall be a controlled low-strength, self-leveling concrete material consisting of a mixture of Portland cement, aggregate, fly ash, water, and admixtures conforming to the following:
 - a. Portland Cement: ASTM C150, Type II, maximum of 50 pounds per cubic yard.
 - b. Aggregate: Concrete sand, selected material from the excavation, imported material, or a combination thereof. Aggregate size shall meet the following gradation:

Table 8 – Flowable Fill

Sieve Size	Percentage Passing by Weight (%)
1 ½ inch	100
1 inch	80 to 100
¾ inch	60 to 100
3/8 inch	50 to 100
No. 4	40 to 80
No. 100	10 to 40

- c. Soluble Sulfate Content: shall not exceed 0.3% by dry weight.
 - d. Water: Potable quality.
 - e. Water-Cement Ratio: 3.5:1 maximum.
 - f. Fly Ash: Class C per ASTM C618, maximum of 300 pounds per cubic yard.
 - g. The minus No. 200 Sieve fraction shall be nonplastic.
2. Proportion the flowfill to be a flowable, nonsegregating, self-consolidating, nonshrink slurry.
3. The water content shall not exceed that required to provide a mix that will flow, can be pumped, and will maintain the soil in suspension without segregation of the aggregate while it is being placed.

4. Proportion the aggregate, cement, and water either by weight or volume.
5. Use as little cement for each cubic yard of material produced as necessary to make the flowfill flowable.
6. The temperature of the flowfill discharged into the trench shall be below 90°F.
7. The unconfined compressive strength at seven (7) days shall be a minimum of fifty (50) psi and a maximum of three-hundred (300) psi per ASTM D4832.
8. Flowfill shall not be used as pipe bedding material under any circumstance.

G. Insulation Board

1. Insulation board shall be extruded polystyrene foam board with a minimum thickness of four-inches (4").
2. Insulation board shall be suitable for in-ground geotechnical applications.
3. Manufacturers: Dow Chemical Company STYROFOAM or approved equivalent.

H. Trench Backfill

1. Suitable backfill material shall be soil obtained from the excavation that is free of frozen material stumps, roots, brush, other organic matter debris, and other items.
2. Backfill materials that are obtained from trench excavated materials to the extent such material is available, shall be screened if particles larger than three (3) inches are present. Screening shall be performed either while backfilling directly into the trench or during the trenching operation. If screened during trenching, the material shall be maintained free of unscreened material during the handling and backfilling process. Hand selecting rocks from the backfill as it is placed into the trench will not be permitted in lieu of screening. Backfill shall be moisture conditioned prior to being placed in the trench.
3. Compaction and moisture requirements in the trench backfill shall comply with the following:
 - a. State Highway – 100% relative compaction in paved and shouldered areas; 95% relative compaction in all other areas. Moisture content +/- 2%.
 - b. Paved roadways, sidewalks and other areas to receive pavement – Top twelve (12") to 95% relative density; remainder 90% relative density. Moisture content +/- 2%.
 - c. Gravel Roadways – 90% relative density for entire trench length.
 - d. Sodded or lawn areas – 90% relative density. Moisture content +/- 2%.

PART 3 - EXECUTION

A. Preparation

1. Clearing

Remove stumps, roots, brush, other vegetation and debris from areas that will be disturbed by the construction operations.

2. Pavement Removal

- a. Remove any pavement, curbs, gutters, sidewalks and other surface improvements necessary to install the pipeline and appurtenances.
- b. Remove bituminous pavement to clean, straight lines at locations necessary to accommodate the work. Width of removal for pipelines shall be kept to a minimum as dictated by trenching operations but shall extend six inches (6") to twelve inches (12") beyond the limits of trenching excavation. Make pavement cuts with spade-bitten air hammer, saw or other approved method so as to provide a straight and square edge. Should a cut edge become damaged during the course construction, the edge will be re-cut prior to pavement replacement.
- c. Remove concrete surfacing materials to neatly sawed edges with saw cuts made to a minimum depth of 1½ inches or as otherwise required to neatly remove surfacing materials. Make saw cuts in straight lines and at right angles to the alignment of sidewalks or curb and gutter. If the saw cut should fall within thirty inches (30") of an existing construction joint, expansion joint or edge, the concrete shall be removed to the joint or edge.

3. Sod Removal

In lawn areas, cut and roll back sod before trenching. Store sod for re-installation after completion of backfilling operations.

4. Topsoil Removal

- a. Strip existing topsoil from areas to be disturbed by construction operations.
- b. Stockpile in areas designated by the Design Engineer. Keep topsoil segregated from non-organic trench excavation materials and debris.
- c. Do not compact topsoil during stripping, stockpiling or placing.

5. Sheeting, Shoring and Bracing

- a. Except where trench banks are cut back on a stable slope, provide and maintain all sheeting necessary to protect adjoining grades and structures from caving, sliding, erosion or other damage all in accordance with applicable codes and governing authorities.
- b. Do not remove any sheeting unless the pipe strength is sufficient to support the trench loads based on trench width measured to the back of sheeting.
- c. Remove sheeting and shoring as excavations are backfilled in a manner to

protect the construction or other structures, utilities or property. Do not remove any sheeting after backfilling.

B. Trench Excavation

1. Dewatering

- a. The Contractor shall be responsible for obtaining all permits required for dewatering and shall be responsible for all associated dewatering costs.
- b. Provide and maintain means and devices to remove and dispose of water entering the trench excavation during the time the trench is being prepared for the pipe laying, during the laying of the pipe, and until the pipe and trench zone backfilling has been completed. These provisions shall apply during both working and nonworking hours, including lunch time, evenings, weekends, and holidays. Dispose of the water in a manner to prevent damage to adjacent property and in accordance with regulatory agency requirements.
- c. Do not drain trench water through the pipeline under construction. Do not allow groundwater to rise around the pipe until pipe and trench zone backfilling is complete.
- d. Good surface drainage shall be provided around temporary excavation slopes to direct surface runoff away from the excavations. In no case shall water be allowed to pond at the top of excavations along the alignment. Slopes shall also be protected against erosion.

2. Trench Widths

- a. Excavate trenches to provide pipe clearance for proper pipe installation, jointing and embedment.
- b. Provide a minimum clearance of twelve inches (12") on each side of the pipe.
- c. The maximum allowable width of trench at one foot (1') above the top of the pipe shall not be greater than the outside diameter of the pipe plus thirty-six inches (36") for all sizes.

3. Length of Open Trench

- a. Limit the length of open trench to the amount of pipe which can be installed in one (1) working day.
- b. Pipeline installation shall follow trench excavation within 100 lineal feet (100').
- c. Trench backfill shall follow pipe installations within 100 lineal feet (100').
- d. Approved cleanup shall follow trench excavations within 400 lineal feet (400').

4. Excavation

- a. Unless otherwise indicated on the drawings, all excavations shall be made by open cut. Provisions for installations of sanitary sewer lines and appurtenances in other than open cut conditions shall be specifically detailed in the drawings and construction documents for the project.

- b. Over-Excavation
 - i. Whenever wet or otherwise unstable material that is incapable of supporting pipe is encountered in the bottom of the trench, over excavate such material to a depth suitable for construction on stable pipe bedding.
 - ii. If the trench is excavated below the required grade, refill any part of the trench excavated below the grade with pipe bedding or stabilization material. Place the material over the full width of trench to the established bottom of trench grade in compacted layers not exceeding six (6) inches deep.
 - c. Rock Excavation
 - i. Where rock excavation is necessary, over excavate the trench bottom a minimum of six inches (6") below the bottom of the pipe twenty-four (24) inches in diameter or less and nine inches (9") for pipe larger than twenty-four (24) inches.
 - ii. Backfill over-excavation with compacted pipe bedding or stabilization material.
- C. Backfilling and Pipe Installation
- 1. Foundation Stabilization
 - a. Backfill areas over-excavated due to unsuitable subgrade material with stabilization material. Place stabilization material over the full width of the trench and compact in layers not exceeding six (6) inches deep up to the required bottom of trench grade.
 - b. Place geotextile fabric on top of the stabilization material prior to placement of the bedding material.
 - 2. Installing Buried Piping
 - a. Accurately grade trench bottoms to provide uniform bearing and support for each section of pipe on undisturbed ground at every point along its entire length.
 - b. Provide a smooth uniform surface in the pipe subgrade where bedding material will be placed.
 - c. Dig bell holes and depressions for joints after the trench bottom has been brought to final grade. Bell holes and depressions shall be only of such length, depth and width as required for properly making the particular type of joint.
 - d. The use of earth mounds for bedding the pipe and adjusting for grades shall not be allowed.

- e. Embedment material shall be placed in the trench on prepared subgrade in accordance with requirements of these specifications. The embedment material shall be brought to a density beneath the proposed pipeline as required herein.
- f. Shape the pipe bedding material to provide a continuous uniform bearing support at all points along its length except at required bell holes.
- g. The embedment material shall be placed a minimum of twelve inches (12") over the pipe.
- h. Place backfilled material above embedment materials in a manner to prevent damage or misalignment of the pipeline. Place in lifts of a thickness to acquire the specific backfill density or in conformance with other regulatory requirements.
- i. Unless otherwise specified or required by local governing authority, all backfill should be placed in a manner to achieve the required compaction.

3. Method of Compaction

- a. Use compaction methods and equipment appropriate for the backfill material. Do not use equipment or methods that will transmit damaging shocks to the pipe.
- b. Compaction by jetting shall not be permitted unless material is of suitable material as determined by the Town. In no case will compaction by jetting be permitted in state highways or paved or gravel roadways.
- c. Do not use mechanical compacting equipment in the zone above the horizontal centerline of the pipe and below a plane one (1) foot above the top of the pipe.
- d. Rock and bedrock encountered in the excavation shall not be used in backfill.

D. Field Quality Control

1. Density Testing and Control

- a. Density testing as may be required by the Town's representatives shall be the responsibility of the Contractor and/or Developer.
- b. Results of such density testing shall be reported directly to the Town by the testing agency. All reports shall be submitted with the seal and signature of a registered Professional Engineer experienced in the testing of soil materials.
- c. Density tests in the vicinity of vaults or manholes shall be performed at a minimum of one (1) foot away from the edge of vault/manhole sections or valve boxes.
 - i. Tests shall be performed in random directions from the vault, manhole, or valve box, on separate lifts.
 - ii. A minimum of one (1) test shall be performed, on opposite sides of the vault, manhole or valve box, for every two (2) feet of backfill material.

2. Soil Compaction Tests

- a. Conduct soil testing in accordance with the requirements of ASTM C698 or AASHTO T99, "Standard Method of Test for Moisture-Density Relations of Soils Using a 5.5 lb. Rammer and a twelve inch (12") Drop". Use AASHTO T99 method A, B, C, or D as appropriate on soil condition and judgment of the testing laboratory.
- b. Samples tested shall be representative of materials to be placed (or altered). Obtain optimum moisture density curve for each type of material or combination of materials encountered or utilized.
- c. Testing shall include Atterberg Limits, grain size determination, and specific gravity. Use test results for a basis for compaction control.
- d. Conduct tests for density control during compaction operations in accordance with the requirements of ASTM D2922, ASTM D1556, or ASTM D2167.

3. Test Frequency

- a. The Town representative shall determine the location of all density testing to be performed.
- b. As a minimum, three (3) tests for every 1,000 lineal feet of trench shall be performed. The Contractor and/or Developer shall excavate material to the depth directed by the Town representative to the testing and backfill test holes in accordance with these specifications.

A. Surface Restoration

1. Fine grade all areas disturbed by the construction operations after completion of backfilling and compacting. Areas which are to receive pavements, surfacing, topsoil or landscaping shall be graded as required to allow installation of the specific surface treatment. Grade all other areas to match the existing ground line.
2. Replace suitable topsoil to the depth of stripping over all areas disturbed by the construction that do not receive other surface treatment.

B. Restoration

1. Restore to their original conditions all surface improvements encountered during trenching or construction. Said improvements shall include but not be limited to the following: surfacing, sidewalks, curb, valley gutters, trees and shrubs, other surface vegetation, driveways, mailboxes, utilities, signs or other improvements.
2. Meet the requirements specified for the particular type of improvement to be repaired or replaced.
3. All surface improvements shall meet the requirements of the local governing agency and/or the requirements shown on the contract drawings approved by the Town.

4.3 SANITARY SEWER MAIN AND SERVICE INSTALLATION

PART 1 – GENERAL

A. Description

This section addresses the installation of sanitary sewer collection mains and services and construction practices that may be used for installation.

B. Job Conditions

1. Pipe delivered for construction shall be strung so as to minimize entrance of foreign material.
2. All openings in the pipeline shall be closed with watertight plugs when pipe laying is stopped at the close of a day's work or for other reasons, such as rest breaks or meal periods. Do not allow debris, tools, clothing or other materials to enter the pipe.
3. Use effective measures to prevent uplifting or floating of the pipeline prior to completion of backfilling operations.
4. Do not install pipe when the trench contains water or when the trench bottom is unstable. Water that is encountered in the trench shall be removed to the extent necessary to provide a firm subgrade.

PART 2 – MATERIALS

A. Pipe – Refer to pipe material specifications herein.

B. Manholes – Refer to manhole specifications herein.

C. Service Lines – Refer to sewer Service Line specifications herein.

PART 3 - EXECUTION

A. Trenching, Backfilling, and Compaction

Refer to trenching, backfilling, and compaction specifications herein.

B. Connections to the Existing System

1. Connections to the existing sewer system shall be made at an existing manhole or by setting a new manhole on the existing line.
2. At locations where a connection to an existing sanitary sewer collection main is to be made, the Contractor shall locate the existing main both vertically and horizontally and verify its exact size and material prior to start of construction.

C. Sewer Main Installation

1. The only acceptable method for laying sanitary sewer lines shall be with a laser.
2. Begin pipe laying at the lowest point, unless directed otherwise by the Town, and install the pipe with the spigot ends pointing in the direction of the flow and bells pointing uphill.

3. Lay the pipe true to line and grade.
4. As each length of pipe is placed in the trench, the joint shall be completed in accordance with the pipe manufacturer's recommendations.
5. The offset between the invert shall be less than 1% of the inside pipe diameter.
6. Secure the pipe in place with the specified bedding material tamped under and around the pipe. Do not walk on small diameter pipe or otherwise disturb any piping after jointing has been completed.
7. All foreign matter or soil shall be removed from the inside of the pipe before it is lowered into its position in the trench and shall be kept clean at all times during and after laying. All openings along the line of the sewer shall be securely closed and during suspension of work at any time, suitable pipe plugs or closures shall be placed to prevent water, soil or other materials from entering the pipeline.
8. Where the depth of public sewer main is less than eight (8) feet deep measured from the top of the pipe to the finished ground surface, four inches (4") of blueboard insulation protection shall be provided.

D. Sewer Service Installation

1. Sanitary sewer service connections to the collection system shall be made with a wye or tapping saddle and shall be separated by at least five (5) feet along the sewer main length, including connections on the opposite side of the collection main.
2. Connect all Service Lines to mains with a wye or saddle in the top one-half of the sewer main. Connections made in the lower half or at mid-point of the main shall have prior approval of the Town and may require the installation of a backflow prevention device.
3. Connection of Service Lines to mains shall only be accomplished with the use of an acceptable tapping machine or hole saw. Wye saddles will be permitted when holes are cut using the appropriate hole template and the cuts are no larger than 1/4" larger than template outline.
4. Plug all Service Lines stub outs with an air cap or plug unless the Service Line will be immediately connected to a building sewer.
5. All basement drains are required to have a check or backflow valve.
6. Building sewer services less than eight (8) feet deep in snow removal areas shall be installed with four inches (4") of blueboard insulation protection.
7. Fittings, Couplings, Wyes, and Saddles
 - a. Fittings, couplings, wyes and saddles shall be the same material as the pipeline or as specifically manufactured for the particular installation.

- b. Jointing of dissimilar materials shall be permitted only with approval of the Town representative. Jointing of such dissimilar materials shall be through the use of fittings, couplings, wyes, saddles, adapters or adhesives specifically manufactured for such transitions.

4.4 POLYVINYL CHLORIDE (PVC) GRAVITY SEWER LINE

PART 1 - GENERAL

A. Description

This section is a minimum guideline for furnishing and installing polyvinyl chloride (PVC), non-pressure pipe and fittings.

B. Pipe Markings

1. The following shall be clearly shown on the exterior of the pipe:
 - a. Manufacture's name.
 - b. Appropriate ASTM designation.
 - c. SDR number.

C. Delivery, Storage and Handling

1. Avoid damage to pipe from impact, bending, compression or abrasion during handling and storage.
2. Store pipe on flat surface which provides even support for the pipe barrel with bell end overhanging. Do not stack pipe higher than five feet (5').
3. Do not store pipe and fittings in direct sunlight for extended periods (greater than two or three weeks). Any discoloration of the pipe material shall be evidence of ultraviolet damage and shall be reason for rejection.
4. Ship rubber gaskets in cartons and store in a clean area away from grease, oil, ozone producing electric motors, heat and the direct rays of the sun.
5. Use only nylon protected slings to handle pipe. The use of hooks, bare cables or chains will not be permitted.

D. Criteria for Acceptance

1. Pipe which has any of the following visual defects shall not be accepted:
 - a. Improperly formed pipe such that pipe intended to be straight has an ordinate, measured from the concave side of the pipe exceeding 1/16" per foot of length.
 - b. Pipe which is out-of-round to prohibit proper jointing.
 - c. Improperly formed bell and spigot ends.
 - d. Pipe which is fractured, cracked, chipped or damaged in any manner.

- e. Pipe or fittings not properly marked.
2. The manufacturer will provide a certification to the Town that all products supplied to the project are in conformance with these specifications.

PART 2 - MATERIALS

A. Pipe Material

1. Sanitary sewer collection mains and services shall be polyvinyl chloride (PVC) with a maximum Standard Dimension Ratio (SDR) of 35 (Pipe Stiffness 46 psi).
2. All four-inch (4") through fifteen-inch (15") PVC shall conform to ASTM D3034.

B. Joints

1. Joints shall be bell and spigot, push-on with single rubber gasket. Joints shall conform to ASTM D3212.
2. Joining of dissimilar pipe materials shall be accomplished with a specially manufactured rubber connection with stainless steel tightening bands.
3. Manufacturers: Mission Rubber Company, Fernco, or equivalent.
4. Solvent cement joints may be used for four inch (4") and six inch (6") pipe.

PART 3 – EXECUTION

Refer to sanitary sewer pipe and service installation specifications herein.

4.5 DUCTILE IRON GRAVITY SEWER LINE

PART 1 – GENERAL

A. Description

This section is a minimum guideline for furnishing and the installation of gravity sewer ductile iron pipe (DIP) and appurtenances.

B. Pipe Markings

1. Manufacture's name.
2. Appropriate ASTM designation.
3. Gravity sewer DIP shall be marked with the date of the lining system application and the numerical application sequence of that date.

C. Delivery, Storage and Handling

1. Avoid damage to pipe from impact, bending, compression or abrasion during handling and storage.

2. Store pipe on flat surface which provides even support for the pipe barrel with bell end overhanging. Pipe shall be stored on a surface that provides even support for the pipe barrel. Pipe shall not be stored in such a way as to be supported by the bell.
3. Do not stack pipe higher than five feet (5').
4. Use only nylon protected slings to handle pipe. The use of hooks, bare cables or chains will not be permitted.
5. Do not skid or roll pipe into pipe already on the ground.
6. Do not damage pipe coating or lining.
7. Store and use pipe lubricants in a manner which will avoid contamination.
8. Pipe, gaskets, and all other installation materials shall be stored in accordance with the manufacturer's specifications.

D. Criteria for Acceptance

1. Pipe which is fractured, cracked, chipped or damaged in any manner shall not be accepted.
2. The manufacturer will provide a certification to the Town that all products supplied to the project are in conformance with these specifications.

PART 2 - MATERIALS

A. Pipe Material

1. Gravity sewer ductile iron pipe (DIP) shall be manufactured in accordance with AWWA C150 and AWWA C151.
2. Gravity sewer DIP shall have an exterior asphaltic coating, minimum one (1) mil thick, on the pipe exterior.

B. Lining

Gravity sewer DIP shall be interior lined with ceramic epoxy, forty (40) mil nominal thickness. (Protecto 401 Ceramic Epoxy Lining or equivalent.)

C. Joints

1. Pipe joints shall be push-on gasket in conformance with AWWA C111.
2. Restrained joints shall be mechanical joint, restrained joint or restrained slip joint.
3. The use of flanged joints is not permitted.

D. Fittings

Fitting shall be furnished in accordance with AWWA C104, C110, and C111.

E. Polyethylene Encasement

1. All buried DIP shall be encased in polyethylene in accordance with AWWAC105, Method A.
2. Polyethylene encasement shall be eight (8) mil minimum thickness.

PART 3 – EXECUTION

Refer to sanitary sewer pipe installation specifications herein.

4.6 SANITARY SEWER SERVICE LINES

PART 1 – GENERAL

This section addresses the furnishing and installation of sanitary sewer service lines, clean-outs, and other appurtenances.

PART 2 – MATERIALS

A. Pipe

1. Refer to PVC pipe material specifications herein.
2. Services for new construction shall have tee or wye connections.

B. Tapping Saddle

1. Tapping saddle shall be manufactured from specially formulated high durometer polyvinyl chloride (PVC).
2. Saddle shall be supplied with T-300 stainless steel clamps for attaching the saddle to the main line.
3. Tapping saddle shall be tee style.
4. Manufacturers: Fernco Flexible Tap Saddles (Tee Style) or equivalent.

C. Coupling

1. Flexible coupling may be used when bell and spigot joints cannot be made.
2. Flexible couplings shall be made from elastomeric polyvinyl chloride (PVC).
3. Coupling shall be supplied with T-300 stainless steel clamps.
4. Manufacturers: Fernco or equivalent.

D. Cleanouts

1. Cleanout shall be rated for HS-20 traffic loadings.
2. Cleanout riser shall be the same material and diameter as the service piping and solvent welded.

3. Cleanout riser shall be capped with a threaded brass cleanout plug.
4. Cleanout riser shall be installed in a cast iron or ductile iron service box. Service box lid shall be marked with an "S" or "Sewer."
5. Service Box Manufacturers: Tyler-Union or equivalent.

PART 3 – EXECUTION

Refer to sanitary sewer service installation specifications herein.

4.7 MANHOLES

PART 1 - GENERAL

- A. Description
 1. This section addresses sanitary sewer manholes and includes the acceptable products, materials, and construction practices to be used in the construction and installation of manholes.
 2. Manholes shall be furnished with all accessories, including base, cone section, gaskets, and ring and cover.
- B. Delivery, Storage and Handling
 1. Manholes shall be handled, stored, and protected in such a manner as to prevent damage to materials.
 2. All joint surfaces shall be free from dirt, oil, and grease at the time of installation.

PART 2 - MATERIALS

- A. Precast Concrete Manholes
 1. Except as otherwise specially approved by the Town, manholes shall be precast concrete and manufactured in accordance with the referenced specifications.
 2. Precast manhole bases, barrels, and cone sections shall be manufactured in accordance with ASTM C478 and shall be made with Type I/II cement. All cone sections shall be the eccentric type with the exception of shallow (flat top) manholes.
 3. Refer to concrete specifications herein.
- B. Ring and Cover
 1. Standard iron ring and covers shall be HS-20 load capable cast iron conforming to ASTM A48.
 2. All rings shall be maximum eight-inches (8") and minimum four-inches (4") in height.
 3. The word "SEWER" shall be cast in the cover.
 4. Pick-hole shall be one and on-half inch (1 ½") wide by one-half inch (½") deep.

5. Manholes outside of road rights-of-way shall have a locking type cover and ring bolted to the concrete cone.
6. Cast iron ring and cover shall be supplied with a bituminous coating.
7. Covers shall be a non-perforated, non-skid pattern.
8. Manufacturers : Neenah Foundry - Stock No. R-1706; Castings, Inc. – Stock No. MH-400-24 C.I.; Hutchinson Foundry and Steel Inc. – MH-400 or equivalent.

C. Steps

1. Step shall be made of a minimum of 3/8-inch diameter grade 60 steel reinforcing rod completely encapsulated in a copolymer polypropylene plastic, conforming to ASTM A615, ASTM C478, and ASTM D4101.
2. Manhole steps shall have a maximum vertical spacing of twelve inches (12") unless otherwise specified by the Town.
3. Manufacturers: M.A. Industries, Inc PS2-PFS, PS2-PF, or equivalent.

D. Grade Adjustment Rings

1. Precast grade adjustment rings shall be manufactured in accordance with ASTM C478 and shall be made of Type I/II cement.
2. Grade adjusting rings shall be sealed with approved sealer and grouted inside and out.
3. Grade adjustment rings between the ring and cover shall not exceed twenty-four inches (24") to the first step.

E. Mortar

1. Mortar shall be Sand-Cement grout, using the following ratio of ingredients:
 - a. One (1) part Portland Cement conforming to ASTM C150, Type I/II.
 - b. Two (2) parts sand conforming to ASTM C144.
 - c. One-half (1/2) part hydrated lime conforming to ASTM C207, Type S.

F. Grout

- G. Grout shall be pre-mixed or job-mixed nonmetallic and nonshrink.

H. Prefomed Plastic Gaskets

1. All prefomed plastic gaskets shall conform to Federal specifications SS-S-00210 (210-A), Type I, rope form, 1.5 inches (1.5") diameter.
2. Manufacturers: Henry Ram-nek or equivalent.

