

South Avenue Safe Streets for All

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Overview

The City of Missoula (City), Missoula County (County), and the Missoula Metropolitan Planning Organization (MPO) are proud to submit this collaborative Safe Streets for All (SS4A) grant application. **South Ave Safe Streets** is a project to enhance safety, improve accessibility, and provide equitable transportation along a corridor that serves both City and County residents. The need for improvements to South Ave is well-established in regional and local planning documents. This project location appears on the Community Transportation Safety Plan (CTSP)¹ crash hotspot map, is prioritized in the 2050 Long-Range Transportation Plan (LRTP)², and is included in the city's Capital Investment Program (CIP)³ for future funding.

South Avenue is the principal east/west arterial in the middle of Missoula, stretching over 5 miles from the University of Montana campus at the base of Mount Sentinel across the valley to the Bitterroot River. West of Reserve Street - the location of this project – the corridor serves schools, a medical center and physician campus, assisted living facilities, regional recreation destinations, and other diverse residential and commercial uses, while also connecting the neighborhood west of Reserve to dense city services east of Reserve St. However, the roadway lacks essential elements of a safe transportation system such as sidewalks, bike facilities, drainage structures, streetlighting, and turn lanes. Crashes occur regularly, and there have been several fatalities and/or serious injuries of people biking and walking in recent years.

Despite the lack of safe facilities, people often bike and walk to work, recreate at Fort Missoula Regional Park (FMRP), and to/from the activities of daily life. Based on Eco-Visio Counters placed along the corridor, we average 103 pedestrians daily on the existing shared-use path near Community Medical Center and FMRP. Every day, these people risk bodily harm from passing vehicles that are turning or drifting off the roadway. People accessing Mountain Line bus service lack safe crossings and ADA accessible stops. While parts of the south side of the road include a shared use path, it is incomplete, disconnected, and lacks any established crossings to the north side of the street and the destinations nearby. Many of these identified safety issues affect particularly vulnerable citizens. School children from Big Sky High School and Target Range School are at risk while walking to and from classes; young families risk their safety when walking to/from Mountain Home Montana (a shelter for young mothers); elderly folks and people with disabilities from nearby residential facilities cannot safely access healthy spaces to walk, connect to transit services, or even safely walk to medical appointments across the street; and other hospital patients who do not have access to a car are unable to safely access transit from the medical campus.

The improvements proposed by the South Ave Safe Streets project will increase safety and predictability along this busy travel corridor. Bicycle lanes will clearly delineate safe space for people bicycling and using other micromobility options. Sidewalks will remove people from the roadway shoulder and onto a safe, comfortable space generally separated from vehicular traffic by a landscaped boulevard. Crosswalks will be marked and enhanced at all key crossing points including intersections near bus stops, Community Medical Center, Big Sky High School, and FMRP. This project will complement and complete the existing shared-use path on the south side

¹ Missoula Community Transportation Safety Plan. 2019.

https://www.ci.missoula.mt.us/DocumentCenter/View/49937/2019_CTSP_FINAL

² Missoula 2050 Long Range Transportation Plan. 2021.

https://www.missoulampo.com/files/ugd/31250b_66ec0b40355843a4bdb608880f427245.pdf

³ Capital Investment Program. <http://www.ci.missoula.mt.us/121/Community-Investment-Program>

of South Ave and create a clear connection to a shared-use path along Clements Road, providing safe, secure, and connected facilities for people biking and walking between neighborhood amenities and the Target Range School. The project will widen the existing shared-use path to better reflect current best practices and the amount of usage the schools, regional park, and other uses are generating. The project will improve safety and increase accessibility for transit riders by establishing well-designed and ADA-compliant bus stops that are connected to the sidewalk network. A two way left turn lane will improve driver predictability and operations, reducing unsafe right-side passes and other behavior born of impatience. Lighting will make the corridor safer for all users 24 hours a day.

The South Ave Safe Streets project is truly multimodal, collaborative, and critical for some of our community and region's most vulnerable populations.

Project Description & Location

This project involves improvements along two miles of South Ave W and a quarter mile of Clements Road, as shown in **Figure 1**. Both streets are functionally classified as minor arterials, and the project area connects a rural Missoula County neighborhood to the center of the City of Missoula, by way of a 156-acre regional park and a large hospital and medical campus. The project will create Complete Street connections for all users from the destinations along the corridor (of which there are many) to dense city services like grocery, retail, restaurants, shopping mall, parks, schools, etc. just east of the project area. Key design elements include:

- New two-way left turn lane (TWLTL) from 26th Ave to 31st Ave
- New 6-foot sidewalk on the north side of South Ave from Reserve St to Clements Rd and on the east side of Clements Rd from South Ave to North Ave
- New 6-foot bicycle lane on the north side of South Ave from Reserve St to Clements Rd
- Extension of shared use path on south side of South Ave connecting to existing non-motorized network
- Upgraded shared use path on west side of Clements Rd from South Ave to North Ave
- New roundabout at South Ave/Clements Rd intersection
- Channelization and safety enhancements at all intersections along South Ave
- New marked and enhanced crosswalks, including pedestrian refuge islands on South Ave at the intersections with 26th Ave and 31st Ave, and rectangular Rapid Flashing Beacons at 31st Ave and Clements Rd
- Upgraded bus stops
- New roadway and shared use path lighting between 26th Ave and 36th Ave
- New curb & gutter and associated stormwater drainage structures

Designs are detailed in **Appendix B**.

**Response to
Selection Criteria
Safety Impact**

Description of the Safety Problem: This project implements engineering interventions to address historical crash trends, mitigate known risks,

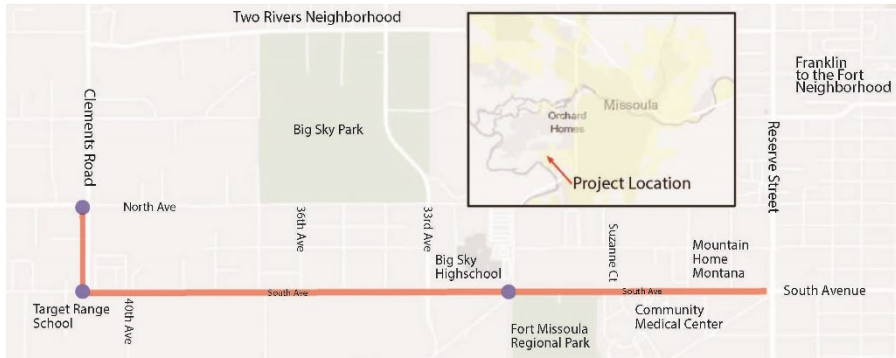


Figure 1. South Ave Safe Streets project extent and key intersections.

and improve safety for all users. Pedestrians, transit users, and bicyclists are endangered by the lack of basic facilities like sidewalks, bike lanes, bus stops, and marked crossings. Children walking to school, young families meeting their daily needs, and elderly folks attending medical appointments all currently use the shoulder or even walk in the street where the shoulder is nonexistent or hazardous. Bicyclists ride in the narrow shoulder of the north side of South Ave or share the lane with higher speed traffic due to lack of a bike lane. There are numerous closely-spaced intersections and driveways in the eastern third of the project area, and the lack of turn lanes along the corridor leads to left-turn opposite direction, rear-end, and right-angle collisions. This condition also increases congestion, reducing response times for emergency services to and from the hospital, and leading some impatient drivers to make dangerous maneuvers like shooting gaps and passing on the right in the gravel shoulder.

Between 2016 and 2020, 107 crashes involving 272 people were reported on South Ave from Reserve St to Clements Rd. The crash rate for this nearly 2-mile segment is 10.9 annual crashes per mile, or 458 to 638 annual crashes per 100 million vehicle-miles traveled (VMT). Comparatively, the Missoula County crash rate is 53 crashes per 100 million VMT, making the South Ave crash rate more than 8 times higher than the County average. The crash rate for the quarter mile segment of Clements Rd is 547 annual crashes per 100 million VMT, which is more than 10 times the County average.

In January 2022, a pedestrian was struck and killed near the South Ave and 26th Ave intersection. Missoula Police Department provided the following context: “There is no sidewalk area in this block, and the side of the road had snow build-up, forcing the pedestrian to walk in the roadway...”. Two rear-end crashes in the block between 26th Ave and Old Fort Rd resulted in serious injuries.

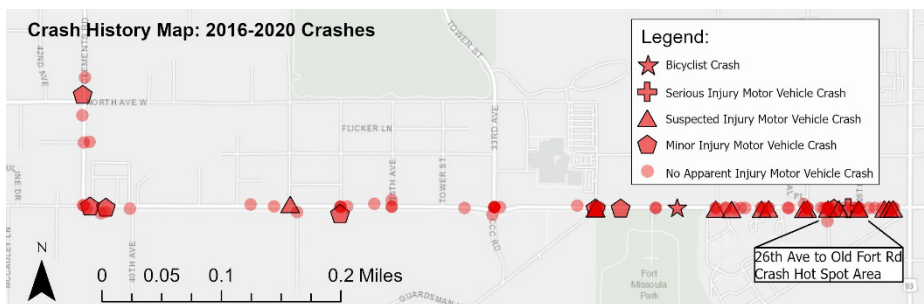


Figure 2. South Avenue Crash History Map.

Serious Injury & Fatality Hot Spot Analysis; Identification of High-Risk Roadway Features:
With the highest annual crashes per 100 million VMT, the block from 26th Ave

to Old Fort Rd is considered the corridor's "hot spot" for serious injuries and fatalities. However, the project's roadway segments, shown in **Figure 2**, have similar high-risk features as this hot spot location. The primary differentiator of the hot spot location and the rest of the project limits is the hot spot's larger volume in vehicular traffic. It is anticipated that other fatality and serious injury hot spots will develop as traffic increases if the underlying conditions are not addressed.

Safety Impact Assessment:

In addition to mitigating existing crash history, this project proactively addresses risks using Crash Modification Factors (CMF). The Safety Impact Assessment (**Appendix C**) focuses on estimating the proposed infrastructure improvements' impact on reducing serious injuries and fatalities based on crash history of the project area and known risks. Highlights include:

Measured Safety Impact for Reducing Serious Injuries & Fatalities: From January 1, 2016 to May 1, 2022, there was an average of 0.635 serious injuries per year on the South Ave project segment. The TWLTL is estimated to provide an annual serious injury reduction of 0.395 serious injuries per year. During the same time period, there was an average of 0.159 fatalities per year. The installation of sidewalk is estimated to result in at least 0.140 annual lives saved per year.

Measured Safety Impact of Proposed Bicycle Lane: From January 1, 2016 to December 31, 2020, there was an average of 0.400 bicycle crashes per year. The proposed bicycle lane and shared use path extensions are estimated to result in a reduction of 0.177 bicycle crashes per year by reducing the crossing instances and reducing the risk of bicycles mixing with vehicular traffic. Furthermore, the installation of a bike lane CMF is applicable to all crash types and injury severities yielding an estimated annual crash reduction of 9.282 crashes per year.

Measured Safety Impact of Raised Median Islands: During the 5-year period of reviewed crash data, there was an average of 0.800 rear end or sideswipe crashes per year on South Ave at the intersections with 26th Ave and 31st Ave. Proposed raised median islands at these locations are estimated to reduce at least 0.207 crashes per year.

Measured Safety Impact of Roadway Lighting: An average of 2.000 crashes in "dark-not lighted" conditions occurred per year. It was estimated that installing roadway lighting along South Ave from Reserve St to 36th Ave is estimated to reduce crashes occurring in dark conditions by 0.640 crashes per year.

Measured Safety Impact of Two-Way Left Turn Lane Installation: The 5-year review period shows an average of 8.400 crashes per year attributed to the lack of turn facilities on South Ave from 26th Ave to 31st Ave. Installation of a TWLTL is estimated to reduce the crash rate by 3.682 crashes per year.

Benefit Cost Analysis: A benefit cost analysis (BCA) was developed to monetize the predicted safety benefits of the proposed project and compare those to the overall construction and long-term operations and maintenance costs. The BCA was completed following the U.S. Department of Transportation's *Benefit-Cost Analysis Guidance for Discretionary Grant Programs*. While this guidance offers monetized values for all KABC0 crash severity types as well as additional project benefits such as environmental and user-based costs, the BCA for this project (full report included in **Appendix C**) focuses only on the SS4A grant program objective of reducing serious injuries and fatalities for all roadway users and excludes all other crash types/injury severities. For the 20-year analysis period, the expected benefit-cost ratio is 2.3. This demonstrates that not only will the project have safety benefits that will persist over time, the monetized value of the

safety benefits and residual value of the project after 20 years is more than twice as much as the project's construction and long-term operations and maintenance costs.

Equity, Engagement, and Collaboration

The South Ave Safe Streets project area is emblematic of the dynamic and diverse characteristics of an urban project in rural Montana. The project area runs from rural areas and historic farmland past newer suburban residences, schools, and a regional park; it connects to a hospital, multistory office buildings, multifamily housing, and, ultimately, shopping centers and the highest traffic volume city street (Reserve Street) in the state of Montana. The nature of the project area ensures this infrastructure investment will address longstanding inequities in health and safety outcomes for vulnerable populations. There is ample data, analysis, and planning documentation demonstrating how the project is built on equity, engagement, and collaboration.

Equity is a major lens through which the MPO and partner jurisdictions evaluate and prioritize projects. Missoula Invest Health, a planning partnership between City and County planners, public and private health officials, and non-profit leaders, created an interactive map layering infrastructure and access to basic services with a variety of demographic, socioeconomic, and health statistics. Three neighborhoods stand out for their clear correlation between lack of historical mobility and infrastructure investment and relatively high percentages of low-moderate income households, rates of obesity, people over 65, etc. The closest of these neighborhoods (Franklin to the Fort) is directly adjacent to the project area, and the project area neighborhood (Two Rivers) also has disadvantaged characteristics. One eighth of the neighbors of the South Ave project live in poverty, over 53% are renter burdened, 19% are homeowner burdened, 26% of adults live with obesity, 33% of the population is over 65 (2nd highest in city), and 55.5% of families with one female adult and children live in poverty.⁴ The project area census tract (9.01) is indicated as health and resilience disadvantaged using the provided SS4A data dashboard.⁵

The most recent LRTP evaluated growth and transportation investment through an equity framework to support historically underrepresented communities. The resulting projects recommended for funding over the next 30 years will improve affordability and provide more transportation choices in how people travel. The City of Missoula developed its own scoring system to prioritize 5-year funding Capital Investment Program cycles which gives double points to projects that address equity concerns. In both the MPO's and the City's scoring processes, this South Ave Safe Streets project emerged as one of the top priorities.

To achieve the safety and equity goals of the project, many stakeholders collaborated on project development over the last several years. A previous public meeting held on February 4, 2020 demonstrated support for the general improvements. Consultations with the high school, hospital, regional park, Bicycle/Pedestrian Advisory Board, group living facilities such as Mountain Home Montana, and City, County and MPO staff shaped finer details such as location and treatment of crossing facilities, turning lanes at specific intersections, and trail connectivity. A public meeting held on September 7, 2022 shared the scope of this grant application to gather additional suggestions for ways safety can be improved along the corridor.

⁴ [2021-MIH-Neighborhood-Report \(missoula.mt.us\)](https://missoula.mt.us/2021-MIH-Neighborhood-Report)

⁵ <https://usdot.maps.arcgis.com/apps/dashboards/99f9268777ff4218867ceedfabe58a3a>

The South Ave Safe Streets project is rooted in equity and will provide critical safety improvements for some of the most vulnerable members of our community. It was developed in collaboration with multiple jurisdictions and in consultation with adjacent property owners, many of whom serve and represent vulnerable community members.

Effective Practices and Strategies

This grant will transform South Ave, a busy arterial without basic facilities for non-motorized and transit users, into a Complete Street with additional safety enhancements, allowing all users to more safely travel to, along, and across the corridor. The City and County partnered to include Clements Rd and ensure connectivity to a mobile home park and neighborhood market and restaurant.

To maximize the safety benefits of this project, the City and County will utilize several of FHWA's Proven Safety Countermeasures: bicycle lanes, pedestrian walkways on both sides of the street, crosswalk visibility enhancements, pedestrian refuge islands, rectangular rapid flashing beacons, a roundabout, TWLTL, and lighting. Other than a roundabout at 33rd Ave installed as part of the FMRP construction, none of these countermeasures currently exist to provide for safe movement of people using any mode of transportation.

This project focuses on complete street elements by adding bicycle and pedestrian facilities—utilizing the walkway and bike lane countermeasures – on the north side of South Ave to separate traffic modes and reduce potential conflicts. Non-motorized facilities on both sides of the street will connect those traveling to and from the neighborhoods and schools on the north side of the street to the destinations on the south side of the street, further utilizing FHWA's Countermeasures by adding ADA-compliant curb cuts and marked crossings with pedestrian refuge islands and lighting. At Big Sky High School (31st Ave) and Target Range School (Clements Rd), the project includes Rectangular Rapid Flashing Beacons (RRFBs).

A new roundabout at the intersection of South Ave and Clements Rd will create a safer intersection on the west edge of the project area and improve the crossing for people biking and walking to Target Range School and using the shared-use path to for commuting and recreation. The roundabout will reduce vehicle conflicts at this intersection that is anticipated to see traffic increase when a new bridge is constructed across the Bitterroot River to the west (a separate project led by the state DOT). As a proven safety countermeasure, the change in intersection control from stop control to a roundabout will be expected to provide an 82% decrease in serious and fatal crashes over the life of the improvement.

Adding a TWLTL along the corridor and right turn lanes at key intersections are also proven safety countermeasures. Given the number of rear-end and turn-based conflicts at many of the intersections and driveway entrances, these countermeasures were determined to be a good fit for this corridor, as noted in the SIA in **Appendix C**.

The South Ave Safe Streets project encompasses several elements of the USDOT's Safe System Approach: safer people, safer roads, safer speeds, and post-crash care. The project calls for context appropriate Safer Speed roadway design—designing facilities for speeds on the road. Motorists currently drive too fast for the conditions and facilities present, and roadway design does not reduce vehicular speeds, nor does it forgive errant maneuvers. Through the Safer Roads

approach, the project calls for separated non-motorized facilities to “mitigate human mistakes and account for injury tolerances” and “to facilitate safe travel by the most vulnerable users.” Appropriate facilities for speeds via the Safer Roads and Safer Speeds elements creates Safer People, encouraging responsible behavior through design for comfort level and behavior of road users, prioritizing people reaching their destination unharmed. The proposed project will consolidate and improve access to the hospital located along the corridor, improving emergency response time and access to the hospital emergency care center, which in turn facilitates and improves Post-Crash Care.

The South Ave Safe Streets project fosters innovative practices through data-driven research and experimentation. One way the project does this is by working on access consolidation wherever the opportunity arises. In preliminary design phases, the City and County have successfully coordinated access management with Mountain Home Montana, a shelter for young mothers, and the Church of the Nazarene. Mountain Home has agreed to pursue shared-access easements with their neighbors. The Church will also pursue shared access agreements with neighbors and will move its South Ave driveway to the adjacent side street, reducing the number of conflict points in this stretch from five to two and introducing new access points on a lower speed roadway.

The project team is also working with the transit agency, Missoula Urban Transportation District (MUTD), to increase bus stop layout and location safety. In the proposed design, buses will either stop completely blocking the associated travel lane or completely outside the travel lane. Either of these conditions are safer than the existing stops, at which buses pull onto the shoulder and partially block the adjacent travel lane. With the new design, vehicle drivers will be less likely to encroach on the opposing travel lane to pass a stopped bus.

Climate Change, Sustainability, and Economic Competitiveness

The South Ave Safe Street project will advance regional mobility, climate, and economic goals. First and foremost, this is a sustainable, safe, and accessible multi-modal project that will help the region achieve its ambitious mode-split goals. The project adds sidewalks, bike lane, and shared-use path improvements, combined with safe crossings and bus stops. Increasing the multi-modal level of service will provide realistic transportation options along a busy corridor that includes trips to schools, medical facilities, regional recreation, and other services. Based on the success of similar projects in Missoula and our current high level of non-SOV mode share, we expect this project to generate a significant mode-shift towards biking, walking, and transit ridership.

Air quality is a concern in Missoula due to the geographic constraints of the valley and entrapment of pollutants through inversions. Promoting a shift to sustainable travel modes will continue our current trend of improving air quality. Growth in the adjacent neighborhoods will be served by a multi-modal street rather than the current auto-centric facility that leads to higher emissions.

Stormwater management improvements planned with this project will help protect a vulnerable aquifer, Missoula's sole source of drinking water. The aquifer is shallow (avg. 20 to 30 feet below ground), and extremely high infiltration rates mean that it is vulnerable to contamination. Pretreatment will involve vegetated swales and biological filtration prior to discharge into dry

wells. This project will create landscaped and treed boulevards. This green infrastructure will help filter air and water pollutants, shade pedestrians, provide pollinator habitat, mitigate urban heat island effects, and potentially calm traffic.

This project supports and extends the region’s economic development potential by linking residential neighborhoods, FMRP, Historical Fort Missoula, a regional medical campus, and other uses to commercial centers and Urban Renewal District III to the east. With expanded playing fields and trail facilities, new revenue generated from the redeveloped FMRP is conservatively estimated at \$4 million annually. The South Ave corridor is experiencing growth in both jobs and housing, which requires safe, comfortable, and convenient access for people of all ages and abilities. South Ave links new and expanding development with existing and expanding services. It is imperative that these connections be as safe and accessible as possible.

Project Readiness

Project partners are in good position to deliver this project in a timely manner consistent with all applicable local, State, and Federal requirements. Project design elements were prepared to at least a 30% level of completion and can be advanced to full construction documents in short order. The team is confident all required permitting, approvals, and construction can be met well in advance of the statutory deadline of project completion within 5 years.

Project Approach and Schedule

The schedule of pre-construction and construction activities, detailed in **Figure 3** below, will be followed to ensure successful delivery of the project within the required 5-year timeframe between grant agreement execution and project completion.

	2023			2024			2025			2026		
Grant Award	◆											
Grant Agreement						◆						
Procurement												
Preliminary Engineering (PE) Phase												
Preliminary Design												
Public Involvement												
NEPA Document												
ROW Acquisition												
Utility Coordination												
Final Design												
Permitting & Approvals												
Grant Funding Obligation												
Construction (CN) Phase												

Figure 3. Project Schedule

Environmental Permits and Reviews: NEPA documentation will take place over the summer of 2024 and is expected to have minimal risk. The City and County currently do not anticipate impacts to any culturally significant properties, including those associated with FMRP, and there are no known endangered species habitat, contaminated soil, or leaky underground storage tank sites within the project limits. Existing tree and vegetation impacts are also expected to be minimal, and all associated removals or trimming would occur in compliance with the Migratory

Bird Treaty Act. Additionally, no floodplain, wetland, or stream permitting is anticipated under Montana's Joint Application for Proposed Work in Montana's Streams, Wetlands, Floodplains, and Other Water Bodies. The construction contractor will be required to apply for a General Permit for Storm Water Discharges Associated with Construction Activity, commonly known as a SWPPP Permit, for construction disturbance.

State and Local Approvals: The improvements in this proposed project will be constructed within existing and acquired City and County right-of-way. South Ave is a City and County maintained urban highway route (U-8120A) requiring consultation with MDT, however, the project is being designed to meet MDT's Geometric Design Standards for Urban & Developed Areas and no formal approvals will be required unless changes to the operational characteristics are proposed. This project has been developed in consultation with MDT, particularly in respect to planned future bridge improvements to the west and at the intersection approach at Reserve Street to the east.

Finally, since the project site is partially within the Missoula Municipal Separate Storm Sewer System (MS4) area, associated storm drainage design will need to comply with the relevant General Permit issued by the State. MS4 requirements are regulated by the local jurisdiction and are primarily a function of compliance in design with respect to storm water conveyance, management, and quality.

Federal Transportation Requirements Affecting State and Local Planning: The project is included in the Missoula Long-Range Transportation Plan and, should this 2022 SS4A Grant application be successful, the Missoula Metropolitan Planning Organization's Transportation Improvement Program will be amended to include the project. Construction of the project was considered in the air quality conformity analysis for the LRTP, which was approved by FHWA in 2021.

Project Risk Assessment:

There are several risks typically associated with this type of project, many of which are mitigated by the significant progress made to date. These include:

Environmental: Through project planning and preliminary design, the City and County have continued to conduct public involvement and evaluate potential social and environment impacts. There are no known sensitive environmental areas impacted, no displacement of people, residences or businesses, no significant impact on historical, cultural or recreational locations, and will not impact planned growth or land use in the area. If awarded grant funding, this project is expected to complete any required environmental review efficiently through existing design and analysis, and the City and County have included sufficient time and resources in the project schedule.

Public Involvement: The City and the County collaboratively engaged in substantial public outreach and engagement prior to this grant application. The City held several public meetings and met with individual property owners along the length of the project within City limits (roughly Reserve St to 36th Ave). This project was included in the MPO's Long Range

Transportation Plan and was specifically noted for its importance during meetings and other engagement efforts. Finally, the City, County and MPO jointly held a public meeting to discuss the project on September 7, 2022 in anticipation of the grant application, and held additional conversations with property owners subject to potential ROW impacts. Letters of support were obtained from all affected property owners, demonstrating the broad support this project has within the surrounding neighborhood and community.

Right-of-Way: Most of the project will be contained within existing ROW or public access easements. Additional easement or ROW acquisition is necessary in a few locations to fully construct project elements as proposed. However, significant progress has been made to date to secure support from adjacent property owners. ROW acquisition needs are shown in Appendix B. Additionally, four residential parcels north of FMRP currently extend to the centerline of South Ave, where that portion of the existing street is contained within a historic prescriptive easement. The project design aligns associated project elements on the north side of the street within the existing westbound driving lane, thereby maintaining all associated proposed infrastructure within the historic prescriptive easement and not impacting the adjacent properties.

Coordination with Community Hospital, City Parks and Recreation, and the Target Range School along the south side of the project and several property owners along constrained sections on the north side has been ongoing throughout this process. While ROW acquisition has not yet been fully negotiated, adjacent property owners have demonstrated willingness to work with the City and County in good faith to provide the necessary access for these important safety and accessibility improvements.

Utility relocation: The project improvements will have some utility impacts along the corridor, particularly along the north side of roadway where power lines are located within areas planned for sidewalk and/or expanded roadway. City staff have initiated coordination with Northwestern Energy, the electrical utility provider, and is proactively planning for any necessary relocation needs. In addition, the project schedule and budget include appropriate time and resources to ensure utilities can be relocated with no impact to services or transportation improvements.

Cost Inflation: Construction costs in Missoula have increased dramatically over the last several years. The 2019 Mullan BUILD Grant project, a previously awarded federal-aid grant, saw significant cost increases as contractors struggled with material and labor shortages during the pandemic. This forced the design team to defer many important project elements and add additional local funding to get the project underway. In order to prevent similar impacts on the South Ave Safe Streets project, we have included a 7% annual increase for construction, as well as design and construction contingencies. The City and the County worked collaboratively on the 2019 Mullan BUILD Project and are successfully delivering a complete project over the next year. The team is confident they can deliver this project on time and within budget as well.

Project Budget

The South Ave Safe Streets project costs are based on a 30% design order of magnitude opinion of probable costs. Costs include appropriate estimates for grant administration, right-of-way, environmental review, construction, contingencies, and cost inflation assuming construction in 2025. These estimates are based on recent projects in the Missoula area and reflect trends in project costs. A detailed project design and cost estimate are included in **Appendix A** and **B**.

Summary Project Budget & Funding Sources:

Sources of Project Funds	Non-Federal	SS4A	% of Total
City of Missoula:			
Transportation Impact Fees	\$400,000.00		3%
Parking District Fees	\$300,000.00		2.58%
BaRSSA	\$777,402.40		6.68%
Federal Share:	n/a	\$5,909,609.61	50.77%
City of Missoula Total:	\$1,477,402.40		n/a
Missoula County:			
BaRSSA	\$400,000.00		3.44%
Entitlements	\$200,000.00		1.72%
Marijuana Tax	\$50,411.12		0.43%
Road Fund	\$200,000.00		1.72%
Federal Share:	n/a	\$3,401,644.47	29.23%
Missoula County Total:	\$850,411.12		n/a
Funding Source Total:	\$2,327,813.52	\$9,311,254.08	100%
Project Elements			
	Estimated Cost	Non-Federal	SS4A
Reserve Street to 36th Avenue:	\$7,387,012.01	\$850,411.12	\$3,401,644.47
36th Avenue to Clements Rd:	\$4,252,055.59	\$1,477,402.40	\$5,909,609.61
Entire Project Total:	\$11,639,067.60		

SS4A Self-Certification Worksheet

Question	Response, Document and Page Number
1. Are both of the following true:	
<i>a. Did a high-ranking official and/or governing body in the jurisdiction publicly commit to an eventual goal of zero roadway fatalities and serious injuries?</i>	Yes, the Transportation Policy Coordinating Committee (TPCC), which is the MPO's decision making body, publicly committed to the vision zero goal through the 2019 Community Transportation Safety Plan (CTSP), (Pgs: V, 2, 3,
<i>b. Did the commitment include either setting a target date to reach zero, OR setting one or more targets to achieve significant declines in roadway fatalities and serious injuries by a</i>	Yes, the CTSP includes a goal to reduce the 5-year average of fatal and serious injuries by 25% from 2018-2023. This is a continuance from the 2013 CTSP.
2. To develop the Action Plan, was a committee, task force, implementation group, or similar body established and charged with the plan's development, implementation, and	The Transportation Safety Advisory Committee (TSAC) oversaw the development of the plan and identification of the Emphasis Areas, Strategies and Action Items
3. Does the Action Plan include all of the following?	
<i>a. Analysis of existing conditions and historical trends to baseline the level of crashes involving fatalities and serious injuries across a jurisdiction, locality, Tribe, or</i>	Yes, the plan contains detailed crash analyses from 2007-2017 within the MPO Planning Area (MPA)
<i>b. Analysis of the location(s) where there are crashes, the severity, as well as contributing factors and crash types;</i>	Yes, the CTSP contains location based crash frequency, type, severity and contributing circumstances
<i>c. Analysis of systemic and specific safety needs is also performed, as needed (e.g., high risk road features, specific safety needs of relevant road users; and</i>	Yes, the CTSP looks at intersection safety, high risk behavior, and non-motorized
<i>d. A geospatial identification (geographic or locational data using maps) of higher risk locations.</i>	Yes, the CTSP relies on geographic data through GIS
4. Did the Action Plan development include all of the following activities?	
<i>a. Engagement with the public and relevant stakeholders, including the private sector and community groups;</i>	In addition to stakeholders represented on the TSAC, a public open house, online survey and Community Safety Summit were held to gather further public input
<i>b. Incorporation of information received from the engagement and collaboration into the plan; and</i>	Yes, the public input was incorporated into the Emphasis Areas ultimately identified in the CTSP
<i>c. Coordination that included inter- and intra-governmental cooperation and collaboration, as appropriate.</i>	The coordination included City and County agencies, Montana Department of Transportation, Law enforcement, Medical & EMS, and ADA representation
5. Did the Action Plan development include all of the following?	

<p><i>a. Considerations of equity using inclusive and representative processes;</i></p>	<p>Although the CTSP did not explicitly address equitability, the Missoula Metropolitan Planning Organization's 2050 Long-Range Transportation Plan (LRTP) used both safety criteria from the CTSP and equitability considerations in the project scoring methodology. LRTP: https://www.missoulampo.com/_files/ugd/31250b_66ec0b40355843a4bdb608880f427245.pdf Appendix D, E: https://www.missoulampo.com/_files/ugd/31250b_ca3d325be11247e9bf84ef64e370c626.pdf</p>
<p><i>b. The identification of underserved communities through data; and</i></p>	<p>LRTP equity scoring considered LMI (Low to moderate income), City/County Invest Health program including persistent poverty, social service accessibility, school accessibility and multi-modal access. LRTP: https://www.missoulampo.com/_files/ugd/31250b_66ec0b40355843a4bdb608880f427245.pdf Appendix D, E: https://www.missoulampo.com/_files/ugd/31250b_ca3d325be11247e9bf84ef64e370c626.pdf</p>
<p><i>c. Equity analysis, in collaboration with</i></p>	<p>LRTP had a comprehensive collaboration with appropriate</p>
<p>6. Are both of the following true?</p>	
<p><i>a. The plan development included an assessment of current policies, plans, guidelines, and/or standards to identify opportunities to improve how processes prioritize safety; and</i></p>	<p>LRTP contains a full list of plans evaluated during the development of the LRTP (pg. 4) LRTP: https://www.missoulampo.com/_files/ugd/31250b_66ec0b40355843a4bdb608880f427245.pdf Appendix D, E: https://www.missoulampo.com/_files/ugd/31250b_ca3d325be11247e9bf84ef64e370c626.pdf</p>
<p><i>b. The plan discusses implementation through the adoption of revised or new policies, guidelines, and/or standards.</i></p>	<p>Yes. The CTSP recommends several policy improvements related to safety.</p>
<p>7. Does the plan identify a comprehensive set of projects and strategies to address the safety problems identified in the Action Plan, time ranges when the strategies and projects will be deployed, and explain project prioritization criteria?</p>	<p>The CTSP provides the basis for safety prioritization and a final scored list of the LRTP. LRTP: https://www.missoulampo.com/_files/ugd/31250b_66ec0b40355843a4bdb608880f427245.pdf Appendix H: https://www.missoulampo.com/_files/ugd/31250b_ca3d325be11247e9bf84ef64e370c626.pdf</p>
<p>8. Does the plan include all of the following?</p>	
<p><i>a. A description of how progress will be measured over time that includes, at a minimum, outcome data</i></p>	<p>Yes. Severe crashes are monitored annually and evaluated against local reduction goals. Overall 5-Year average reduction is established in the CTSP</p>
<p><i>b. The plan is posted publicly online.</i></p>	<p>https://www.ci.missoula.mt.us/DocumentCenter/View/49937/2019_CTSP_FINAL</p>
<p>9. Was the plan finalized and/or last updated between 2017 and 2022?</p>	<p>Yes, 2019</p>

South Avenue

Safe Streets and Roads for All Grant

Contents

Appendix A - Budget

Appendix B - Design

Appendix C - Safety

Appendix D - Letters of Support

Appendix A - Budget

Opinion of Probable Costs



WGM GROUP
Community Values. Inspired Futures.

Project Name: South Avenue Reconstruction Reserve to 36th
 Project No.: 170410
 Prepared By: SG/RMS
 Approved By: SMM
 Date: September 13, 2022

Preliminary

Description: **Order of magnitude opinion of probable cost based on preliminary plans representing 60% design.**

ITEM #	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
SCH A-Demolition					
1	Asphalt Removal	35,064	SY	\$ 6.00	\$ 210,384.00
2	Curb Removal	1,144	LF	\$ 6.00	\$ 6,864.00
3	Remove Tree and Rootball and Dispose of Offsite	20	EA	\$ 600.00	\$ 12,000.00
4	Remove Shrubs and Roots and Dispose of Offsite	1	LSUM	\$ 3,000.00	\$ 3,000.00
5	Remove Sump	15	EA	\$ 1,000.00	\$ 15,000.00
6	Remove Sidewalk	470	SF	\$ 2.50	\$ 1,175.00
7	Remove Fence and Salvage to Owner	668	LF	\$ 5.00	\$ 3,340.00
8	Remove Sign and Dispose of Offsite	37	EA	\$ 100.00	\$ 3,700.00
9	Remove Sign and Salvage to Owner	12	EA	\$ 200.00	\$ 2,400.00
10	Reset Signs	6	EA	\$ 600.00	\$ 3,600.00
11	Remove Pin Down Curb and Dispose of Offsite	20	EA	\$ 75.00	\$ 1,500.00
12	Remove Bollard and Dispose of Offsite	1	EA	\$ 150.00	\$ 150.00
13	Remove Luminaire Pole	2	EA	\$ 1,000.00	\$ 2,000.00
14	Relocate Mailbox	18	EA	\$ 500.00	\$ 9,000.00
Subtotal					\$ 274,113.00
SCH B-Improvements					
SCH-B1 Road					
1	Mobilization	1	LSUM	\$ 100,000.00	\$ 100,000.00
1	Excavation Above Subgrade (18639 CY Cut / 5102 CY Fill)	18,639	CY	\$ 25.00	\$ 465,975.00
2	4" Thickness Hot Plant Mix. Type 'B'	27,586	SY	\$ 25.00	\$ 689,650.00
3	12" Thickness 3/4" Minus Crushed Base Course	10,328	SY	\$ 40.00	\$ 413,120.00
4	2" Thickness Hot Plant Mix. Type 'B'	710	SY	\$ 16.00	\$ 11,360.00
5	6" Thickness 3/4" Minus Crushed Base Course	710	SY	\$ 8.00	\$ 5,680.00
6	3" Thickness Hot Plant Mix. Type 'C'	5,860	SY	\$ 20.00	\$ 117,200.00
7	4" Thickness 3/4" Minus Crushed Base Course	8,204	SY	\$ 6.00	\$ 49,224.00
8	4" Thickness Concrete	38,854	SF	\$ 6.00	\$ 233,124.00
9	6" Thickness Concrete	7,011	SF	\$ 7.50	\$ 52,582.50
10	8" Thickness Concrete	14,087	SF	\$ 9.00	\$ 126,783.00
11	6" Thickness 1.5" Minus Crushed Base Course	18	SY	\$ 20.00	\$ 360.00
12	6" Combined Curb and Gutter	14,328	LF	\$ 18.00	\$ 257,904.00
13	8" Combined Curb and Gutter	959	LF	\$ 25.00	\$ 23,975.00
14	New Signs	72	EA	\$ 700.00	\$ 50,400.00
15	Payment Markings Paint	122	GAL	\$ 160.00	\$ 19,520.00
16	Words and Symbols	11	GAL	\$ 160.00	\$ 1,760.00
17	8-Foot Sump	49	EA	\$ 3,500.00	\$ 171,500.00
18	Inlet	15	EA	\$ 1,500.00	\$ 22,500.00
19	Detectable Warning Device	630	SF	\$ 40.00	\$ 25,200.00
20	Fence	30	LF	\$ 20.00	\$ 600.00
Subtotal					\$ 2,738,417.50
SCH-B2 Electric					
1	SERV Assembly-200 AMP	1	EA	\$ 10,000.00	\$ 10,000.00
2	Pull Boxes / Conduit / Conductor	1	LS	\$ 4,500.00	\$ 4,500.00
3	Decorative Luminaire Pole Type 1	48	EA	\$ 4,500.00	\$ 216,000.00
4	Decorative Luminaire Pole Type 2	61	EA	\$ 4,000.00	\$ 244,000.00
5	Luminaire Assembly 126 LED	48	EA	\$ 3,000.00	\$ 144,000.00
6	Luminaire Assembly 70 LED	61	EA	\$ 2,000.00	\$ 122,000.00
7	Foundation-Concrete	57	CY	\$ 1,800.00	\$ 102,600.00
Subtotal					\$ 843,100.00
SCH-B3 Landscaping					
1	Topsoil Stripping and Stockpiling	4,487	CY	\$ 5.00	\$ 22,435.00
2	Topsoil and Seed 6" Depth	8,423	SY	\$ 2.50	\$ 21,057.50
3	Topsoil and Seed 7" Depth	10,384	SY	\$ 2.50	\$ 25,960.00
4	Tree	143	EA	\$ 900.00	\$ 128,700.00
Subtotal					\$ 198,152.50
Construction Subtotal					\$ 4,053,783.00
Mobilization (8%)					\$ 324,302.64
Traffic Control (5%)					\$ 202,689.15
Erosion Control (2%)					\$ 81,075.66
Design Contingency (10%)					\$ 405,378.30
Project Subtotal					\$ 5,067,228.75
Design Engineering (5%)					\$ 253,361.44
Construction Engineering (10%)					\$ 506,722.88
Administration Fees (4%)					\$ 202,689.15
PROJECT TOTAL					\$ 6,030,002.22
3 Years Inflation @ 7%					\$ 1,357,009.79
2025 PROJECT TOTAL					\$ 7,387,012.01

Opinion of Probable Costs



WGM GROUP
Community Values. Inspired Futures.

Project Name: South Avenue SS4A Grant Application

Project No.: 220718

Prepared By: DBG

Approved By: SMM

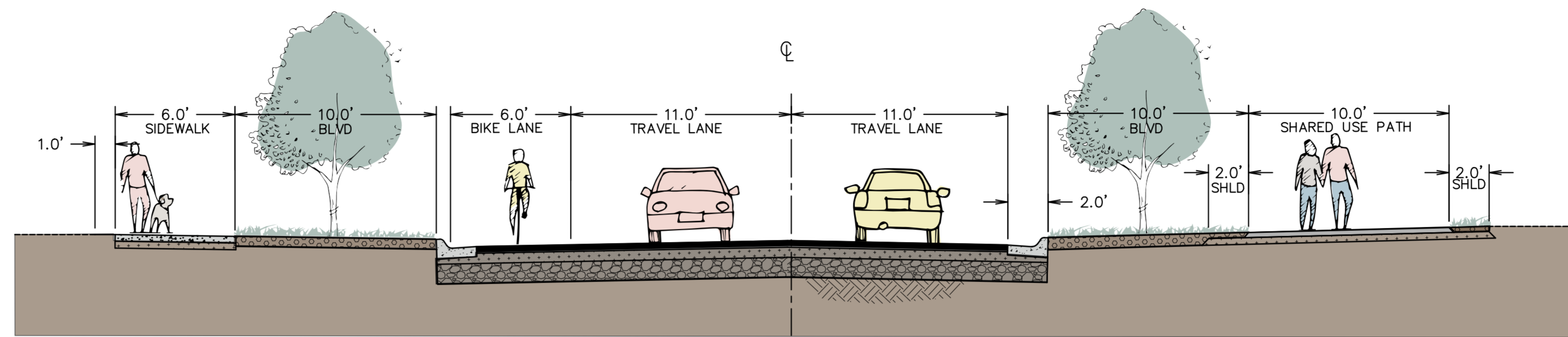
Date: September 13, 2022

Preliminary

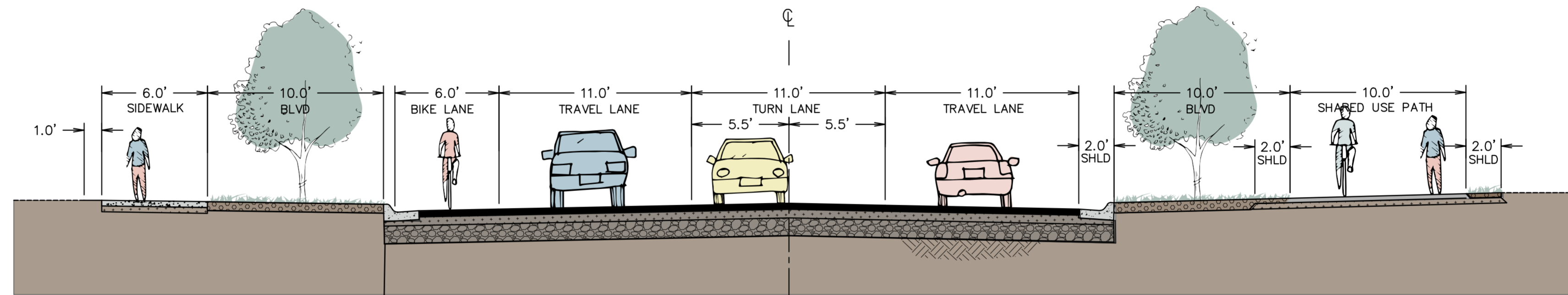
Description: **Order of magnitude opinion of probable cost based on preliminary plans representing 50% design.**

ITEM #	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL
1	Miscellaneous Work	1	LS	\$ 50,000.00	\$ 50,000.00
2	Asphalt Removal	13,935	SY	\$ 6.00	\$ 83,610.00
3	2" Asphalt Mill	7,500	SY	\$ 8.50	\$ 63,750.00
4	Excavation Above Subgrade	6,000	CY	\$ 25.00	\$ 150,000.00
5	Combined Concrete Curb & Gutter	10,110	LF	\$ 25.00	\$ 252,750.00
6	4" Thickness Concrete Sidewalk	27,670	SF	\$ 6.00	\$ 166,020.00
7	6" Thickness Concrete Sidewalk	6,072	SF	\$ 7.50	\$ 45,540.00
8	8" Thickness Concrete Sidewalk	11,642	SF	\$ 9.00	\$ 104,778.00
9	Detectable Warning Devices	780	SF	\$ 40.00	\$ 31,200.00
10	3" Thickness Asphalt Concrete Surface Course Type "C" (Trail)	4,795	SY	\$ 20.00	\$ 95,900.00
11	4" Thickness 3/4" Minus Crushed Base Course (Trail)	6,891	SY	\$ 6.00	\$ 41,346.00
12	4" Thickness Asphalt Concrete Surface Course Type "B" (Road Patch)	7,130	SY	\$ 25.00	\$ 178,250.00
13	2" Thickness Asphalt Concrete Surface Course Type "B" (Overlay)	9,673	SY	\$ 16.00	\$ 154,768.00
14	6" Thickness 3/4" Minus Crushed Base Course (Road Patch)	4,950	SY	\$ 8.00	\$ 39,600.00
15	12" Thickness 3" Minus Sub-Base Course	2,948	CY	\$ 40.00	\$ 117,920.00
16	Handrail	150	LF	\$ 100.00	\$ 15,000.00
17	Topsoil Stripping (10' Wide 4" Deep Excavation and Stockpiling)	1,350	CY	\$ 15.00	\$ 20,250.00
18	Topsoil and Seed	1,250	CY	\$ 50.00	\$ 62,500.00
19	New Sign	33	EA	\$ 700.00	\$ 23,100.00
20	Striping	1	LS	\$ 22,500.00	\$ 22,500.00
21	Rectangular Rapid Flashing Beacon	1	LS	\$ 40,000.00	\$ 40,000.00
22	Culvert	40	LF	\$ 150.00	\$ 6,000.00
23	Irrigation Cap	195	SF	\$ 25.00	\$ 4,875.00
24	12" Sch. 40 PVC Storm Drain Pipe	201	LF	\$ 35.00	\$ 7,035.00
25	Catch Basin	7	EA	\$ 2,000.00	\$ 14,000.00
26	Sump	40	EA	\$ 3,000.00	\$ 120,000.00
Subtotal					\$ 1,910,692.00
Mobilization (8%)					\$ 152,855.36
Traffic Control (5%)					\$ 95,534.60
Erosion Control (2%)					\$ 38,213.84
Design Contingency (25%)					\$ 477,673.00
Project Subtotal					\$ 2,674,968.80
Design Engineering (15%)					\$ 401,245.32
Construction Engineering (10%)					\$ 287,731.08
Administration Fees (4%)					\$ 106,998.75
PROJECT TOTAL					\$ 3,470,943.95
3 Years Inflation @ 7%					\$ 781,111.64
2025 PROJECT TOTAL					\$ 4,252,055.59

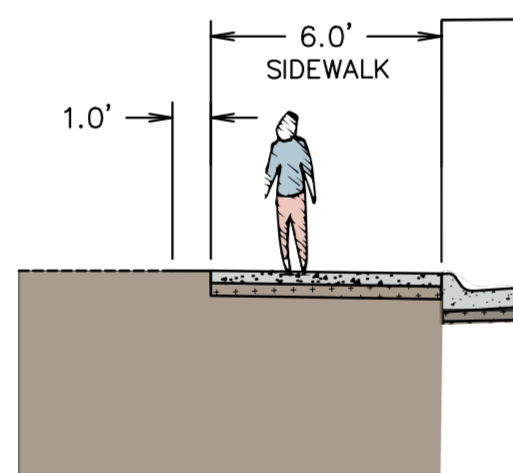
Appendix B - Design



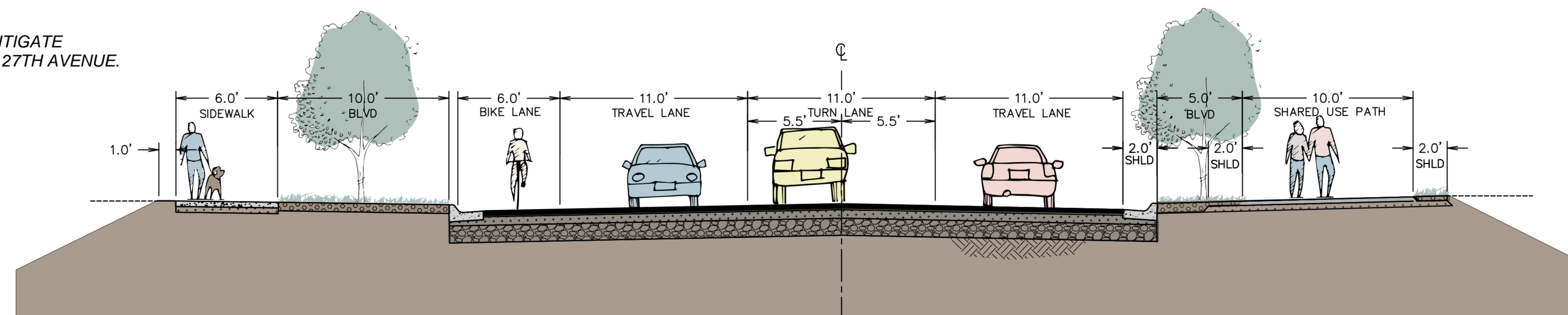
TYPICAL SECTION 1
TWO LANE ROADWAY
NO SCALE



TYPICAL SECTION 2
TWO LANE W/ CENTER TURN LANE
NO SCALE



ATTACHED SIDEWALK ON NORTH SIDE OF STREET TO MITIGATE RIGHT-OF-WAY IMPACTS FROM 3008 SOUTH AVENUE TO 27TH AVENUE.



TYPICAL SECTION 3
TWO LANE W/ CENTER TURN LANE (NARROW BLVD RIGHT)
NO SCALE

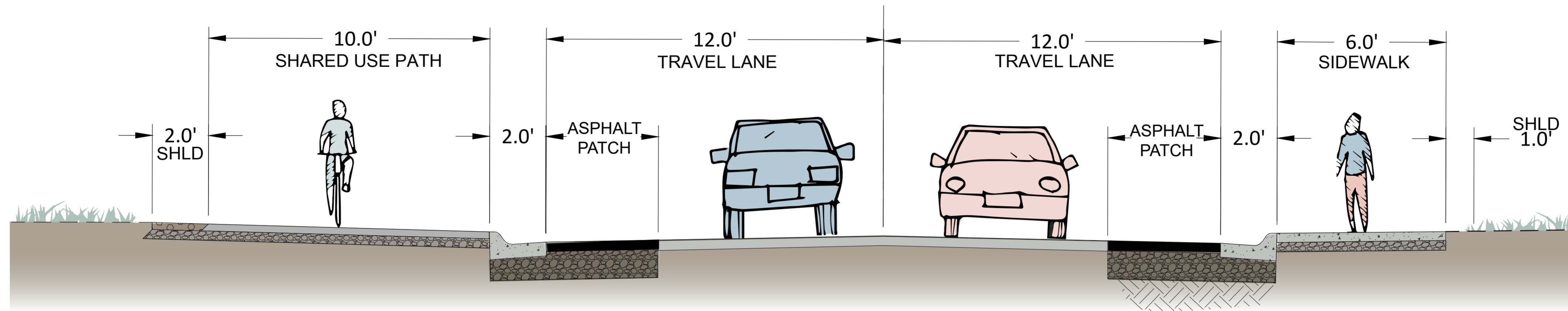


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SOUTH AVENUE RECONSTRUCTION - TYPICAL SECTIONS

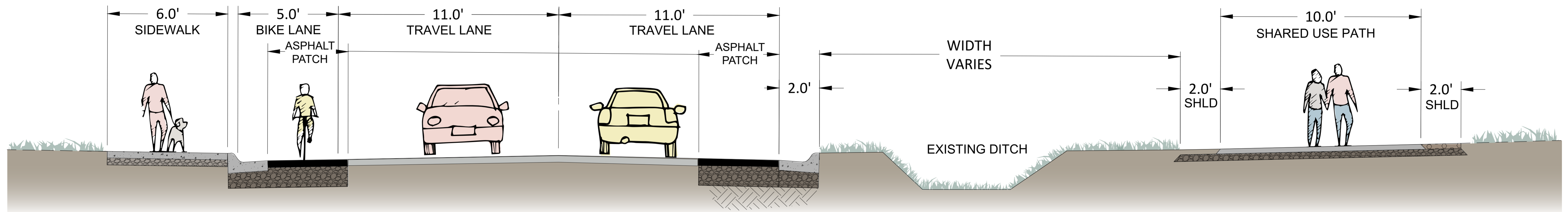


SOUTH AVENUE TYPICAL RECONSTRUCTION



CLEMENTS ROAD TYPICAL SECTION

SOUTH AVENUE TO NORTH AVENUE



SOUTH AVENUE TYPICAL SECTION

CLEMENTS ROAD TO 37TH AVENUE

SOUTH AVENUE RECONSTRUCTION

MISSOULA, MONTANA

CITY OF MISSOULA PROJECT #2015-013

SHEET INDEX:

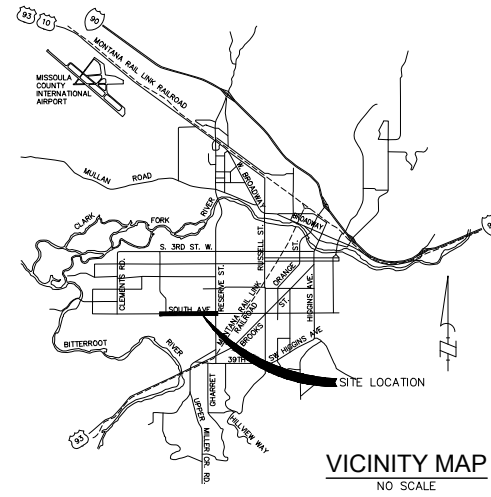
<u>ROADWAY</u>	
C1	COVER SHEET
C2	GENERAL NOTES, CONTROL, AND LEGEND
C3-C4	TYPICAL SECTIONS
C5-C7	DETAILS
C8-C23	STREET PLAN AND PROFILE
<u>SIGNING AND STRIPING PLANS</u>	
S1-S2	SIGNING AND STRIPING DETAILS
S3-S11	SIGNING AND STRIPING PLANS
<u>ELECTRICAL PLANS</u>	
E1-E8	ELECTRICAL PLANS



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PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/13/22



811
Know what's below.
Call before you dig.
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

WGM GROUP, INC. ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS (HORIZONTAL AND VERTICAL). THE EXISTING UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