I. Modular Mechanical Seals

1. Modular mechanical sealing devices shall utilize interlocking synthetic rubber links shaped to continuously fill the annular space between the pipe sleeve or coring and the passing pipe. Assembled links shall form a continuous rubber belt around the pipe, with a pressure plate under each bolthead and nut.
2. Manufacturers: Pipeline Seal and Insulator, Inc., Linkseal; Advance Products & Systems, Inc., INNERLYNX, or equivalent.

J. Manhole Encapsulation System

1. Heat-shrinkable sleeves shall be high shrink irradiated and cross-linked polyethylene impermeable backing, coated with protective heat activated adhesive.
2. Manufacturers: WrapidSeal or equal.

K. Interior Coating

1. Manholes that may be subject to deterioration from hydrogen sulfide (H₂S) shall be interior coated with an approved coating material as specified by the Design Engineer.
2. The Design Engineer shall determine if conditions require an interior coating to protect the manhole from corrosion.

L. Intermediate Platforms

1. Manholes having twenty (20) feet or more from manhole rim to invert may require intermediate manhole platforms.
2. Intermediate platforms shall be designed by the Design Engineer. Platform design shall be submitted to the Town for review and approval.

M. Marker Post

Marker post shall be USA BlueBook, Rhino Fiberglass for Sewer, Stock Number 70460.

PART 3 - EXECUTION

A. Manhole Installation

1. Provide segmental precast concrete barrel sections a maximum of four feet (4') in length with preformed flexible gasket material between each barrel section as jointing material.
2. Provide one, one foot (1') high barrel section beneath a reducing ring or cone cap to bring the manhole ring and cover to within eight inches (8") of desired grade.
3. Provide precast concrete two inch (2") high grade adjustment rings to the ring and cover to the desired grade.

4. Where the pipeline passes through a manhole in straight alignment without changing directions, the sanitary sewer pipe may be laid through the manhole base and the top of the pipe cut out after a cast-in-place concrete base has been installed. The bottom of the manhole shall be smoothly shaped to conform to the pipe as shown on the Construction Details.
5. Concrete floors in the manhole shall have a broom finish.
6. Where intersecting pipelines or pipelines requiring deflections at manholes require that inverts on the manholes be shaped to match the pipe sections, such construction shall be accomplished in accordance with the Construction Details.
7. Form the flowline configuration of intersection pipes to allow for free uninterrupted flow of sanitary sewerage through and out of the manhole. All channel inverts shall be finished smooth by steel troweling. All inverts shall be placed and finished with a single pour of cast-in-place concrete.
8. Placement of grout and/or other material to repair and/or reshape the manhole invert shall not be permitted unless specifically approved by the Town.
9. Cast-in-place concrete bases for manholes shall be constructed in a manner to provide for a smooth level surface on which a vertical barrel section shall be placed. Completely watertight joints shall be made utilizing preformed flexible gasket material or a precast concrete base section may be utilized.
10. A marker post shall be placed a minimum two (2) feet, maximum three (3) feet, behind the manhole facing the street.
11. Install an external drop manhole where the invert elevation difference between the invert in and the invert out is twenty-four inches (24") or more.

4.8 CONCRETE

A. Cement

1. All cement shall be Portland Cement conforming to ASTM C150, Type II.

B. Aggregate

1. All fine and coarse aggregate shall conform to ASTM C33.

C. Water

All water shall be free from objectionable quantities of silt, organic matter, alkali, salts, and other impurities and conform to ASTM C94.

D. Admixtures

1. Air-Entraining Admixtures
 - a. Air-entraining agents will be permitted and shall conform to ASTM C260.
 - b. Total air content: 5.0% to 6.5%

2. Water Reducing Admixtures
 - a. Water reducing admixtures may be utilized if approved by the Town.
 - b. Water reducing admixtures shall be in conformance with ASTM C494, Type A.
 3. Fly Ash
 - a. When fly ash is used in concrete, the cement replacement shall not exceed 20%.
 - b. Fly ash shall conform to ASTM C618, Class F.
- E. Reinforcing Materials
1. All reinforcing materials shall conform to ASTM A185, ASTM A615, and ASTM A996.
 2. All bars shall be Grade 60.
- F. Mix Design
1. All concrete shall have a minimum 28-day compressive strength 4,000 pounds per square inch (psi).
 2. The water-cement ratio shall be 0.45.
 3. Slump shall be maintaining between one-inch (1") minimum to three-inch (3") maximum for all concrete.

4.9 TESTING SANITARY SEWER PIPELINES AND APPURTENANCES

PART 1 – GENERAL

- A. Description
1. This section addresses the testing of sanitary sewer collection mains, manholes, and appurtenances. The testing needs to be arranged for and conducted by the contractor or his representative. The town does not own the testing equipment.
 2. Contractor must give a minimum 24-hour notice to the town for inspections.
 3. All sanitary sewer pipelines shall be air tested per these specifications.
 4. All sanitary sewer manholes shall be vacuum tested per these specifications.
 5. All sanitary sewer collection systems shall be mandrel tested for deflection, lamp tested for straight and true alignment and video inspected per these specifications.

PART 2 – MATERIALS (Not Used)

PART 3 - EXECUTION

A. General

1. Testing shall be conducted when:

- a. Backfill and compaction has been completed but before paving and curb gutter improvements are installed.
 - b. Line and manholes have been thoroughly cleaned of all foreign material.
2. The Contractor shall furnish all equipment, labor, and incidentals necessary to perform tests. The pressure gauge shall be capable of indicating pressure to the nearest 0.1 pounds per square inch (psi) increment.
- B. Pipeline Testing
1. Alignment Testing
 - a. Each section of pipeline between manholes will be subject to testing by lamping to determine where proper alignment has been accomplished and whether any displacement of the pipe has occurred during construction.
 - b. The Contractor and/or Developer shall provide suitable assistance for the Town representative to observe this work.
 - c. The Contractor and/or Developer shall be responsible for repairing and retesting any alignment, displaced pipe or other defects discovered during this testing in accordance with these specifications.
 - d. "Full moon" shall be visible for vertical grade alignments. No less than "half moon" shall be visible for horizontal alignments.
 - e. The determination of the acceptability of the pipeline. Alignment by lamping shall rest solely with the Town's representative and his decision shall be final.
 2. Deflection Testing
 - a. Each section of sanitary sewer shall be tested for deflection by an independent testing firm as hired by the Contactor prior to Town acceptance and as deemed necessary within the warranty period by the Town.
 - b. The Contractor and/or Developer shall provide all necessary equipment, labor, and other facilities to accomplish testing. A mandrel certified by the pipe manufacturer's representative for dimensional quality shall be utilized.
 - c. The maximum allowable deflection for Town acceptance is 5% of the base internal diameter.
 - d. The maximum allowable deflection at the end of the warranty period shall be 7.5% of the base internal diameter.

- e. Mandrel outside diameters in inches is as follows:

Table 9 – Allowable Pipe Deflection – Mandrel Test

Pipe Size (in)	Nominal I.D. (in)	5% Deflection Mandrel	7.5% Deflection Mandrel
8"	7.920	7.524	7.326
10"	9.900	9.405	9.158
12"	11.780	11.191	10.897
15"	14.426	13.705	13.344

- f. Should the vertical deflection of the pipe be found to exceed 5% of the internal diameter, the Contractor will remove the pipe, install proper bedding, replace the pipeline material and properly place and compact all backfill material in accordance with these specifications. Any areas removed and replaced shall be subject to retesting.

3. Air Test

- a. Conduct air tests in conformance with ASTM F1417 and these specifications.
- b. All pressures in this section assume no groundwater back pressure. If groundwater is present, increase test air pressures to compensate for the back pressure. Each foot of groundwater produces approximately 0.433 psi back pressure. For groundwater in excess of five feet (5') above the pipe crown an infiltration test shall be used in lieu of air testing.
- c. Preparation for Tests
- i. Flush and clean the sewer line prior to the testing in order to wet the pipe surfaces and produce more consistent results.
 - ii. Plug and brace all openings in the main sewer line and the upper end of any connections. Check all leakage.
 - iii. If leaks are found, release the air pressure, eliminate the leaks and start the test procedure over again.
- d. Testing Procedure
- i. Conduct tests in conformance with ASTM F1417 and these specifications.
 - ii. Add air until the internal pressure of the sewer line is raised to approximately four (4) psi gauge at which time the flow of air shall be reduced and the pressure maintained between 3.5 and 4.5 psi gauge for a sufficient time to allow the air temperature to come to equilibrium with the temperature of the pipe.
 - iii. After the temperature has stabilized, the pressure shall be permitted to drop to 3.5 psi gauge at which time a stopwatch or a sweep second hand watch shall be used to determine the time lapse required for the air pressure to drop to 2.5 psi gauge.

- iv. Determine the time required for the air pressure to drop from 3.5 PSIG to 2.5 PSIG. The time elapsed shall not be less than:

$$T = \frac{DK}{0.085Q}$$

Where:

T = shortest time(s) allowed for the air pressure to drop 1.0 PSIG. K = 0.000419DL but not less than 1.0
 Q = leak rate in cubic feet/minute/square feet of internal surface = 0.0015 CFM/SF
 D = measured average inside diameter of pipe (in)
 L = length of test section (ft)

- v. The following table contains the test durations for pipe diameters between eight-inches (8") and fifteen inches (15"), for pipe lengths up to 500 feet.

Table 10 – Specified Test Duration for Length of Pipe Indicated (Duration in min:sec)

Pipe Diameter (in)	Pipe Length (ft)					
	0 -150	200	250	300	350	400
8	7:34	7:34	7:34	7:36	8:52	10:08
10	9:26	9:26	9:53	11:52	13:51	15:49
12	11:20	11:24	14:15	17:05	19:56	22:47
15	14:10	17:48	22:15	26:42	31:09	35:36

- vi. All plugs must be sufficiently braced to prevent blowouts and the pipeline must be completely vented before attempting to remove the plugs.
- vii. As a precaution, pressurizing equipment shall be provided with a regulator set to five (5) psi to avoid over-pressurizing and damaging an otherwise acceptable line.

4. Infiltration Test

- a. If groundwater exists in excess of five feet (5') above the pipe crown an infiltration test for leakage shall be used.
- b. The Contractor shall provide a pre-approved device capable of measuring flow in the pipe in fifteen (15) minute intervals and providing a total flow at the end of the testing period.
- c. Flow measurement shall be twenty-four (24) hours minimum and shall be conducted only after backfill and trench/area dewatering operations are complete and groundwater has returned to normal elevations.
- d. The maximum allowable infiltration for sanitary sewers shall not exceed 50 gallons per day/inch nominal diameter pipe/mile (0.95 gpd/inch/100ft).

C. Manhole Testing

1. Vacuum Testing

- a. Manholes shall be tested before the ring and cover and grade adjustment rings are installed, and after backfill and compaction is complete.
- b. Conduct tests in conformance with ASTM C1244 and these specifications.
- c. Preparation for tests:
 - i. All lift holes, joints, and other imperfections shall be filled with an approved non-shrink grout, to provide a smooth finish appearance.
 - ii. All pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the manholes.
- d. Test Procedure:
 - i. The test head shall be placed at the top of the manhole in accordance with the manufacturer's recommendation.
 - ii. A vacuum of ten-inches (10") mercury (Hg) shall be drawn in the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off.
 - iii. The time shall be measured for the vacuum to drop to nine-inches (9") mercury (Hg).
 - iv. The manhole shall pass if the time for the vacuum reading to drop from ten-inches (10") mercury (Hg) to nine-inches (9") mercury (Hg) meets or exceeds the values indicated in the following table:

Table 11 – Manhole Vacuum Testing Durations

Depth (ft)	Diameter (in)		
	48	60	72
	Time (seconds)		
8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97
26	64	85	105
28	69	91	113
30	74	98	121

- v. If the manhole fails any test, necessary repairs shall be made by an approved method and the manhole shall be retested until a satisfactory test is obtained.

D. Televising Sewer Mains

1. All sanitary sewer mains shall be televised three (3) months prior to the end of the warranty period or as deemed necessary within the warranty/construction period by the Town.
2. The televising shall be made by the Contractor or a Sub-consultant to the Contractor and the recording shall be submitted to the Town for review and acceptance.
3. The recording shall be made using a color camera, self-propelled or other, having sufficient light to show detail of problem areas and joints. Camera shall have a swivel head capable of looking up each service connection.
4. All recordings will have location (i.e. manhole # to manhole #), time, date, and footage displayed.

4.10 BORINGS AND ENCASEMENTS

PART 1 – GENERAL

A. Description

1. This section addresses the installation of a casing pipe by boring (or jacking) or as an open trench encasement and includes the acceptable products, materials, and construction practices.

2. The specifications provided in this section are the minimum requirements for casing pipe borings and encasements.

B. Design Considerations

1. The Design Engineer shall specifically design each casing pipe boring (or jacking) installation.
 - a. Casing pipe thicknesses specified in this section are based upon superimposed loads and not upon the loads which may be placed on the casing pipe as a result of jacking operations.
 - b. Provide increased casing pipe strength as necessary to withstand jacking loads.
2. The Design Engineer shall size the casing pipe such that the inside clearance is at least one-inch (1") greater than the maximum outside diameter of the casing spacer runners.

C. Requirements of Regulatory Agencies

1. The type of casing pipe material and its properties will normally be specified by the agency granting permission to cross. Such crossings shall be subject to approval by the Town to avoid conflicts in requirements or standards between the Town and the agency granting permission to cross.
 - a. The Contractor shall provide a letter, permit, or an approved crossing application to the Town from the agency granting the crossing approval.
 - b. The Contractor shall obtain the necessary bonds, insurance or indemnity required by the crossing permit for protection against damage, interference with traffic, or service that may be caused by the construction activities.

PART 2 - MATERIALS

A. Carrier Pipe

1. The carrier pipe shall be the same nominal diameter as the system main on either side of the casing pipe.
2. For situations where more than one (1) pipe joint falls within the casing pipe, the carrier pipe shall be restrained through the casing.
3. Casing spacers are required on all carrier pipes.

B. Casing Pipe

1. AWWA C900 Polyvinyl Chloride (PVC) Pipe
2. AWWA C905 Polyvinyl Chloride (PVC) Pipe
3. AWWA C151 Ductile-Iron Pipe (Polywrapped)

4. Steel Pipe
 - a. The casing pipe shall be new, smooth steel conforming to ASTM A139, Grade B (no hydro.)
 - b. Minimum Yield Strength – 35,000 psi
 - c. Exterior Coating – Not required.
5. The following table indicates what minimum casing pipe diameter and material to use in relation to the carrier pipe diameter. It also provides steel casing pipe minimum wall thicknesses and specifies when to use casing spacers and end seals. The Design Engineer shall confirm the required casing pipe diameter to use, especially when the carrier pipe has joint restraint.

Table 12 – Casing Pipe Specifications

Carrier Pipe Diameter (in)	Casing Pipe Diameter (in)	Boring and Encasement	Encasements Only
		Steel Casing Pipe – Minimum Wall Thickness (in)	Allowable Casing Pipe Materials
4"	8"	0.322	C900 PVC, C151 DIP, Steel
6"	12"	0.375	C900 PVC, C151 DIP, Steel
8"	16"	0.375	C900 PVC, C151 DIP, Steel
10"	20"	0.375	Steel
12"	24"	0.500	Steel
15"	30"	0.500	Steel

6. End seals are required on all casing pipe installations.
- C. Accessories
1. Casing Spacers
 - a. Casing spacers shall be in a “centered-restrained” configuration in the casing pipe.
 - b. Casing spacers shall be sized such that the height of the risers and runners have no less than one-inch (1”) clearance from the inside wall of the casing pipe.
 - c. Band
 - i. Casing spacers shall be constructed of circular stainless steel bands that bolt together to form a shell around the carrier pipe.
 - ii. Material – T-304 stainless steel

- iii. Minimum Thickness – 14 gauge
 - iv. Use an eight-inch (8”) band width for carrier pipes twelve-inches (12”) in diameter and smaller, unless otherwise recommended by the manufacturer.
 - v. Use a twelve-inch (12”) band width for carrier pipes larger than twelve-inches (12”) in diameter, unless otherwise recommended by the manufacturer.
- d. Liner
- i. Material – Polyvinyl Chloride (PVC)
 - ii. Minimum Thickness – 0.090-inches
 - iii. Hardness-Durometer – 85-90
 - iv. Electrical Properties – 1,380 V/min
- e. Risers (Support Structures)
- i. a. Material – T-304 stainless steel
 - ii. b. Maximum Thickness – 10 gauge
- f. Assembly Hardware
- i. Bolts – 5/16” - 18 x 2 1/2” T-304 stainless steel or plated
 - ii. Nuts – Hex, 5/16”
 - iii. Washers – 5/16” SAE 2330
- g. Runners
- i. Material - Glass Filled Polymer or Ultra High Molecular Weight (UHMW) Polyethylene.
 - ii. Minimum Width – Two-inches (2”)
 - iii. Runners shall be mechanically bolted to the risers.
- h. Manufacturers: Cascade Waterworks Mfg., PSI Pipeline Seal & Insulator, Inc. or equivalent.
2. Casing Pipe End Seals
- a. Material - Seamless neoprene rubber
 - b. Minimum Thickness – 1/8”
 - c. Type – Pull on
 - d. Bands and clamps – T-304 stainless steel

- e. Size shall be specific to the casing-carrier pipe combination.
 - f. Manufacturers: Cascade Waterworks Mfg., PSI Pipeline Seal & Insulator, Inc. or equivalent.
3. Anode Bag
- a. 45-lb prepackaged zinc anode, two (2) inches square by a minimum 45-inches long.
 - b. Anode lead wire shall be AWG No. 12 stranded copper wire with THWN insulation conforming to UL 83. Wire shall be attached to the steel core with silver brazing material. The connection shall be encapsulated in a heat shrinkable sleeve. Anode lead wire shall be of sufficient length to extend from the anode to the designated termination point without a splice. Wires with cut or damaged insulation will not be accepted, and replacement of the entire lead will be required at the Contractor's expense.

PART 3 - EXECUTION

A. Carrier Pipe Installation

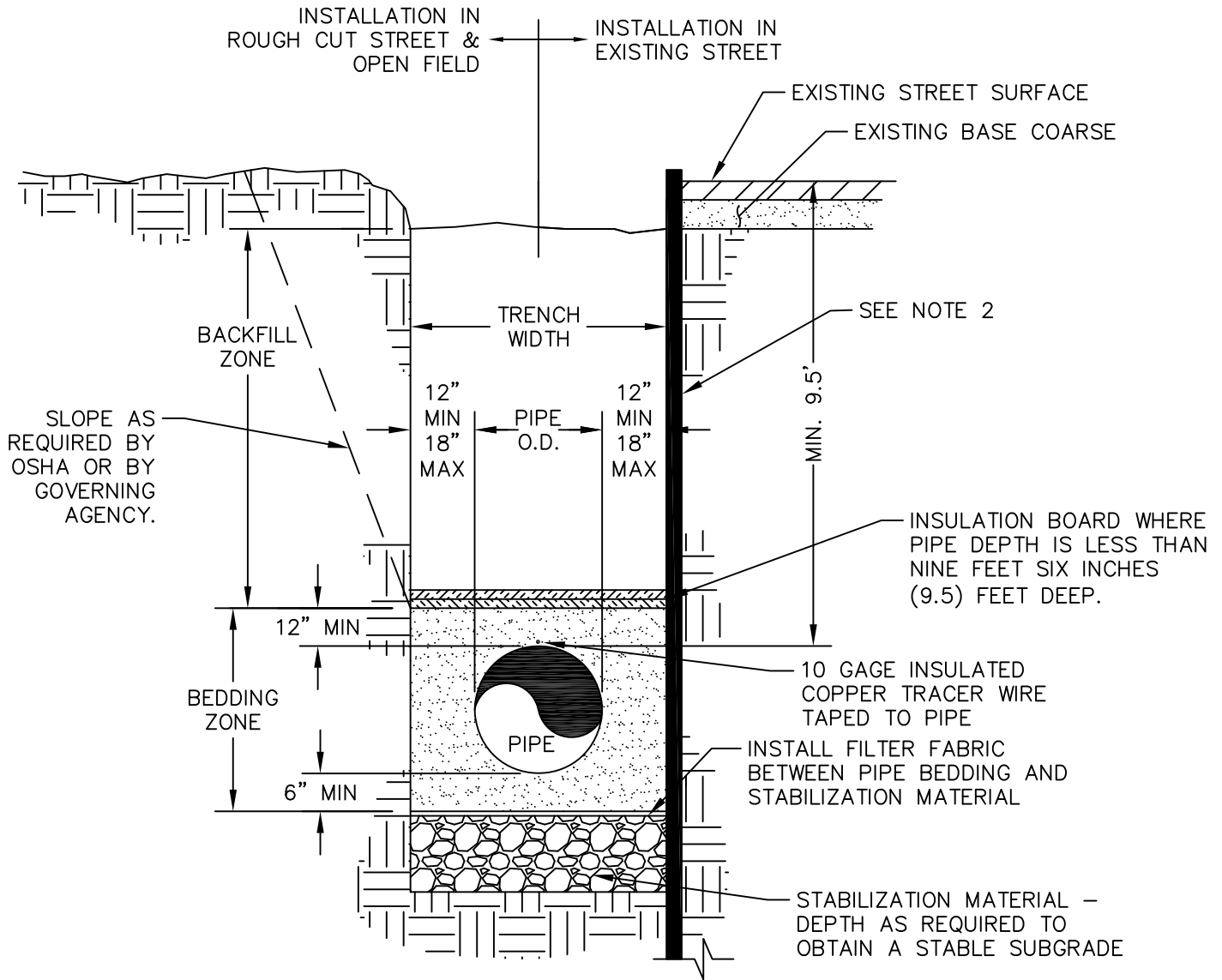
- 1. Carrier pipe shall be installed at the elevations and grades shown on the Construction Drawings.
- 2. Install the carrier pipe in accordance with the pipe material's specification.
- 3. Restrain the carrier pipe within the casing pipe, as required in accordance with this specification.
- 4. Install casing spacers one (1) to two (2) feet on either side of the bell joint and one (1) every six (6) to eight (8) feet apart thereafter, for a total of three (3) casing spacers per pipe length unless otherwise specified by the manufacturer or Town.
- 5. Casing spacers are required on all pipes.
- 6. Seal the ends of the casing pipe with casing pipe end seals. End seals are required on all casing pipe installations.

B. Casing Pipe Installation

- 1. Casing pipe shall be installed to the grade and alignment shown on the approved Construction Drawings.
- 2. Grade and alignment shall not deviate more than 0.3 feet horizontally and 0.1 foot vertically from that shown on the Construction Drawings.