Quality Assurance/Quality Control

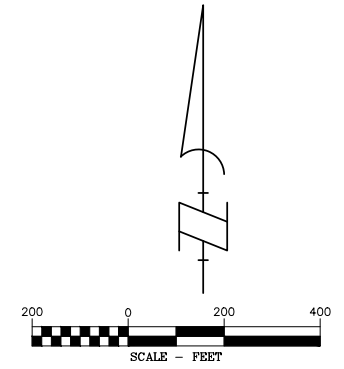
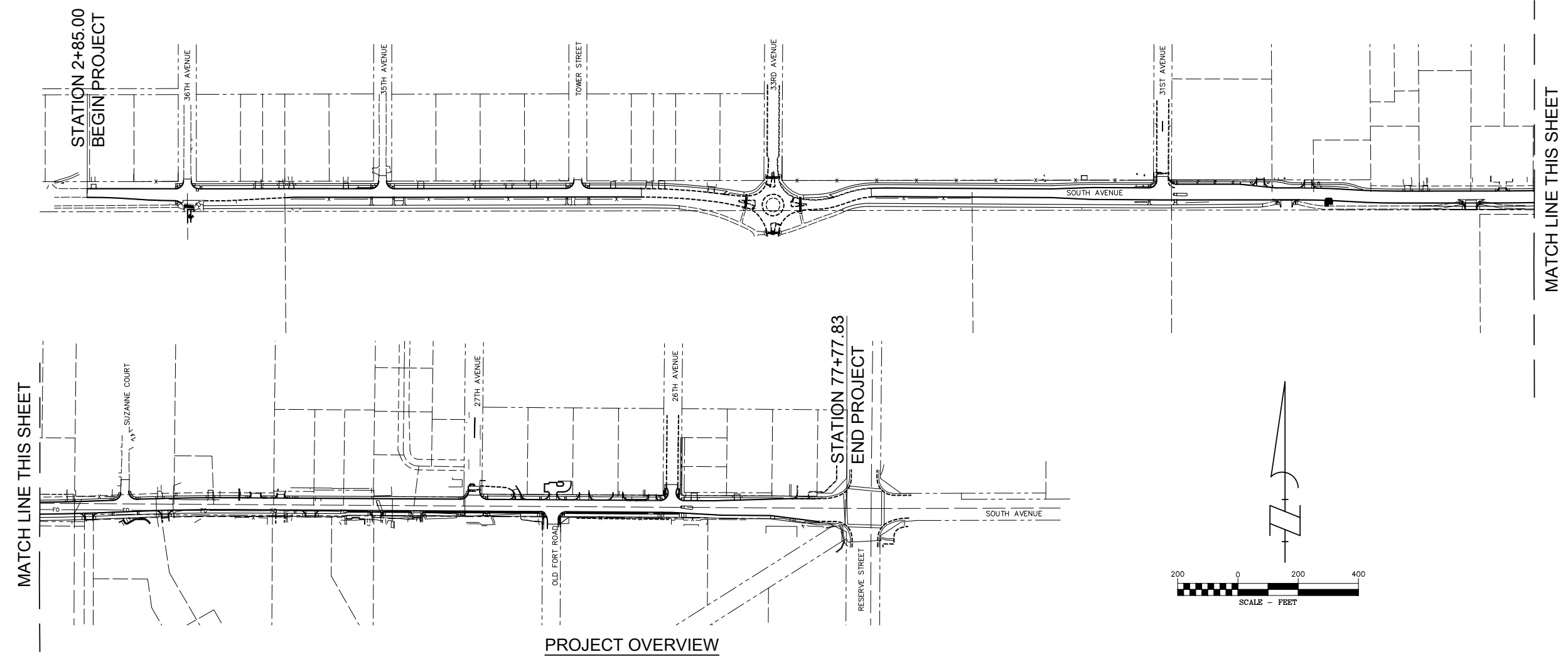
Self Check

Self Check By:

Date:

APPROVED

By Benton Anderson at 4:00 pm, Sep 13, 2022



COVER SHEET
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

REVISIONS:

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: CV
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET **C1 OF C23**

FILE: W:\Projects\170410\CAD_Data\Design\170410_CV.dwg

GENERAL NOTES:

- 1) ALL WORK SHALL CONFORM TO THE MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS, SIXTH EDITION, APRIL 2010, AS AMENDED BY THE MISSOULA CITY PUBLIC WORKS STANDARDS AND SPECIFICATIONS, NOVEMBER 18, 2020, MISSOULA PARKS AND RECREATION DESIGN MANUAL 2018 EDITION, REVISED APRIL 17, 2020, AND SPECIAL PROVISIONS IN THE PROJECT MANUAL AS APPLICABLE.
- 2) CONTRACTOR SHALL FIELD VERIFY THE LOCATION, SIZE, AND DEPTH OF ALL UTILITIES INCLUDING ALL SERVICES TO ALL PROPERTIES. THESE DRAWINGS MAY NOT SHOW ALL FACILITIES. THE DEPTHS OF ALL EXISTING UTILITIES ARE UNKNOWN. BURIED UTILITIES SHOWN ON THIS SITE ARE BASED ON AVAILABLE RECORDS AND UTILITY LOCATOR PAINT MARKS. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
- 3) CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM CITY OF MISSOULA, STATE OF MONTANA, AND UTILITY COMPANIES PRIOR TO STARTING WORK.
- 4) ALL CONCRETE AREAS ARE DESIGNED TO HAVE A 1.5% MAXIMUM CROSS SLOPE UNLESS OTHERWISE SHOWN ON THE PLANS.
- 5) ALL MATERIALS AND WORKMANSHIP OF IMPROVEMENTS SHALL MEET OR EXCEED ADA AS WELL AS STATE AND LOCAL REGULATIONS. WHERE THERE IS A CONFLICT BETWEEN THESE PLANS AND THE SPECIFICATIONS, OR ANY APPLICABLE STANDARD, THE HIGHER QUALITY STANDARD SHALL APPLY.
- 6) CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO BEGINNING CONSTRUCTION.
- 7) CONTRACTOR RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL EROSION CONTROL MEASURES, AND PROTECTING HAUL OFF/DROP ON ADJACENT PARKING AREAS AND PUBLIC RIGHTS OF WAY. CONTRACTOR RESPONSIBLE FOR CLEANING ANY MATERIAL HAULED OFF/DRUG ONTO ADJACENT PARKING AREAS OR PUBLIC RIGHTS OF WAY.
- 8) CONTRACTOR RESPONSIBLE FOR LOCATING EXISTING IRRIGATION SYSTEM AND REPAIRING ANY CONTRACTOR DAMAGE TO SYSTEM.
- 9) GRADING AND SLOPE INFORMATION PRESENTED IN THIS PLAN SET IS BASED ON DESIGN GRADES AND BEST AVAILABLE MAPPING INFORMATION. EXISTING ELEVATIONS AT TIE IN POINT ELEVATIONS SHALL BE VERIFIED PRIOR TO INSTALLATION OF EXTERIOR IMPROVEMENTS. NOTIFY ENGINEER IF DIFFERENT CONDITIONS ARE FOUND. CONTRACTOR RESPONSIBLE FOR ENSURING POSITIVE DRAINAGE AND ADA COMPLIANCE FOR CONSTRUCTED IMPROVEMENTS.
- 10) THIS PLAN IS TO BE USED TO ASSIST THE CONTRACTOR IN HORIZONTAL LOCATION DURING THE STAKING AND LAYOUT. IF THE CONTRACTOR DISCOVERS ANY DISCREPANCY BETWEEN THE GIVEN DATA AND THE INTENT SHOWN BY THE DRAWINGS, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR CLARIFICATION.
- 11) CONTRACTOR SHALL COMPLY WITH ALL CITY OF MISSOULA TRAFFIC CONTROL REQUIREMENTS.

SURVEY CONTROL:

HORIZONTAL DATUM:
MONTANA 2500 STATE PLANE COORDINATE SYSTEM NAD83(2011)(EPOCH:2010.0000) @ GROUND

VERTICAL DATUM:
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
(GEOID 12A)

PROJECT TAKEN TO GROUND @
N: 979708.53
E: 831894.41
ELEV: 3161.00
GRID TO GROUND SCALE FACTOR 1.0007521096

CONTROL POINTS

PT#	NORTHING	EASTING	ELEV.	DESC.
1	980404.14	831378.40	3160.45	WGM RPC
4	980229.36	833946.91	3171.87	WGM OPC
5	980396.31	833790.43	3170.68	WGM OPC
6	980293.00	833421.29	3168.59	WGM OPC
7	980400.90	832755.33	3164.00	WGM OPC
8	980371.19	832152.31	3163.20	MAG NAIL
9	980501.86	830855.67	3158.90	WGM OPC
10	980476.98	830291.38	3158.31	MAG NAIL
11	980562.15	829863.52	3156.85	WGM OPC
12	980536.31	829240.74	3153.14	MAG NAIL
13	980625.87	828545.84	3151.39	WGM OPC
14	980603.37	827928.13	3150.23	MAG NAIL
15	980629.83	827301.97	3148.82	WGM OPC
16	980691.72	826644.93	3147.25	WGM OPC

VERTICAL BENCHMARKS

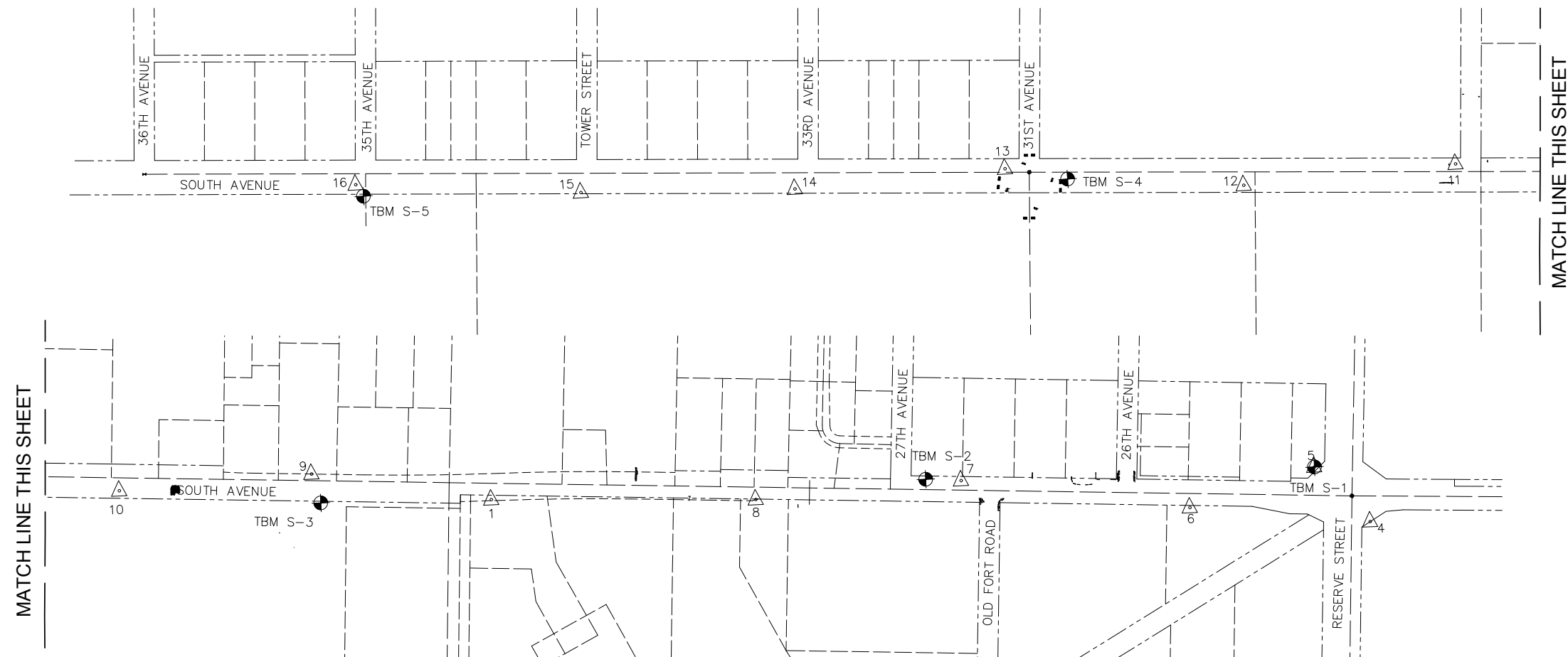
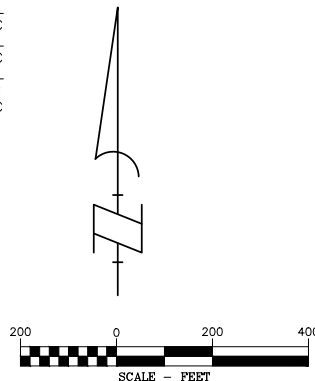
TBM S-1: 3171.43'
"X" ON BOLT SW CORNER HOLIDAY SIGN
TBM S-2: 3167.09'
"X" ON ARROW BOLT FIRE HYDRANT
TBM S-3: 3161.42'
"X" ON CONCRETE LIGHT POLE BASE
TBM S-4: 3151.40'
"X" ON CONCRETE LIGHT POLE BASE
TBM S-5: 3147.77'
"X" ON TOP BACK CURB

LEGEND-PROPOSED

- EDGE OF ASPHALT
- CURB AND GUTTER (CATCH)
- CURB AND GUTTER (SPILL)
- CURB AND GUTTER LAYDOWN
- 4" THICK CONCRETE SIDEWALK
- 6" THICK CONCRETE SIDEWALK
- 8" THICK CONCRETE SIDEWALK
- ASPHALT
- W WATER MAIN
- WS WATER SERVICE
- SD STORM DRAIN
- BE BURIED ELECTRIC LINE
- X X FENCE
- IRRIGATION DITCH
- IR IRRIGATION LINE
- SL SLEEVE
- CONTOUR (1 FOOT INTERVAL)
- IRRIGATION CULVERT
- WATER VALVE
- FIRE HYDRANT
- BLOW OFF
- WELL
- CURB BOX
- STORM DRAIN MANHOLE
- DRAINAGE SUMP
- DRAINAGE INLET (CURB BACKED LID)
- DRAINAGE SUMP (CURB BACKED LID)
- LIGHT POLE
- SIGN
- DETECTABLE WARNING DEVICE

LEGEND-EXISTING

- RIGHT OF WAY
- EASEMENT LINE
- LOT LINE
- EXTERIOR BUILDING WALL
- CONCRETE SIDEWALK
- EDGE OF ASPHALT
- CURB AND GUTTER
- CURB AND GUTTER W/DRIVEWAY OPENING
- EDGE OF GRAVEL
- W WATER MAIN
- WS WATER SERVICE
- S SANITARY SEWER MAIN
- SS SANITARY SEWER SERVICE
- SD STORM DRAIN
- AP AERIAL POWER LINE
- BE BURIED ELECTRIC LINE
- T BURIED TELEPHONE LINE
- FO BURIED FIBER OPTIC
- TV BURIED CABLE TELEVISION
- G GAS MAIN
- X X FENCE
- IRRIGATION DITCH
- CONTOUR (1 FOOT INTERVAL)
- CURB BOX/WATER SERVICE VALVE
- WATER VALVE
- FIRE HYDRANT
- BLOW OFF
- WELL
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEANOUT
- STORM DRAIN MANHOLE
- DRAINAGE SUMP
- CURB INLET
- UTILITY POLE
- GUY WIRE
- LIGHT POLE
- ELECTRIC PEDESTAL
- ELECTRIC METER
- PULL BOX
- TELEPHONE PEDESTAL
- CABLE TELEVISION PEDESTAL
- GAS METER
- GAS MAIN VALVE
- EVERGREEN TREE (SIZE AS NOTED)
- DECIDUOUS TREE (SIZE AS NOTED)
- BUSH
- MAIL BOX
- SIGN
- TEMPORARY BENCH MARK



PRELIMINARY
PLOTTED: 9/13/22
SAVED: 9/13/22

GENERAL NOTES, CONTROL, AND LEGEND
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

REVISIONS:

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: CV-2
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:
SEPTEMBER 2022

SHEET **C2 OF C23**

FILE: W:\Projects\170410\CAD_Data\Design\170410_CV.dwg

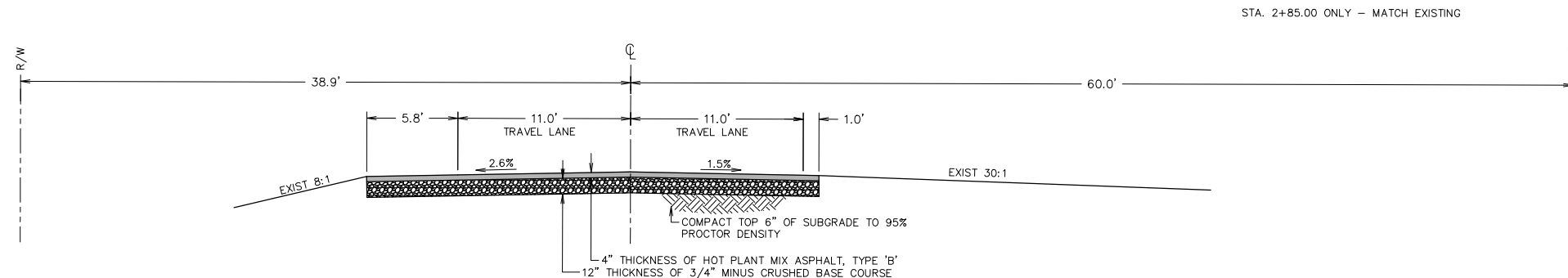


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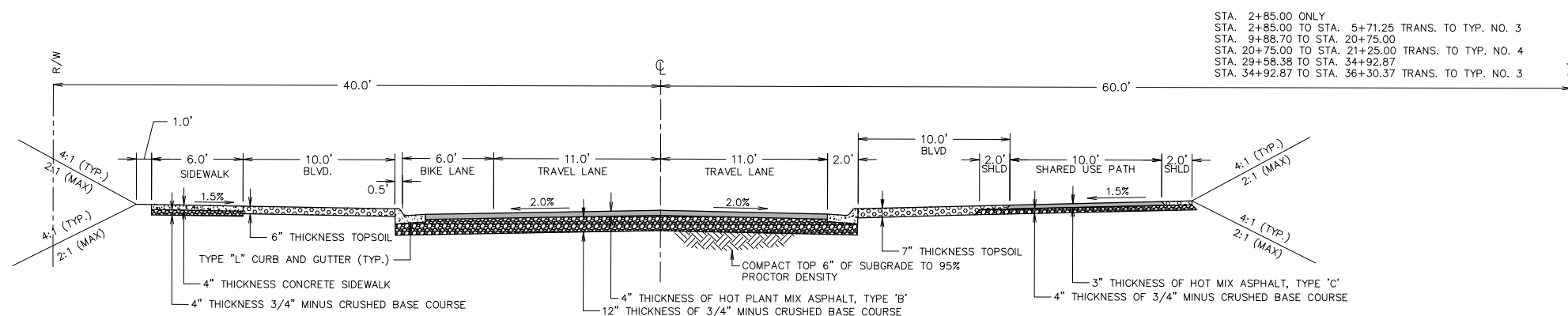
PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/13/22

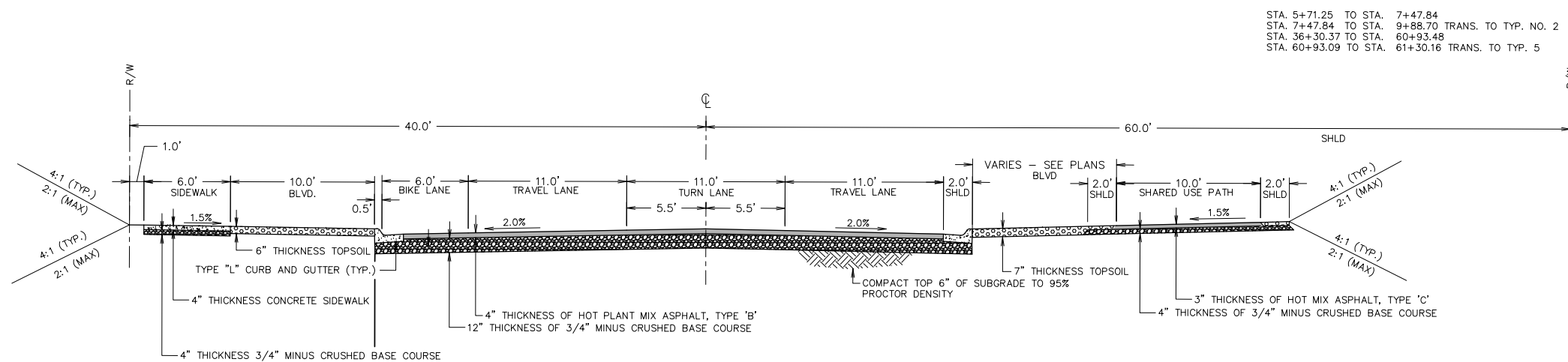
TYPICAL SECTIONS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA



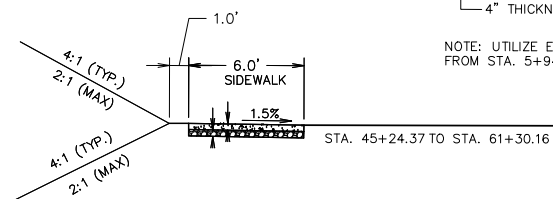
TYPICAL SECTION 1
MATCH EXISTING ROADWAY @ 36TH STREET
NO SCALE



TYPICAL SECTION 2
TWO LANE ROADWAY
NO SCALE



TYPICAL SECTION 3
TWO LANE W/CENTER TURN LANE
NO SCALE



REVISIONS:

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: C3
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET **C3 OF C23**

FILE: W:\Projects\170410\CAD_Data\Design\170410_ST_PLN.dwg



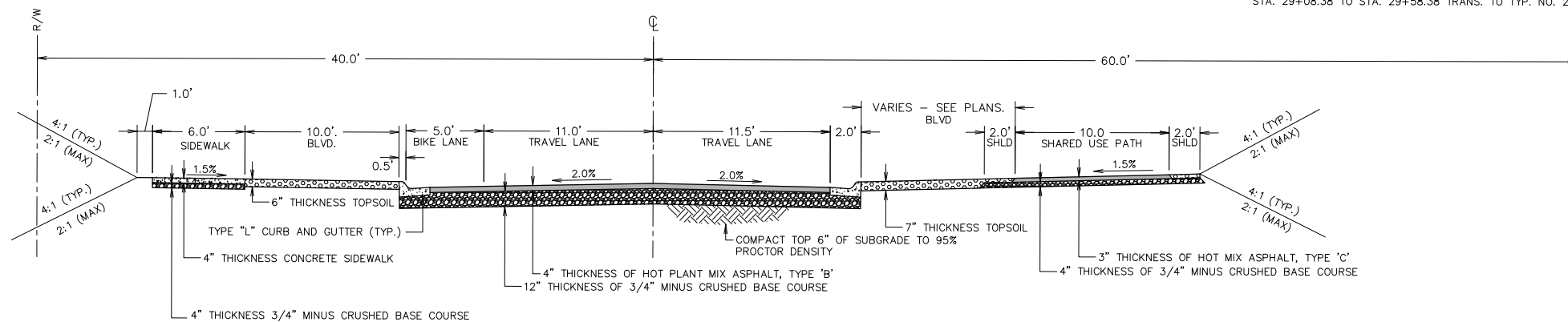
WGM GROUP
WWW.WGMGROUP.COM

PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/13/22

TYPICAL SECTIONS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

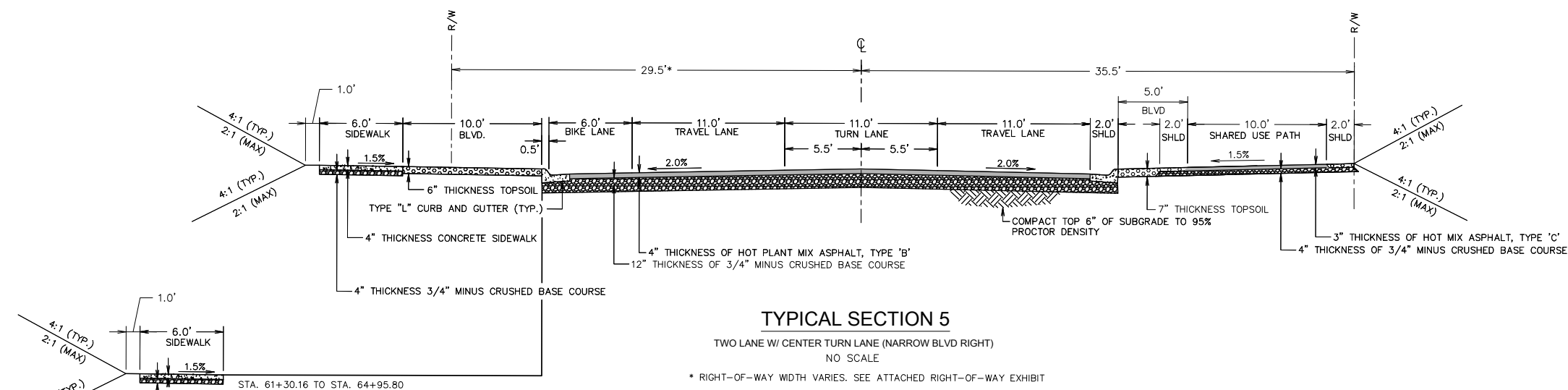
STA. 21+25.00 ONLY - MATCH EXISTING ROUNDABOUT
STA. 29+08.55 ONLY - MATCH EXISTING ROUNDABOUT
STA. 29+08.38 TO STA. 29+58.38 TRANS. TO TYP. NO. 2



TYPICAL SECTION 4

MATCH EXISTING ROUNDABOUT
NO SCALE

STA. 61+30.16 TO STA. 71+97.09
STA. 71+97.09 TO STA. 76+76.29 TRANS. TO TYP. NO. 6

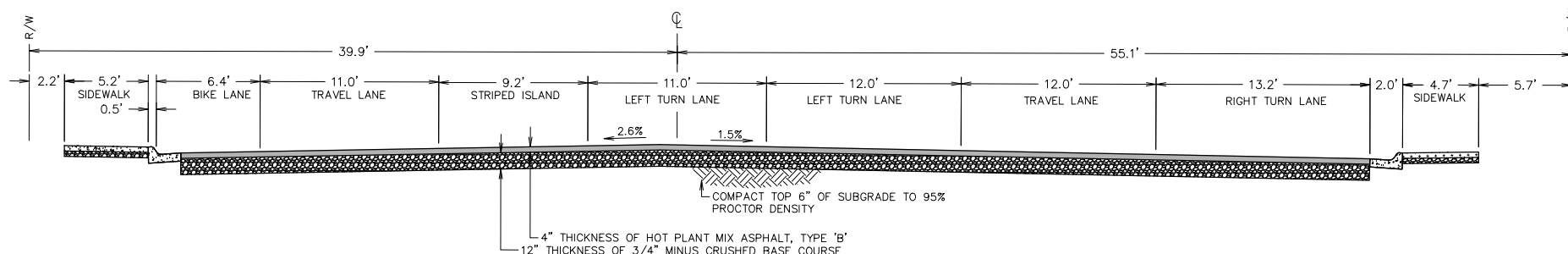


TYPICAL SECTION 5

TWO LANE W/ CENTER TURN LANE (NARROW BLVD RIGHT)
NO SCALE

* RIGHT-OF-WAY WIDTH VARIES. SEE ATTACHED RIGHT-OF-WAY EXHIBIT

STA. 76+76.29 ONLY - MATCH EXISTING



TYPICAL SECTION 6

MATCH EXISTING AT EAST END
NO SCALE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: C4
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET C4 OF C23

FILE: W:\Projects\170410\CAD_Data\Design\170410_ST_PLN.dwg



WGM GROUP
WWW.WGMGROUP.COM

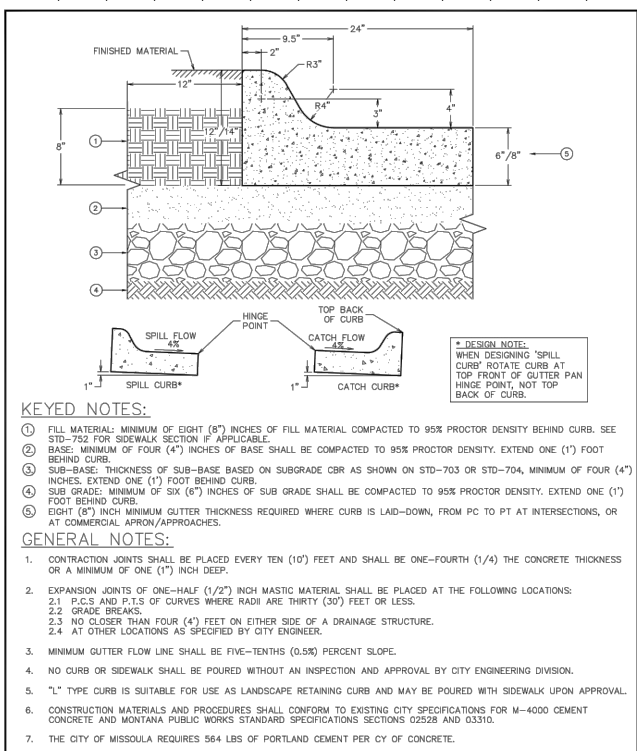
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

DETAILS

NO.	DESCRIPTION	DATE

SEPTEMBER 2022

SHEET C5 OF C23



KEYED NOTES:

- FILL MATERIAL: MINIMUM OF EIGHT (8") INCHES OF FILL MATERIAL COMPACTED TO 95% PROCTOR DENSITY BEHIND CURB. SEE STD-752 FOR SIDEWALK SECTION IF APPLICABLE.
- BASE: MINIMUM OF FOUR (4") INCHES OF BASE SHALL BE COMPACTED TO 95% PROCTOR DENSITY. EXTEND ONE (1') FOOT BEHIND CURB.
- SUB-BASE: THICKNESS OF SUB-BASE BASED ON SUBGRADE CBR AS SHOWN ON STD-703 OR STD-704, MINIMUM OF FOUR (4") INCHES. EXTEND ONE (1') FOOT BEHIND CURB.
- SUB GRADE: MINIMUM OF SIX (6") INCHES OF SUB GRADE SHALL BE COMPACTED TO 95% PROCTOR DENSITY. EXTEND ONE (1') FOOT BEHIND CURB.
- EIGHT (8") INCH MINIMUM GUTTER THICKNESS REQUIRED WHERE CURB IS LAID-DOWN, FROM PC TO PT AT INTERSECTIONS, OR AT COMMERCIAL APRON/APPROACHES.

GENERAL NOTES:

- CONTRACTION JOINTS SHALL BE PLACED EVERY TEN (10') FEET AND SHALL BE ONE-FOURTH (1/4) THE CONCRETE THICKNESS OR A MINIMUM OF ONE (1") INCH DEEP.
- EXPANSION JOINTS OF ONE-HALF (1/2") INCH MASTIC MATERIAL SHALL BE PLACED AT THE FOLLOWING LOCATIONS:
2.1 P.C.S AND P.T.S OF CURVES WHERE RADI ARE THIRTY (30') FEET OR LESS.
2.2 GRADE BREAKS.
2.3 NO CLOSER THAN FOUR (4') FEET ON EITHER SIDE OF A DRAINAGE STRUCTURE.
2.4 AT OTHER LOCATIONS AS SPECIFIED BY CITY ENGINEER.
- MINIMUM GUTTER FLOW LINE SHALL BE FIVE-TENTHS (0.5%) PERCENT SLOPE.
- NO CURB OR SIDEWALK SHALL BE POURED WITHOUT AN INSPECTION AND APPROVAL BY CITY ENGINEERING DIVISION.
- "L" TYPE CURB IS SUITABLE FOR USE AS LANDSCAPE RETAINING CURB AND MAY BE POURED WITH SIDEWALK UPON APPROVAL.
- CONSTRUCTION MATERIALS AND PROCEDURES SHALL CONFORM TO EXISTING CITY SPECIFICATIONS FOR M-4000 CEMENT CONCRETE AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS SECTIONS 02528 AND 03310.
- THE CITY OF MISSOULA REQUIRES 564 LBS OF PORTLAND CEMENT PER CY OF CONCRETE.

December 2021

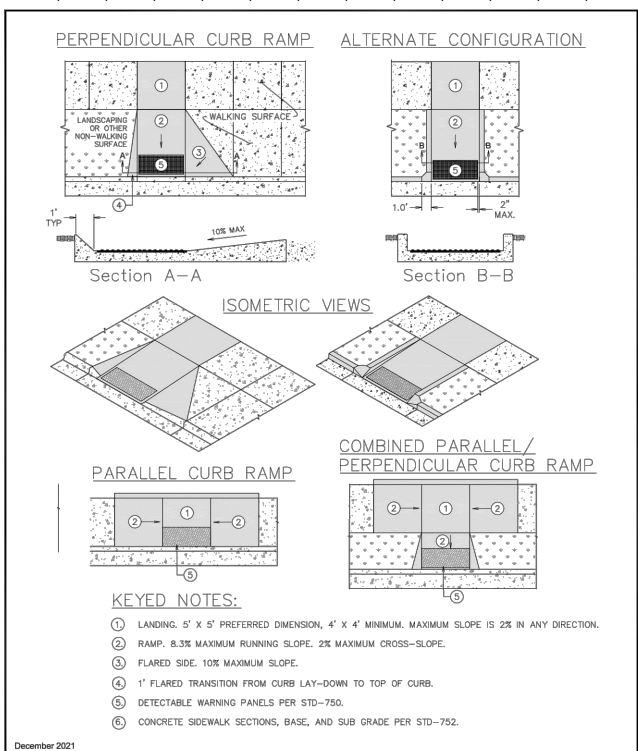
Typical "L" Type Curb/Gutter Section

Engineering Division

Approved By
City Engineer
Kevin J. Slovorp

Adopted: 01/30/1980
Revised: 09/03/2020

STD - 740



KEYED NOTES:

- LANDING: 5' X 5' PREFERRED DIMENSION, 4' X 4' MINIMUM. MAXIMUM SLOPE IS 2% IN ANY DIRECTION.
- RAMP: 8.3% MAXIMUM RUNNING SLOPE, 2% MAXIMUM CROSS-SLOPE.
- FLARED SIDE: 10% MAXIMUM SLOPE.
- 1" FLARED TRANSITION FROM CURB LAY-DOWN TO TOP OF CURB.
- DETECTABLE WARNING PANELS PER STD-750.
- CONCRETE SIDEWALK SECTIONS, BASE, AND SUB GRADE PER STD-752.

December 2021

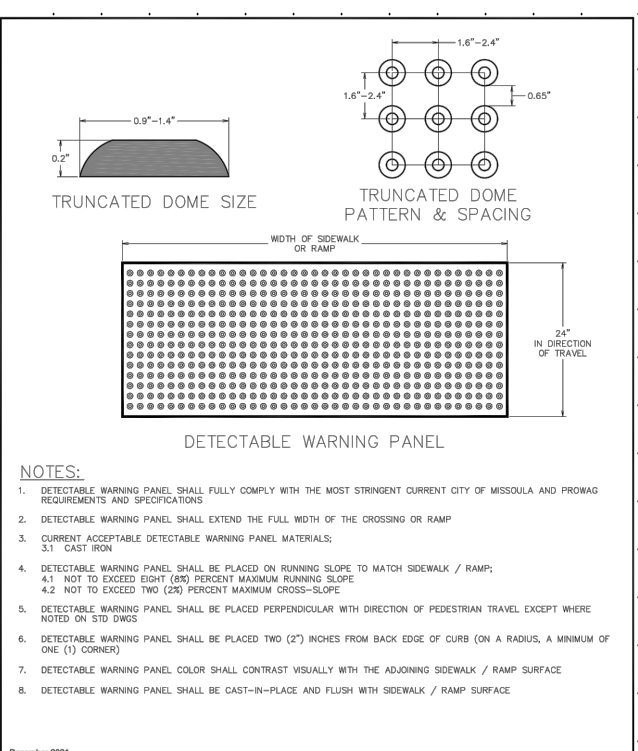
Curved Ramp Details (Sheet 1 of 4)

Engineering Division

Approved By
City Engineer
Kevin J. Slovorp

Adopted: 01/30/1980
Revised: 08/23/2021

STD - 751-1



NOTES:

- DETECTABLE WARNING PANEL SHALL FULLY COMPLY WITH THE MOST STRINGENT CURRENT CITY OF MISSOULA AND PROWAG REQUIREMENTS AND SPECIFICATIONS
- DETECTABLE WARNING PANEL SHALL EXTEND THE FULL WIDTH OF THE CROSSING OR RAMP
- CURRENT ACCEPTABLE DETECTABLE WARNING PANEL MATERIALS:
3.1 CAST IRON
- DETECTABLE WARNING PANEL SHALL BE PLACED ON RUNNING SLOPE TO MATCH SIDEWALK / RAMP:
4.1 NOT TO EXCEED EIGHT (8%) PERCENT MAXIMUM RUNNING SLOPE.
4.2 NOT TO EXCEED TWO (2%) PERCENT MAXIMUM CROSS-SLOPE
- DETECTABLE WARNING PANEL SHALL BE PLACED PERPENDICULAR WITH DIRECTION OF PEDESTRIAN TRAVEL EXCEPT WHERE NOTED ON STD DWGS
- DETECTABLE WARNING PANEL SHALL BE PLACED TWO (2") INCHES FROM BACK EDGE OF CURB (ON A RADIUS, A MINIMUM OF ONE (1) CORNER)
- DETECTABLE WARNING PANEL COLOR SHALL CONTRAST VISUALLY WITH THE ADJOINING SIDEWALK / RAMP SURFACE
- DETECTABLE WARNING PANEL SHALL BE CAST-IN-PLACE AND FLUSH WITH SIDEWALK / RAMP SURFACE

December 2021

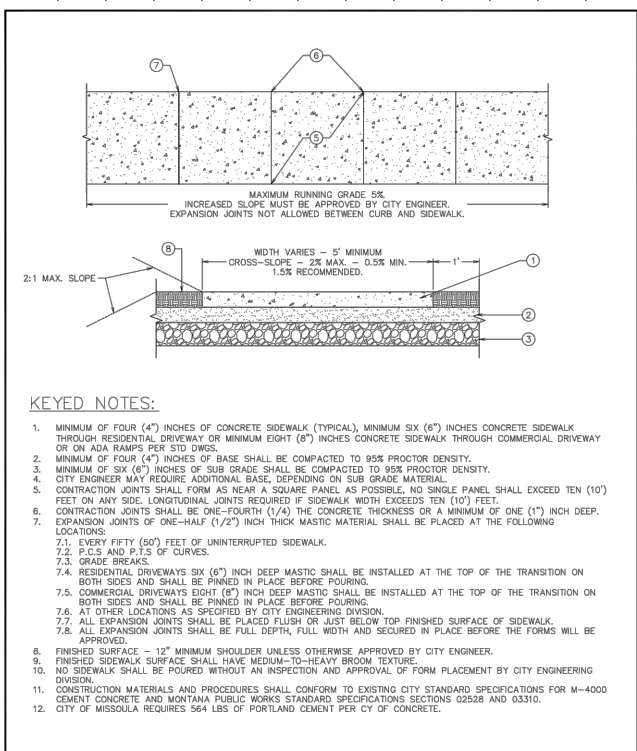
Detectable Warning Panel

Engineering Division

Approved By
City Engineer
Kevin J. Slovorp

Adopted: 03/12/2004
Revised: 09/13/2021

STD - 750



KEYED NOTES:

- MINIMUM OF FOUR (4") INCHES OF CONCRETE SIDEWALK (TYPICAL), MINIMUM SIX (6") INCHES CONCRETE SIDEWALK THROUGH RESIDENTIAL DRIVEWAY OR MINIMUM EIGHT (8") INCHES CONCRETE SIDEWALK THROUGH COMMERCIAL DRIVEWAY OR ON ADA RAMPS PER STD DWGS.
- MINIMUM OF FOUR (4") INCHES OF BASE SHALL BE COMPACTED TO 95% PROCTOR DENSITY.
- MINIMUM OF SIX (6") INCHES OF SUB GRADE SHALL BE COMPACTED TO 95% PROCTOR DENSITY.
- CITY ENGINEER MAY REQUIRE ADDITIONAL BASE, DEPENDING ON SUB GRADE MATERIAL.
- CONTRACTION JOINTS SHALL FORM AS NEAR A SQUARE PANEL AS POSSIBLE. NO SINGLE PANEL SHALL EXCEED TEN (10') FEET ON ANY SIDE. LONGITUDINAL JOINTS REQUIRED IF SIDEWALK WIDTH EXCEEDS TEN (10') FEET.
- CONTRACTION JOINTS SHALL BE ONE-FOURTH (1/4) THE CONCRETE THICKNESS OR A MINIMUM OF ONE (1") INCH DEEP.
- EXPANSION JOINTS OF ONE-HALF (1/2") INCH THICK MASTIC MATERIAL SHALL BE PLACED AT THE FOLLOWING LOCATIONS:
7.1 EVERY FIFTY (50') FEET OF UNINTERRUPTED SIDEWALK.
7.2 P.C.S AND P.T.S OF CURVES.
7.3 GRADE BREAKS.
7.4 RESIDENTIAL DRIVEWAYS SIX (6") INCH DEEP MASTIC SHALL BE INSTALLED AT THE TOP OF THE TRANSITION ON BOTH SIDES AND SHALL BE PINNED IN PLACE BEFORE POURING.
7.5 COMMERCIAL DRIVEWAYS EIGHT (8") INCH DEEP MASTIC SHALL BE INSTALLED AT THE TOP OF THE TRANSITION ON BOTH SIDES AND SHALL BE PINNED IN PLACE BEFORE POURING.
- ALL EXPANSION JOINTS SHALL BE PLACED FLUSH OR JUST BELOW TOP FINISHED SURFACE OF SIDEWALK.
- ALL EXPANSION JOINTS SHALL BE FULL DEPTH, FULL WIDTH AND SECURED IN PLACE BEFORE THE FORMS WILL BE APPROVED.
- FINISHED SURFACE - 12" MINIMUM SHOULDER UNLESS OTHERWISE APPROVED BY CITY ENGINEER.
- FINISHED SIDEWALK SURFACE SHALL HAVE MEDIUM-TO-HAVY BROOM TEXTURE.
- NO SIDEWALK SHALL BE POURED WITHOUT AN INSPECTION AND APPROVAL OF FORM PLACEMENT BY CITY ENGINEERING DIVISION.
- CONSTRUCTION MATERIALS AND PROCEDURES SHALL CONFORM TO EXISTING CITY STANDARD SPECIFICATIONS FOR M-4000 CEMENT CONCRETE AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS SECTIONS 02528 AND 03310.
- CITY OF MISSOULA REQUIRES 564 LBS OF PORTLAND CEMENT PER CY OF CONCRETE.

December 2021

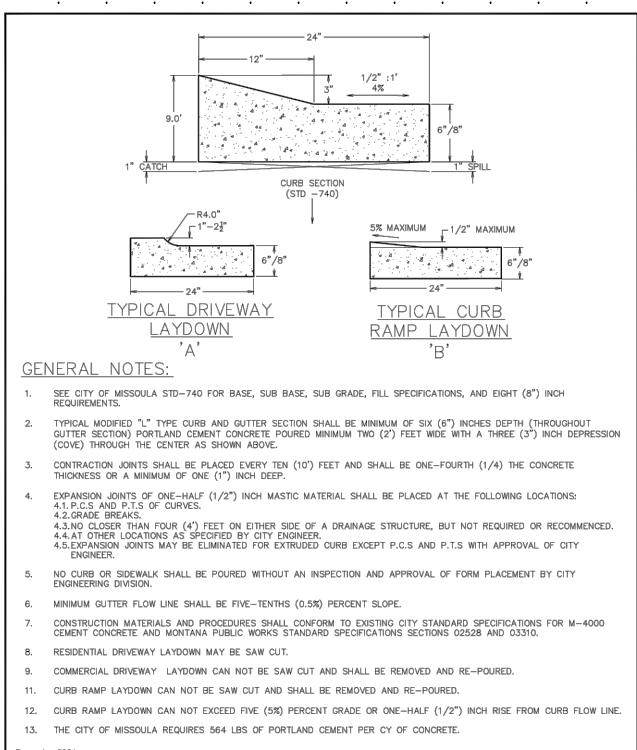
Typical Sidewalk Section

Engineering Division

Approved By
City Engineer
Kevin J. Slovorp

Adopted: 02/29/1996
Revised: 03/22/2017

STD - 752



GENERAL NOTES:

- SEE CITY OF MISSOULA STD-740 FOR BASE, SUB BASE, SUB GRADE, FILL SPECIFICATIONS, AND EIGHT (8") INCH REQUIREMENTS.
- TYPICAL MODIFIED "L" TYPE CURB AND GUTTER SECTION SHALL BE MINIMUM OF SIX (6") INCHES DEPTH (THROUGHOUT GUTTER SECTION) PORTLAND CEMENT CONCRETE POURED MINIMUM TWO (2') FEET WIDE WITH A THREE (3") INCH DEPRESSION (COVE) THROUGH THE CENTER AS SHOWN ABOVE.
- CONTRACTION JOINTS SHALL BE PLACED EVERY TEN (10') FEET AND SHALL BE ONE-FOURTH (1/4) THE CONCRETE THICKNESS OR A MINIMUM OF ONE (1") INCH DEEP.
- EXPANSION JOINTS OF ONE-HALF (1/2") INCH MASTIC MATERIAL SHALL BE PLACED AT THE FOLLOWING LOCATIONS:
4.1 P.C.S AND P.T.S OF CURVES.
4.2 GRADE BREAKS.
4.3 NO CLOSER THAN FOUR (4') FEET ON EITHER SIDE OF A DRAINAGE STRUCTURE, BUT NOT REQUIRED OR RECOMMENDED.
4.4 AT OTHER LOCATIONS AS SPECIFIED BY CITY ENGINEER.
4.5 EXPANSION JOINTS MAY BE ELIMINATED FOR EXTRUDED CURB EXCEPT P.C.S AND P.T.S WITH APPROVAL OF CITY ENGINEER.
- NO CURB OR SIDEWALK SHALL BE POURED WITHOUT AN INSPECTION AND APPROVAL OF FORM PLACEMENT BY CITY ENGINEERING DIVISION.
- MINIMUM GUTTER FLOW LINE SHALL BE FIVE-TENTHS (0.5%) PERCENT SLOPE.
- CONSTRUCTION MATERIALS AND PROCEDURES SHALL CONFORM TO EXISTING CITY STANDARD SPECIFICATIONS FOR M-4000 CEMENT CONCRETE AND MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS SECTIONS 02528 AND 03310.
- RESIDENTIAL DRIVEWAY LAYDOWN MAY BE SAW CUT.
- COMMERCIAL DRIVEWAY LAYDOWN CAN NOT BE SAW CUT AND SHALL BE REMOVED AND RE-POURED.
- CURB RAMP LAYDOWN CAN NOT BE SAW CUT AND SHALL BE REMOVED AND RE-POURED.
- CURB RAMP LAYDOWN CAN NOT EXCEED FIVE (5%) PERCENT GRADE OR ONE-HALF (1/2") INCH RISE FROM CURB FLOW LINE.
- THE CITY OF MISSOULA REQUIRES 564 LBS OF PORTLAND CEMENT PER CY OF CONCRETE.

December 2021

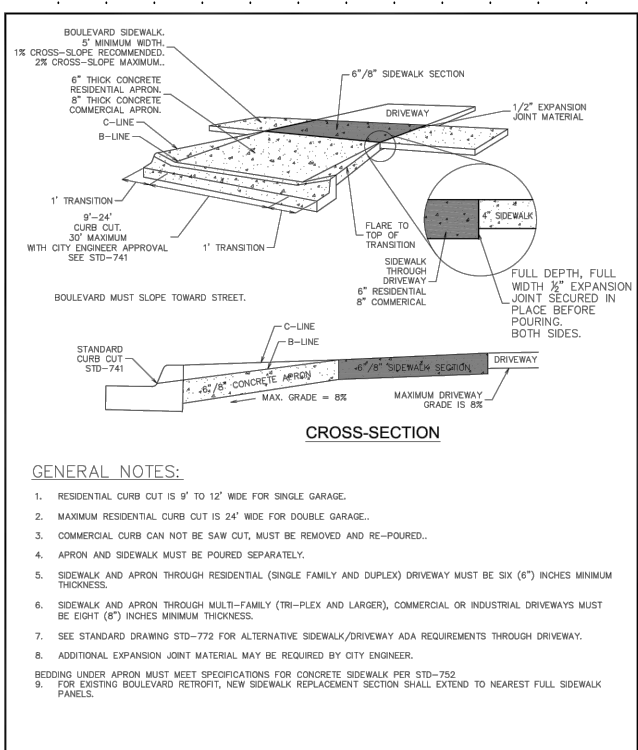
Modified "L" Type Curb/Gutter Section

Engineering Division

Approved By
City Engineer
Kevin J. Slovorp

Adopted: 04/18/1974
Revised: 09/03/2020

STD - 741



GENERAL NOTES:

- RESIDENTIAL CURB CUT IS 9' TO 12' WIDE FOR SINGLE GARAGE.
- MAXIMUM RESIDENTIAL CURB CUT IS 24' WIDE FOR DOUBLE GARAGE.
- COMMERCIAL CURB CAN NOT BE SAW CUT, MUST BE REMOVED AND RE-POURED.
- APRON AND SIDEWALK MUST BE POURED SEPARATELY.
- SIDEWALK AND APRON THROUGH RESIDENTIAL (SINGLE FAMILY AND DUPLEX) DRIVEWAY MUST BE SIX (6") INCHES MINIMUM THICKNESS.
- SIDEWALK AND APRON THROUGH MULTI-FAMILY (TRI-PLEX AND LARGER), COMMERCIAL OR INDUSTRIAL DRIVEWAYS MUST BE EIGHT (8") INCHES MINIMUM THICKNESS.
- SEE STANDARD DRAWING STD-772 FOR ALTERNATIVE SIDEWALK/DRIVEWAY ADA REQUIREMENTS THROUGH DRIVEWAY.
- ADDITIONAL EXPANSION JOINT MATERIAL MAY BE REQUIRED BY CITY ENGINEER.
- BEDDING UNDER APRON MUST MEET SPECIFICATIONS FOR CONCRETE SIDEWALK PER STD-752
- FOR EXISTING BOULEVARD RETROFIT, NEW SIDEWALK REPLACEMENT SECTION SHALL EXTEND TO NEAREST FULL SIDEWALK PANELS.

December 2021

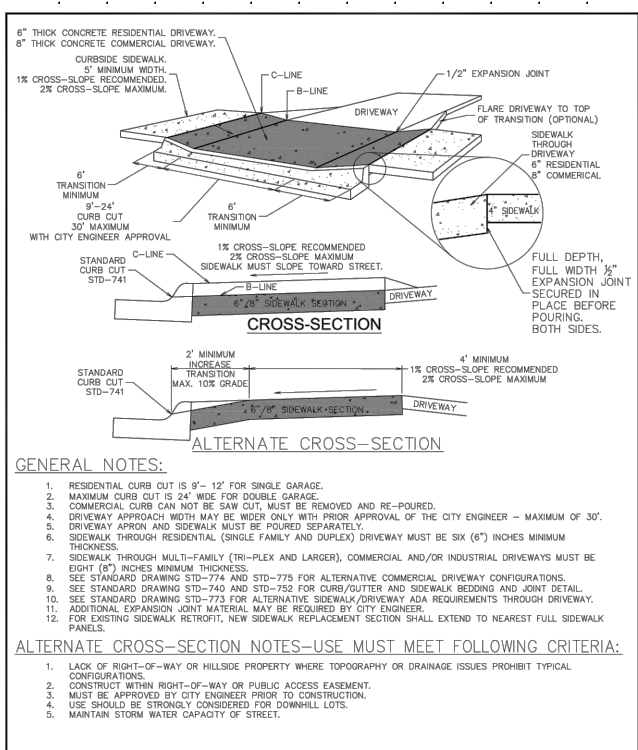
**Standard Driveway Opening for Boulevard Sidewalk
25 Parking Spaces or Less**

Engineering Division

Approved By
City Engineer
Kevin J. Slovorp

Adopted: 04/09/1973
Revised: 04/04/2017

STD - 771



GENERAL NOTES:

- RESIDENTIAL CURB CUT IS 9' - 12' FOR SINGLE GARAGE.
- MAXIMUM CURB CUT IS 24' WIDE FOR DOUBLE GARAGE.
- COMMERCIAL CURB CAN NOT BE SAW CUT, MUST BE REMOVED AND RE-POURED.
- DRIVEWAY APPROACH WIDTH MAY BE WIDER ONLY WITH PRIOR APPROVAL OF THE CITY ENGINEER - MAXIMUM OF 30'.
- DRIVEWAY APRON AND SIDEWALK MUST BE POURED SEPARATELY.
- SIDEWALK THROUGH RESIDENTIAL (SINGLE FAMILY AND DUPLEX) DRIVEWAY MUST BE SIX (6") INCHES MINIMUM THICKNESS.
- SIDEWALK THROUGH MULTI-FAMILY (TRI-PLEX AND LARGER), COMMERCIAL AND/OR INDUSTRIAL DRIVEWAYS MUST BE EIGHT (8") INCHES MINIMUM THICKNESS.
- SEE STANDARD DRAWING STD-774 AND STD-775 FOR ALTERNATIVE COMMERCIAL DRIVEWAY CONFIGURATIONS.
- SEE STANDARD DRAWING STD-740 AND STD-752 FOR CURB/GUTTER AND SIDEWALK BEDDING AND JOINT DETAIL.
- SEE STANDARD DRAWING STD-773 FOR ALTERNATIVE SIDEWALK/DRIVEWAY ADA REQUIREMENTS THROUGH DRIVEWAY.
- ADDITIONAL EXPANSION JOINT MATERIAL MAY BE REQUIRED BY CITY ENGINEER.
- FOR EXISTING SIDEWALK RETROFIT, NEW SIDEWALK REPLACEMENT SECTION SHALL EXTEND TO NEAREST FULL SIDEWALK PANELS.