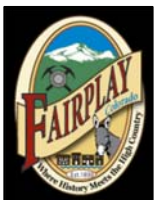
SECTION 5 CONSTRUCTION DETAILS

DRAFT



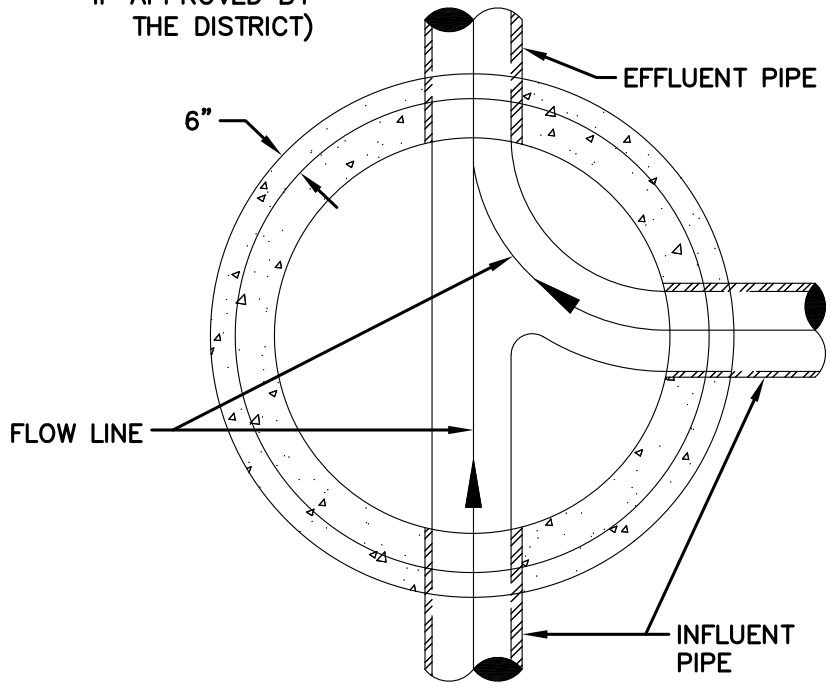
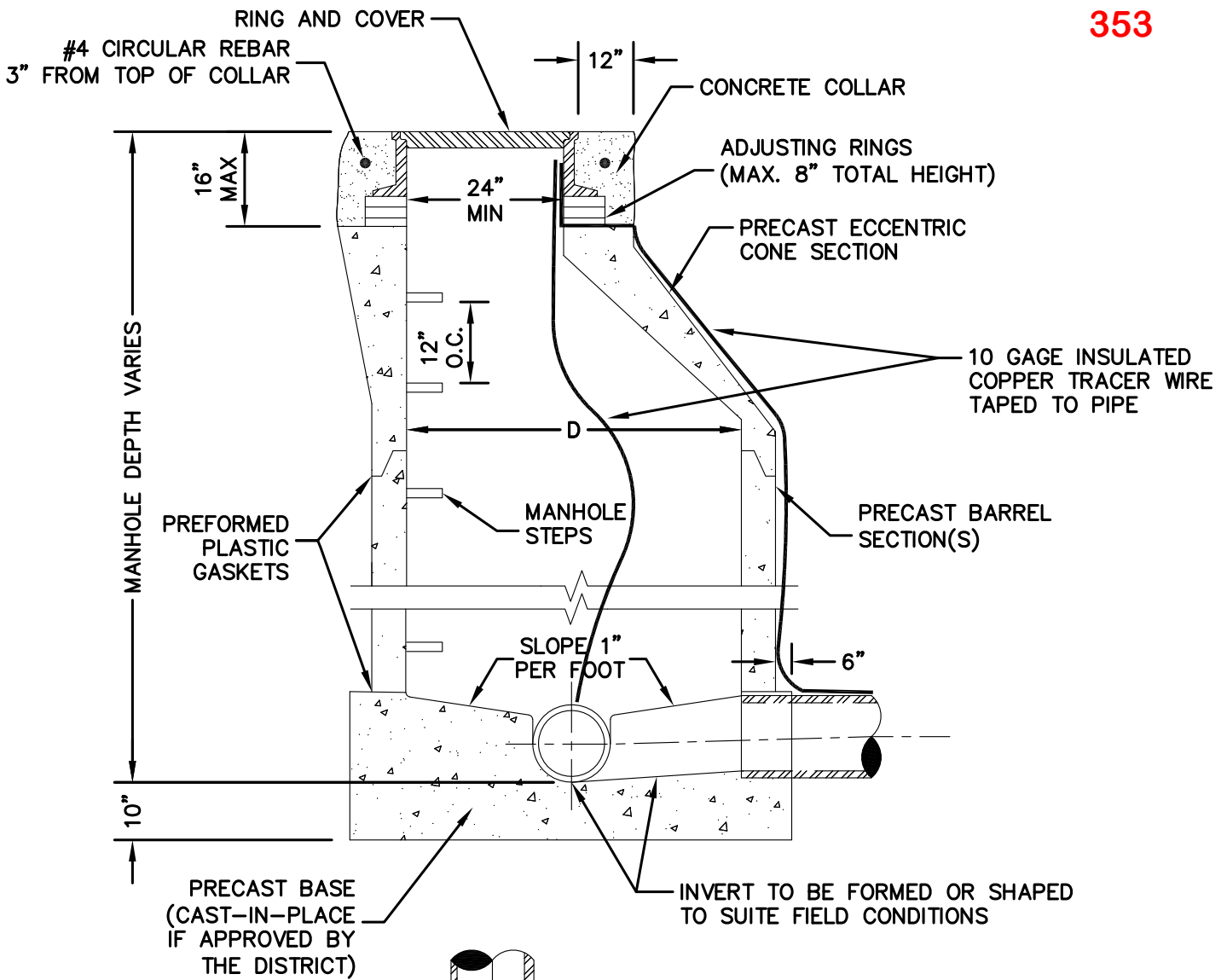
NOTES:

1. REFER TO TOWN OF FAIRPLAY WASTEWATER TECHNICAL SPECIFICATIONS FOR STABILIZATION, FILTER FABRIC, BEDDING, BACKFILL MATERIAL, AND COMPACTION REQUIREMENTS.
2. TRENCHES SHALL BE SHORED, BRACED, OR SHEETED AS NECESSARY FOR THE SAFETY AND PROTECTION OF PERSONNEL AND OTHER UTILITIES.
3. COVER ON PIPE:
 - A. MINIMUM COVER: 9.5 FEET
 - B. 7.5 FEET TO 9.5 FEET: ONE 2-INCH LAYER OF INSULATION (2-INCHES TOTAL)
 - C. 5.5 FEET TO 7.5 FEET: TWO 2-INCH LAYERS OF INSULATION (4-INCHES TOTAL)
 - D. LESS THAT 5.5 FEET: NOT PERMITTED.



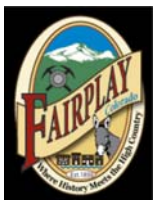
TRENCH DETAIL

DETAIL NO. S-1



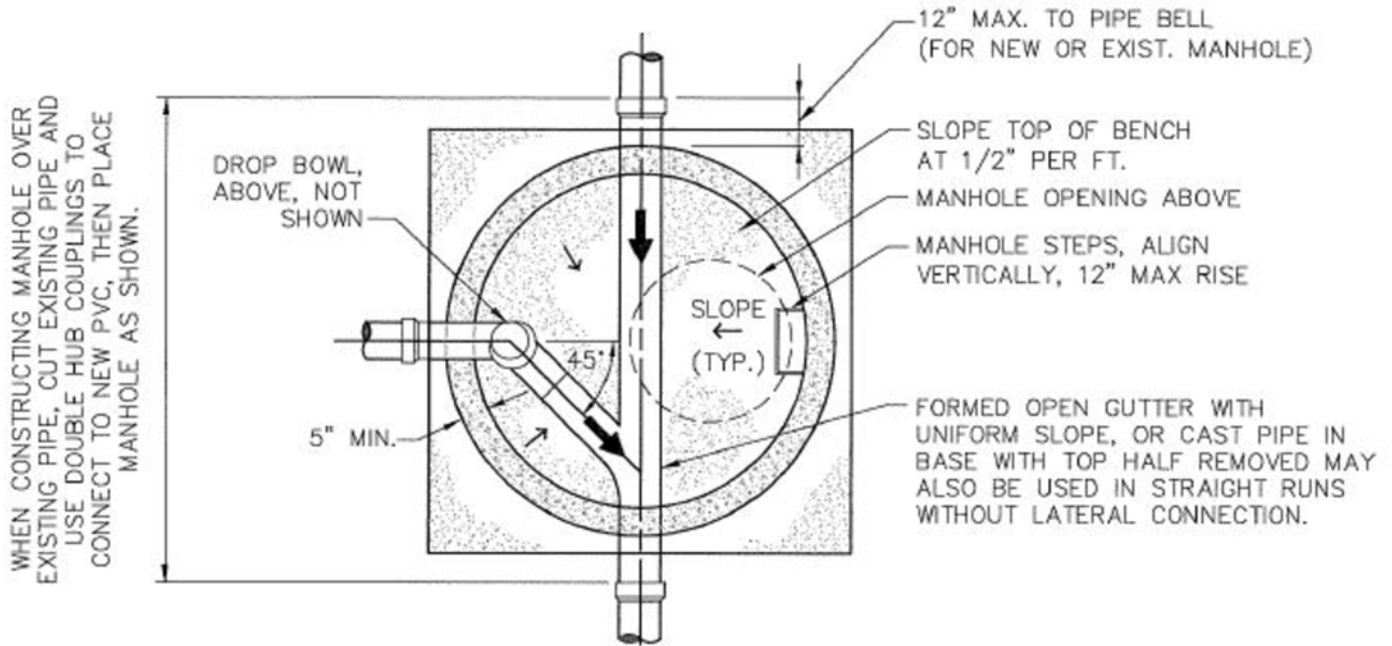
NOTES:

1. REFERENCE FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS FOR MINIMUM MANHOLE DIAMETER (D) AND MATERIAL/INSTALLATION REQUIREMENTS.
2. MANHOLES INSTALLED IN GROUNDWATER ABOVE THE BASE SHALL HAVE ALL MANHOLE SECTION JOINTS SEALED PER FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS.



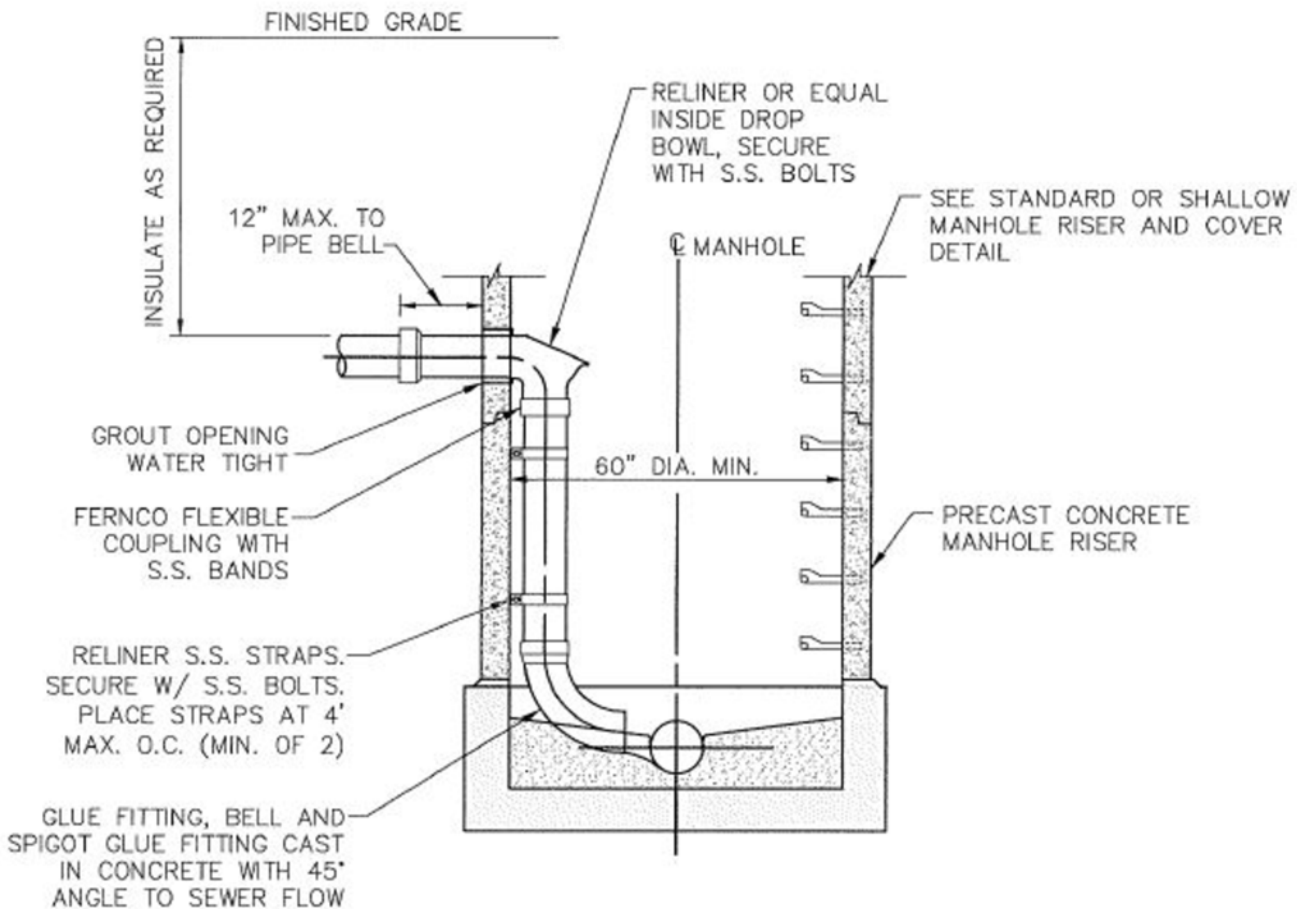
STANDARD SANITARY SEWER MANHOLE

DETAIL NO. S-2



PLAN VIEW

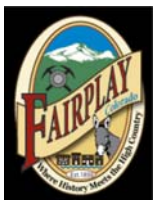
NOTE:
ANY DROP OF GREATER THAN 18" REQUIRES DROP MANHOLE.

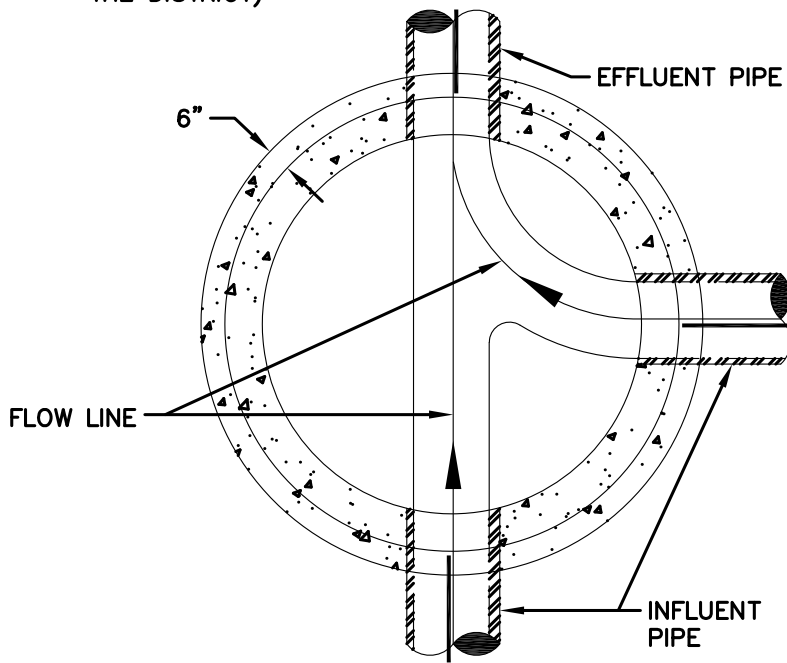
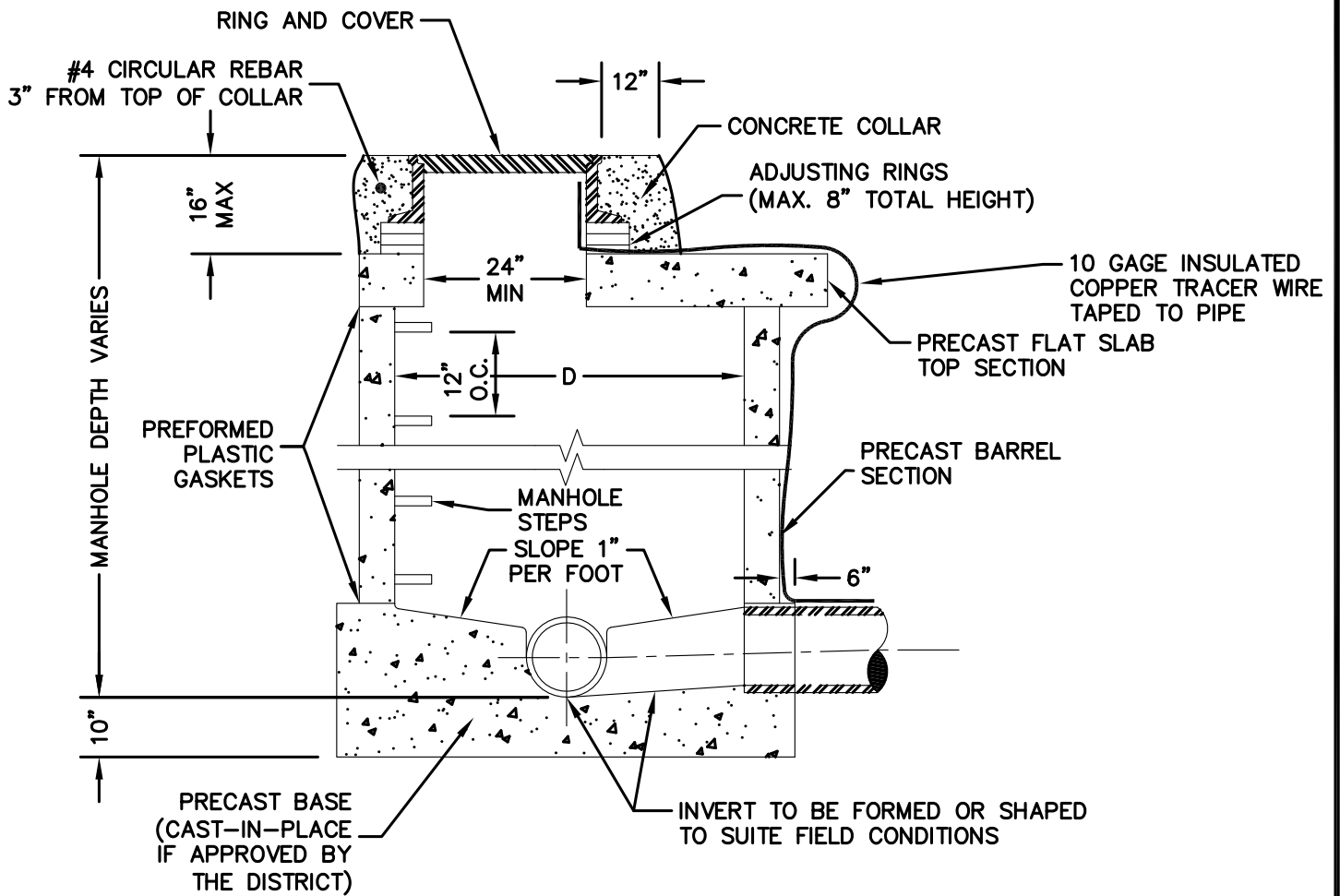


SECTION VIEW

INSIDE DROP MANHOLE

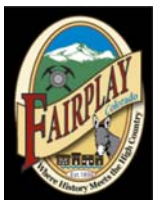
DETAIL NO. S-3





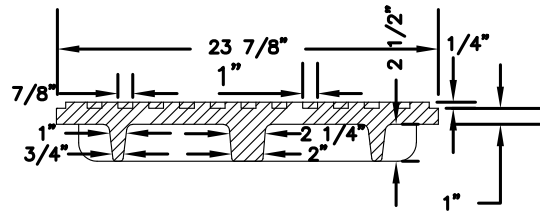
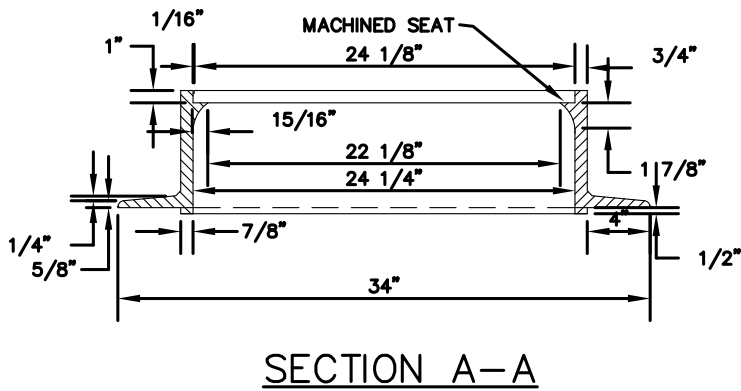
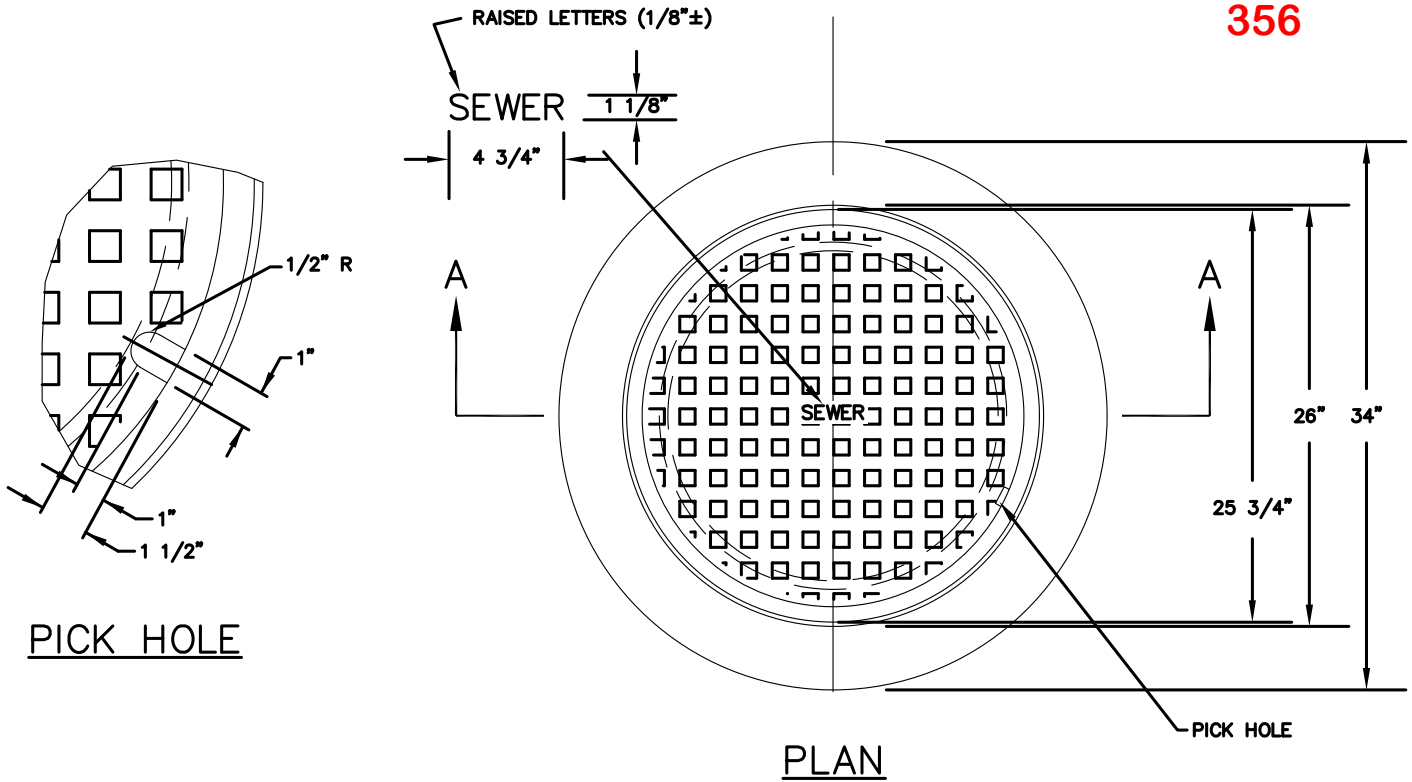
NOTES:

1. THIS DETAIL SHALL BE USED WHEN THERE IS LESS THAN SIX (6) FEET OF COVER OVER THE TOP OF THE PIPE.
2. REFERENCE FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS FOR MINIMUM MANHOLE DIAMETER (D) AND MATERIAL/INSTALLATION REQUIREMENTS.
3. MANHOLES INSTALLED IN GROUNDWATER ABOVE THE BASE SHALL HAVE ALL MANHOLE SECTION JOINTS SEALED PER FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS.



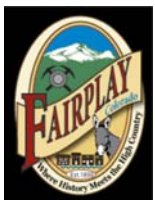
SHALLOW SANITARY SEWER MANHOLE

DETAIL NO. S-4



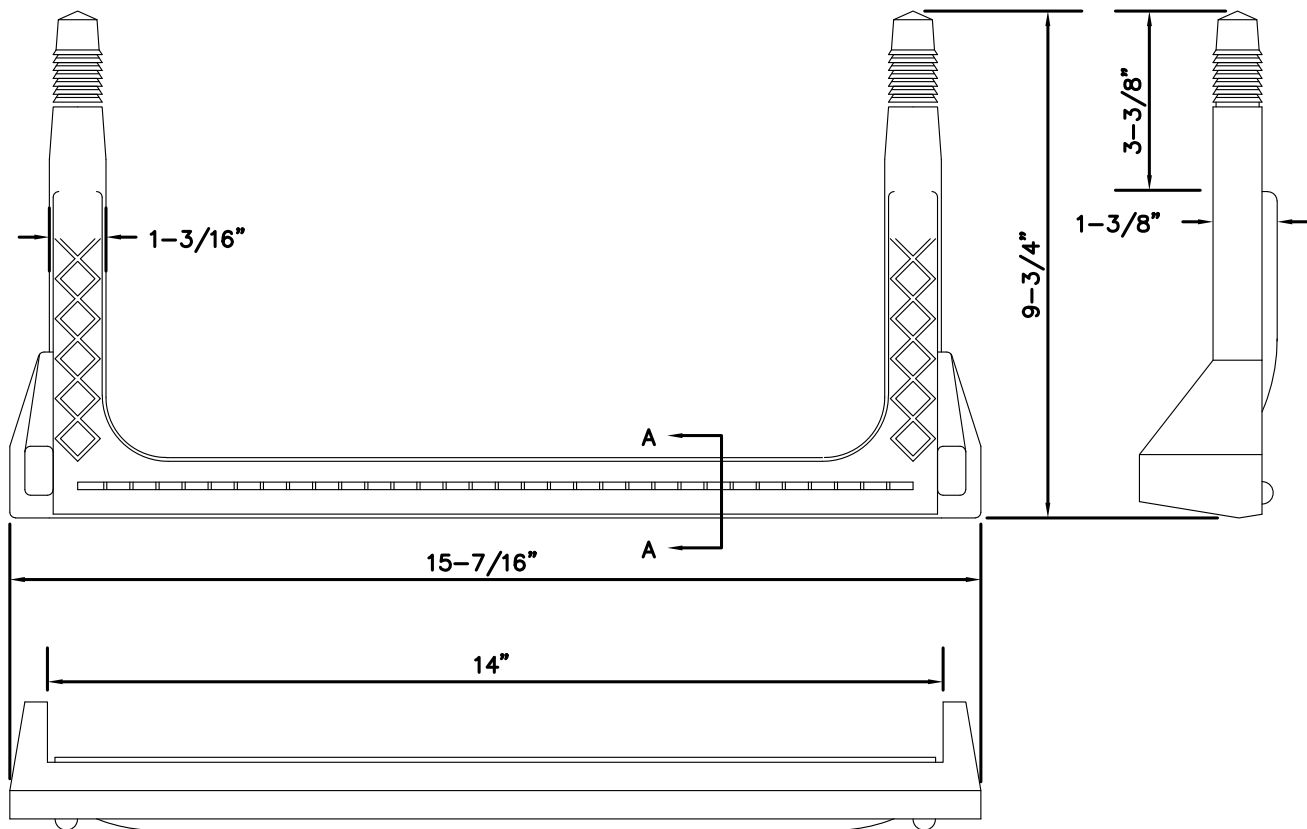
NOTES:

1. CASTING SPECIFICATIONS: ASTM A-48 WITH A MINIMUM TENSILE STRENGTH OF 25 KSI (CLASS 25).
2. ALL CASTINGS TO BE DIPPED IN ASPHALT BASE PAINT (OR APPROVED EQUAL).
3. CASTINGS SHALL BE AS SPECIFIED IN THE FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS.