ALTERNATE CROSS-SECTION NOTES-USE MUST MEET FOLLOWING CRITERIA:

- LACK OF RIGHT-OF-WAY OR HILLSIDE PROPERTY WHERE TOPOGRAPHY OR DRAINAGE ISSUES PROHIBIT TYPICAL CONFIGURATIONS.
- CONSTRUCT WITHIN RIGHT-OF-WAY OR PUBLIC ACCESS EASEMENT.
- MUST BE APPROVED BY CITY ENGINEER PRIOR TO CONSTRUCTION.
- USE SHOULD BE STRONGLY CONSIDERED FOR DOWNHILL LOTS.
- MAINTAIN STORM WATER CAPACITY OF STREET.

December 2021

**Standard Driveway Opening for Curbside Sidewalk
(less than 25 parking spaces)**

Engineering Division

Approved By
City Engineer
Kevin J. Slovorp

Adopted: 04/09/1973
Revised: 04/04/2017

STD - 772

5 C5 STANDARD DRIVEWAY LAYDOWN CURB NO SCALE

6 C5 DRIVEWAY OPENING FOR BLVD SIDEWALK NO SCALE

7 C5 DRIVEWAY OPENING FOR CURB SIDEWALK 1/2 NO SCALE

FILE: W:\Projects\170410\CAD Data\Design\170410 DT.dwg



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SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

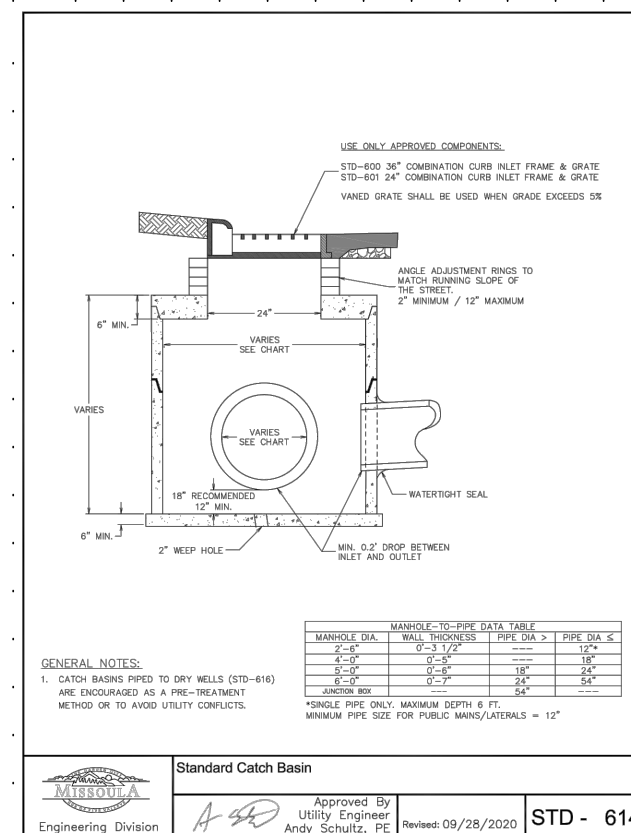
DETAILS

REVISIONS:
NO. DESCRIPTION DATE

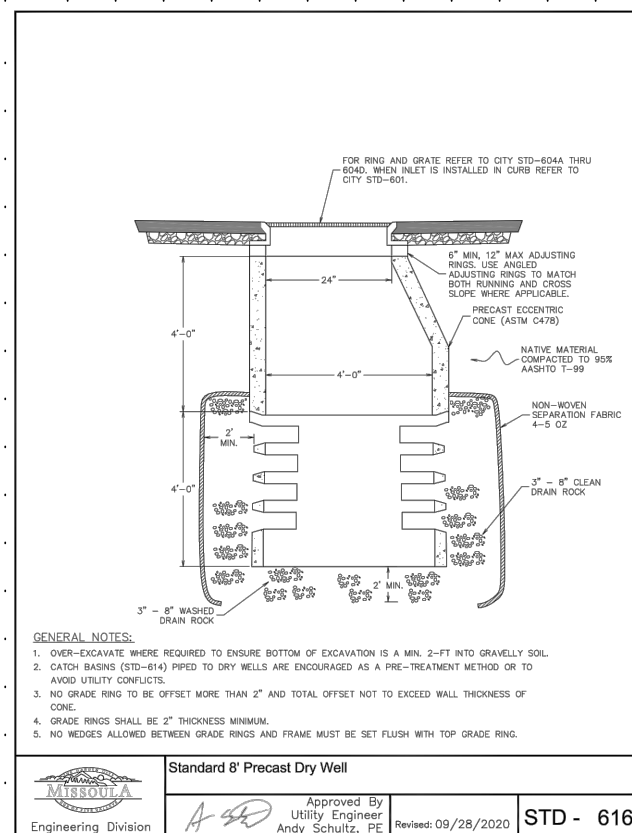
PROJECT: 170410
LAYOUT: C6
SURVEYED: WGM GROUP
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

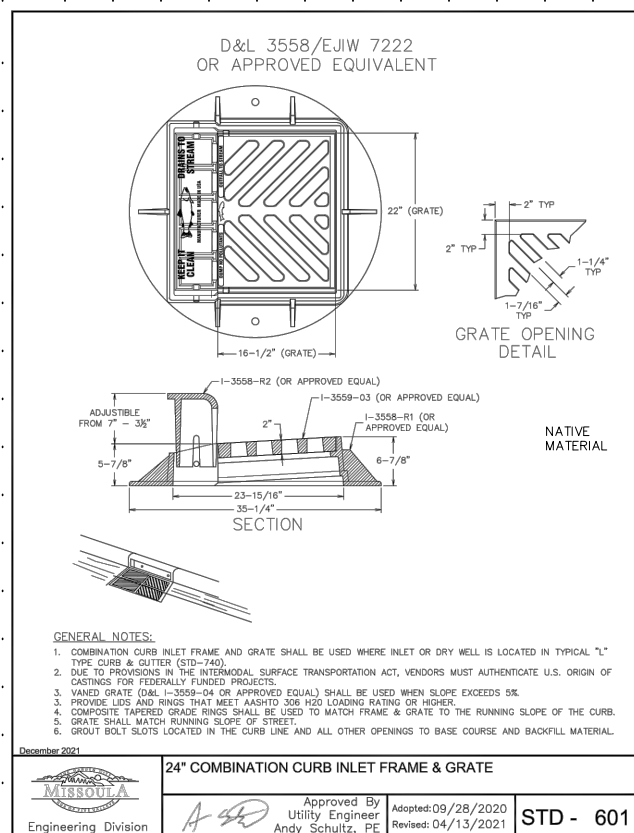
SHEET C6 OF C23



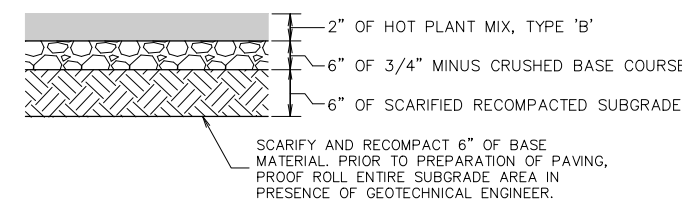
3 30" INLET DETAIL
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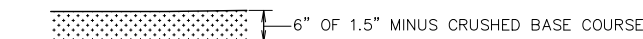
2 8-FOOT SUMP DETAIL
NO SCALE



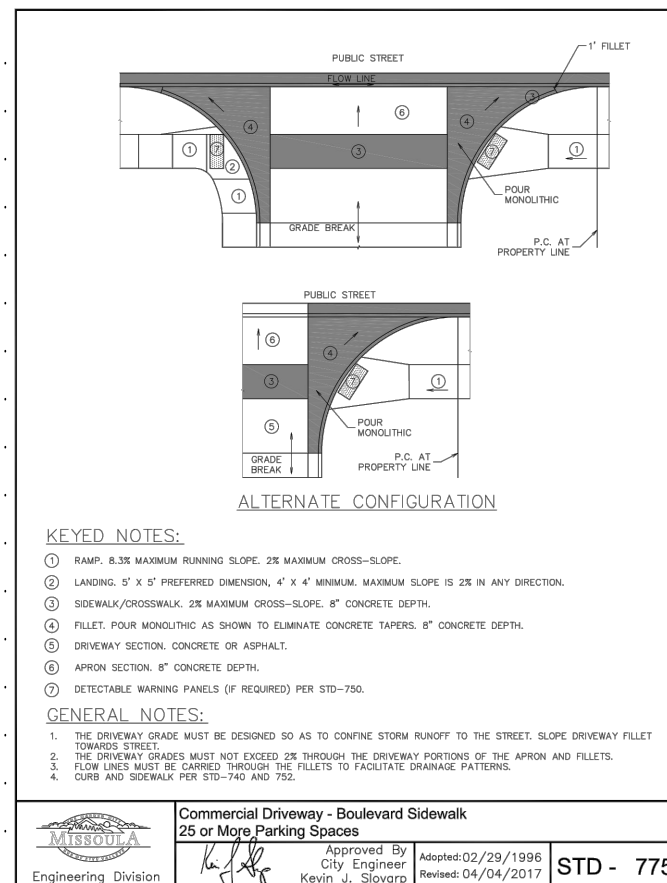
1 STANDARD CURB INLET DETAIL
NO SCALE



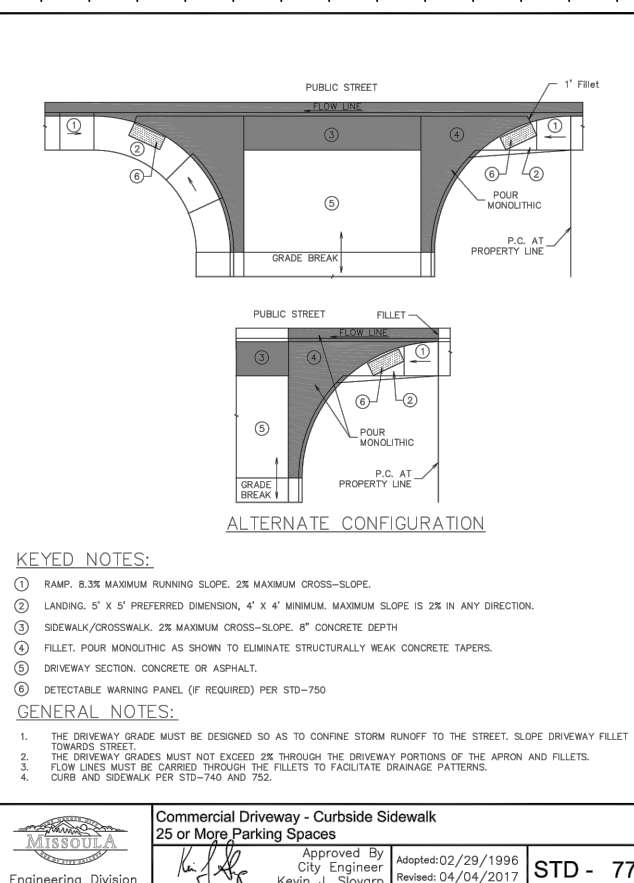
6 TYPICAL DRIVEWAY SECTION
NO SCALE



7 TYPICAL GRAVEL PARKING LOT AND DRIVEWAYS
NOT SCALE



5 COMMERCIAL DRIVEWAY MOD 2
NO SCALE

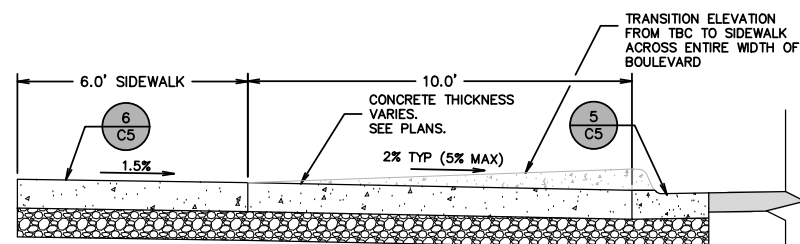
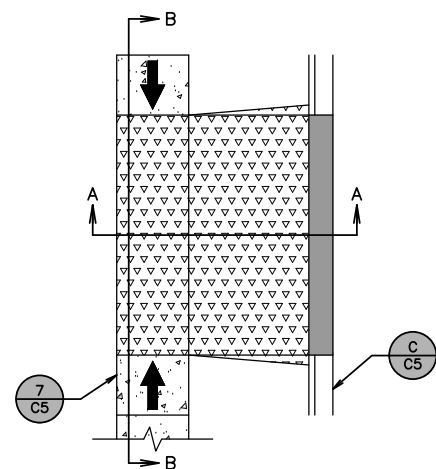
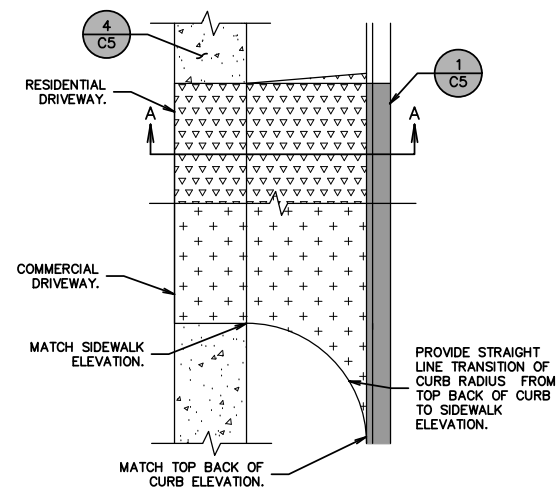


4 COMMERCIAL DRIVEWAY MOD 1
NO SCALE

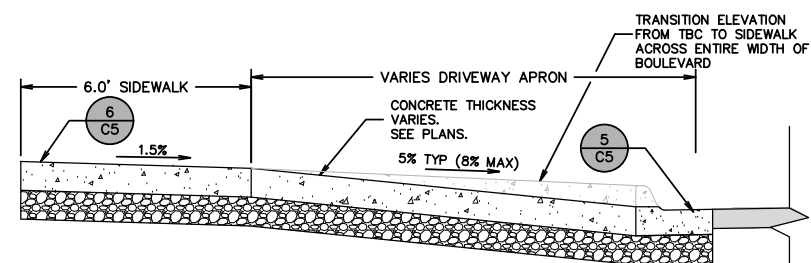
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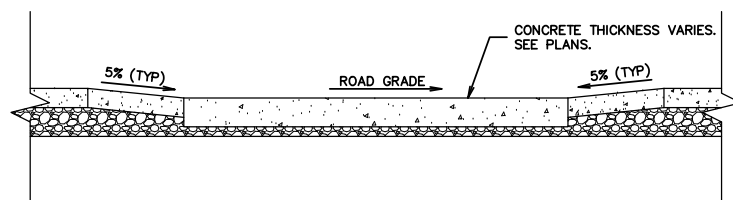


SECTION A-A
NO SCALE



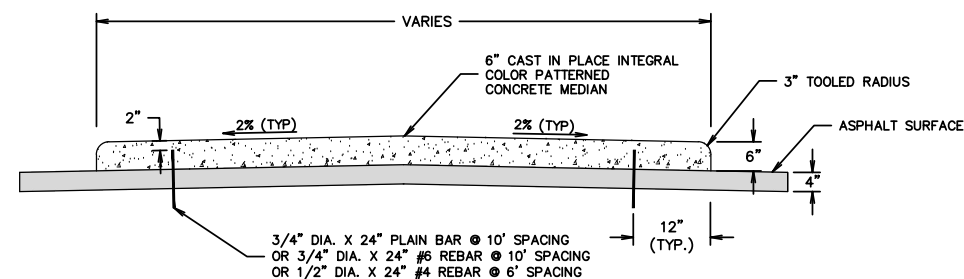
SECTION A-A
NO SCALE

1 C7 TYPE I DRIVEWAY APRON GRADING DETAIL
NO SCALE

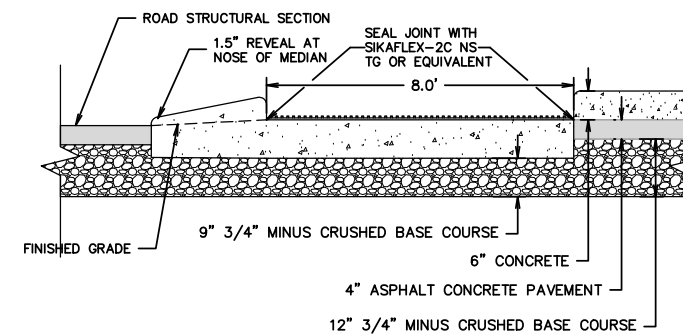


SECTION B-B
NO SCALE

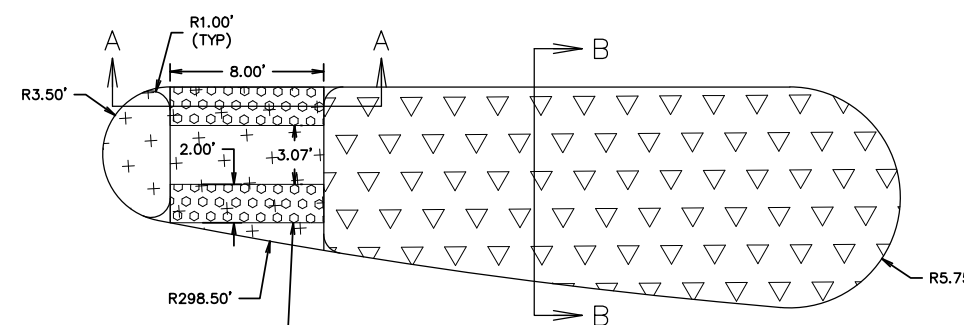
2 C7 TYPE II DRIVEWAY APRON GRADING DETAIL
NO SCALE



SECTION B-B
NO SCALE



SECTION A-A
NO SCALE



3 C5 CHANNELIZING ISLAND DETAIL
NO SCALE

DETAILS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 170410
LAYOUT: C7
SURVEYED: WGM GROUP
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET C7 OF C23

FILE: W:\Projects\170410\CAD_Data\Design\170410_DT.dwg



WGM GROUP
WWW.WGMGROUP.COM

PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/13/22

STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

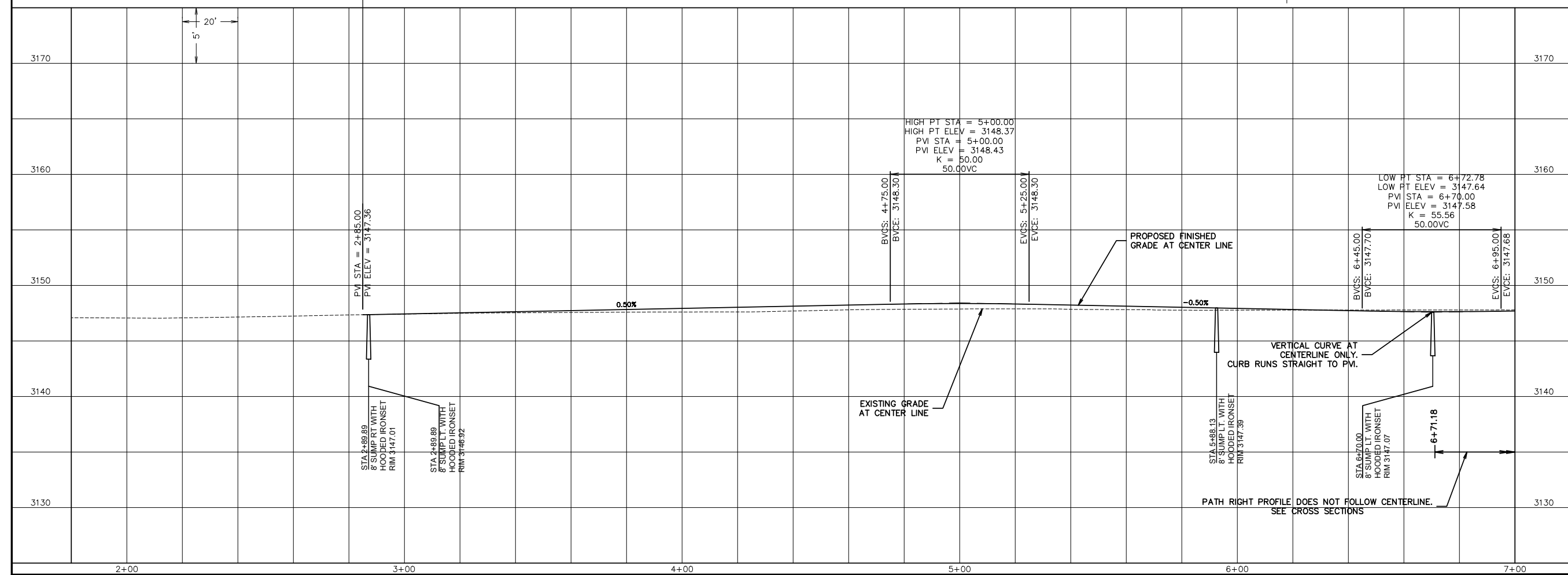
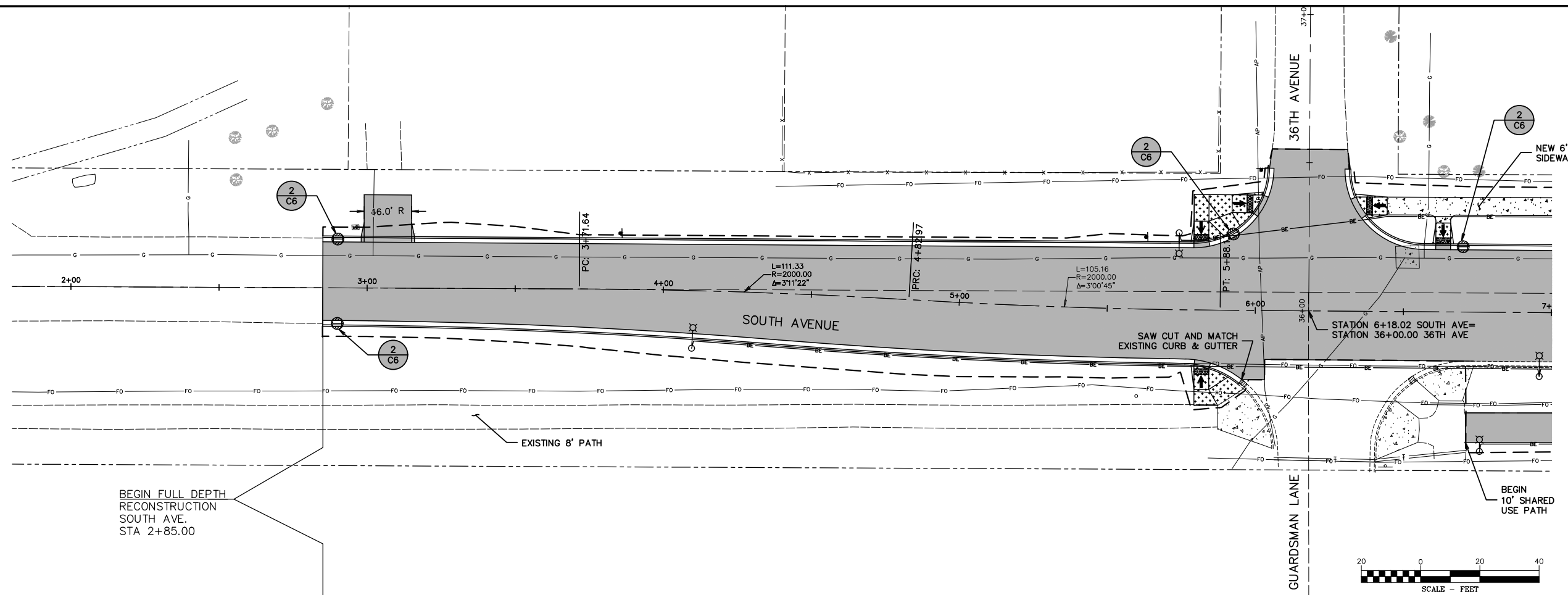
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-1
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET **C8 OF C23**



FILE: W:\Projects\170410\CAD_Data\Design\170410_ST_PLN.dwg



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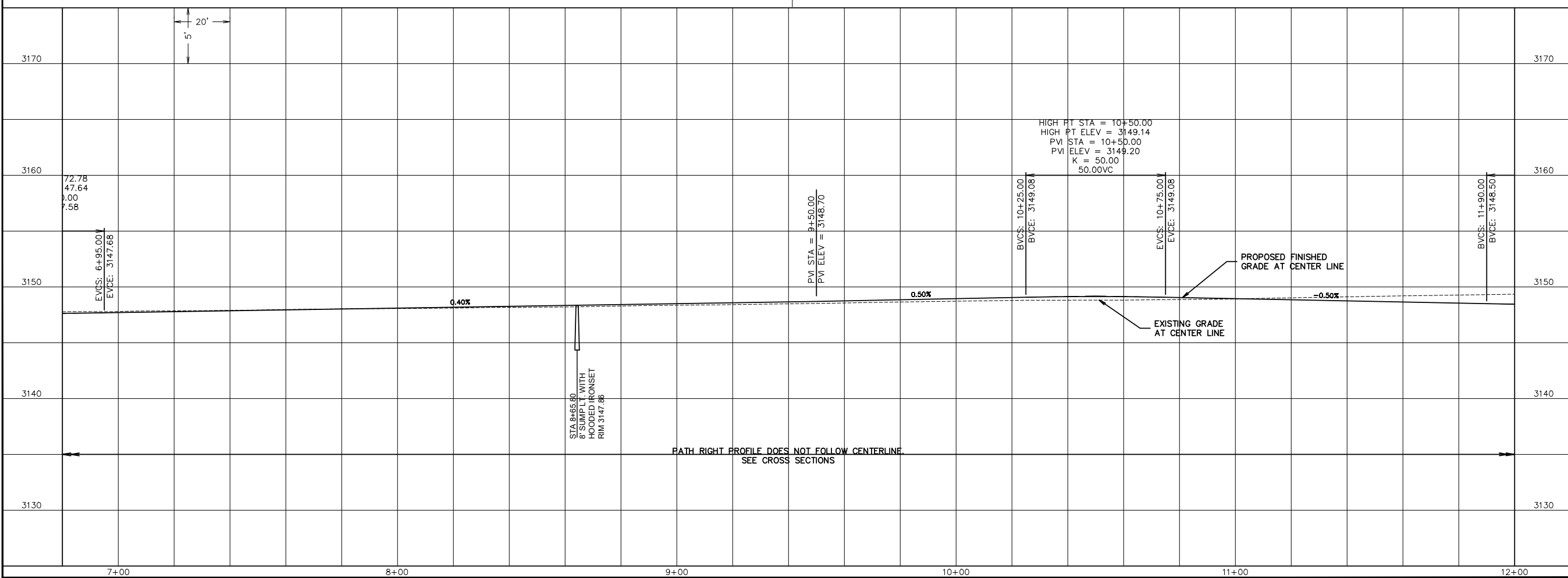
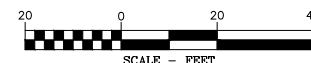
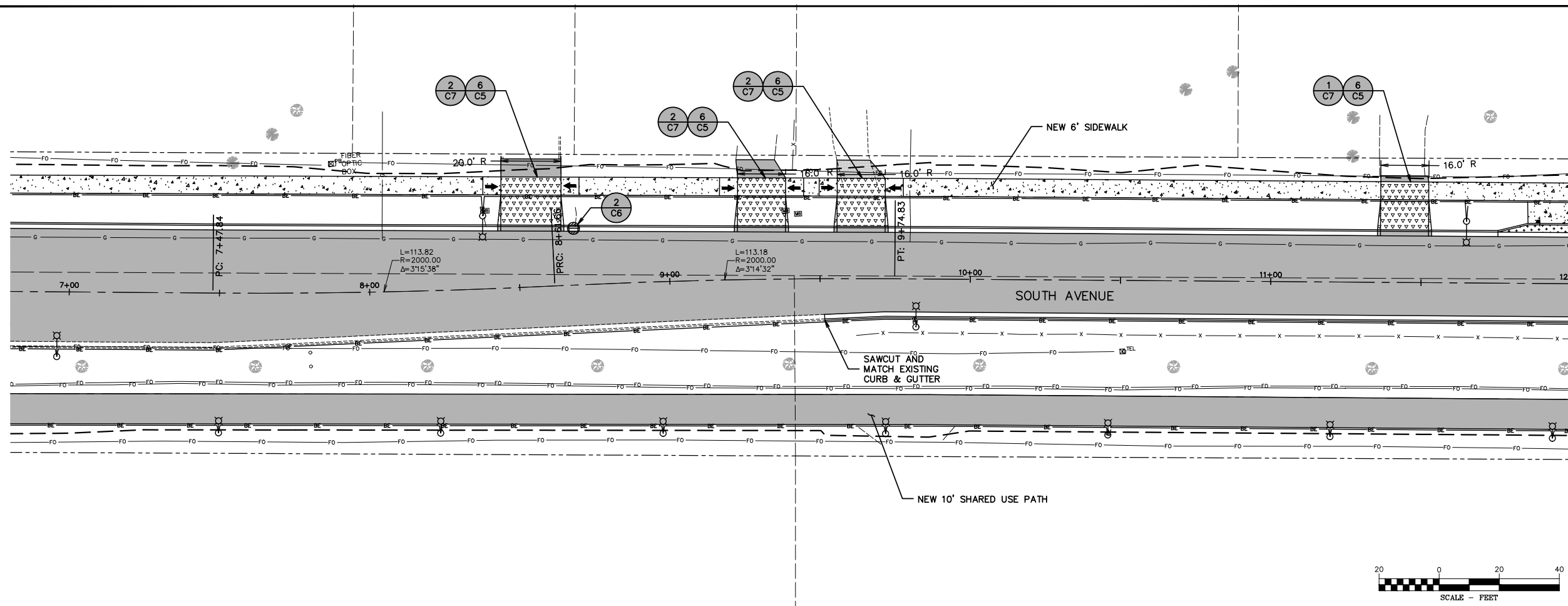
STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-2
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET C9 OF C23