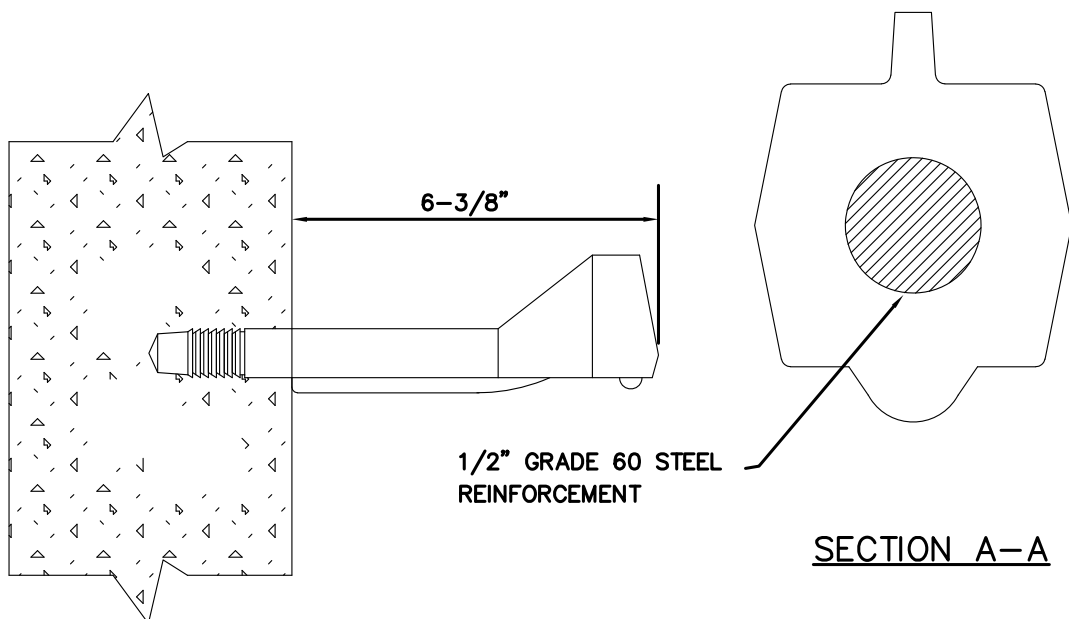


MANHOLE RING AND COVER

DETAIL NO. S-5

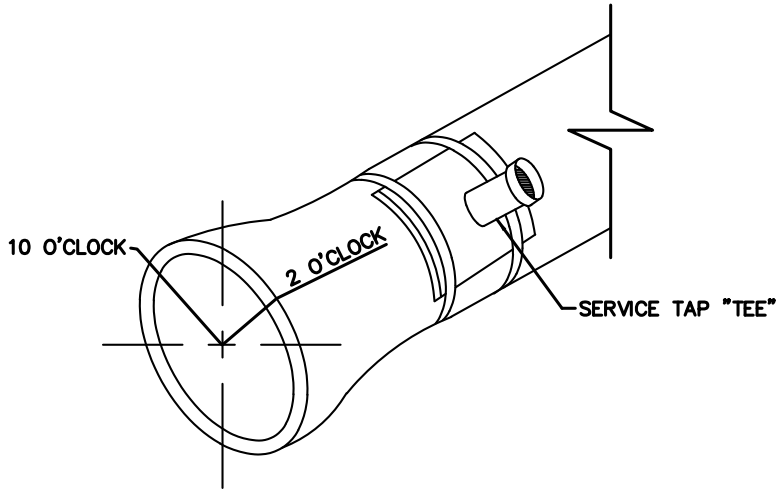


COPOLYMER POLYPROPYLENE PLASTIC

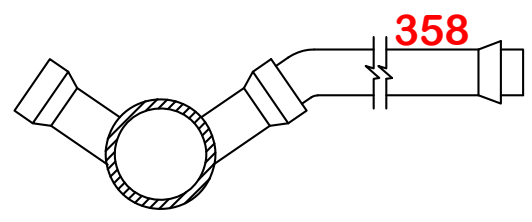


MANHOLE STEPS

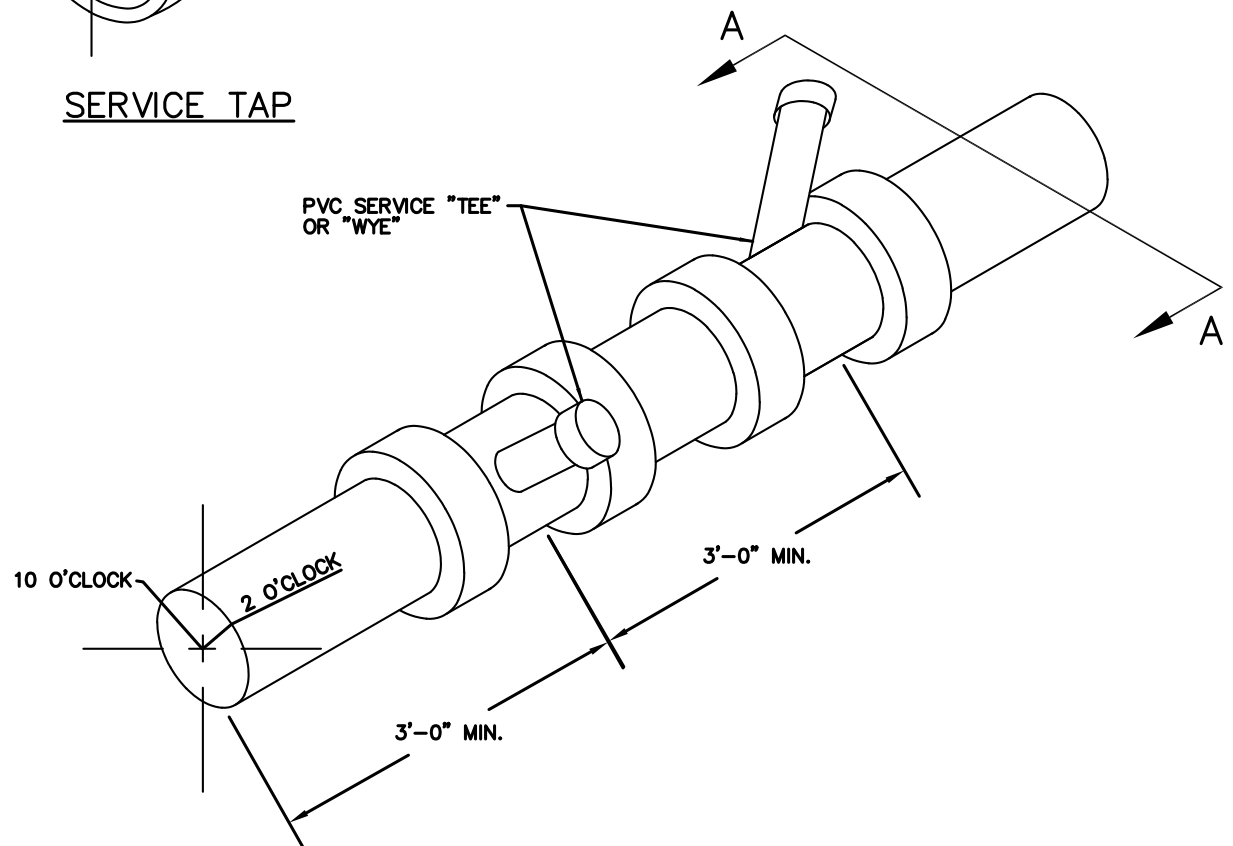
DETAIL NO. S-6



SERVICE TAP



SECTION A-A



NEW CONSTRUCTION

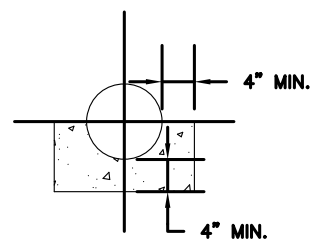
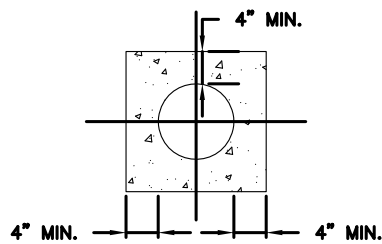
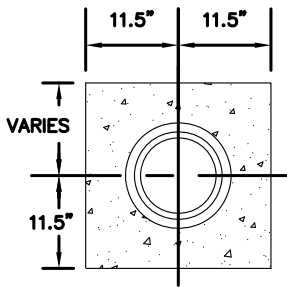
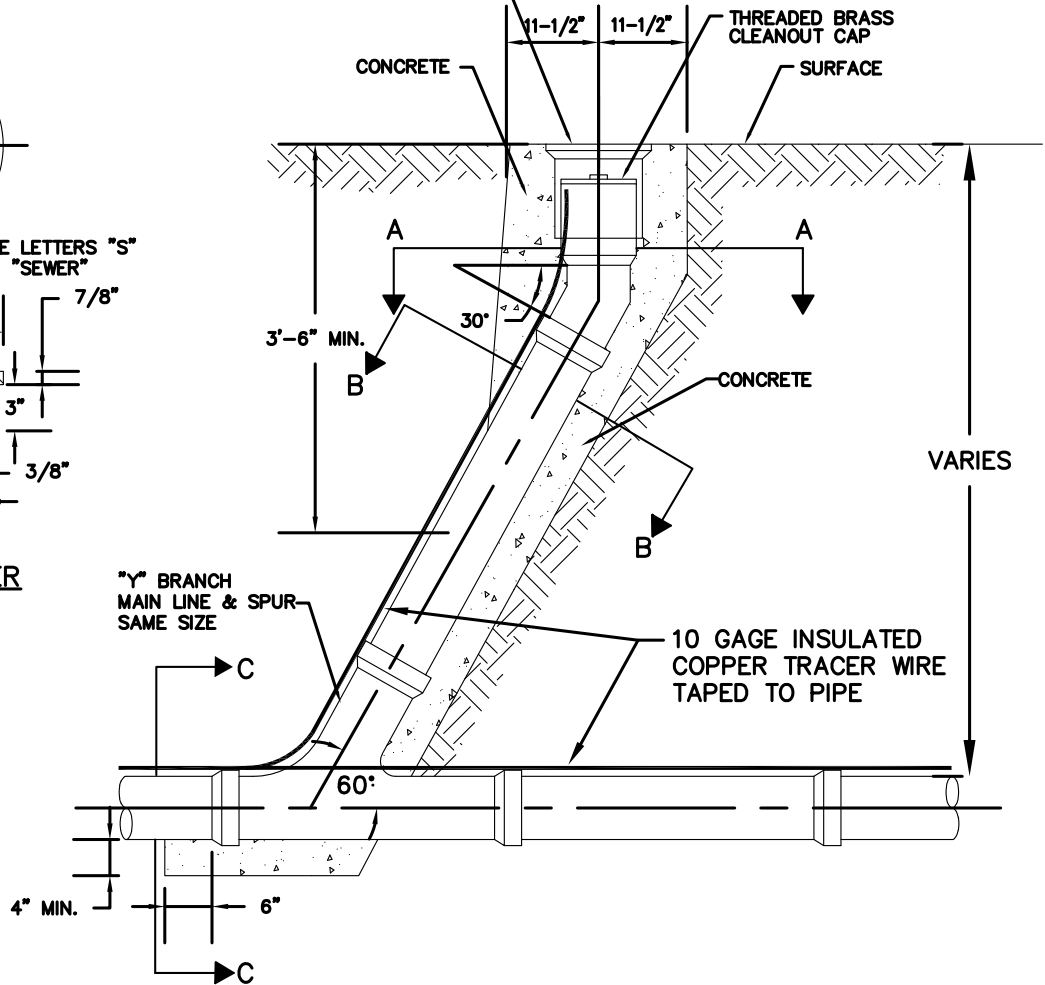
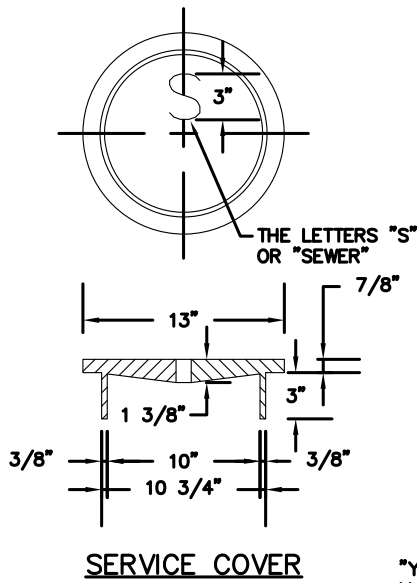
NOTES:

1. SANITARY SEWER SERVICE TAPS SHALL BE LOCATED ON THE MAIN AT THE 2 O'CLOCK OR 10 O'CLOCK POSITION.
2. THE MINIMUM DISTANCE BETWEEN ANY TWO CONSECUTIVE FITTINGS SHALL BE 3 FEET, MEASURED BETWEEN FITTING CENTERLINES.
3. SANITARY SEWER SERVICE TAPS SHALL NOT BE MADE WITHIN 5 FEET OF A PIPE JOINT, OR 5 FEET FROM EDGE OF MANHOLE BASE.
4. A MAXIMUM OF FOUR SERVICE TAPS ARE ALLOWED PER 20 FOOT LENGTH OF PIPE.
5. IN NO CASE SHALL THE SERVICE PIPE BE ALLOWED TO PROTRUDE INTO THE PIPE.



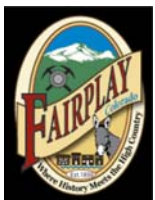
SANITARY SEWER SERVICE CONNECTION

DETAIL NO. S-7



NOTE:

1. REFER TO FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS FOR MATERIALS AND INSTALLATION REQUIREMENTS.



SANITARY SEWER SERVICE CLEANOUT

DETAIL NO. S-8

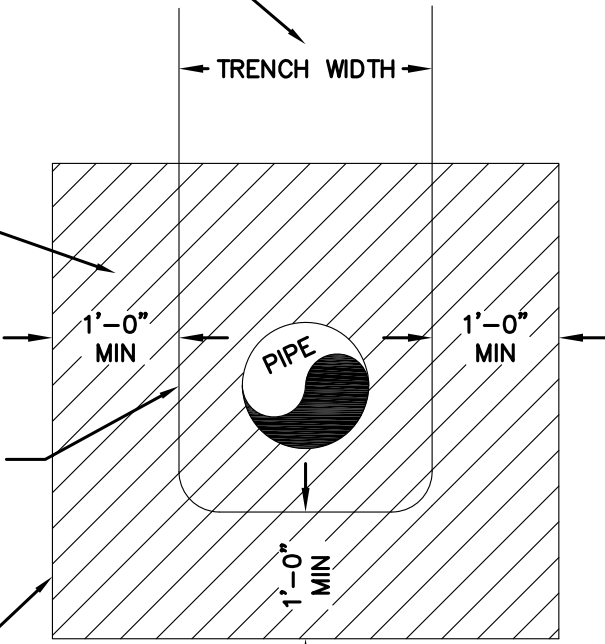
NOTES: 360

1. REFER TO FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS FOR GROUNDWATER BARRIER MATERIAL AND COMPACTION REQUIREMENTS.
2. LOCATE GROUNDWATER BARRIERS PER ACCEPTED CONSTRUCTION DRAWINGS AND FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS.

REPLACE ZONE ABOVE GROUNDWATER BARRIER WITH NATIVE BACKFILL OR SELECT MATERIAL

KEY INTO UNDISTURBED SOIL (TYPICAL SIDES & BOTTOM OF TRENCH)

TRENCH WIDTH



LIMITS OF EXCAVATED TRENCH

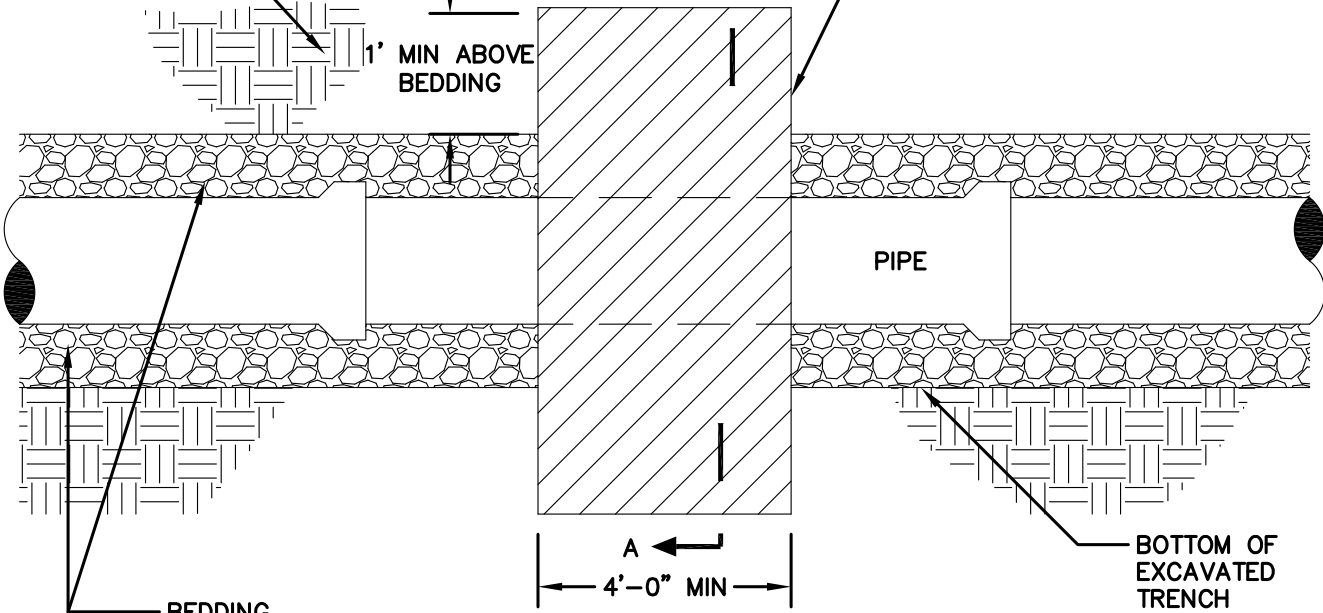
GROUNDWATER BARRIER

SECTION A-A

TRENCH BACKFILL

1' MIN ABOVE BEDDING

GROUNDWATER BARRIER



BEDDING

PIPE

BOTTOM OF EXCAVATED TRENCH

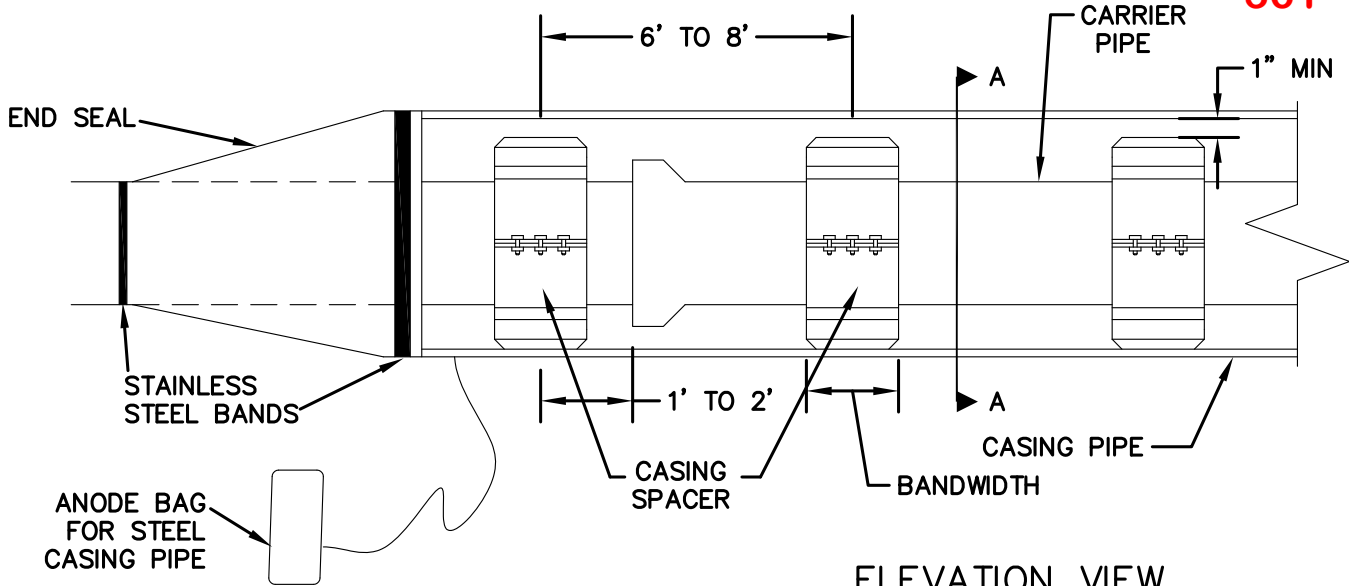
4'-0" MIN

ELEVATION VIEW

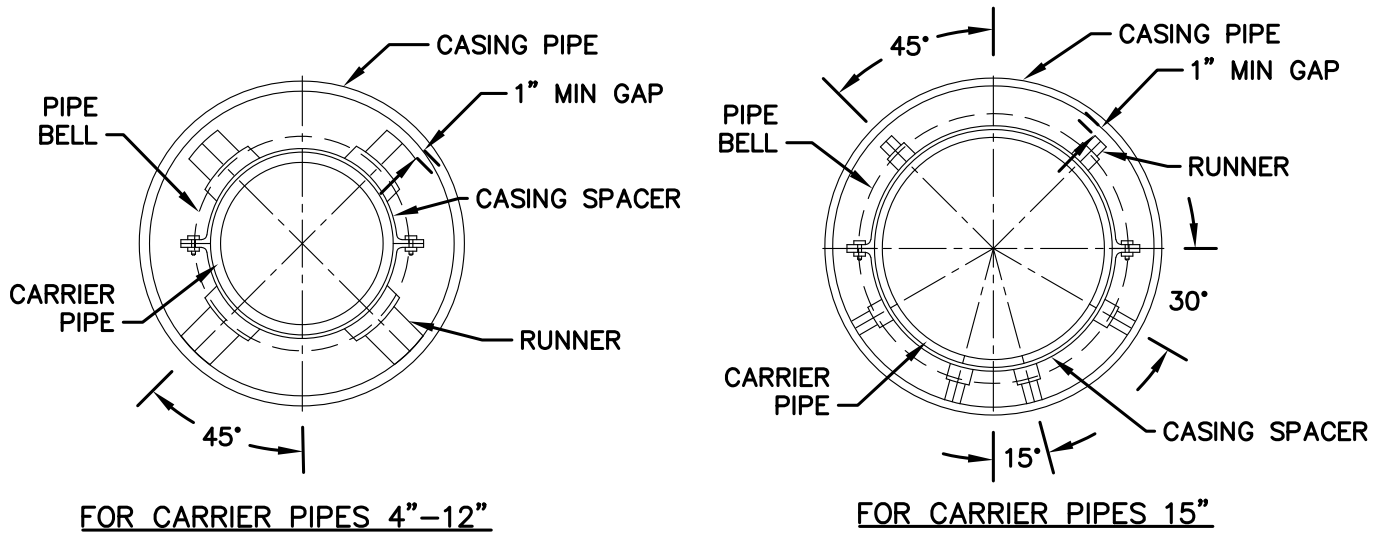


GROUNDWATER BARRIER

DETAIL NO. S-9



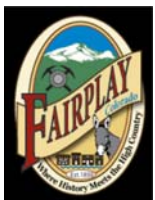
ELEVATION VIEW



SECTION A-A

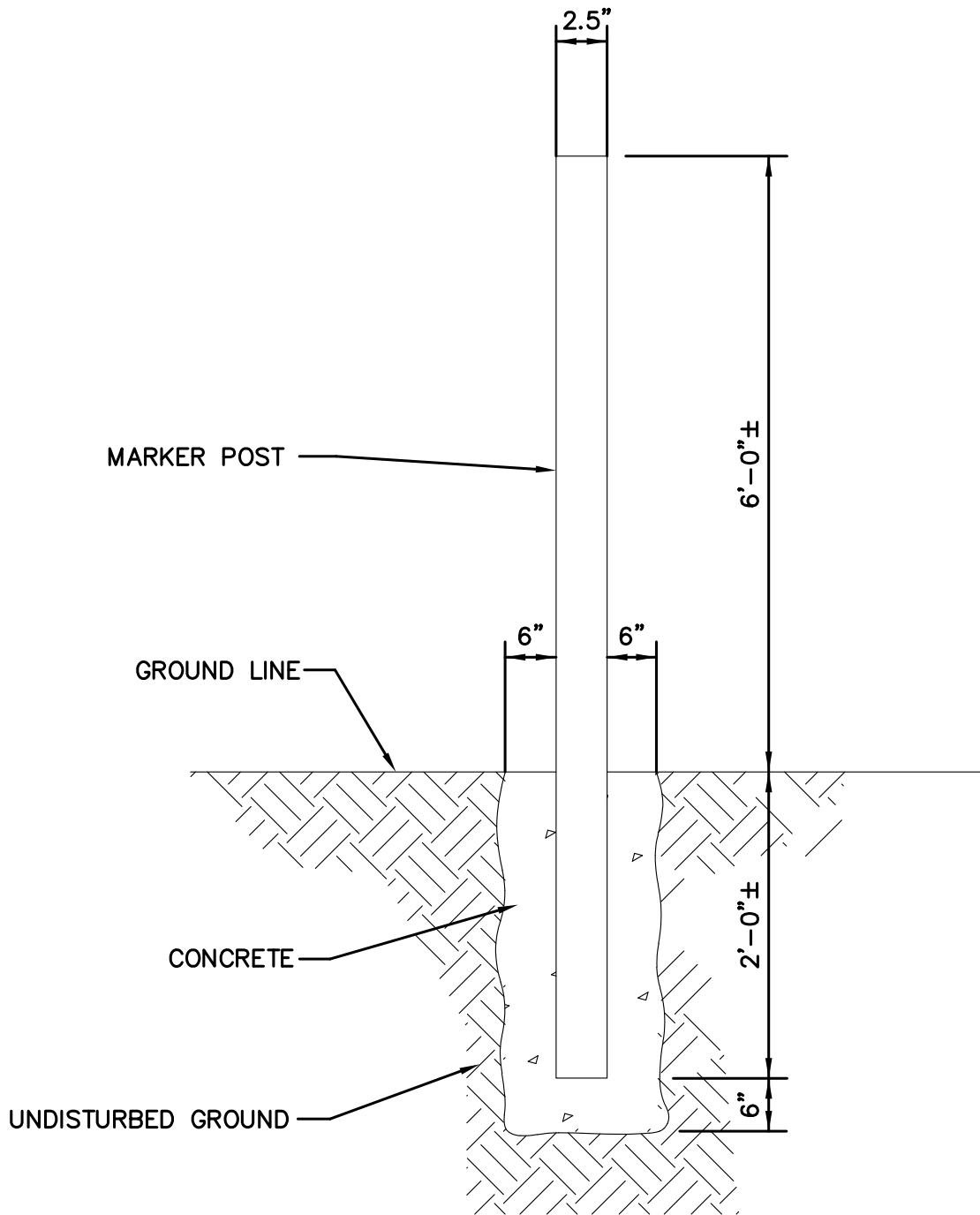
NOTES:

1. CASING PIPE, CASING SPACERS, END SEALS, AND ANODE BAG TO BE SUPPLIED AND INSTALLED PER FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS.
2. RECOMMENDED CASING SPACER POSITIONING – PLACE ONE CASING SPACER 1-2 FT ON EITHER SIDE OF THE BELL JOINT AND ONE EVERY 6-8 FT APART THERE AFTER FOR A TOTAL OF 3 CASING SPACERS PER PIPE LENGTH UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER OR CITY.
3. FOR 12" DIAMETER AND SMALLER CARRIER PIPES USE 8" CASING SPACER BANDWIDTH.
4. FOR CARRIER PIPES LARGER THAN 12' DIAMETER USE 12" CASING SPACER BANDWIDTH.
5. CASING SPACERS TO BE IN THE "CENTER RESTRAINED" POSITION.
6. POLYWRAP DIP CASING PIPES.
7. ALL BORINGS & ENCASEMENTS WILL REQUIRE END SEALS AS SHOWN.



BORINGS AND ENCASEMENTS

DETAIL NO. S-10



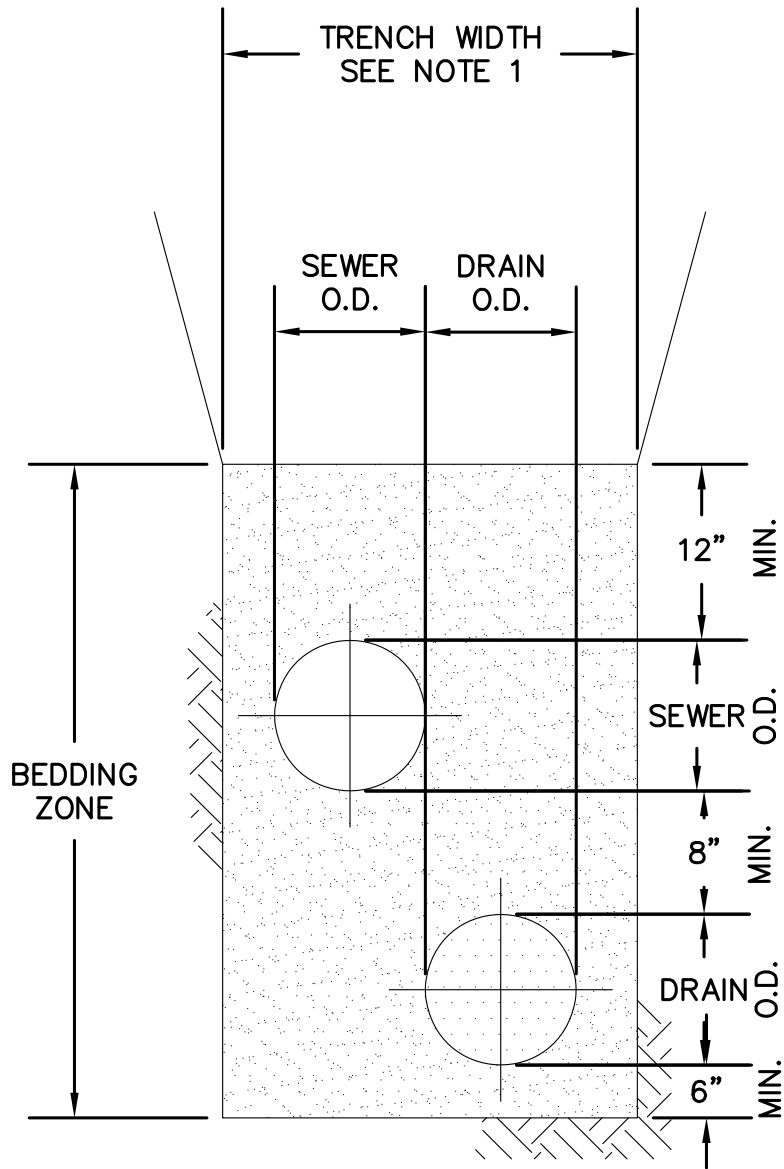
NOTES:

1. POST SHALL BE PLACED A MINIMUM 2 FEET, MAXIMUM 3 FEET BEHIND THE MANHOLE WITH FLAT SIDE FACING THE STREET.
2. SEE FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS FOR MARKER POST REQUIREMENTS.



MARKER POST DETAIL

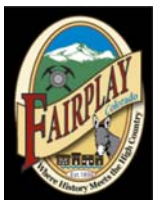
DETAIL NO. S-11



TYPICAL CROSS SECTION

NOTES:

1. THIS DETAIL TO BE USED IN CONJUNCTION WITH THE TRENCH DETAIL.
2. REFER TO FAIRPLAY SANITATION DISTRICT TECHNICAL SPECIFICATIONS FOR BEDDING MATERIAL REQUIREMENTS.



UNDERDRAINS

DETAIL NO. S-12

APPENDIX A POLICIES IMPACTING NEW SEWER SERVICES

Policies listed below are intended to provide guidance in meeting the minimum requirements for new Service Lines. The items described in the list are not all inclusive; therefore, additional items may be required.

- A. The sewer within the Town of Fairplay is handled by the Town of Fairplay. Regular office hours are: Monday – Friday – 8:30 AM – 4:30 PM.

Town of Fairplay P.O. Box 267
– 901 Main Street
Fairplay, CO 80440
Tele: (719) 836-2622

- B. The Contractor is responsible for calling in utility locates. UNCC dial 811.
- C. The System Investment Fee (SIF) payable to the Town. There is a sliding fee schedule for commercial uses. A set of plans for the floor layout is required in order to calculate the EQR value and the System Investment Fee.
- D. A road cut permit must be obtained from the Town of Fairplay for any digging within the Town limits.
- E. All Service Line taps and installation are required to be inspected by the Town. The Town shall be provided adequate notice to schedule inspections. A Reinspection Fee will be charged if the Contractor is not ready at the scheduled inspection appointment time. Fee must be paid in advance of reinspection.
- F. All sewer service piping shall be a minimum SDR 35 PVC and shall require freeze protection with blue board insulation if installed less than eight (8) feet deep. Sewer services shall be installed in accordance with the Town's standard Trench Detail.
- G. A cleanout is required at the outside of the building and every one-hundred (100) feet out to the sewer main. The minimum grade for a 4" line is 2% or 1/4" per foot. There is no maximum grade.
- H. No sewer service shall be backfilled until the Town has inspected the installation of the tap. If backfill is done before inspection, the Town will require that the tap be exposed.
- I. An as-built drawing indicating the location of the service tap on the main, the service line in relation to the building and how it lays on the lot to the tap, and the depths of the line and cleanouts shall be submitted to the Town. It is important the information be as accurate as possible to enable the Town and future Owners to locate the line on the property.
- J. All food preparation businesses shall require a grease trap/interceptor. All sinks and dishwashers shall be connected to the grease trap/interceptor.
- K. All car washes are required to have a sand/oil separator.
- L. Refer to the Fairplay Sanitary Town Rules and Regulations for additional requirements.

APPENDIX B SERVICE LINE CONNECTION CHECKLIST

Items provided in this checklist are intended to provide guidance in meeting the minimum requirements for new Service Line connections. The items described in the checklist are not all inclusive; therefore, additional items may be required.

- Copy of Town Rules and Regulations
- Application for Sewer Connection Completed and Submitted
- Site/Remodeling Plans Submitted
- Additional EQR Fees: Amount_ Date Paid_ _ (EQR fees are determined based on the plans submitted at the time of application. Additional EQR fees may be due prior to the issuance of the Certificate of Occupancy if construction is different than shown on plans.)
- Contractor's Proof of Liability submitted/on file (minimum \$500,000 coverage)
- Release of Lien Form (Provided in Appendix F)
- Copy of Forms to Applicant
 - o Application
 - o Release of Lien Form
- As-Built Drawings submitted in accordance with the Town Rules and Regulations before a Certificate of Occupancy will be issued.

APPENDIX C MAIN LINE EXTENSION CHECKLIST

Items provided in this checklist are intended to provide guidance in meeting the minimum requirements for new mainline extension. The items described in the checklist are not all inclusive; therefore, additional items may be required.

- Copy of Town Rules and Regulations
- Formal Application
 - Developer/Owner makes Formal Application to the Board.
 - Developer/Owner prepares and submits design plans to be reviewed by the Town Engineer.
 - Developer/Owner prepares final plans.
 - The Board approves plans.
- Inclusion into the Town
 - File a Petition for Inclusion.
 - A Hearing is set and Notice is published.
 - The Hearing is held.
 - The Board approves and signs the Petition for Inclusion.
 - The approved Petition for Inclusion paperwork is submitted to Town Court for approval.
 - After the Petition for Inclusion is approved by Town Court, record it in the Park County Records.
- Line Extension Agreement
 - Developer/Owner submits signed and notarized Line Extension Agreement.
 - The Line Extension Agreement is approved and signed by the Board.
 - The Line Extension Agreement is recorded in the Park County Records.
 - Developer/Owner pays required fees:
 - Line Extension Fee
 - Fees for recording the Line Extension Agreement with Park County Records.
- Performance Bond
- System Investment Fee (SIF) payment
- Proof of Liability Insurance submitted/on file (minimum \$500,000 coverage)
- Permits
- Recorded Easements
- Utility Locates – UNCC Dial 811.
- Line Acceptance Agreement:
 - Developer/Owner submits signed and notarized Line Acceptance Agreement.
 - The Line Acceptance Agreement is approved and signed by the Board.
 - Developer/Owner submits one (1) year warranty
 - Conditions of Line Acceptance Agreement are met:
 - Developer/Owner submits statement of project costs.
 - Developer/Owner posts 10% maintenance bond.
 - Developer/Owner submits as-built drawings in accordance with the Town Rules and Regulations
- One (1) Year Warranty Period Expires
 - Conditions not met – bond is held
 - Conditions are met – bond is returned

APPENDIX D SANITARY SEWER CONSTRUCTION NOTES

1. All construction work to be accepted by the Town shall conform to the Town of Fairplay Rules and Regulations.
2. Contractor shall verify all utility locations prior to construction. Dial 811 for UNCC utility locates 48 hours prior to any excavation Work.
3. Maintain a minimum of ten (10) feet horizontal clear distance separation between potable water mains/services and sanitary sewer mains/services. Potable water mains/services are to be located 18 inches minimum above the sanitary sewer mains/services. If field conditions vary from those shown on these plans and the sanitary sewer mains/services cannot be located below the water main/service, a clear vertical distance of eighteen (18) inches below cannot be maintained, or a minimum ten (10) foot horizontal separation cannot be achieved, the Town shall be contacted immediately to review the situation.
4. All sewer service wyes and taps shall be staked by a survey crew and furnished and installed by the Contractor. The Contractor shall furnish to the Town "as-constructed" location of taps.
5. At least one (1) week prior to the start of construction, a pre-construction meeting will be held at the Town office and attended by the Contractor and representatives of the Town and other approving agencies. It will be the responsibility of the Contractor to schedule this meeting.
6. Should any variations before or during construction to the sanitary sewer collection system designs be considered, notice must first be given to the Town to determine if it needs acceptance by the Town. If so, a new plan shall be drawn and submitted to the Town for acceptance by the Town 72 hours prior to construction.
7. The Contractor shall have in his possession at all times one (1) signed copy of the plans which have been approved by the Town of Fairplay.
8. The Contractor shall verify existing pipe or manhole inverts at tie-in points prior to making connections.
9. All materials and workmanship shall be subject to inspection by the Town of Fairplay. The Town of Fairplay reserves the right to accept or reject any materials and workmanship that does not conform to its Rules and Regulations.

APPENDIX E EASEMENT DEED

KNOWN BY ALL MEN PRESENT THAT_

whose _____ address _____ is _____
hereinafter referred to as the "Grantor", FOR AND IN CONSIDERATION OF TEN DOLLARS (\$10.00) and other good and valuable considerations, the receipt of which is hereby acknowledged, hereby, TRANSFERS, CONVEYS, AND QUITCLAIMS to THE TOWN OF FAIRPLAY, a Special Town organized and operating under the laws of Colorado, it's assessors and assigns, hereinafter referred to as the "Grantee," the following described real property situated in Park County, State of Colorado, for a sanitary sewer easement. Below is a description of the easement:

SEE ATTACHED LEGAL DESCRIPTION AND EXHIBIT

The Grantor reserves the right to the use and the enjoyment of the surface of the easement and the right-of-way provided that such use shall not unreasonably interfere with the Grantee's construction, operation, repair, replacement, removal, and maintenance of the sewer line and the manhole, including without limit, installation of permanent structures thereon, and the planting of trees and large shrubs. In the event of the Grantee's exercise of its right to repair, maintain, replace, or remove the line and/or manhole, Grantee shall restore the surface of the easement and the right-of-way, at the Grantee's cost and expense, to a condition substantially similar to the condition existing prior to Grantee's activities. The Grantee shall provide reasonable advance notice of the need for repair, maintenance, replacement, or removal of the line or manhole.

IN THE WITNESS WHEREOF the Grantor has hereunto set their hand and seal SIGNED THIS
_ DAY OF _ , 20_ .

GRANTOR: _____

STATE OF COLORADO)
COUNTY OF PARK) ss

The foregoing instrument was acknowledged before me this _ day of _,
20 _ , by ___ _ .

WITNESS MY HAND AND MY SEAL
MY COMMISSION EXPIRES_

(NOTARY PUBLIC)

APPENDIX F RELEASE OF RIGHT OF LIEN

Town of Fairplay
P.O. Box 267 – 901 Main Street
Fairplay, CO 80440
Tele: (719) 836-2622

RELEASE OF RIGHT OF LIEN

(print until signature)

I, _____, dba - _____
_____ (Contractor Company Name) hereby release the
TOWN OF FAIRPLAY, from all claims of a mechanic's lien for labor, services, machinery,
tools, equipment, or materials heretofore furnished for the construction, alterations, improvement, addition
to or repair or the sewer system, streets, structures or improvements at:

(Street Name or Location)

For Lot: _____, Block: _____, in _____
Also known as: _____

in the **TOWN OF FAIRPLAY**, County of Park and State of Colorado.

REINSPECTION FEE IS \$75.00 PLUS TRAVEL

Date: _____

Print Name: _____

Signature: _____

Address: _____

Telephone: _____

Email: _____

Town of Fairplay

Wastewater Rules and Regulations

ADOPTED: May 6, 2024

Town of Fairplay, 901 Main Street, Fairplay, Colorado 80440

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EFFECTIVE DATE

These Rules and Regulations of the Town of Fairplay affect the health, safety and general welfare of the inhabitants of the Town of Fairplay collection system; therefore, the provisions hereof shall have full force and effect upon the date of their adoption.

Adopted this ____ day of _____, 2024.

Signed: _____
Mayor Frank Just

Attest: _____

DRAFT

SECTION 1 RULES AND REGULATIONS

1.1 SCOPE

- A. These Rules and Regulations are adopted by the Town of Fairplay in accordance with the authority conferred by the Colorado's Special District Act, Title 32, Article 1 of the Colorado Revised Statutes.
- B. The purpose of these Rules and Regulations is to provide for the control, management and operation of the wastewater treatment and collection systems of the Town of Fairplay, including additions, extensions, and connections thereto.
- C. The Mayor and Board of Trustees of the Town of Fairplay expressly declares that the adoption of these Rules and Regulations serves a public purpose and are necessary for the health, safety, security, and general welfare of the Customers of the Town of Fairplay Collection System.
- D. These Rules and Regulations shall be treated and considered as new and comprehensive and shall supersede all prior Rules and Regulations of the Town of Fairplay. The Mayor and Board of Trustees of the Town of Fairplay reserves the right to make rulings concerning matters not covered herein as and when appropriate, in the opinion of the Board.
- E. It is intended that the Rules and Regulations shall be liberally construed to affect the general purpose set forth herein, and that each and every part thereof is separate and distinct from other parts. No omission or additional material set forth in these Rules and Regulations shall be construed as a waiver, alteration, or deviation from any grant of power, duty or responsibility, limitation or restriction, imposed or conferred, upon the Board of Trustees by virtue of statute now existing or subsequently amended, or under any contract or agreement existing between the Town and any other governmental entity. Nothing contained herein shall be so construed as to prejudice or affect the right of the Town to secure full benefit and protection of any law now enacted or which may subsequently be enacted by the Colorado General Assembly or as decided by the Appellate Courts of Colorado, pertaining to governmental or proprietary affairs of the Town.
- F. These Rules and Regulations may be amended, altered, repealed, or reenacted at any regular or special meeting of the Board and set forth, in writing, signed by the Mayor of the Board. Such action shall not be deemed as an amendment to the Rules and Regulations, unless expressly set forth in such writing. Prior notice of such amendments shall not be required to be provided by the Town.
- G. If any section, subsection, paragraph, clause, or other provisions of Rules and Regulations shall for any reason be held to be invalid or unenforceable, the invalidity or unenforceability of such section, subsection, paragraph, clause, or other provision shall not affect any of the remaining provisions.

1.2 DEFINITIONS AND ABBREVIATIONS

- A. **ACTUAL COST** - All direct costs applicable to construction of given facilities including construction, engineering, inspection, plans, approval fees, required bonding, "as-built" drawings and other costs incurred necessary for completion.

- B. **ACTIVITY ENTERPRISE** – That water activity enterprise established pursuant to C.R.S. 37-45.1-101 et seq., which was created by the Town to operate the wastewater collection and treatment facilities of the Town; sometimes referred to as the “Enterprise.”
- C. **ADMINISTRATIVE ASSISTANT** – Person responsible for daily management of the business affairs of the Town.
- D. **APPLICANT** – Any real property Owner, whether an individual or individuals, firm, corporation, partnership, association, government entity, association, or other entity requesting sewer service to be provided by the Town.
- E. **APPROVED** – Acceptable under specification or standards stated in the Rules and Regulations, as determined by the Board of Trustees or its designated representative.
- F. **APPROVED TESTING AGENCY** – Organization primarily established and certified for the purpose of testing to approved standards and approved by the Board.
- G. **AS-CONSTRUCTED DRAWINGS** – Drawings reflecting actual conditions and information after construction is complete. Also referred to as As-Built Drawings.
- H. **BLEEDING** – Continuous discharge of a potable water system of a household or building.
- I. **BOARD** – Board of Trustees
- J. **BOARD OF TRUSTEES** – Elected governing body of the Town of Fairplay.
- K. **BUILDING DRAIN** – That part of the lowest horizontal piping of any building’s plumbing/drainage system from the stack or horizontal branch, exclusive of storm sewer, extending to a point not less than five (5) feet outside the building. This does not include any discharge from any roof or exterior collection system or internal sump system; these systems are strictly forbidden from discharging into any Service Line which discharges to the Town’s wastewater collection system.
- L. **BUILDING SEWER SERVICE SYSTEM** – The building sewer line that is part of the horizontal piping of the building drainage system which extends from the end of the building drain, to the Service Line, and which receives the discharge of the building drain and conveys it to the Town’s wastewater collection system.
- M. **COLLECTION MAIN** – See Sewer Main.
- N. **COLLECTION SYSTEM** – See definition for Public Sewer.
- O. **COMMERCIAL USE** – The following uses shall be deemed “Commercial Use,” including, but not limited to: hotel, motel, lodge, dormitory, condo-tel, rooming house, bed and breakfast, café, hospital, bar, private club, filling station, garage, laundry, restaurant, industrial building, office building, car wash, and any other User not providing permanent residential dwelling space.
- P. **CONNECTION PERMIT** – Written authorization by the Board of Trustees to connect to the Town’s wastewater collection and treatment system in accordance with and for so long as the User complies with the Rules and Regulations of the Town.
- Q. **CONTRACTOR** – A person, firm, corporation, partnership, association, or entity performing work within the Town. Contractors must be licensed to perform the type of work to be undertaken.

- R. CRITERIA - The Town of Fairplay adopted "Design Criteria, Technical Specifications, and Construction Details."
- S. CROSS CONNECTION – Connection or arrangement, physical or otherwise, between a potable water supply system and any building drain or building sewer carrying used or polluted water.
- T. CUSTOMER – Any real property Owner, whether an individual or individuals, firm, corporation, partnership, association, or other entity authorized to connect to the Town's wastewater collection and treatment system pursuant to a revocable Connection Permit issued by the Board of Directors. Also referred to as "User" or "Owner."
- U. DESIGN ENGINEER – The partnership, corporation, or individual who is registered as a Professional Engineer, according to Colorado statutes, who is hired by the Developer or Owner to conduct engineering design services and may be empowered by the Developer or Owner to act as his agent.
- V. DEVELOPER – Shall mean any real property Owner, whether an individual or individuals, firm, corporation, partnership, association, governmental entity or other entity bearing the actual costs of construction of Sewer Line(s) on a particular property.
- W. Town – The Town of Fairplay.
- X. TOWN ENGINEER – Individual or representative of an engineering firm who is a Professional Engineer retained by the Town responsible for consultation with the Board of Trustees regarding feasibility studies, design and construction of sewer services, main line extensions, inclusions, and plant expansions.
- Y. TOWN FACILITIES – The Town's sewer lines, treatment works, and all easements and appurtenances thereto. The term does not include Service Lines.
- Z. DOMESTIC – Refers to any water use by temporary or permanent residential use of property which is not a Commercial use, which results in wastewater discharge to the Public Sewer.
- AA. EASEMENT – An acquired legal right for the specific use of land owned by others.
- BB. ENTERPRISE – See definition for Activity Enterprise.
- CC. EQR – Equivalent Residential Unit
- DD. FIXTURE UNIT – Any plumbing unit supplying wastewater to the Town's collection system such as, but not limited to: sinks, toilets, dishwashers, urinals or water fountains, as described by the International Plumbing Code (IPC).
- EE. GOVERNMENT/EXEMPT USER – A Customer or potential Customer of the Town, which pays regular service charges to the Town for use of the Town's services, but is not subject to those property taxes which would otherwise provide revenues to the Town, which revenues are used only to defray Town expenses, as well as provide financial reserves for repair, replacement or mandatory future improvements.
- FF. GRADE – The slope or fall of the line or pipe as measured from the point where the Service Line leaves the building to the point where it taps the Town's wastewater collection system or in the case of Sewer Mains, the pipe slope between manholes.