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SAVED: 9/13/22

STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

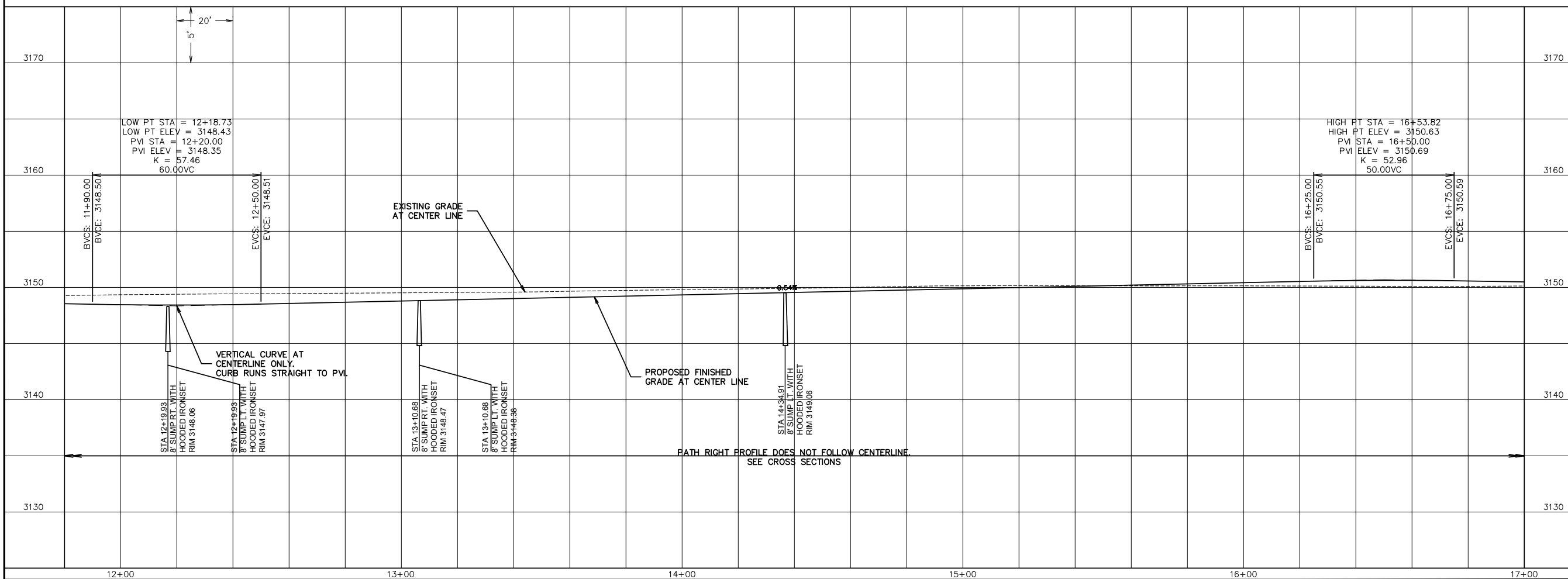
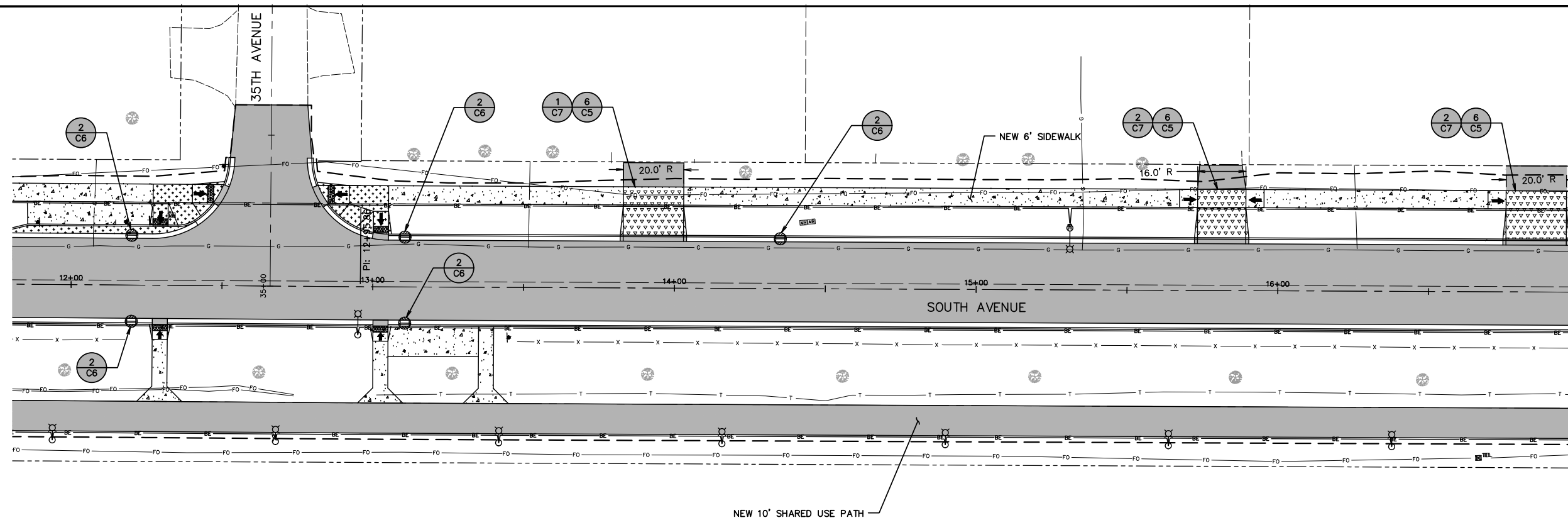
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-3
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET **C10** OF **C23**



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STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

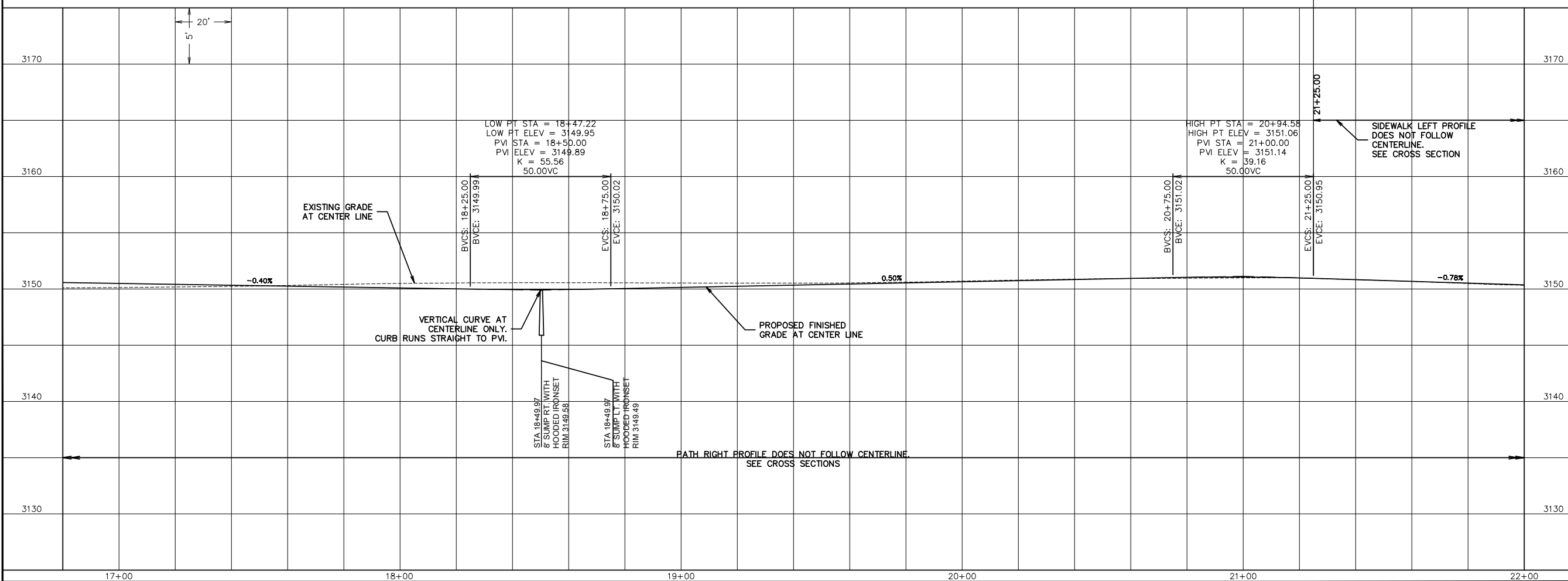
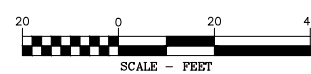
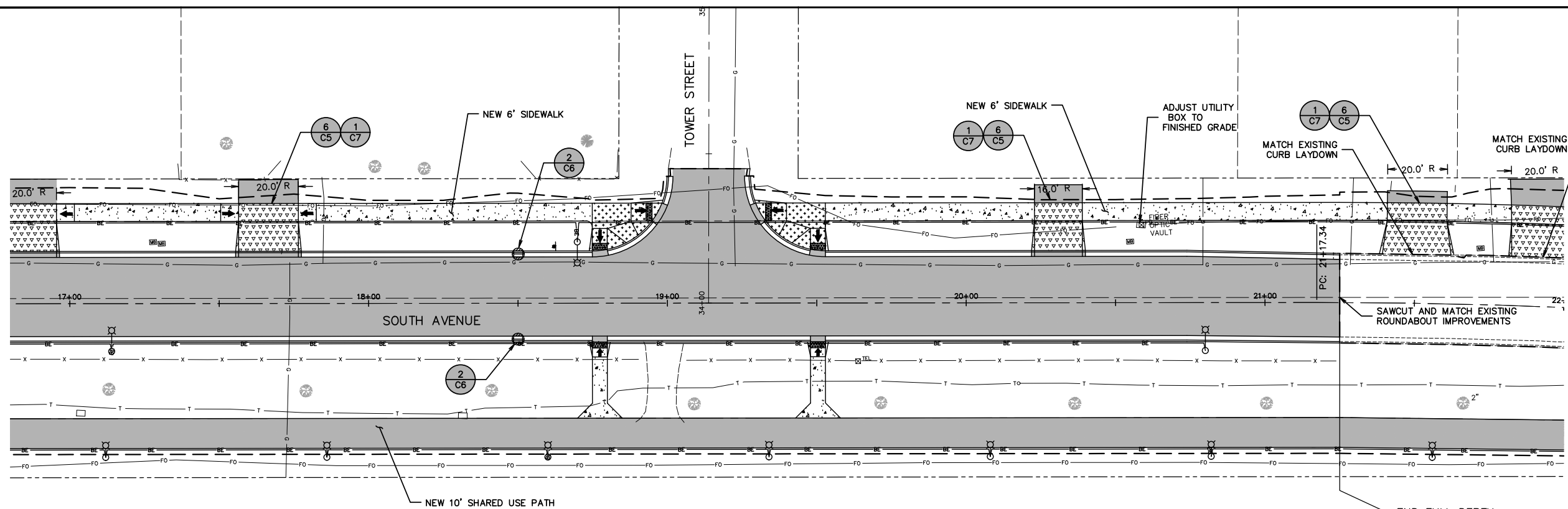
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-4
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

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SHEET **C11** OF **C23**



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STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

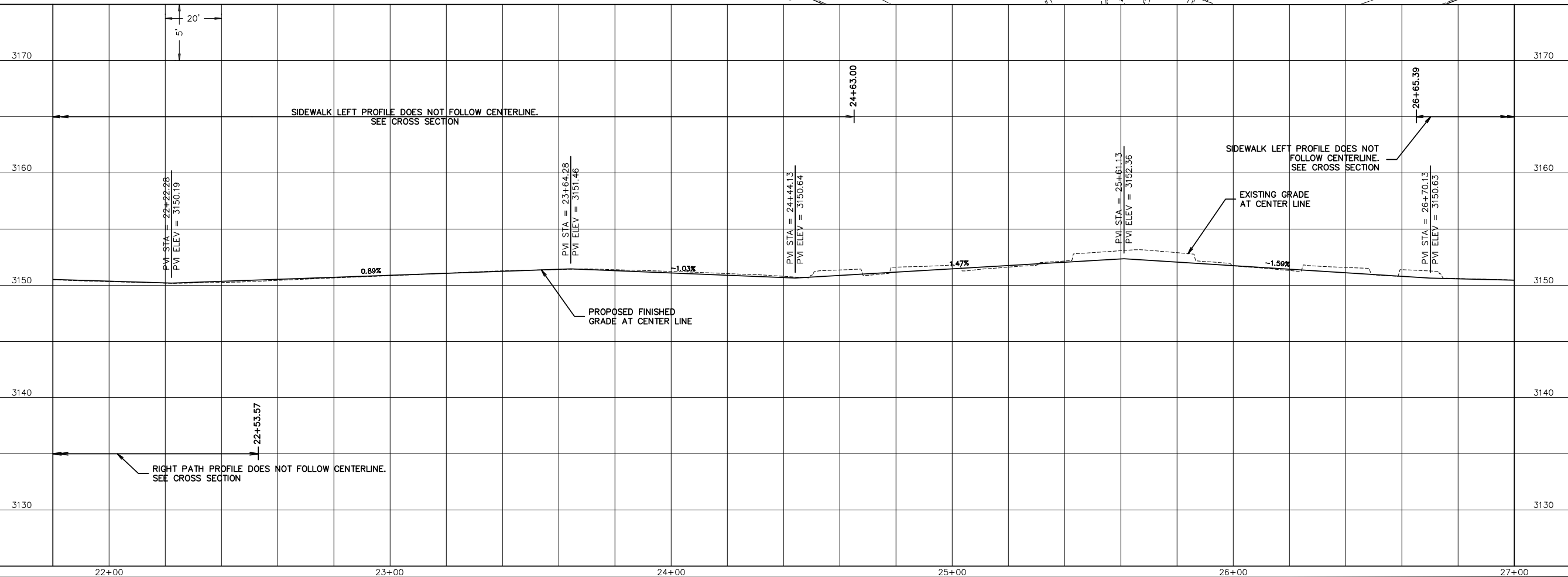
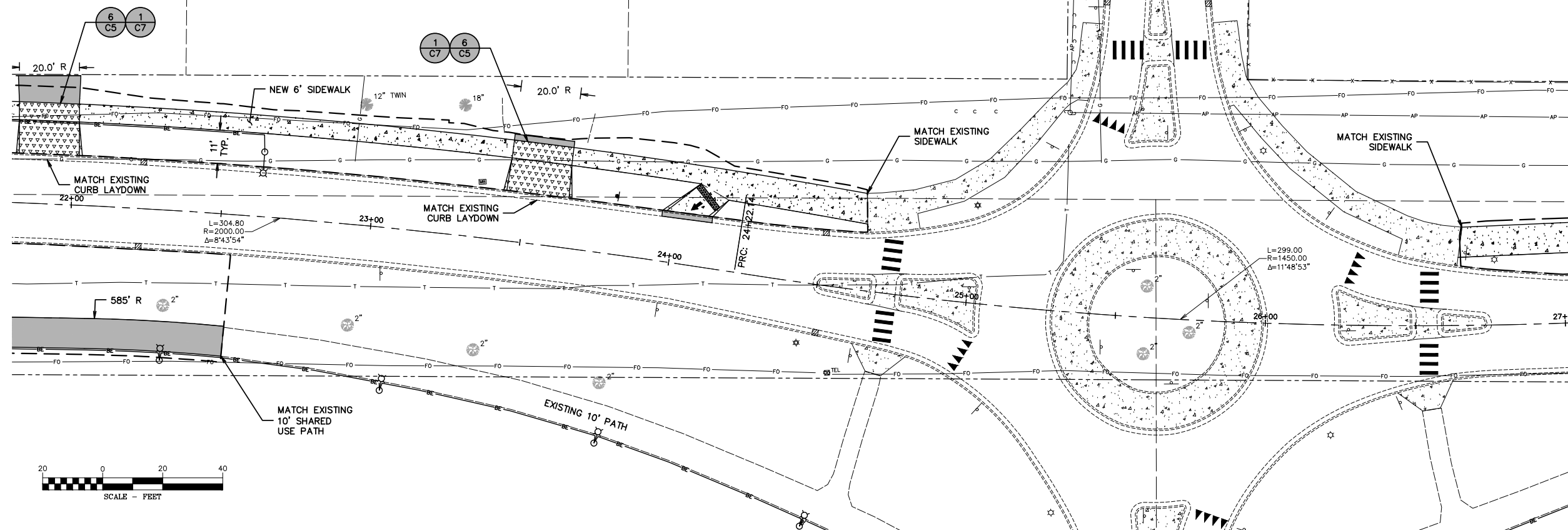
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NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-5
SURVEYED: WGM
DESIGN: SMM
DRAFT: SKD/BEA
APPROVE: TDI
DATE:

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SHEET C12 OF C23



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STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

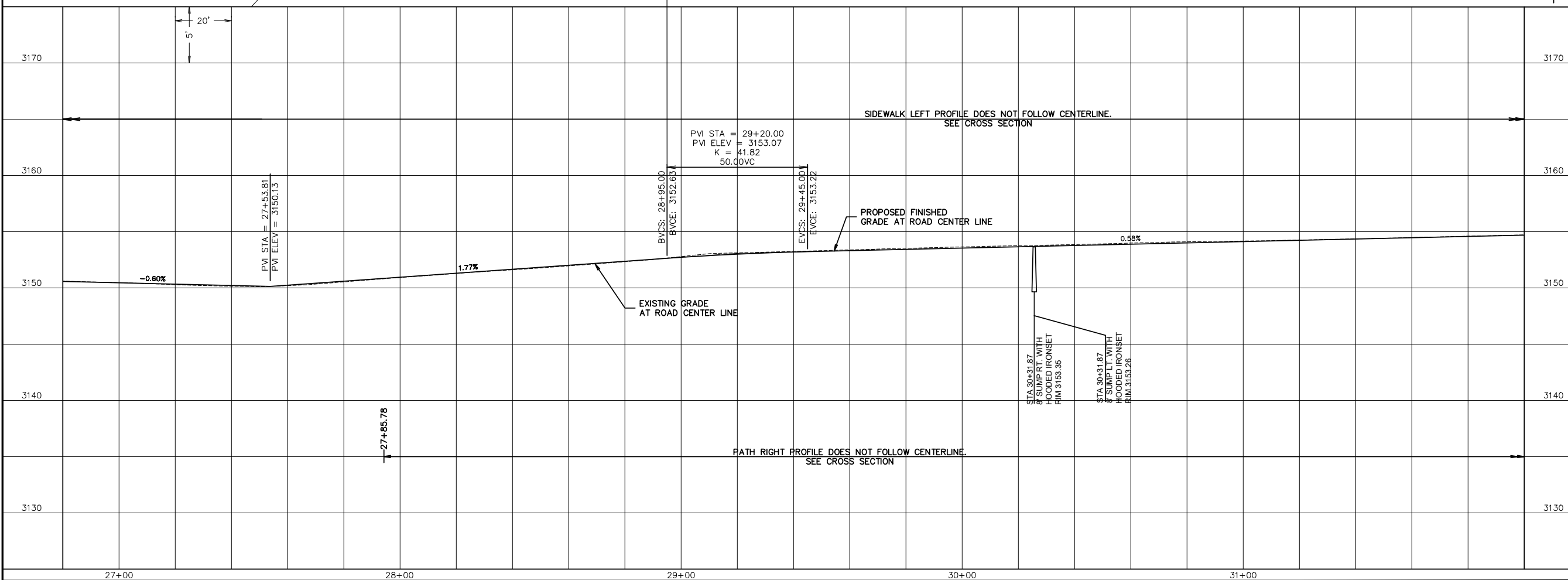
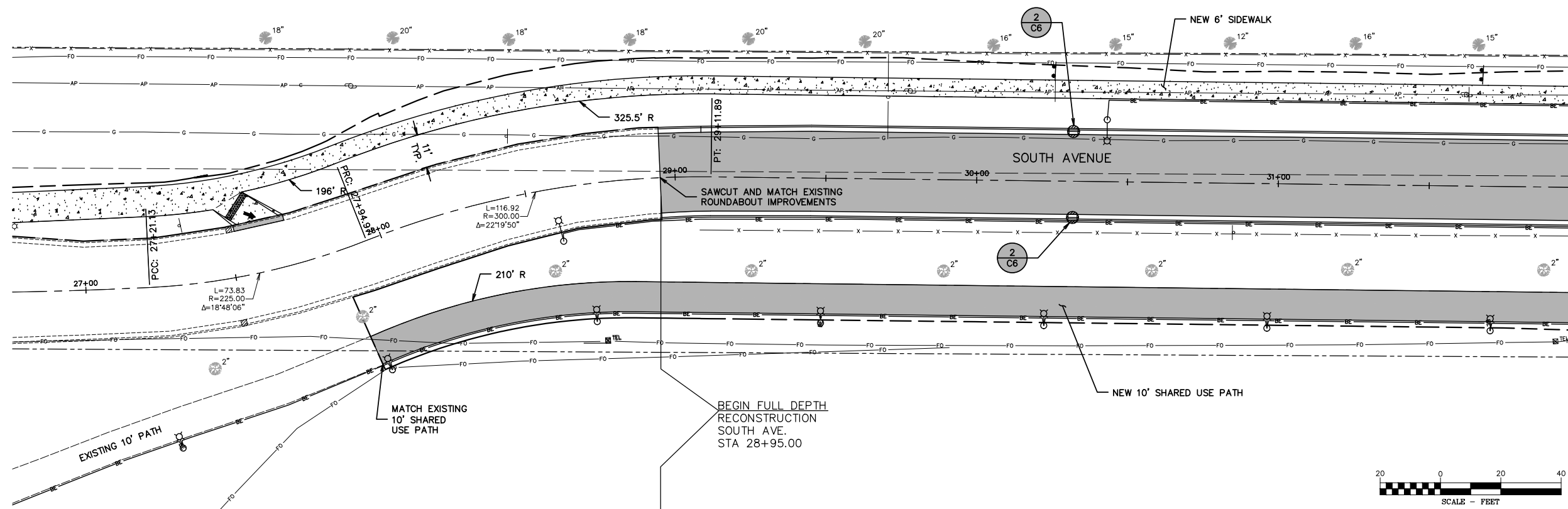
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NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-6
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