- GG. GREASE TRAP/INTERCEPTOR – A plumbing appurtenance that is installed on a sanitary Sewer Service to intercept oily and greasy waste from wastewater discharge. Also referred to as a Grease Trap.
- HH. INSPECTOR – That person acting under the direction and authorization of the Board of Trustees, whose duties shall include inspection of all excavations, installation of, and repairs to any tap of a building’s Service Line or Sewer Mains.
- II. IPC – International Plumbing Code
- JJ. MANAGER – Person responsible for the daily operations of the Town’s wastewater collection and treatment facilities.
- KK. OWNER – The record Owner of any property receiving, required to receive, or which will, upon some action (e.g., physical connection after payment of all fees and charges) receive wastewater collection, treatment, or related service from the Town. Although others may act on the Owner’s behalf, (e.g., one who applies for a Connection Permit or uses the Owner’s property, such as a tenant), the Owner is the party which is ultimately responsible for compliance with the Town’s Rules and Regulations, including payment of all fees and charges. May also be referred to as “Customer” or “User.”
- LL. PARTY – See definition for Person.
- MM. PERSON – Any individual or individuals, firm, company, corporation, partnership, association, governmental authority or agency, or other entity.
- NN. PROFESSIONAL ENGINEER – Engineer licensed in the State of Colorado according to State of Colorado statutes.
- OO. PUBLIC SEWER – Any sewer collector lines, mains, appurtenances or accessories owned by the Town.
- PP. PVC – Polyvinyl chloride pipe.
- QQ. REAL PROPERTY – All lands or interest in lands to which title or the right of title has been acquired from the government of the United States or from sovereign authority ratified by treaties entered into by the United States or from the State of Colorado.
- RR. RULES AND REGULATIONS - The Town of Fairplay adopted “Rules and Regulations.”
- SS. SAND INTERCEPTOR - A plumbing appurtenance that is installed on a sanitary Sewer Service to intercept sand and grit from wastewater discharge. Also referred to as a Sand Trap.
- TT. SERVICE LINE – That private sewer line extending from the building being served by the Town to the Sewer Main.
- UU. SEWER LINE – See Sewer Main.
- VV. SEWER MAIN – Any pipe or conduit for carrying wastewater, as so designated by the Town, to which the Town may allow the connection of Service Lines. Such sewer mains are part of the Public Sewer/Collection System.
- WW. SHALL – Means “mandatory.”

- XX. SPECIFICATIONS – The technical specifications, as adopted or accepted by the Town, for the design, installation and construction of sewer lines, services, and appurtenances.
- YY. STUB OUT – A portion of Service Line extending from the Sewer Main to the boundary of a property to be served or a portion of Sewer Main extending from a manhole, installed for the convenience of the Developer or property Owner.
- ZZ. SYSTEM INVESTMENT FEE (SIF) – A charge established and assessed by the Town upon each potential User, based upon the number of Equivalent Residential Units (EQRs) or portions thereof, which are charged to compensate the Town for any and all capital costs, including, without limitation, reserve funds, sinking funds and associated debt service costs of the Town’s treatment plant and collection system, associated with provision of new or expanded connection permits.
- AAA. TAP – The physical connection between the private Service Line and the Town’s Sewer Main.
- BBB. USER – Any real property Owner, whether an individual or individuals, firm, corporation, partnership, association governmental entity or other entity to whose property sewer service is supplied by the Town. Also referred to as “Customer” or “Owner.”
- CCC. USER FEE – The monthly fee/charge paid by all Customers for the revocable privilege of using lines, equipment, and treatment services provided by the Town.

1.3 OWNERSHIP AND OPERATION OF FACILITIES

- A. Town Responsibility
1. The Town shall be responsible for the planning, operation, maintenance, repair, and replacement of the Town’s wastewater and treatment system.
 2. The Town shall not be liable for any consequences, including inadequate treatment or interruption of the collection system or treatment services brought about by circumstances beyond the Town’s reasonable control.
 3. Nothing herein shall be construed as a waiver of any of the Town’s or its employees’ rights to governmental immunity pursuant to the Colorado Governmental Immunity Act, codified at C.R.S. §§ 24-10-101, et seq.
- B. Town Ownership
1. All existing collection and main lines connected with and forming an integral part of the wastewater collection and treatment system shall be deemed the property of the Town.
 2. All extensions, enlargements or replacement collection or main lines built and installed in accordance with Town specifications shall be conveyed to the Town, even if they are financed, paid for or installed by others.
 3. All Sewer Lines beginning at and extending from the tap, including the tap connection to the Town main or collector line to each building or unit drain, shall be considered private property and appurtenant to the real property being served by the private Sewer Line.
- C. Right of Access on Property

1. Employees or agents of the Town, bearing and displaying proper credentials and identification, shall be permitted to enter all private properties during regular business hours for the purpose of inspection, observation, measurement, sampling and testing, operation, maintenance, repair, or replacement of the collection system and appurtenances.
2. The Board or their designee (e.g., the Town Engineer) shall have the right to inspect all work during construction to insure installation in accordance with Town Rules and Regulations.

D. Liability

1. In consideration for the Town permitting any and all Customers to connect to and continue to use the Town's wastewater collection and treatment system, it is expressly agreed that no Customer shall have any claims for injury or damages against the Town arising from:
 - a. Blockage of the wastewater collection system or interruption of service arising from circumstances beyond the Town's control.
 - b. "Smoking" or chemical tracing of lines to determine building drain and Service Line connections to the Town's mains.
 - c. Service interruption as a result of actions requested by a Customer or arising from circumstances beyond the Town's control.
 - d. Breakage of Service Mains by Town personnel in carrying out routine functions of the Town.

E. Owner Responsibility

1. Each Owner shall be responsible for installing and maintaining, repairing or replacing the entire length of Service Line from the building drain to the Sewer Main including the physical connection to the Sewer Main.
2. Construction of the Service Line shall be done in accordance with the Town's Rules and Regulations.

1.4 LINE EXTENSION REQUIREMENTS

A. General

1. It shall be unlawful for any person to construct a Sewer Line extension within the jurisdiction of the Town without first making a formal application to the Board for review and approval and having complied with the Rules and Regulations of the Town.
2. All line extensions within the Town shall be made pursuant to review and approval of the Board, its designated representative or the Town Engineer.
3. Plans and other supporting documents for line extensions shall be submitted to the Board along with application for a line extension. Said plans and documents shall be prepared at the Owner's expense and approved for compliance with the Board's Rules and Regulations.

4. Any Petition for Inclusion, Line Extension Agreement, and the Line Acceptance Agreement between a Developer and the Town shall be submitted with the formal application. The Line Extension Agreement form is provided in Appendix C. The Line Acceptance Agreement Form is provided in Appendix D. Sewer Main extensions will be subject to a charge for plan review and construction inspections as provided in the Schedule of Fees and Charges provided in Appendix B.

B. Main Line Extensions

1. All extensions shall be installed beyond the point of connection to the far side of the property so that the sewer may continue. All sewer line extensions shall be installed along the entire property frontage, width or depth to the far side of any property served, so the sewer line may continue to the adjoining property.
2. The Town may, at its sole and absolute discretion, extend lines under such conditions as the Board deems appropriate.
3. Where sewer mains cannot be installed in a street, private drive or common area, and must be installed in easements between adjacent pieces of property, the lines will terminate at the point on the line or corner of the property being served which requires the least amount of construction.
4. Extension of Sewer Lines to serve property already in the Town, but not part of a platted subdivision, shall be paid for or financed by the Developer. All such Sewer Lines shall be dedicated to the Town, free and clear of any and all liens or encumbrances.
5. No Sewer Line shall be extended outside the Town boundary, except to serve property within the Town, (across "islands," or between "peninsulas") except upon prior written consent of the Board.

C. Reimbursement for Oversizing

1. The Town may, at its sole and absolute discretion, require construction of lines larger than is needed to adequately serve a development. Participation by the Town in the cost of the oversized lines shall be at the sole and absolute discretion of the Town and in no event shall exceed the difference in cost of the minimum size line and the oversized line.
2. The Town may require construction of lift stations of larger capacity than that necessary to serve the initial development contemplated by the Developer. The cost of this type of oversizing may be paid by the Town and collected from future connectors to the lines served by the lift station.

1.5 LINE EXTENSION CONSTRUCTION AND ACCEPTANCE PROCEDURE

- A. When agreement has been reached between the real property Owner or Developer with regard to engineering layout or design, and the performance bond for labor, material and engineering fee has been paid to the Town, the Owner or Developer may then proceed with construction.

- B. Each real property Owner or Developer who desires service will, with the approval of the Town, plat or dedicate to the Town appropriate easements and rights-of-way in which to construct facilities required to cross land not being developed or under the Developer/Owner's control for granting a public right-of-way. The Developer shall convey to the Town, using Town approved forms, all easement, rights-of-way, or other property rights necessary for continued use of such facilities. The dimensions of these property rights shall be determined by the Town and all documents conveying such rights shall be duly recorded at the Developer's expense.
- C. All lines and appurtenances must be inspected by the Town before being covered or backfilled. If a Developer covers any line or appurtenance prior to inspection by the Town, said line or appurtenance shall be uncovered at Developer's expense in order for inspection to proceed.
- D. All lines and manholes must pass testing in accordance with these Rules and Regulations, before being accepted by the Town.
- E. Developers, who have completed construction of facilities, whether line extensions, enlargements or replacements, shall before such facilities are accepted by the Town, convey all such facilities, including all appurtenances thereto, to the Town by means of a Town approved bill of sale, free and clear of all liens and encumbrances.
- F. Provide the Town as-constructed record drawing in accordance with these Rules and Regulations
- G. Warranty
 - 1. All facilities conveyed shall be subject to a two (2) year warranty during which the Developer shall be responsible for all corrections or repairs upon the facilities conveyed. The Town shall conditionally accept conveyance of such facilities upon completion and shall finally accept said conveyance at the end of the two (2) year warranty period.
 - 2. The Contractor shall warrant the work to be free from faulty materials and workmanship for a period of not less than two (2) year from the date of Final Acceptance, which one year period shall be covered by a Maintenance Bond ten percent (10%) of the cost of construction.

1.6 SEWER SERVICE CONNECTION REQUIREMENTS

- A. All habitable or usable buildings to be utilized for trade, commerce, industry or dwelling within the Town shall be connected to the Town's wastewater collection system except where economically infeasible and where a written waiver is granted thereto by the Town.
- B. All habitable or usable existing buildings within the Town shall connect to the Town's collection system, at the Owner's expense, when a Sewer Main is available within four hundred (400) feet of an Owner's premises, unless a written waiver has been issued by the Board.
- C. No Owner shall extend his Service Line in order to supply service to any other Owner.
- D. A separate and independent Service Line shall be provided for every building. A group of buildings may be connected to a single Service Line within Property boundaries if it can be shown that said buildings/land cannot be sold separately.

- E. No septic tanks, vaults or private sewage disposal systems shall be installed within the boundaries of the Town, unless specifically permitted in writing by the Town.
- F. Contents of private septic vaults or sewer services/systems are not allowed to be pumped into the Town's wastewater collection system.
- G. It is the responsibility of the Owner of the property being served, to install the private Service Line from the tap on the Town's Sewer Main to the building drain. Sewer Service Lines shall be constructed at the Owner's expense.
- H. The section of the Service Line from the Sewer Main to the Owner's property line, including the physical connection to the Sewer Main, must be inspected by the Town's designated inspector. Failure to construct the private Service Line in accordance with the Town's Rules and Regulations may result in a requirement to uncover the connection and disconnect at the Owner's expense.

1.7 EQR DEFINITION AND USER CLASSIFICATIONS

A. Equivalent Residential Unit (EQR) Definition

1. An Equivalent Residential Unit, or EQR, is the average daily flow of wastewater that a single-family residential dwelling unit discharges into the collection system. For non-residential uses, an EQR equivalent shall be used. A listing of EQR equivalents for common residential and non-residential uses is provided in the Schedule of User Classifications and EQR Equivalents provided in Appendix A. This list is not all inclusive.
2. One (1) EQR is estimated to contribute 300 gallons per day (gpd).
3. The EQR wastewater characteristics (i.e. biochemical oxygen demand (BOD), total suspended solids (TSS)) shall adhere to the Waste Classifications section of these Rules and Regulations.
4. Under no condition shall the calculated EQR for a given use be less than one (1) EQR, unless otherwise approved in writing by the Town.

B. User Classifications

1. For the purpose of levying reasonable, uniform, and equitable charges, the following User classifications are provided, but not limited to:
 - a. Single Family Dwelling – Shall be constructed as a living unit suitable for occupancy by one (1) or more individuals of a family and forming a separate structure from any other dwelling unit consisting of one (1) or more habitable rooms arranged, occupied, intended or designed to be occupied by one (1) family's facilities for living, sleeping, cooking, and eating.
 - b. Multiple Family (Multifamily) Dwelling – Shall consist of a single structure or structures attached to other dwelling units wherein more than one (1) single family unit exists.
 - c. Hotels, Motels, Condo-tels, Lodges, Boarding Houses, Dormitories, Bed and Breakfast – A building or unit providing sleeping facilities. Depending on the nature of the use, such units may be classified on a per bed space basis (see Hospitals) in lieu of a per room basis, as determined by the Town.

- d. Mobile Homes – Are defined as a unit capable of being transported on wheels behind a standard power unit, and can be moved on normal streets, roads, and highways. Said unit must be suitable for living quarters, working quarters and provide normal domestic sanitary conveniences.
 - e. Restaurants, Bars, Cafes, and Private Clubs - Are defined as any establishment providing food or beverage services to the general public or to private membership and whether or not charges for such services of goods and beverages are made. Such units shall be classified by seating capacity. Any facility providing a commercial kitchen for any and all uses, including catering, shall be included within this classification.
 - f. Filling Stations and Garages – Are defined as a service outlet providing for the servicing of vehicular units. Automatic or manual car wash facilities are not included in this classification. A separate classification is provided for such car wash facilities.
 - g. Car Washes – Are defined as facilities designed for the external cleaning of vehicles.
 - h. Laundry – Are defined as public, coin operated laundry and drying facilities for clothing and textile usage. Charges for such use do not reflect laundry facilities in hotel, motel, condominium, condo-tel, lodge, bed and breakfast, dormitory, etc. A separate charge is provided herein for such laundry facilities on the basis of a percentage of the total EQRs.
 - i. Schools - Are defined as any private or public institution established and utilized for instruction of any individual or groups, and where said units are operational on a regularly reoccurring basis for a period of at least six (6) weeks or longer on a normal five (5) day week.
 - j. Hospitals - Are defined as either private or public health care institutions providing overnight facilities for care of patients. Such units shall be classified on a per bed space basis which shall mean; a single bed shall constitute one (1) bed space; a double, queen, or king bed shall constitute two (2) bed spaces and any additional thereto shall constitute more than two (2) bed spaces.
 - k. Commercial Use – Is defined as any establishment providing or selling a service. Common commercial uses are provided in the Schedule of User Classifications and EQR Equivalents provided in Appendix A.
 - l. Other – Are defined as any Customer or use not fitting into a named User Classification. The Town reserves the right to assign or create a classification and set rates or surcharges appropriate for that classification.
2. If there is any combination of uses as defined in these Rules and Regulations or by the Town, then the combination yielding the highest EQR shall be the basis for determining User charges.

1.8 WASTE CLASSIFICATIONS

A. General

1. For customer uses with wastewater flows not characterized as Acceptable Sewage, the Town may, at its own discretion, assign a higher EQR value than what was calculated for the use due to anticipated higher biochemical oxygen demand (BOD) or total suspended solids (TSS).
2. Wastewater characteristics vary in composition and strength, specifically for non-residential uses, and will be evaluated by the Town on a case-by-case basis.

B. Acceptable Sewage

1. Acceptable sewage can be treated by Town facilities without pretreatment.
2. Acceptable sewage shall have a daily average concentration of not more than 275 mg/L biochemical oxygen demand (BOD) and 275 mg/L total suspended solids (TSS).
3. Acceptable sewage shall not contain any unlawful discharges.

C. Special Sewage

1. Special sewage does not conform to the definition for Acceptable Sewage, but can be accepted by the Town after pretreatment by the User.
2. Swimming pool drain water containing chlorine must be approved by the Town prior to release.

D. Prohibited Sewage

1. Prohibited sewage will have a deleterious effect upon the treatment and collection system or any persons or property.
2. Prohibited sewage includes clear water used for bleeding or drainage.

E. Industrial Sewage

1. Any wastewater or material from any non-domestic source which is liquid or solid and contains:
 - a. Biochemical oxygen demand (BOD) or total suspended solids (TSS) in excess of 275 mg/L.
 - b. Substances which may create a fire or explosive hazard.
 - c. Wastewater with a pH of less than 6.0 or greater than 9.0.
 - d. A temperature capable of raising the temperature of wastewater flows measured at the headworks of the Town's treatment plant by 20 degrees Celsius (°C).
 - e. Hospital wastes.

- f. Any and all substances considered “toxic/hazardous” under standards of the U.S. Environmental Protection Agency, the Colorado Department of Public Health and Environment or the U.S. Department of Transportation.

F. Pretreatment and Testing

1. If a waste flow from any facility is determined to constitute “Industrial Sewage,” the Town, in its sole and absolute discretion, shall generally require regular testing and pretreatment of such Industrial Sewage, at the expense of the party which is the source of such waste, prior to such wastes being introduced into the Town’s wastewater collection and treatment system.
2. When required by the Town, the Owner of any Property served by a Service Line carrying Special Sewage or Industrial Sewage shall install and maintain, at the Owner’s expense, a suitable control manhole on such Service Line to facilitate observation, sampling, and measurement of the wastewater.
3. Any Owner introducing Special Sewage or Industrial Sewage into the Town’s system may, in the sole and absolute discretion of the Town, be required to provide at the Owner’s expense, industrial pretreatment facilities necessary to remove any contents of the Special Sewage or Industrial Sewage which negatively impact the Town’s wastewater collection and treatment system or process. Each Owner whose Service Line carrying Special Sewage or Industrial Sewage which requires pretreatment shall pay for review of the proposed industrial pretreatment process by the Town Engineer.
4. All measurements, tests, and analysis of the characteristics of the waters and waste shall be determined in accordance with “Standard Methods for the Examination of Water and Wastewater,” and shall be determined at the control manhole, or upon suitable samples taken at the manhole. In the event that no manhole is required, the “control manhole” shall be considered to be the downstream manhole in the wastewater collection system nearest to the point where the Service Line is connected.

1.9 FEES AND CHARGES

- A. Customers connecting to the sewer collection system are subject to the fees and charges described in the following sections. Refer to the Schedule of Fees and Charges provided in Appendix B for a listing of the actual fees and charges.

- B. System Investment Fee (SIF)

A System Investment Fee (SIF) will be charged and collected from all Customers of the Town at the time a Connection Permit is issued. The SIF will be based upon the appropriate EQR figures for the use of the Property made by the Customer, as determined by the Town.

- C. User Fee

1. A User Fee will be collected monthly from each Customer of the Town. The User Fee shall be based on the appropriate EQR figures for the use on the property made by the Customer, as determined by the Town, based upon information provided by Owner.

2. It is the intent of the Board that the User Fee shall be established using a “Cost of Service” approach, such that Users pay a roughly proportional amount for services based upon the estimated maximum potential use demand of each Customer. Such User Fee shall be periodically reviewed by the Board and may be modified or amended as part of the Town’s annual budget process.
3. User Fee charges for new construction shall begin the day of the tap inspection by the Town.
4. The amount due on all Customer accounts shall be paid in full to the Town by the last day of the month following the billing period. Where the Customer believes the statement is in error, the Customer must file in writing, a notice to the Town of the presumed error, and request a clarification from the Town. Upon review by the Town, and re-submittal or revision of the statement, payment shall be due no later than ten (10) days from the postmarked date of the resubmitted statement.
5. Customers who establish a payment plan will not be assessed a late fee as long as payments are received as scheduled. The Town shall further have the right, in its sole and absolute discretion, after an informal hearing as provided below, to terminate service by disconnection or otherwise to any Customer.
6. If any Owner’s bill is delinquent for a period of thirty (30) days or more, the Town may proceed as follows:
 - a. The Town shall deliver to the delinquent Owner, by prepaid certified mail, return receipt requested, a shut off notice. Said shut-off notice will require the bill to be paid within ten (10) days from the time of receipt of the notice.
 - b. If the Owner or the occupant of the premises cannot be located for service of the shut off notice, it shall be lawful to attach said notice to the front door of the affected premises.
 - c. The Owner or current occupant of the premises shall have the right to request an informal hearing before the Board, which is authorized to make adjustments or to establish a payment schedule for overdue amounts. Said request must be made in writing within forty-eight (48) hours after receipt of the shut-off notice.
 - d. If the charges are not paid within ten (10) days of notice, and no informal hearing is requested, the Board shall disconnect sewer service to the property by hiring an excavator to dig up and plug the Service Line, at the Owner’s expense.
 - e. A Shut-Off Notice Fee shall be charged to the Owner.
 - f. All unpaid user fee charges shall be considered perpetual liens on the Property served until paid in full. The Town reserves the right to use all other statutory authorized collection procedures to secure payment of past due charges.

D. Delinquent Accounts

1. Any account which is delinquent beyond the collection due date will be assessed a monthly penalty equal to ten dollars (\$10.00).

2. In addition to this penalty amount, the Town shall charge interest upon the unpaid balance of any past due account in the amount of one percent (1%) per month until paid in full.

E. Line Extension Fees

1. The Town shall charge Line Extension Fees for new Service Lines and Collection Mains to cover the cost of plan review and inspection.
2. The Line Extension Plan Review Fee shall be a charge determined by the actual cost of engineering review of Line Extension or Service Line being proposed. Such Fee is payable at the time of plan submittal for such extension.

F. Returned Check Charge

The Town shall levy a charge to a User's account for a check returned by a bank for insufficient funds.

G. Discontinuance of Service

1. Any person who wishes to discontinue the use of sewer service shall file a written or verbal notice with the Town and pay all current and back charges for Sanitation services. The fee for turning off sewer service at the request of the consumer shall be as set and determined by the Town.
2. The fee for discontinuing and resuming sewer service for valid maintenance purposes shall be as set and determined by the Town.
3. Any maintenance shut-down under this provision will not exceed seventy-two (72) hours unless the Town states that the maintenance requires more time. The basic charge will still be assessed during maintenance shut-downs.
4. Notwithstanding any discontinuance of service, the basic charge shall continue to be charged to the consumer during said discontinuance.

H. Inspection and Re-inspection Fees

Inspection Fees are included in the Line Extension Fee. There will be an additional charge for reinspection.

I. Roof Drain Connection Penalty Fee

1. No roof drain shall be connected to the Town's wastewater collection system.
2. In specific circumstances, where no other alternative may be reasonable and economically available, the Board, in its sole and absolute discretion, may permit a roof drain connection. Any building contributing flow to the Service Lines from a roof drain which cannot be rerouted out of the sewer system shall pay an additional quarterly fee, to be determined by the Board on a "per square foot of roof space," basis.

J. Disconnection and Reconnection Fees

If service is disconnected by the Town, a disconnection fee will be charged. If service is restored and reconnection to the collection system is made, a reconnection fee will be charged.

K. Grease Trap/Interceptor Penalty Fees

1. A Customer who is required to install a grease trap/interceptor in accordance with these Rules and Regulations, and fails to do so, shall pay a Penalty Fee to cover the additional operation and maintenance costs caused by the grease being released into the Town's facilities.
2. Customers failing to provide documentation of grease trap/interceptor cleaning will be assessed a fifty percent (50%) monthly User Fee surcharge.

L. Preservation of Gravity Sewer System

1. In those instances where pumping stations and force mains are required, the sewer system shall be designed to permit connection into a gravity system with a minimum of expense. Where practicable, easements shall be provided and lines constructed to tie into the gravity system. The Town may, in its sole and absolute discretion, require a Developer to deposit a sum of money in such amount as to ensure the construction of gravity lines within a reasonable time after payment of such deposit, in any event not to exceed ten (10) years.
2. The deposit amount shall be determined at the sole discretion of the Board on a case-by-case basis.

M. Right to Assess

1. The Town has the right to assess any Owner, who is late in payment of any rate, fee, toll or charge, including, without limitation, all disconnection costs, attorneys' fees and court or other costs necessary to or incidental to the collection of said fee or charge.
2. The Town shall also have the right to assess any Owner who has violated these Rules and Regulations or any other applicable rules, regulations or laws, State or Federal, which violation has resulted in expenses to the Town to correct, repair or replace the Town's treatment processes and equipment, or Town collection system components, all such expenses as "fees" or "charges" against the Owner's future use of the collection and treatment system. Such fees and charges may be collected by the Town as part of the monthly fees for continuing use of the Town's system.

N. Right to Lien

1. By statute, until paid, all fees and charges shall constitute a first and perpetual lien on or against the Property served, and such lien may be foreclosed as provided by law.
2. The Town assumes no responsibility hereby for any agreement made between Owners and tenants of the Owner's premises, regardless of how made or the Town having been notified of such agreements. The Owner remains solely liable for payment of all charges of the Town.

1.10 CHANGE OF USE

- A. When any building is intentionally moved, destroyed, remodeled, or renovated for a new use, the original EQR authorization shall be terminated or credited toward the new use.
- B. A credit for the actual amount paid for EQRs previously purchased for the Property will be allowed towards the SIF, which SIF for the new use or structure shall be at the

rate in effect at the time application is made for service to the new use or structure, provided User fees for the original number of EQRs are paid continuously during the time of non-use. Failure to pay such User fees during the period of non-use shall result in a surcharge of one hundred percent (100%) of the User fees not paid. Such surcharge shall be paid at time of application for service to the new use.

- C. It shall be the responsibility of the Owner to establish the number of EQRs originally purchased and the amounts paid for such EQRs for the previous use or structure to be credited against the new use or structure.
- D. The Town shall not be required to refund any SIF's previously collected.
- E. Additions or changes in use of existing buildings shall require a new SIF paid at the time the permit is drawn, at the rate in effect at the time application is made. The building(s) will meet all the requirements of the Rules and Regulations in effect at the time the new SIF is acquired.

1.11 INCLUSIONS

A. Petition

1. A request for inclusion of any real property shall be made to the Town as a "Petition for Inclusion of Real Property," in accordance with Colorado Revised Statutes Title 32, to be accompanied by a non-refundable payment for administrative and legal fees. Fees are summarized in the Schedule of Fees and Charges provided in Appendix B.
2. Additional costs which may be incurred by the Town shall be paid by the Applicant prior to the approval of the inclusion by the Board; or at such time thereafter as may be established by the Board. Once a Petition is submitted, it may not be withdrawn.
3. The Town Board may require any Petitioner for inclusion to enter into an Inclusion Agreement with the Town, upon such terms and conditions as the Town, in its sole and absolute discretion, may decide.