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SHEET C13 OF C23



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PRELIMINARY

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SAVED: 9/13/22

STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

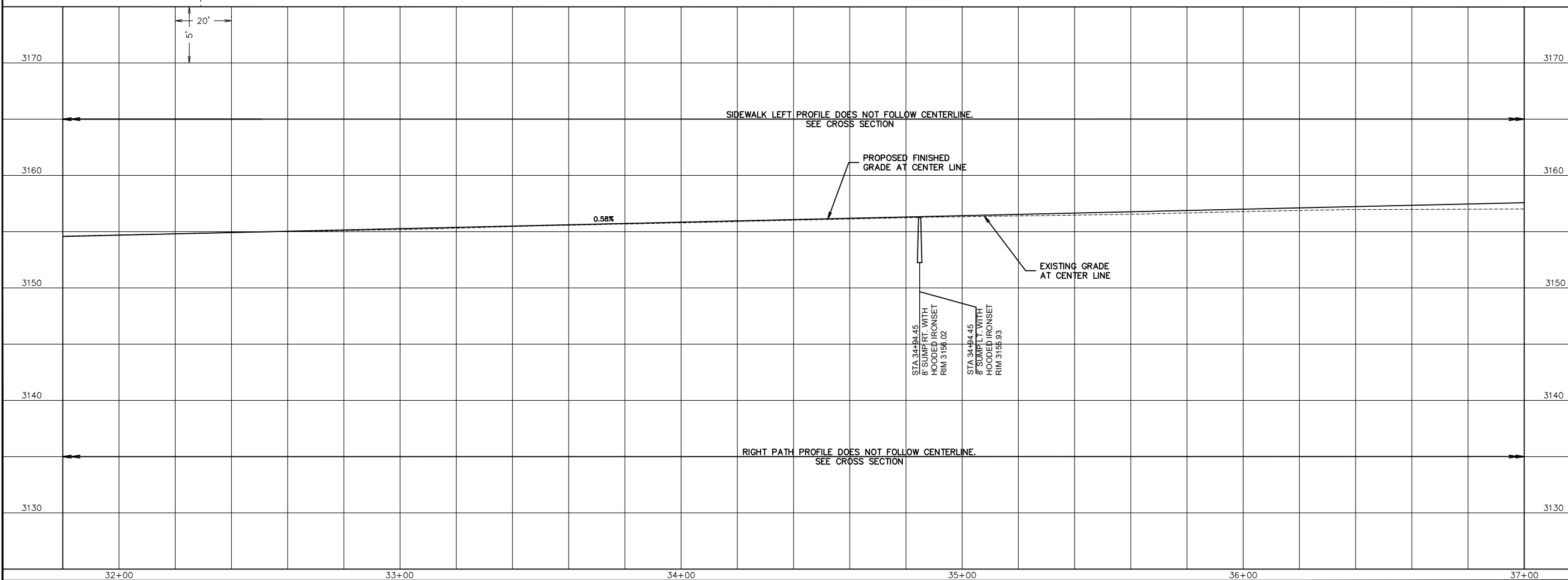
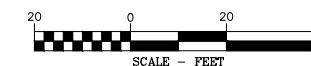
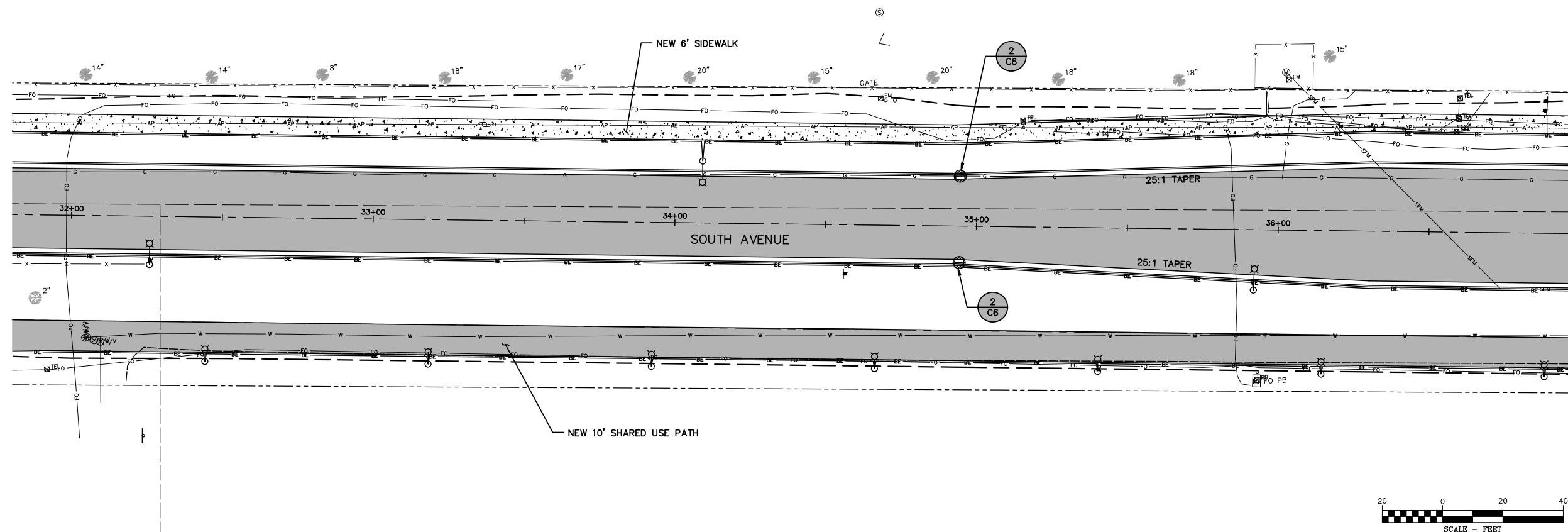
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-7
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET C14 OF C23



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STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

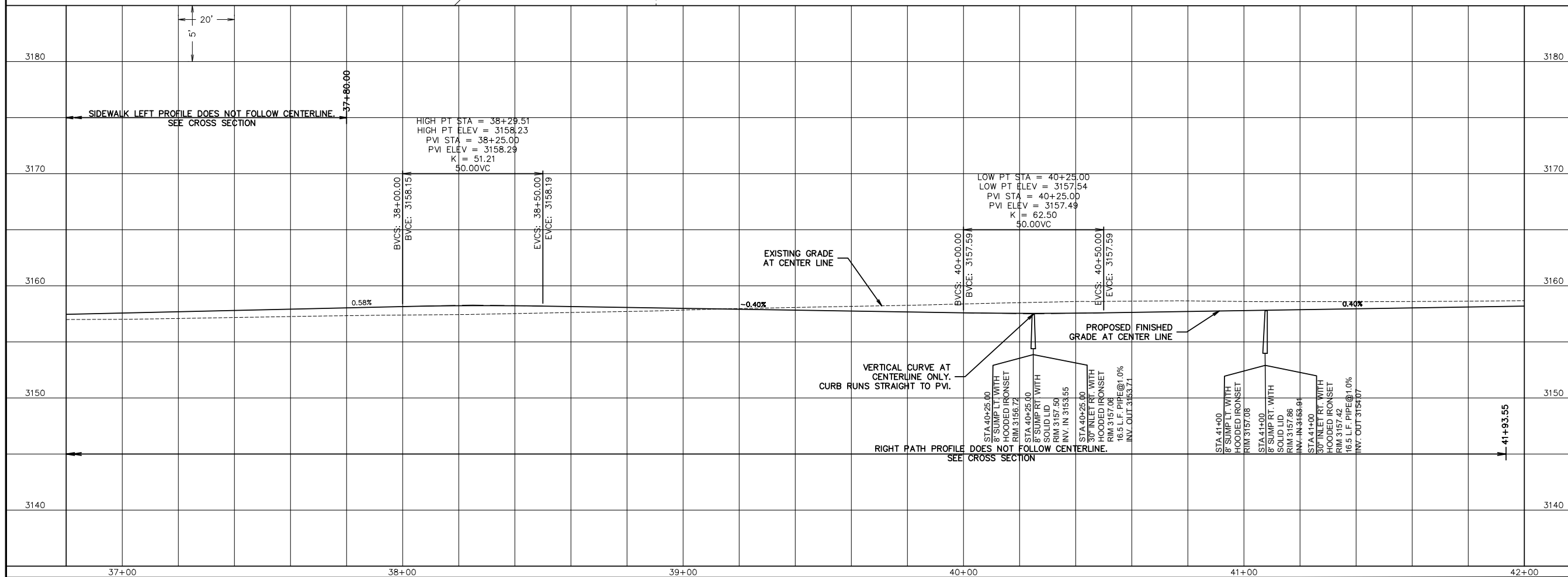
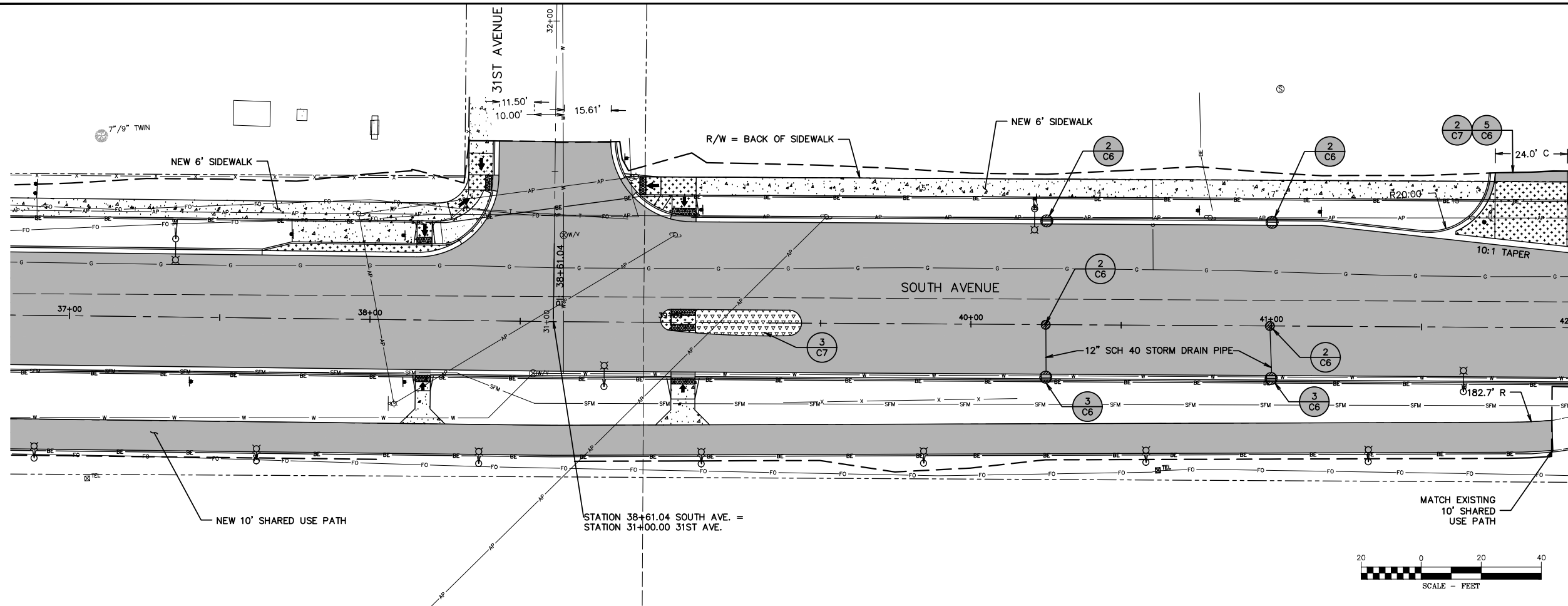
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-8
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET C15 OF C23



FILE: W:\Projects\170410_CAD_Data\Design\170410_ST_PLN.dwg



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PRELIMINARY

PLOTTED: 9/13/22
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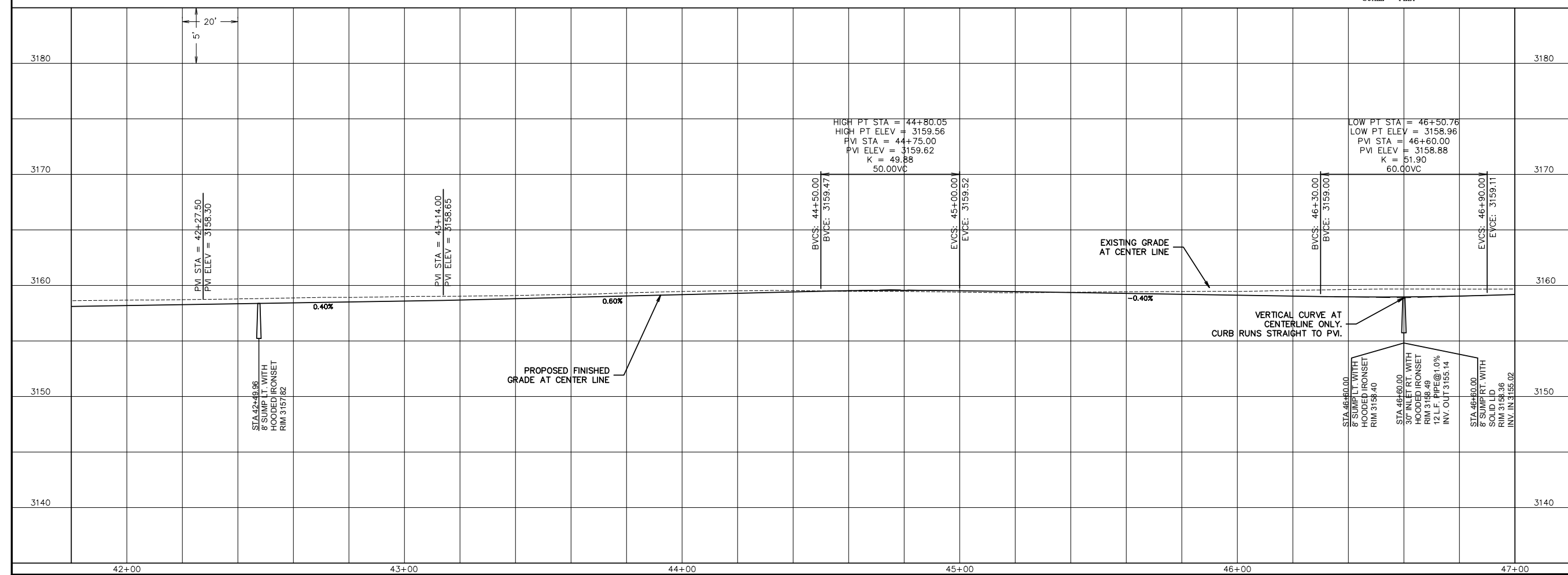
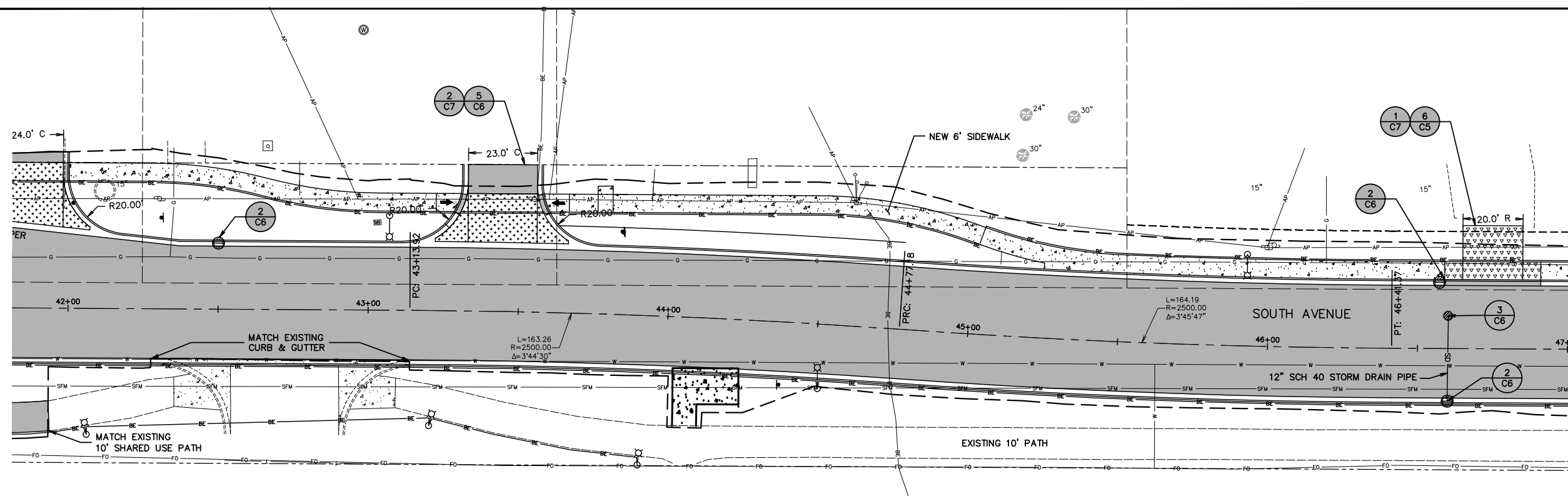
STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-9
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET C16 OF C23



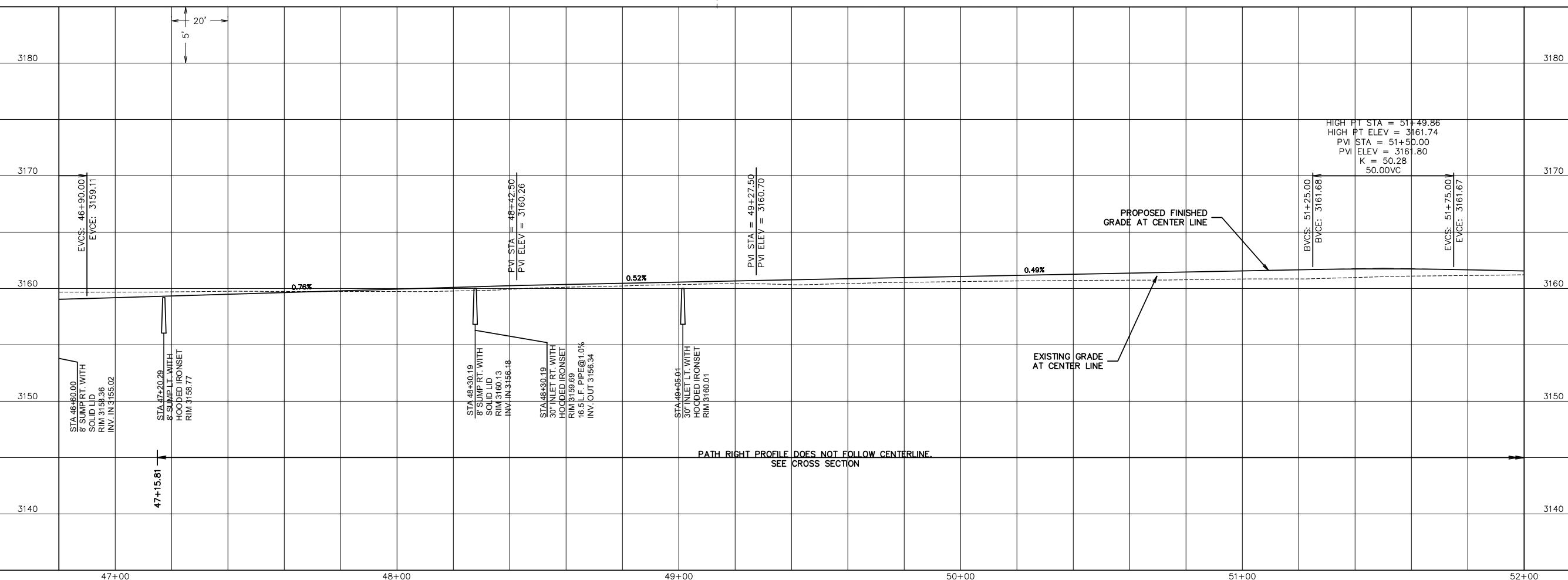
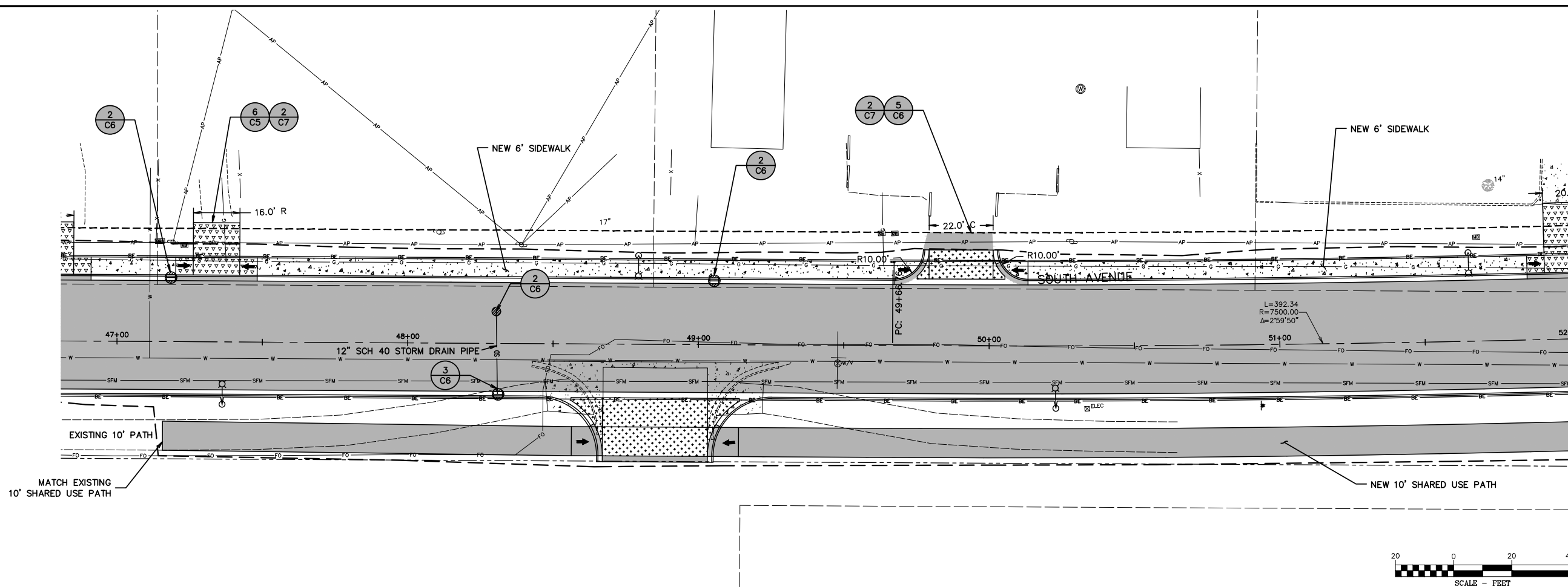
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PLOTTED: 9/13/22
SAVED: 9/13/22



STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

REVISIONS:

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-10
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

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SHEET **C17** OF **C23**

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PLOTTED: 9/13/22
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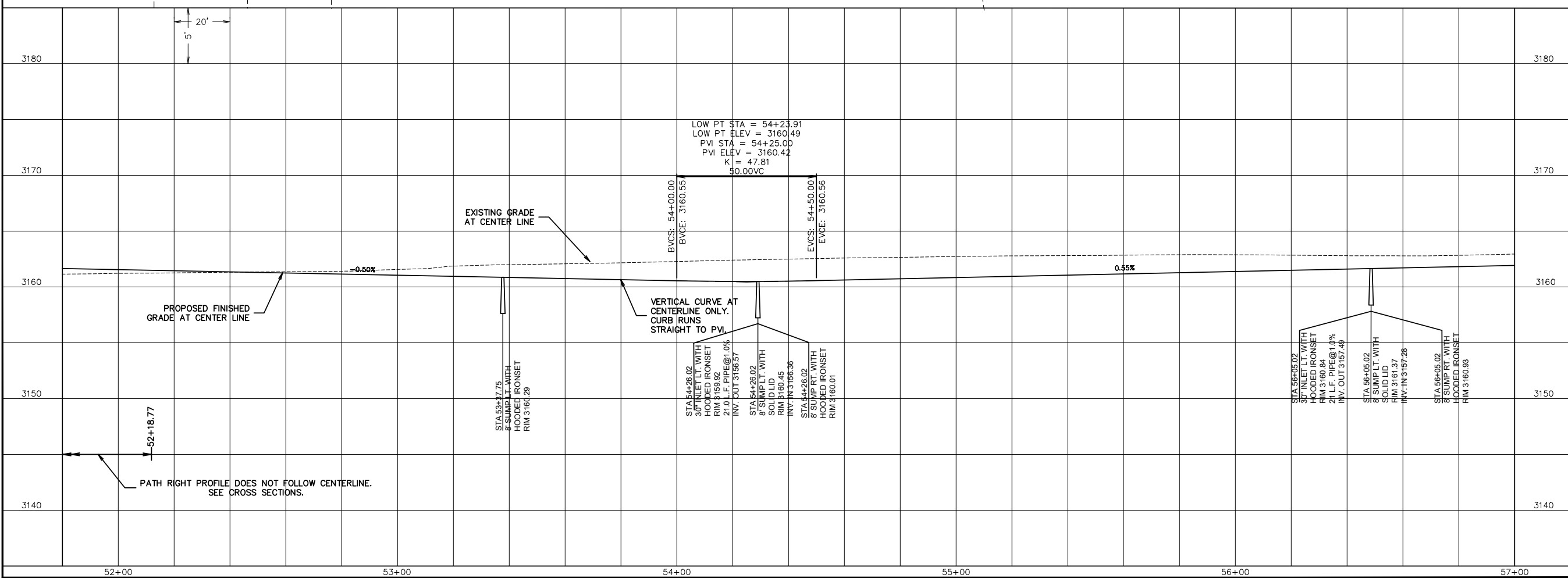
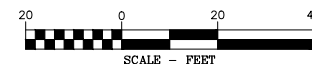
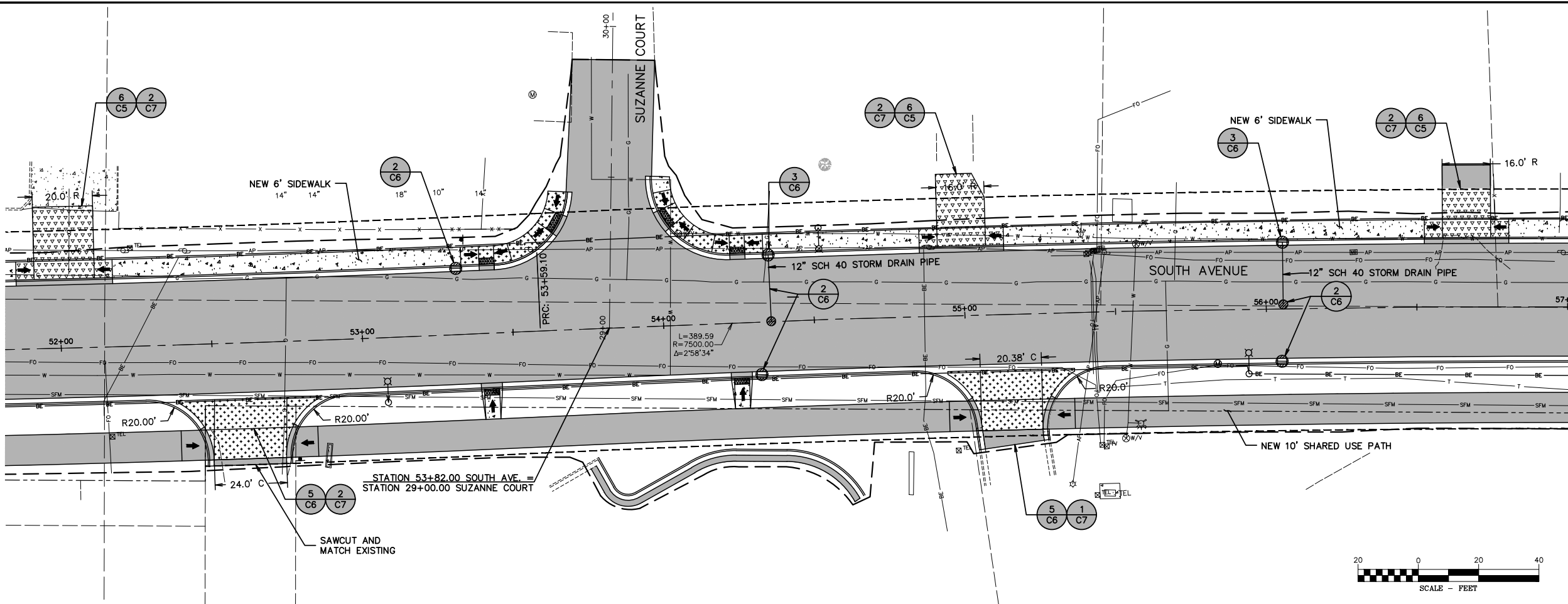
STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-11
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

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SHEET C18 OF C23



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STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