B. Evidence of Ownership

1. It shall be incumbent upon the Applicant to furnish satisfactory evidence of Ownership of the Property to be included.
2. The evidence may consist of a current commitment for a title policy, tax receipts, or certification in lieu thereof, received from and signed by the County Treasurer.

C. Public Hearing

1. The properly filled out and executed petition shall be submitted to the Board to set a date for a public hearing. After the public hearing has been scheduled, legal notice shall be published, as required by law.
2. At the public hearing the Board may approve or disapprove the inclusion of the property upon such terms and conditions, if any, as the Board deems appropriate for the circumstances.
3. If approved, an Order for Inclusion of Property and Notice for the District Court

shall be prepared by the Town, filed with the District Court and copies forwarded to appropriate State and County agencies by the Town.

D. Service Outside the Town

1. The Town may, in its sole and absolute discretion, if it seems advantageous to the Town, furnish service to properties located outside the Town boundaries by contract upon such terms and conditions as the Town, in its sole and absolute discretion, deems advisable. Under no circumstances shall the Town construct any mains at its own expense to serve such properties.
2. Charges for furnishing services outside the Town shall be at the discretion of the Board, who shall take into account the estimated mill levy which such Property would be responsible for if it were part of the Town.

1.12 PROHIBITED ACTIVITIES

- A. No unauthorized person or entity shall uncover, make any connection with, or opening into, use, alter, or disturb any public Service Line or Sewer Main, manhole or other appurtenances or equipment, without first obtaining written permission from the Town.
- B. No person shall discharge to any public sewer or manhole any harmful water or hazardous or toxic wastes or materials, including, but not limited to, materials which are flammable, explosive, caustic, acidic, toxic, whether liquids, solids, or gas, capable of causing obstructions of the flow in the sewers, damage or hazard to structures, equipment processes, biological processes, or personnel of the Town's wastewater collection system or treatment plant. Hazardous or toxic wastes or materials are those defined in applicable federal and state statutes for the U.S. Environmental Protection Agency, the Colorado Department of Health and Environment, and the U.S. Department of Transportation.
- C. No person shall discharge or cause to be discharged any waste classified as Special or Industrial Sewage without appropriate prior pretreatment or other arrangement with the Town, as established prior to such discharge.
- D. No person shall discharge or cause to be discharged any water bleeding flows, storm water, surface water, ground water, roof runoff, sub-surface drainage, cooling water, or unpolluted industrial process waters to any manhole or public sewer.
- E. Infiltration of ground water caused by leaking Service Lines shall not be allowed. Service Lines contributing more than 0.07 gal/hour/100 linear feet of Service Line shall be considered to be leaking and shall be repaired at the expense of the Owner.
- F. No person shall maliciously, willfully, or negligently break, damage, destroy, uncover, deface, or tamper with any portion of the Town's wastewater collection and treatment system. Violations will be referred to the Town Attorney for prosecution to the fullest extent of the law.
- G. No person shall construct or cause to be constructed any appurtenance to their building sewer below the level of the one-hundred (100) year flood plain, as determined by the Federal Emergency Management Agency mapping.
- H. No collected grease shall be discharged to the wastewater collection system. The Town shall conduct random grease trap/interceptor inspections. Where violations exist, the Customer shall have thirty (30) days from the notice of violation to provide

documentation of grease trap/interceptor cleaning. Penalty fees or user fee surcharges shall be assessed to Customer's failing to provide documentation of grease trap/grease interceptor cleaning.

I. Correction of Violations

1. Any person notified by the Town of any violation of the provisions of this section, shall have the violation corrected, within forth-eight (48) hours of notification, unless said notification specifies a longer time frame.
2. If violations are not corrected by the time specified, the Town shall have the authority to correct the violation, at the Owner's expense, or disconnect service to the Property at the Owner's expense.

J. Fees or Fines

1. Any person who violates the provisions of this section may be charged with a misdemeanor.
2. Upon determination of the violation of the provisions in these Rules and Regulations, the Customer shall be charged for such violations in the amount of actual costs for the damages as determined by the Town, up to the maximum amount allowed by law.

1.13 CONNECTION PERMIT

- A. A Connection Permit must be obtained before a Service Line can be connected to a Sewer Main.
- B. Connection Permits issued by the Board of are deemed "revocable licenses," initiated and held by any and all property Owners for so long as such property Owners comply with all applicable Rules and Regulations. The property Owner is ultimately responsible for complying with these Rules and Regulations, including payment of all required rates, fees, tolls, charges and taxes established and imposed by the Town.
- C. A Connection Permit is assigned and attached to a specific property and cannot be transferred to any other property unless specifically authorized, in writing, by the Board.
- D. Before any connection is made to the Town's collection system, a site plan or construction drawings showing the alignment of the Service Line or Sewer Main, the connection to the Sewer Main, the length of the Service Line from the building to the Sewer Main, location of cleanouts and bends in the line, depth of the line from the building to the Sewer Main, and the distance from the nearest manhole to the tap on the Sewer Main, shall be provided to the Town. The Connection Permit shall give a full description of the address, legal description, type of construction, bedroom count, and the name of the Owner/Developer.
- E. Only one premise shall be supplied through a single Service Line, except in the case of hotels, motels, condominiums, apartments, and such buildings as are operated as an integrated unit, with one person, billing entity, or Owner responsible for payment of service fees.
- F. In the case of units with common walls, but separate Ownership, and no one person or entity responsible for the payment of joint User Fees, separate Service Lines shall be run from the building drains of each unit. Service Lines installed in this manner

shall be clearly indicated, along with proper easements dedicated to the Town established and shown on the plat prior to re-subdivision. A group of buildings may be connected to a single Service Line within Property boundaries, if it can be shown that said buildings/land cannot be sold separately.

- G. Any Connection Permit issued by the Town is not and shall not be taken as authority to make any cut in a public street, alley, or right-of-way, or shall not serve in lieu of any permits required by other governmental agencies with jurisdiction over such conditions.
- H. Any Connection Permit constitutes a revocable license to make and use a connection to the Town's sewer system, subject to the Rules and Regulations of the Town. A Connection Permit may be revoked, and the Owner's Service Line disconnected, at the Owner's expense, if installation or use of the Town's facilities or wastewater collection or treatment services are not made in strict accordance with these Rules and Regulations, State and Federal Rules and Regulations or laws, or any prescribed terms or specifications applicable to the Property or any other rules governing the Town.
- I. All connection and inspection fees, including System Investment Fees, are due and payable at the time of the issuance of the Connection Permit.

1.14 PENALTIES AND SEVERANCE

- A. Any person violating any of the provisions of the Rules and Regulations, or whose acts cause the Town to violate the terms of its discharge permit or any other water pollution control regulations or statutes, shall become liable to the Town, for any and all expenses, including, but not limited to, attorneys fees, losses, damages, and fines resulting by reason of such violation.
- B. Any person found to be violating any of the provisions of these Rules and Regulations, or any applicable State or Federal law or regulation, shall be served with written notice stating the nature of the violation and providing a reasonable time, not to exceed thirty (30) days for satisfactory correction of the violation. Any person who shall be charged under the appropriate laws of the State of Colorado, and upon conviction, shall be fined an amount established by the court of the State of Colorado for each violation.
- C. In addition to, and notwithstanding any other provisions of these Rules and Regulations, the Town may, at its option, disconnect the service line from any property owned by any person violating any of the provisions of the Rules and Regulations or for non-payment of scheduled fees and charges for service from the Town. The cost of disconnection and severance from the system shall be charged against the property formerly served by the Town and, until paid, shall constitute a perpetual lien which shall be collected in the same manner as provided herein for the collection of fees and charges, or as otherwise provided by law.

APPENDIX A SCHEDULE OF USER CLASSIFICATIONS AND EQR EQUIVALENTS

The EQR for individual or commercial Users with a use not herein described, or of an unsafe nature, will be set by the Town Board of Trustees.

Under no condition shall the calculated EQR for a given use be less than one (1) EQR, unless otherwise approved in writing by the Town.

Description	EQR Equivalent
Single Family Dwelling Per Unit	1.00
Multifamily Dwelling Per Unit	1.00
Hotel, Motel, Lodge, Rooming House, Bed & Breakfast	
Each Room	0.10
Additional for Kitchen/Kitchenette	0.26
Onsite Manager Unit	1.00
Additional for Laundry Facility (of total EQRs)	15%
*Does not reflect charges for additional facilities, including but not limited to, restaurants, bars, pools, hot tubs, retail.	
Mobile Home Park Per Unit Space	1.00
Restaurant, Café, Bar, Lounge, Private Club	
Full Service (per 10 seats or part thereof)	0.85
Fast Food (per 20 seats or part thereof)	0.85
Banquet Room (per 35 seats or part thereof)	0.85
Drive In (per 4 car spaces or part thereof)	0.85
*Any use providing a commercial kitchen for any and all uses, including catering, shall be included in this classification.	
Gas Station, Convenience Store (EXCLUDES Car Wash)	
Per 2 gas dispensers/nozzles	1.00
For each additional gas dispenser/nozzle	0.38
Laundry, Self Service per each 35 gallon machine	0.38
School (per 100 students and staff or part thereof)	
Without gym or cafeteria	2.00
With gym and without cafeteria	3.00
With gym and cafeteria	4.00
Hospital, Nursing Facility	
Per bedspace	0.11
Additional for Kitchen	0.26
Additional for Laundry Facilities (of total EQRs)	15%
Auto Dealer, Car/Truck Rental per 1,000 sf of building	0.23
Barber Shop, Beauty Salon	
Per first 2 chairs	1.00
Each additional chair	0.10
Bowling Alley per lane (EXCLUDES Restaurant, Bar, etc.)	0.04

Description	EQR Equivalent
Car Wash per stall	1.13
Church	
Church without Kitchen Additional	1.00
for Church with Kitchen	0.26
Dry Cleaner per 1,000 square feet of building	0.75
Office Building per 1,000 sf of building space (EXCLUDES offices that provide services, doctors, dentist, etc.)	0.38
Retail Space per 1,000 sf of building space (INCLUDES offices that provide services, doctors, dentists, etc.)	
With public restrooms	0.38
Without public restrooms	0.23
Garage/Machine Shop per 10 employees (EXCLUDES Retail, Office, and Warehouse Space)	0.45
Factory per 10 employees	0.45
Drug Store/Pharmacy	
Per 1,000 sf of building space	0.23
Additional with public restrooms	0.38
Theater per seat	0.02
Warehouse, Storage Unit	
Per 1,000 sf of building	0.11
Without sewer service	0.00
Swimming Pool, Hot Tub	
Public Pool	1.13
Public Tub	0.26
Private Pool/Tub	0.00
* All public pools and hot tubs shall connect to the Town's Collection System. Pool water discharge with chlorine must be approved by the Town prior to release.	
RV Park	
Minimum tap fee Additional	1.00
per each space	0.10
Detention Center per 3 beds	1.00
* Acceptable Sewage only; Special Sewer accepted under discretionary terms only	
Others not defined in above list	Accepted under discretionary terms only

APPENDIX B SCHEDULE OF FEES AND CHARGES

The information contained in this Appendix is pertinent to all rates, fees, tolls, and charges of whatever nature to be levied for the provision of the wastewater collection and treatment services by the Town.

The rates, fees, tolls, and charges as established herein shall be in effect immediately upon adoption by the Board and shall remain in effect until modified by the Board. Nothing shall prevent the Board from modifying any rates, tolls, fees, charges, or any classifications, provided that the charges upon each member within the classification shall be uniform, according to the number of EQRs assigned to a given Customer.

Schedule of Fees and Charges

Fee	Amount
System Investment Fee (SIF)	\$8,351.00 for one (1) EQR
User Fee	\$65.00 per one (1) EQR
Line Extension Inspection Fee	\$3.00 per lineal foot of sewer main
Line Extension Plan Review Fee	Based on actual cost of engineering review
Reinspection Fee	\$75.00
Delinquent Account Fees	\$10.00 per month plus 1% interest on balance
Inclusion Fee	\$200.00 plus applicable attorneys fees
Disconnect Fee	\$1,000.00
Reconnect Fee	\$1,000.00
Return Check Fee	\$25.00
Lien Charge	\$100.00 plus any additional fees
Post Construction Bond	\$500.00
Copy of Rules and Regulations	\$5.00 per set plus postage if mailed
Copies	\$0.25 per page
Failure to install grease trap/interceptor	Per Section 1.9 (K) of these rules
Failure to properly maintain grease trap/interceptor	50% of monthly use fee
Improper discharge of Special, Prohibited, or Industrial Sewage	Actual cost of damages but not less than \$500.00

APPENDIX C LINE EXTENSION AGREEMENT

Town of Fairplay
P.O. Box 267 – 901 Main Street
Fairplay, CO 80440
Tele: (719) 836-2662

**LINE EXTENSION
AGREEMENT**

THIS AGREEMENT is made and entered into this _____ day of _____, 20____, by and between the Town of Fairplay (“Town”), operating and existing under and by virtue of the laws of the State of Colorado and: _____ (“Developer”).

WHEREAS, the Developer is the Owner of the following described property:

within the boundaries of the Town of Fairplay service area, and it is proposed that said property be served by wastewater facilities constructed pursuant to this Agreement; and

WHEREAS, the Town is not required to extend its facilities beyond those currently existing and all such extensions are undertaken at the discretion of the Town in the interest of the public health, safety and welfare.

THEREFORE, it is mutually understood and agreed as follows:

1. **WASTEWATER FACILITIES.** The wastewater facilities will be designed and constructed in accordance with the most current edition of the Town’s “Rules and Regulations, Design Criteria, Technical Specifications, and Construction Details” (Rules and Regulations), **INCLUDING ALL EXTENSIONS SHALL BE INSTALLED TO THE FAR SIDE OF THE PROPERTY;**

Developer: _____

Engineer: _____

Contractor: _____

Project: _____

2. **ATTORNEYS, ENGINEERING AND INSPECTION FEES.** It is understood the Town will incur legal, engineer and inspection costs associated with the line extension by the Developer. Therefore on or before the commencement of construction of the line extension, the Developer shall deliver to the Town, a cash deposit in the amount equal to Town, a cash deposit in the amount equal to \$300 per lineal foot of the proposed line extension. Such deposit shall be applied toward such costs. Any unused portion of the deposit shall be refunded to the Developer at the end of the warranty period.
3. **WARRANTY.** The Developer shall deliver to the Town a written warranty in accordance with the requirements of the Rules and Regulations.
4. **TRANSFER OF FACILITY.** Following execution of this agreement and upon completion of the wastewater facilities in accordance with Town's Rules and Regulations, Ownership and maintenance responsibility for the facilities will transfer from the Developer to the Town. Before such transfer will occur, the Developer shall deliver to the Town a good and sufficient bill of sale for the wastewater facilities, conveying the facilities free and clear from any and all claims or liens whatever. The Developer shall also deliver all required easements, in a form acceptable to the Town, and said easements must be properly recorded with the Park County Clerk and Recorder prior to submission to the Town. Transfer of the wastewater facilities will take place twelve (12) months from the date the Line Extension Agreement is signed by the Developer and the Town. If at that time the Developer has not completed the testing of the facilities as described in the Rules and Regulations, the Town will complete the testing at the Developer's expense. The Town will direct its Attorney to work with the Park County Clerk and Recorder to ensure the easements and the facilities are free and clear from any claims or liens at the Developer's expense. If the Developer does not perform all obligations under this paragraph on or before the twelve (12) month completion date, the Developer will disconnect the wastewater facilities from the Town's collection system until such time as the proper procedures are completed. If the Developer refuses to disconnect the facilities from the Town's facilities, the Town will disconnect the facilities at the Developer's expense. Reconnection to the Town's facilities shall be at the Developer's expense. If the property is connected to the wastewater facilities and a public health hazard will be created by disconnection of the wastewater facilities, the Town reserves the right to finish the project at the Developer's expense.
5. **OPERATION AND MAINTENANCE OF FACILITIES.** After the wastewater facilities have been transferred and subject to the provisions of the warranty, the Town shall have full responsibility for operations and maintenance of the facilities and the actual costs incurred in connection there within. The Town agrees to allow connection to the facilities in accordance with the Rules and Regulations of the Town.
6. **INDEMNIFICATION.** The Developer hereby agrees to hold harmless the Town, its successors and assigns against any and all liability, loss of damage the Town may suffer as a result of claims or judgments against it under the mechanics' lien law of the State of Colorado, or on account of defective materials and workmanship used to install the facilities. Said indemnification shall include, but not be limited to, court costs, damages, and repair costs and reasonable attorney's fees.
7. **ENFORCEMENT OF CONTRACT.** The Developer and the Town acknowledge and agree that this Agreement may be enforced in law or in equity by a decree of specific performance; damages or such other legal and equitable relief as may be available to either party.
8. **SURVIVAL OF OBLIGATIONS.** The provisions of this Agreement shall be deemed to survive the transfer of the wastewater facilities and shall be binding upon the successors, transferees

and assigns of the parties.

- 9. **ASSIGNMENTS.** The Developer shall not assign its rights or delegate its duties under this Agreement without prior written consent of the Town.
- 10. **REBATE AGREEMENTS.** Rebate agreements, if any, for the wastewater facilities will be addressed by separate agreements with the Town, apart from this Line Extension Agreement.
- 11. **GOVERNING LAW.** This agreement shall be interpreted under the laws of the State of Colorado.

IN THE WITNESS WHEREOF the parties have hereunto set their hand and seals to be affixed the day and year written above.

Developer: _____
 Name: _____
 By: _____
 Title: _____

STATE OF COLORADO)
 COUNTY OF PARK) ss

The foregoing instrument was acknowledged before me this _____ day of _____, 20____,
 by _____.

WITNESS MY HAND AND MY SEAL MY
 COMMISSION EXPIRES _____

 (NOTARY PUBLIC)

Town of Fairplay:

 Name

 Title

APPENDIX D LINE ACCEPTANCE AGREEMENT

Town of Fairplay
P.O. Box 267 – 901 Main Street
Fairplay, CO 80440
Tele: (719) 836-2622

LINE ACCEPTANCE AGREEMENT

On _____, 20____, inspection was completed by the Town of Fairplay for the collection system lines and appurtenances within the area denoted as the Project Sewer Main Extension. The collection system lines and appurtenances appear to have been constructed in accordance with the current Town of Fairplay “Rules and Regulations, Design Criteria, Technical Specifications, and Construction Details”.

All workmanship and material incorporated in this Project shall be warranted for two (2) years (730 days) from the date this letter is signed by the Developer or Owner. The Line Acceptance Agreement may be executed once the following requirements have been met:

1. A signed copy of this letter has been received by the Town from the Developer.
2. A “Maintenance Bond” in the amount of ten percent (10%) of the project cost is posted by the Developer or Owner which assures, to the satisfaction of the Town, performance of whatever additional repair or remedial work that may be required during or at the completion of the 730-day warranty period.
3. A two (2) year (730 days) warranty period and required repair work have been completed.
4. “As-Built” Drawings of the Project have been received by the Town within 90 days.
5. The Developer or Owner shall provide the Town with whatever rights-of-way and/or easements are necessary or appropriate for the purpose of installing and maintaining the utilities transferred by the Developer or Owner to the Town.
6. The expense of any repairs or maintenance to the sewer lines and appurtenant structures caused by defective work, street or utility construction, traffic, or any other reason, including Acts of God, during the two-year warranty period will be borne by the Developer or Owner. The Developer or Owner shall maintain and keep in good repair all sewer lines and appurtenant structures during the warranty period. The Town will notify the Developer or Owner at any time during the warranty period when it is deemed that maintenance is necessary. If this maintenance is not performed by the Developer or Owner, the Town reserves the right to have such cleaning, repairs, or other maintenance performed during this warranty period to insure proper operation of the facilities. If the Town incurs any expense in performing the aforementioned work, the Developer or Owner shall reimburse the Town.
7. One copy of this letter shall be signed, dated, sealed, and returned to the Town of Fairplay office with the Performance Bond to indicate acceptance of the conditions described herein and to establish the commencement date of the one (1) year warranty period.

Town of Fairplay

THIS LETTER WAS DULY RECEIVED AND THE CONDITIONS HEREIN ACCEPTED BY:

By: _____

SEAL & ATTEST

Title: _____

Date: _____

Town of Fairplay - Water Loss Evaluation

MARCH, 2024

Year/Month	Gallons of Water Produced	Gallons of Water Billed	Bulk Water Filled Gallons Sold	Gallons Not Billed (Non-revenue)	% Loss	Influent Intake Gallons Sanitation Plant	Usage/Leakage (Gallons)*
24-Mar	2,568,029	1,890,000	11,000	667,029	25.97%	2,973,653	194,376
24-Feb	2,329,417	2,130,000	1,798	197,619	8.48%	2,767,714	161,703
24-Jan	2,756,914	1,901,000	9,600	846,314	30.70%	2,263,188	1,093,726
23-Dec	2,435,019	1,978,000	8,000	449,019	18.44%	2,429,920	605,099
23-Nov	2,522,724	2,068,000	5,000	449,724	17.83%	2,850,076	272,648
23-Oct	2,441,478	1,986,000	6000	449,478	18.41%	2,782,198	259,280
23-Sep	2,768,984	1,786,000	10,000	972,984	35.14%	2,877,568	491,416
23-Aug	3,766,185	2,767,000	159,012	840,173	22.31%	2,987,411	1,378,774
23-Jul	4,154,652	3,066,000	319,720	1,408,372	33.90%	3,159,293	1,595,359
23-Jun	2,774,533	2,026,000	6000	754,533	27.19%	2,721,888	652,645
23-May	2,827,877	1,785,000	6000	1,036,877	36.67%	2,724,577	703,300
23-Apr	2,879,296	1,648,000	5000	1,236,296	42.94%	2,768,552	710,744
23-Mar	3,100,045	2,390,000	4000	714,045	23.03%	2,944,411	755,634
23-Feb	3,643,134	2,892,000	4000	755,134	20.73%	2,647,201	1,595,933
23-Jan	3,204,152	1,958,000	3,000	1,249,152	38.99%	3,036,092	768,060
22-Dec	2,959,297	2,077,000	3,000	885,297	29.92%	2,935,749	623,548
22-Nov	2,636,174	1,705,000	2,800	933,974	35.43%	2,725,199	510,975
22-Oct	3,107,087	1,672,000	3,000	1,432,087	46.09%	3,119,062	588,025
22-Sep	3,520,790	2,020,000	2,900	1,497,890	42.54%	2,748,647	1,372,143
22-Aug	4,422,770	2,731,000	6,500	1,685,270	38.10%	3,016,516	2,006,254
22-Jul	4,084,981	2,407,000	6,975	1,671,006	40.91%	3,129,599	1,555,382
22-Jun	3,472,184	2,157,000	3,200	1,311,984	37.79%	2,782,182	1,290,002
22-May	2,705,715	1,760,000	1,400	944,315	34.90%	2,801,428	504,287
22-Apr	2,573,411	1,670,000	1,100	902,311	35.06%	2,873,579	299,832
22-Mar	2,589,242	2,067,000	2,750	519,492	20.06%	3,073,850	115,392
22-Feb	2,333,009	1,832,000	2,700	498,309	21.36%	2,758,731	174,278
22-Jan	2,537,579	1,679,000	1,400	857,179	33.78%	3,092,156	45,423
21-Dec	2,552,299	1,939,000	1,000	612,299	23.99%	2,966,896	185,403
21-Nov	2,509,249	1,780,000	2,450	726,799	28.96%	2,677,502	431,747
21-Oct	3,298,065	2,422,000	2,850	873,215	26.48%	2,958,659	939,406
21-Sep	4,125,110	2,439,000	2,700	1,683,410	40.81%	3,028,952	1,696,158
21-Aug	4,396,735	2,781,000	1,700	1,614,035	36.71%	3,072,321	1,924,414
21-Jul	4,495,697	3,231,000	1,800	1,262,897	28.09%	3,498,456	1,597,241
21-Jun	3,939,138	2,577,000	5,025	1,357,113	34.45%	3,294,293	1,244,845
21-May	2,950,224	2,323,000	330	626,894	21.25%	3,282,436	267,788
21-Apr	2,567,775	2,046,000	1,690	520,085	20.25%	3,098,238	69,537
	TOTAL	TOTAL	TOTAL	TOTAL	Avg Loss	TOTAL	Avg Usage
	111,948,970	77,586,000	615,400	34,442,610	29.94%	104,868,193	796,688

Averages 3,109,694 2,155,167 17,094 956,739 2,913,005

Notes:

1. Water leak found and fixed on Meadow Drive early November
2. Metered water leak at Gold Pan Trailer Park, 1.312 million gals (billed) approx 1.230 million gals leaked into ground and not recovered by sanitation plant. 365,933 gallons acutal usage/leakage.
3. PRV leaks discovered at Dollar General and on Front Street.
4. Unmetered leak under building behind the jail.
5. Leak discovered @ 6th and Bogue, tried to isolate and reduced.
6. 6th and Bogue leak continues, waiting on parts. Indication is that County was not logging water correctly during the County Fair.
7. Bogue and 6th leak continues, waiting on parts. Gold Pan Trailer Park and the Sinclair station both had metered leaks with bills doubled.
8. Leak at 6th and Bogue fixed, several meters repaired or replaced.
9. There were 4 days water production #'s were not recorded.

*Usage/Leakage assumes approx. 600,000 gal per month from Spruce Hill and the Trailer Park and no I&I

Town of Fairplay - Individual Well Production Data

	Well 1 (gal)	Well 2 (gal)	Well 3 (gal)	Well 4 (gal)	Monthly (gal)	
Mar-24	786,201	676,937	1,104,882	9	2,568,029	
Feb-24	732,749	578,463	1,018,205		2,329,417	7,640,110
Jan-24	876,848	635,136	1,230,680		2,742,664	
Dec-23	780,278	557,303	1,097,438		2,435,019	
Nov-23	801,963	581,098	1,139,663		2,522,724	
Oct-23	767,924	566,713	1,104,908	1,933	2,441,478	
Sep-23	941,705	605,049	1,222,230		2,768,984	Yearly
Aug-23	1,077,913	855,321	1,766,416	66,535	3,766,185	Production
Jul-23	1,160,540	926,687	1,897,714	169,711	4,154,652	36,518,079
Jun-23	848,217	570,489	1,355,827		2,774,533	
May-23	839,891	678,480	1,309,506		2,827,877	Avg Mthly
Apr-23	857,962	698,616	1,322,718		2,879,296	Production
Mar-23	945,917	773,036	1,381,092		3,100,045	3,043,173
Feb-23	1,107,855	997,272	1,538,007		3,643,134	
Jan-23	989,695	842,890	1,371,567		3,204,152	
Dec-22	925,458	740,169	1,293,670		2,959,297	
Nov-22	788,747	713,701	1,133,726		2,636,174	
Oct-22	880,870	845,956	1,380,261		3,107,087	
Sep-22	943,018	966,788	1,610,984		3,520,790	Yearly
Aug-22	1,270,994	1,147,087	2,004,689		4,422,770	Production
Jul-22	1,338,854	953,189	1,792,938		4,084,981	36,942,239
Jun-22	1,181,982	784,967	1,505,235		3,472,184	
May-22	937,356	607,968	1,160,391		2,705,715	Avg Mthly
Apr-22	901,205	579,729	1,092,477		2,573,411	Production
Mar-22	911,916	586,701	1,090,625		2,589,242	3,078,520
Feb-22	828,909	531,882	972,218		2,333,009	
Jan-22	901,541	583,894	1,052,144		2,537,579	
Dec-21	914,759	576,695	1,060,845		2,552,299	
Nov-21	876,563	583,714	1,048,972		2,509,249	Yearly
Oct-21	1,085,427	779,760	1,432,878		3,298,065	Production
Sep-21	1,304,614	956,774	1,863,722		4,125,110	30,834,292
Aug-21	1,100,385	1,300,920	1,995,430		4,396,735	
Jul-21	1,069,883	1,396,690	2,029,124		4,495,697	Avg Mthly
Jun-21	1,204,249	1,122,587	1,612,302		3,939,138	Production
May-21	1,237,321	707,596	1,005,307		2,950,224	3,426,032
Apr-21	1,119,949	603,099	844,727		2,567,775	

TOTAL	35,239,658	27,613,356	48,843,518	238,188	111,934,720	
	31.48%	24.67%	43.64%	0.21%		



**Town of Fairplay
Building Department
Inspection Type Report
2/1/2024 - 4/1/2024**

		Owner	Contractor	Project Description
Address	515 Castello Ave 2023-019		kenny Nail	NEW SINGLE FAMILY HOME
Status	Issued	Issued	5/16/2023	
Use	RESIDENTIAL - SFR			
111 Insulation (2)				
Address	372 PARK VIEW DR 2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson	RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023	
Use	RESIDENTIAL - SFR			
Address	410 FIFTH ST 2022-059	DARRON DANIELS	DARRON DANIELS	CONSTRUCTION OF SINGLE FAMILY HOME. CONTINUANCE OF OLDER PERMIT THAT HAS SINCE EXPIRED.
Status	Issued	Issued	8/15/2022	
Use	RESIDENTIAL - SFR			
112 Rough Framing (2)				
Address	372 PARK VIEW DR 2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson	RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023	
Use	RESIDENTIAL - SFR			
Address	372 PARK VIEW DR 2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson	RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023	
Use	RESIDENTIAL - SFR			



**Town of Fairplay
Building Department
Inspection Type Report
2/1/2024 - 4/1/2024**

		Owner	Contractor	Project Description	
115 Drywall Screw (2)					
Address	410 FIFTH ST	2022-059	DARRON DANIELS	DARRON DANIELS	CONSTRUCTION OF SINGLE FAMILY HOME. CONTINUANCE OF OLDER PERMIT THAT HAS SINCE EXPIRED.
Status	Issued	Issued	8/15/2022		
Use	RESIDENTIAL - SFR				
Address	372 PARK VIEW DR	2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson	RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023		
Use	RESIDENTIAL - SFR				
312 Electrical Rough (3)					
Address	372 PARK VIEW DR	2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson	RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023		
Use	RESIDENTIAL - SFR				
Address	372 PARK VIEW DR	2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson	RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023		
Use	RESIDENTIAL - SFR				
Address	501 MAIN ST	2024-001			TENANT FINISH OF COMMERCIAL BUSINESS SPACE
Status	Issued	Issued	1/17/2024		
Use	COMMERCIAL				



**Town of Fairplay
Building Department
Inspection Type Report
2/1/2024 - 4/1/2024**

		Owner	Contractor	Project Description
401 Sewer Underground Interior (1)				
Address	501 MAIN ST	2024-001		TENANT FINISH OF COMMERCIAL BUSINESS SPACE
Status	Issued	Issued	1/17/2024	
Use	COMMERCIAL			
407 Gas Line Pressure Test (10 PSI) (1)				
Address	372 PARK VIEW DR	2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023	
Use	RESIDENTIAL - SFR			
412 Plumbing Rough (4)				
Address	613 MAIN ST	2023-043	mike lapp	mike lapp REMODELING INTO 2BED 2BATH RENTAL. THIS IS TOWN CENTER ANY EXTERIOR WORK WILL REQUIRE CERT OF APP.
Status	Issued	Issued	1/25/2024	
Use	RESIDENTIAL - MFR			
Address	372 PARK VIEW DR	2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023	
Use	RESIDENTIAL - SFR			
Address	372 PARK VIEW DR	2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023	
Use	RESIDENTIAL - SFR			



**Town of Fairplay
Building Department
Inspection Type Report
2/1/2024 - 4/1/2024**

		Owner	Contractor	Project Description
Address	501 MAIN ST	2024-001		TENANT FINISH OF COMMERICAL BUSINESS SPACE
Status	Issued	Issued	1/17/2024	
Use	COMMERCIAL			
512 Mechanical Rough (2)				
Address	372 PARK VIEW DR	2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023	
Use	RESIDENTIAL - SFR			
Address	372 PARK VIEW DR	2023-007	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson RESIDENTIAL HOME
Status	Issued	Issued	5/3/2023	
Use	RESIDENTIAL - SFR			



Town of Fairplay
Building Department
Permit Report
1/1/2023 - 4/1/2024

406

	Owner	Contractor	Project Description	Amount	Valuation
Project Type: ADDITION					
Address	271 BEAVER CREEK LN	James March	NEW THREE CAR TWO STORY	\$1,945.35	\$75,000
Permit #	2023-011	POB 1720	GARAGE AND WORKSHOP		
Status	ISSUED	FAIRPLAY, CO 80440			
Use	RESIDENTIAL - SFR				
Issued	5/2/2023				
Finaled					
New Sq Ft					
Project Type: ADDITION & REMODEL					
Address	550 CASTELLO AVE	TOM ROWE	BEDROOM CONVERSION FROM	\$568.37	\$12,000
Permit #	2023-009	PO BOX 8233	GARAGE UNIT 1		
Status	FINALED	BRECKENRIDGE, CO			
Use	RESIDENTIAL - MFR	80424			
Issued	5/9/2023	TOM ROWE			
Finaled	12/5/2023	PO BOX 8233			
New Sq Ft		BRECKENRIDGE, CO			
		80424			
Project Type: DECK					
Address	681 CLARK ST		BUILD NEW/REPLACE DECK	\$220.00	
Permit #	2023-032				
Status	ISSUED				
Use	RESIDENTIAL - SFR				
Issued	7/14/2023				
Finaled					
New Sq Ft					



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	Owner	Contractor	Project Description	Amount	Valuation
Address 701 CLARK ST Permit # 2023-039 Status FINALED Use RESIDENTIAL - SFR Issued 8/30/2023 Finaled 10/25/2023 New Sq Ft	jeffrey shane	jeffrey shane	BUILDING NEW DECK ON BACK OF HOUSE.	\$220.00	
Address 500 MAIN ST Permit # 2023-038 Status ISSUED Use COMMERCIAL Issued 8/31/2023 Finaled New Sq Ft			NEW SEATING DECK	\$756.60	\$24,000
Project Type: DEMOLITION					
Address 331 HWY 285, A Permit # 2023-004 Status FINALED Use COMMERCIAL Issued 3/2/2023 Finaled 8/2/2023 New Sq Ft		ABC Construction po box 1298 fairplay, co 80440	DEMOLITION OF A WALL. NEW PERMIT FOR BUILD BACK	\$181.50	



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	Owner	Contractor	Project Description	Amount	Valuation
Address 501 MAIN ST Permit # 2023-052 Status FINALED Use COMMERCIAL Issued 12/19/2023 Finalled 3/7/2024 New Sq Ft			DEMOLITION OF TENANT SPACE, TI TO FOLLOW		
Project Type: ELECTRICAL					
Address 1255 MEADOWS DR Permit # 2023-001 Status FINALED Use RESIDENTIAL - SFR Issued 1/5/2023 Finalled 10/25/2023 New Sq Ft			ELECTRICAL SERVICE TO MODULAR BUILDING	\$215.06	
Address 901 MAIN ST Permit # 2022-090 Status FINALED Use COMMERCIAL Issued 1/6/2023 Finalled 3/28/2023 New Sq Ft		Winn-Marion Barber	REPLACE VEHICLE CHARGING STATIONS WITH UPGRADED UNITS	\$142.95	



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	Owner	Contractor	Project Description	Amount	Valuation
Address 615 BOGUE ST Permit # 2023-031 Status ISSUED Use RESIDENTIAL - SFR Issued 7/11/2023 Finale New Sq Ft	Kelsey Hanley 615 Bogue street FAIRPLAY, CO 80440	WAVE ELECTRIC	INSTALL ELECTRIC IN SHED	\$142.95	
Address 360 NINTH ST Permit # 2023-046 Status ISSUED Use COMMERCIAL Issued 10/4/2023 Finale New Sq Ft			RESTORATION OF WATER DAMAGED AREA. WORK IS ALREADY DONE.	\$259.90	
Project Type: FENCE					
Address 400 HWY 285 Permit # 2023-013 Status ISSUED Use COMMERCIAL Issued 5/2/2023 Finale New Sq Ft			NEW FENCE ON COMMERCIAL PROPERTY	\$75.00	



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	Owner	Contractor	Project Description	Amount	Valuation
Address 601 BOGUE ST Permit # 2023-017 Status FINALED Use RESIDENTIAL - SFR Issued 5/11/2023 Finalled 10/25/2023 New Sq Ft	Julie Bullock 601 bogue street FAIRPLAY, CO 80440	Julie Bullock 601 bogue street FAIRPLAY, CO 80440	REMOVAL OF OLD WOODEN FENCE, REPLACE WITH CEDAR WOODEN 6' FENCE. REPLACEMENT OF GATE AND ADDITION OF OF ANOTHER GATE IN BACK OF PROPERTY. THIS IS IN CORRELATION WITH A PIIP.	\$75.00	
Address 416 FRONT ST Permit # 2023-025 Status FINALED Use RESIDENTIAL - SFR Issued 5/30/2023 Finalled 10/25/2023 New Sq Ft			NEW AND REPLACEMENT FENCE	\$75.00	
Address 201 EIGHTH ST Permit # 2023-024 Status FINALED Use RESIDENTIAL - SFR Issued 5/31/2023 Finalled 9/20/2023 New Sq Ft	Christiane Baigent		NEW FENCE, MUST MEET LINE OF SIGHT ON MAIN	\$75.00	



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	Owner	Contractor	Project Description	Amount	Valuation
Project Type: MECHANICAL					
Address 610 FRONT ST		Chimney Doctors	NEW WOOD STOVE AND CHIMNEY	\$220.00	\$9,151
Permit # 2023-003					
Status FINALED					
Use RESIDENTIAL - SFR					
Issued 1/18/2023					
Finaled 2/7/2023					
New Sq Ft					
Address 809 CASTELLO	Kendra Wilson		OWNER NEEDS A PERMIT FOR AN ALREADY INSTALLED PELLET STOVE TO SELL HOUSE. EASY PERMIT.	\$75.00	
Permit # 2023-050					
Status FINALED					
Use RESIDENTIAL - SFR					
Issued 12/1/2023					
Finaled 12/12/2023					
New Sq Ft					
Project Type: NEW SINGLE FAMILY RESIDENCE					
Address 517 CASTELLO AVE		Ambrose home Builders	NEW SINGLE FAMILY HOME	\$2,987.42	\$290,000
Permit # 2023-002		8471 Rogers Ct			
Status FINALED		ARVADA, CO 80007			
Use RESIDENTIAL - SFR					
Issued 1/11/2023					
Finaled 12/22/2023					
New Sq Ft					



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	Owner	Contractor	Project Description	Amount	Valuation
Address 699 BOGUE ST Permit # 2023-006 Status ISSUED Use RESIDENTIAL - SFR Issued 3/29/2023 Finale New Sq Ft	Dustin Morgan PO BOX 363 ALMA, CO 80420	Dustin Morgan PO BOX 363 ALMA, CO 80420	CONSTRUCTION OF NEW SINGLE FAMILY RESIDENCE. ICF CONSTRUCTION	\$5,378.73	\$378,662
Address 372 PARK VIEW DR Permit # 2023-007 Status ISSUED Use RESIDENTIAL - SFR Issued 5/3/2023 Finale New Sq Ft	Catherine Seiwart PO 812 FAIRPLAY, CO 80440	Bruce Anderson	RESIDENTIAL HOME	\$9,521.49	\$800,000
Address 515 CASTELLO AVE Permit # 2023-019 Status ISSUED Use RESIDENTIAL - SFR Issued 5/16/2023 Finale New Sq Ft		kenny Nail	NEW SINGLE FAMILY HOME	\$2,636.84	\$250,000



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Address	Owner	Contractor	Project Description	Amount	Valuation
Address 513 CASTELLO AVE Permit # 2023-020 Status ISSUED Use RESIDENTIAL - SFR Issued 5/16/2023 Finale New Sq Ft		kenny Nail	NEW SINGLE FAMILY HOME	\$2,636.84	\$250,000
Address 525 CASTELLO AVE Permit # 2023-021 Status ISSUED Use RESIDENTIAL - SFR Issued 5/16/2023 Finale New Sq Ft		kenny Nail	NEW SINGLE FAMILY HOME	\$2,636.84	\$250,000
Project Type: OTHER					
Address 360 NINTH ST Permit # 2023-015 Status ISSUED Use COMMERCIAL Issued 5/11/2023 Finale New Sq Ft			GREENHOUSE ADDED TO SOUTH SIDE OF STRUCTURE.	\$315.03	



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Address	Owner	Contractor	Project Description	Amount	Valuation
Address 501 MAIN ST Permit # 2023-036 Status FINALED Use COMMERCIAL Issued 8/3/2023 Finaled 10/25/2023 New Sq Ft		Kirył " K" KVALENKA	REPAIR OF THE CAR ACCIDENT HOLE.		
Address 548 FRONT ST Permit # 2023-049 Status ISSUED Use COMMERCIAL Issued 10/24/2023 Finaled New Sq Ft			INSTALLING NEW SIDEWALK AND ADA RAMP. THIS PROJECT IS PART OF A PIIP.	\$232.25	\$5,000
Project Type: PLUMBING					
Address 520 FRONT ST Permit # 2023-005 Status FINALED Use COMMERCIAL Issued 3/3/2023 Finaled 8/2/2023 New Sq Ft 500		Dixie Plumbing	REPLACING 30FT OF SEWER SERVICE LINE FROM CAST IRON TO NEW PVC. WILL USE PEA GRAVEL, AND RIGID INSULATION. WILL HAVE TO CLOSE OFF ALLEY FOR 5 DAYS TO THAW FIRST.	\$71.50	



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Address	Owner	Contractor	Project Description	Amount	Valuation
Address 450 HWY 285 Permit # 2023-028 Status FINALED Use COMMERCIAL Issued 6/27/2023 Finalized 9/20/2023 New Sq Ft		ottos resturant	REPAIR OF EXISTING SEWER LINE FROM CLEANOUT TO TOWNS MANHOLE. NO STREET CUT NEEDED. MANHOLE IS ON PROPERTY.	\$71.50	
Address 415 WITCHER LN Permit # 2023-030 Status FINALED Use RESIDENTIAL - SFR Issued 7/6/2023 Finalized 9/20/2023 New Sq Ft	BOB ELLIOT PO BOX 2048 FAIRPLAY, CO 80440	VICTOR ALMEIDA DILLON, CO 80435	TAPPING WATERLINE ON WITCHER TO BRING WATER TO THE BROKEN DOWN CABIN. WILL CUT INTO PAVED ROAD		
Address 704 FRONT ST Permit # 2023-042 Status FINALED Use RESIDENTIAL - SFR Issued 9/7/2023 Finalized 10/25/2023 New Sq Ft	marc delsette box 1051 FAIRPLAY, CO 80440	diggin jack	REPAIRING SMALL SECTION OF WATER SERVICE LINE. WILL NOT CUT INTO TOWN ROAD. ALL ON OWNER PROPERTY.	\$71.50	



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	Owner	Contractor	Project Description	Amount	Valuation
Address 620 MAIN ST Permit # 2023-044 Status FINALED Use RESIDENTIAL - MFR Issued 9/19/2023 Finalled 10/24/2023 New Sq Ft	SWISSAIRE CONDO ASSOCIATION	KYLE NOLAN	REPAIR OF EXISTING SERVICE LINE IN TWO PLACES, CUT INTO THE DIRT ALLY. WILL REQUIRE A \$1000 DOLLAR BOND AND \$550 FOR PERMIT.		
Address 400 CASTELLO Permit # 2023-047 Status FINALED Use RESIDENTIAL - SFR Issued 10/4/2023 Finalled 10/24/2023 New Sq Ft			INSTALLING NEW WATER SERVICE LINE FROM CRAWLSPACE TO CURBSTOP WILL INSULATE. USING COPPER PIPE	\$71.50	
Address 400 HWY 285 Permit # 2023-048 Status FINALED Use COMMERCIAL Issued 10/5/2023 Finalled 10/25/2023 New Sq Ft			DIGGING AND MOVING ALREADY TAPPED WATERLINE AND SEWER SERVICE LINES TO NEW FOOD TRUCK PLACMENT. WILL BE INSULATED.	\$143.00	



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	Owner	Contractor	Project Description	Amount	Valuation
Project Type: REMODEL					
Address 640 HWY 285 Permit # 2023-010 Status FINALED Use COMMERCIAL Issued 4/19/2023 Finald 8/2/2023 New Sq Ft	Randy Mcfarland	hood builder inc 5925 Evans 215 DENVER, CO 80222	NEW KITCHEN HOOD TYPE 1, HOOD ONLY PERMIT	\$1,622.88	\$63,010
Address 501 HWY 285 Permit # 2023-012 Status ISSUED Use COMMERCIAL Issued 4/26/2023 Finald New Sq Ft			TENANT FINISH FOR BREW ROOM, INTERIOR ONLY. DOES NOT INCLUDE THE EXTERIOR WORK.	\$2,103.48	\$75,000
Address 640 HWY 285 Permit # 2023-014 Status FINALED Use COMMERCIAL Issued 5/9/2023 Finald 8/2/2023 New Sq Ft	Randy McFarland	Randy McFarland	NEW KITCHEN LAYOUT	\$1,128.22	\$35,000



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	Owner	Contractor	Project Description	Amount	Valuation
Address 550 CASTELLO AVE Permit # 2023-023 Status ISSUED Use RESIDENTIAL - MFR Issued 6/14/2023 Finale New Sq Ft	TOM ROWE PO BOX 5617 BRECKENRIDGE, CO 80424	TOM ROWE PO BOX 5617 BRECKENRIDGE, CO 80424	MODIFY LAYOUT OF UNIT 2, TO CREATE ADDITIONAL BATHROOM AND BEDROOM	\$733.95	\$18,000
Address 501 HWY 285 Permit # 2023-027 Status ISSUED Use COMMERCIAL Issued 8/2/2023 Finale New Sq Ft	David Axelrod		EXTERIOR ADDITION FOR BOILER AND SILO	\$1,186.35	\$45,000
Address 900 HATHAWAY ST Permit # 2023-035 Status ISSUED Use RESIDENTIAL - SFR Issued 8/31/2023 Finale 12/7/2023 New Sq Ft	maria Simms 900 Hathaway	maria Simms 900 Hathaway	NEW BATHROOM FIXTURES AND ENLARGED DECK	\$220.00	



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	Owner	Contractor	Project Description	Amount	Valuation
Address 613 MAIN ST Permit # 2023-043 Status ISSUED Use RESIDENTIAL - MFR Issued 1/25/2024 Finale New Sq Ft	mike lapp	mike lapp	REMODELING INTO 2BED 2BATH RENTAL. THIS IS TOWN CENTER ANY EXTERIOR WORK WILL REQUIRE CERT OF APP.	\$1,843.53	\$80,000

Project Type: REROOF

Address 610 FRONT ST Permit # 2022-077 Status FINALED Use RESIDENTIAL - SFR Issued 1/30/2023 Finale 1/31/2023 New Sq Ft	AMANDA SALASIN	CARPENTER ROOFING	REPLACE 18.5 SQR WITH PRO PANEL METAL ROOFING	\$220.00	\$15,000
Address 808 MAIN ST Permit # 2023-033 Status FINALED Use COMMERCIAL Issued 7/18/2023 Finale 10/25/2023 New Sq Ft		R&R ROOFING po box 1389 BAILEY, CO 80421	RE ROOF MULEHIDE SA MODIFIED BITUMEN	\$220.00	



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Address	Owner	Contractor	Project Description	Amount	Valuation
Address 564 CLARK ST Permit # 2023-037 Status FINALED Use RESIDENTIAL - SFR Issued 8/8/2023 Finalized 10/25/2023 New Sq Ft		chris wood	ROOF REPLACEMENT. OWENS CORNING TRUDEFINITION ICE WATER: OWENS CORNING WEATHERLOCK G GRANULAR SELF SEALING.	\$220.00	
Address 720 TROUT CREEK DR Permit # 2023-045 Status FINALED Use RESIDENTIAL - SFR Issued 10/1/2023 Finalized 12/12/2023 New Sq Ft			REROOF IF RESIDENTIAL HOUSE	\$220.00	
Project Type: SIGN					
Address 501 HWY 285, 1A Permit # 2022-092 Status FINALED Use COMMERCIAL Issued 1/2/2023 Finalized 1/31/2023 New Sq Ft		SOUTH PARK BEAUTY 5601 Hwy 285 FAIRPLAY, CO 80440	NEW SIGN FOR NEW TENANT SPACE	\$88.00	



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Address	Owner	Contractor	Project Description	Amount	Valuation
Address 1010 CASTELLO Permit # 2023-040 Status FINALED Use COMMERCIAL Issued 8/31/2023 Finalized 9/12/2023 New Sq Ft			RELOCATION OF EXISTING SIGN	\$884.73	\$30,000
Project Type: SOLAR PANELS					
Address 652 CRAWFORD LN Permit # 2022-091 Status FINALED Use RESIDENTIAL - SFR Issued 2/15/2023 Finalized 4/27/2023 New Sq Ft	KALLIE KIRSTEN	Jeremy Burks 9959 E Geddes Ave CO	INSTALL NEW SOLAR PANELS ON SINGLE FAMILY HOME	\$550.00	\$15,000
Address 564 CLARK ST Permit # 2023-016 Status FINALED Use RESIDENTIAL - SFR Issued 5/9/2023 Finalized 10/25/2023 New Sq Ft			NEW SOLAR PANELS	\$500.00	\$12,600



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Owner	Contractor	Project Description	Amount	Valuation
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Project Type: TENANT IMPROVEMENT

<p>Address 501 MAIN ST Permit # 2024-001 Status ISSUED Use COMMERCIAL Issued 1/17/2024 Finale New Sq Ft</p>		<p>TENANT FINISH OF COMMERCIAL BUSINESS SPACE</p>		
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Project Type: WINDOWS

<p>Address 716 FRONT ST Permit # 2023-029 Status ISSUED Use RESIDENTIAL - SFR Issued 6/30/2023 Finale New Sq Ft</p>	<p>Chad Seuer</p>	<p>REPLACEMENT OF WINDOWS/ QUICK PERMIT</p>	<p>\$75.00</p>	
<p>Address 824 TROUT CREEK DR Permit # 2023-034 Status FINALED Use RESIDENTIAL - SFR Issued 7/20/2023 Finale 8/2/2023 New Sq Ft</p>	<p>SYLVIA SIMMS</p>	<p>REPLACING 4 WINDOWS. THIS PROJECT IS IN CONJUNCTION WITH A PIIP</p>	<p>\$75.00</p>	



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Owner	Contractor	Project Description	Amount	Valuation
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Address 901 MAIN ST
Permit # 2023-041
Status FINALED
Use COMMERCIAL
Issued 9/6/2023
Finaled 11/21/2023
New Sq Ft

Shobie Speer

REPLACING ALL OF THE
WINDOWS IN TOWN HALL.