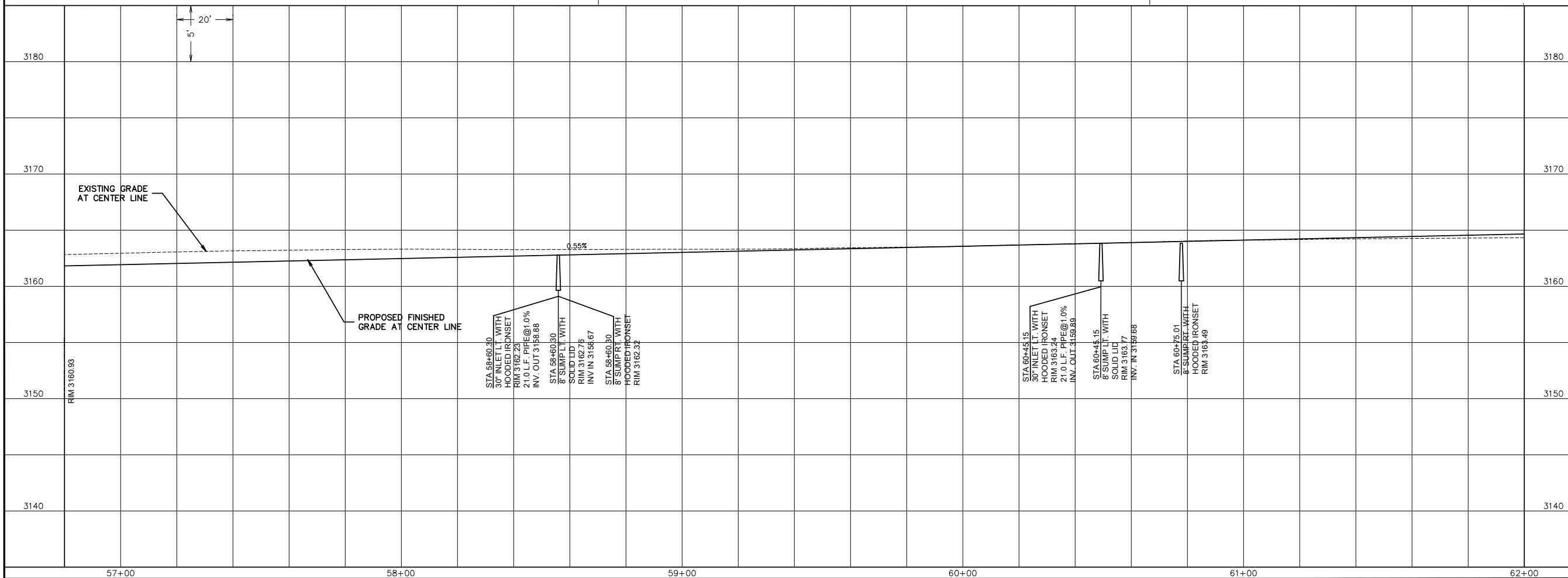
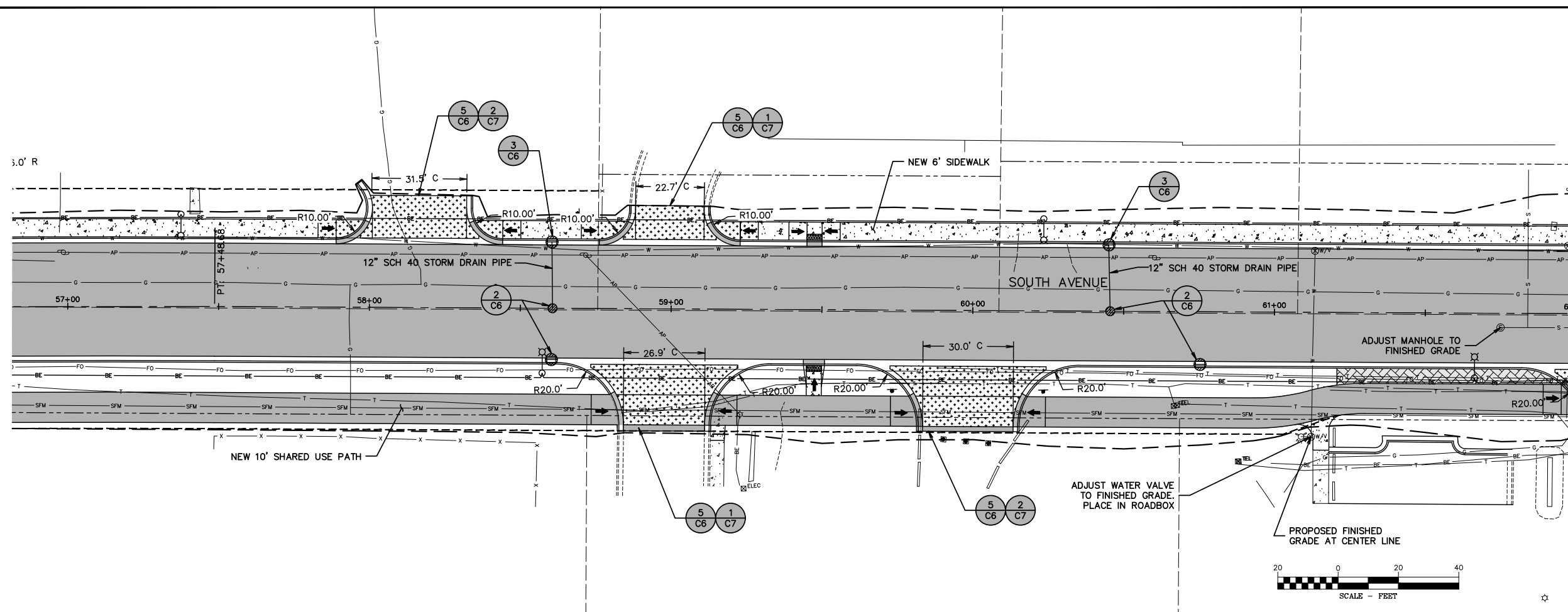
REVISIONS:
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NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-12
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

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SHEET **C19** OF **C23**



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PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/13/22

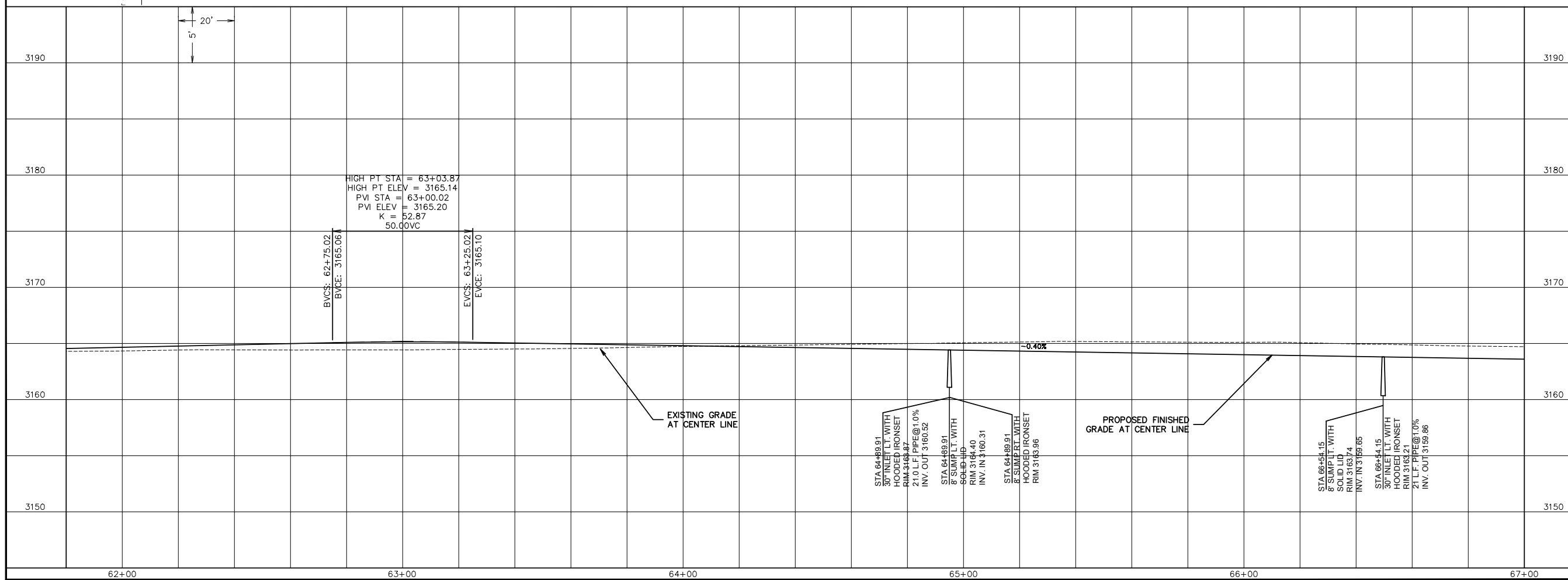
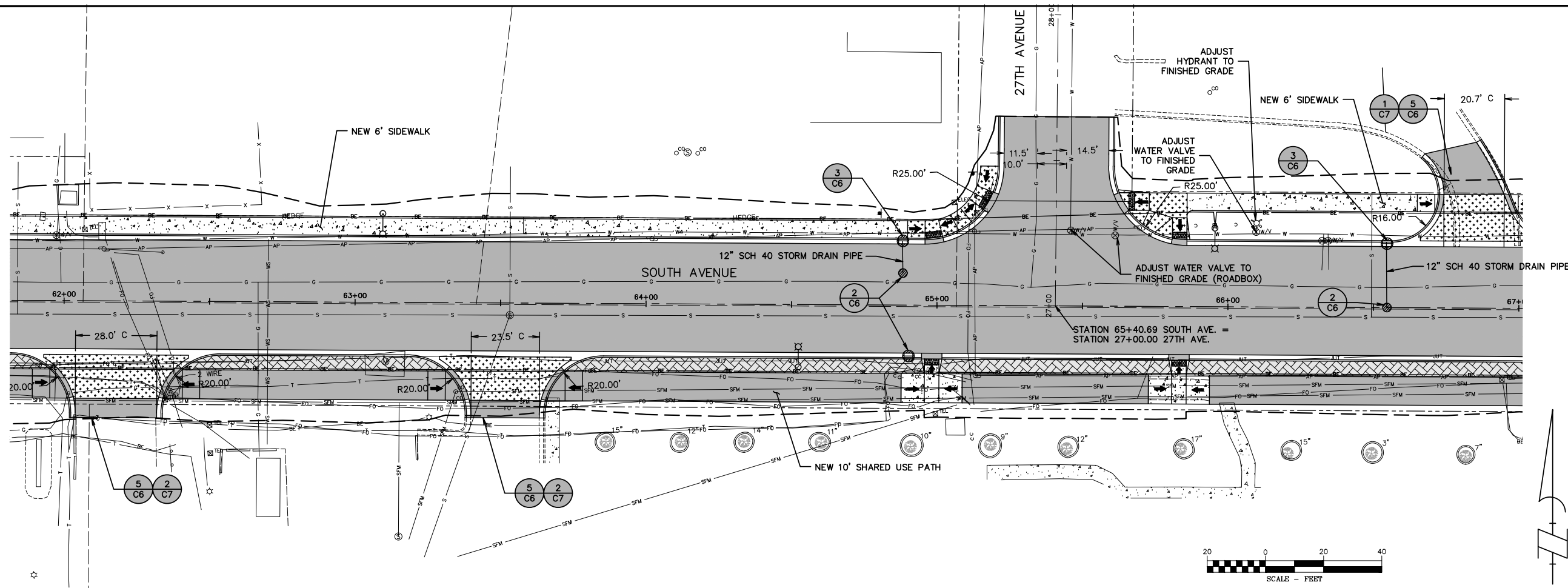
STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

REVISIONS:
NO. DESCRIPTION DATE

PROJECT: 17-04-10
LAYOUT: PLP-13
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

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SHEET **C20** OF **C23**



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STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

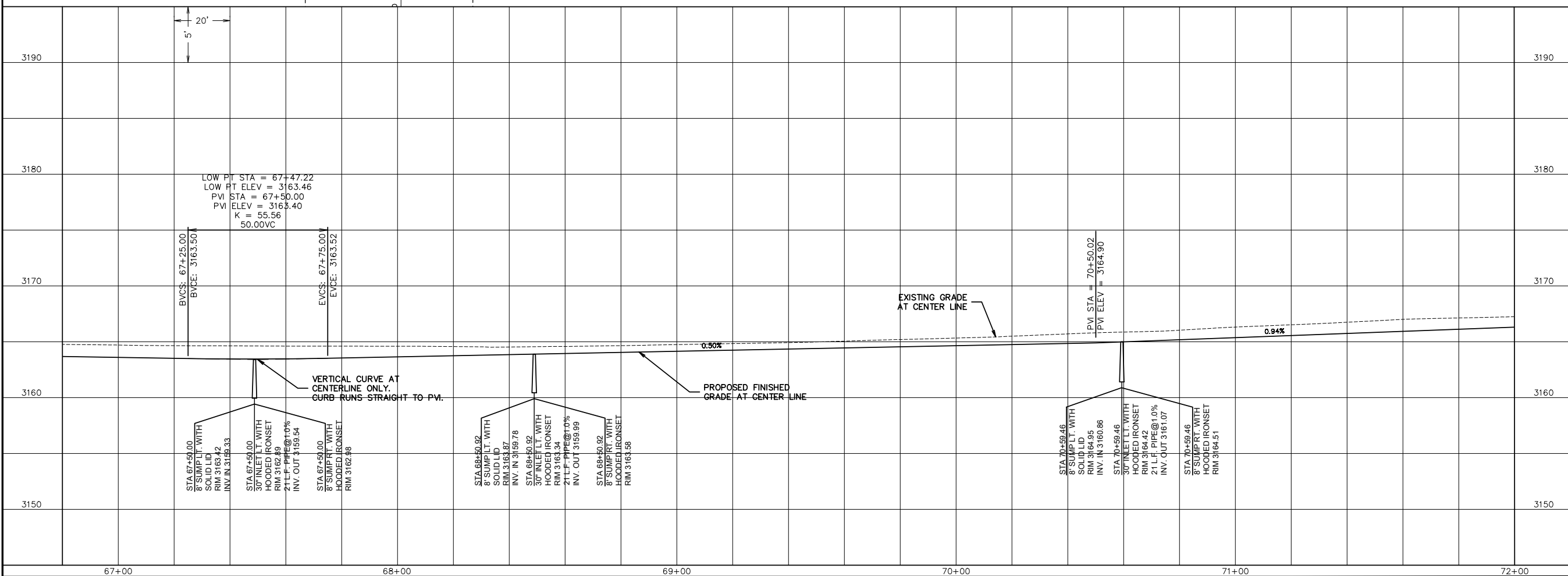
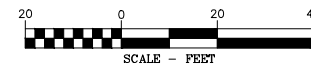
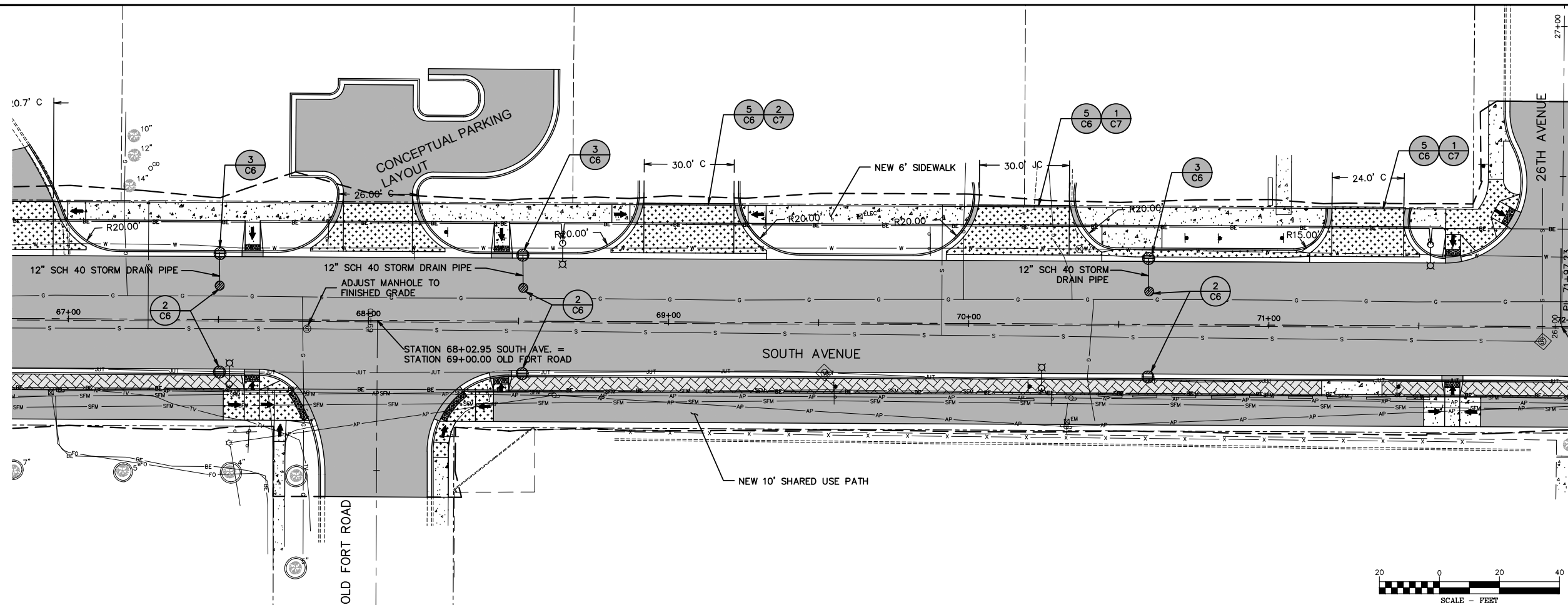
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NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-14
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

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SHEET C21 OF C23



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**STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA**

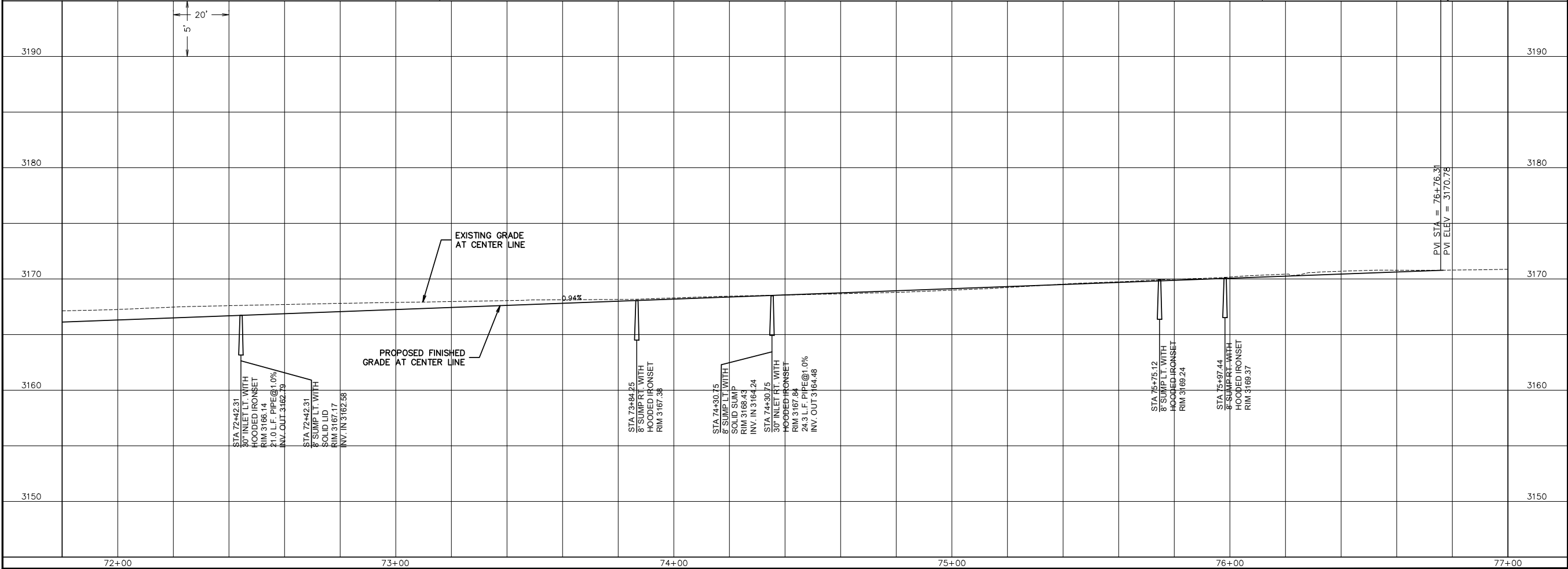
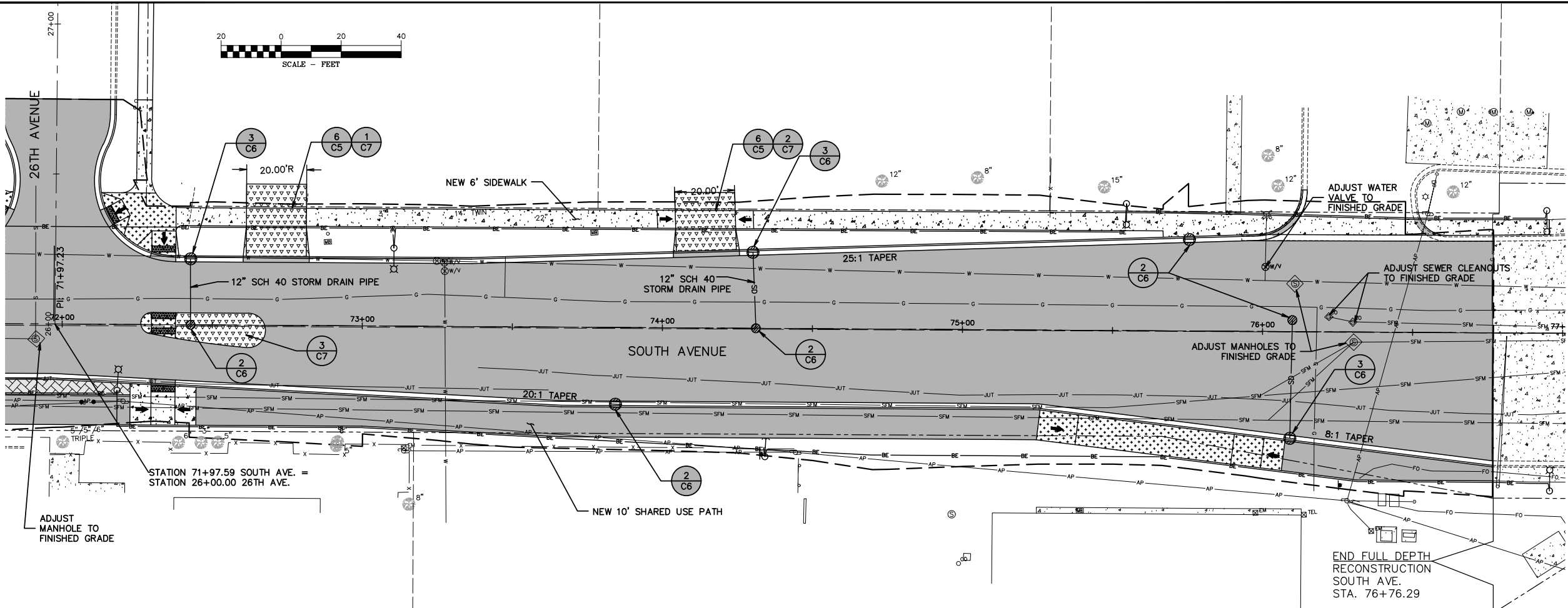
NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-15
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET **C22** OF **C23**

FILE: W:\Projects\170410_Data\Design\170410_ST_PLN.dwg





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STREET PLAN AND PROFILE
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

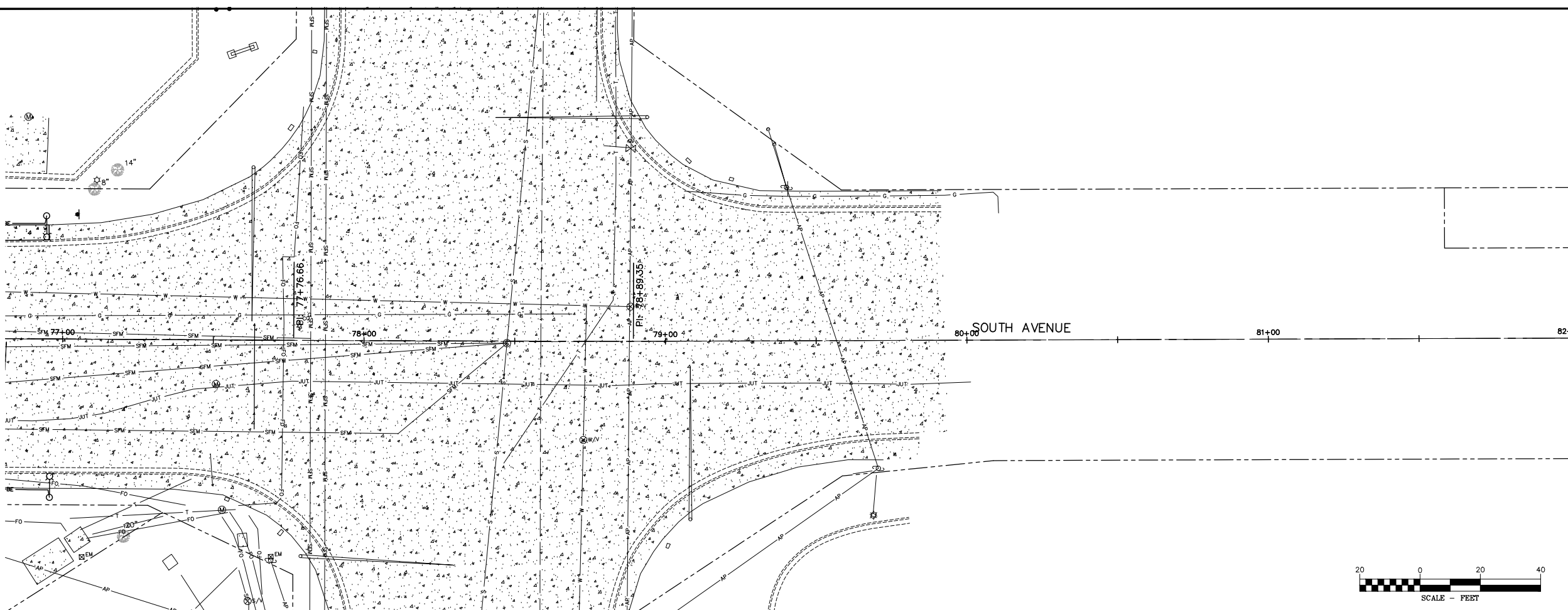
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NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: PLP-16
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET C23 OF C23



20'
10'

EXISTING GRADE
AT CENTER LINE

3190

3180

3170

3160

3150

3190

3180

3170

3160

3150

77+00

78+00

79+00

80+00

81+00

82+00

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PLOTTED: 9/13/22
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PAVEMENT MARKING DETAILS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

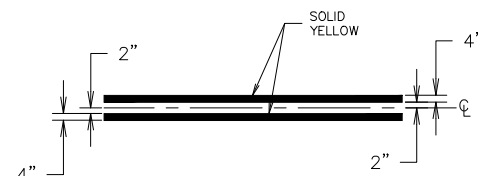
REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S1
SURVEYED: WGM
DESIGN: MDB
DRAFT: BMS/BEA
APPROVE: TDI
DATE:

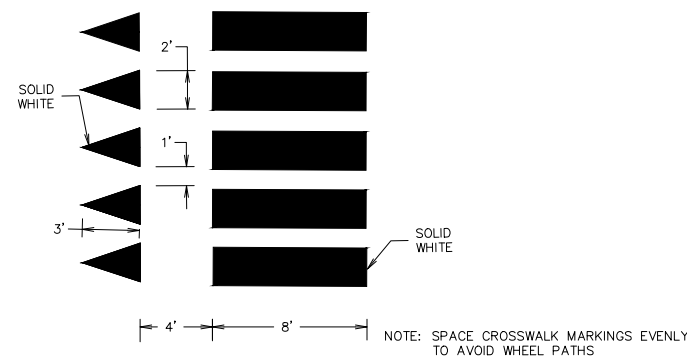
SEPTEMBER 2022

SHEET **S1** OF **S11**

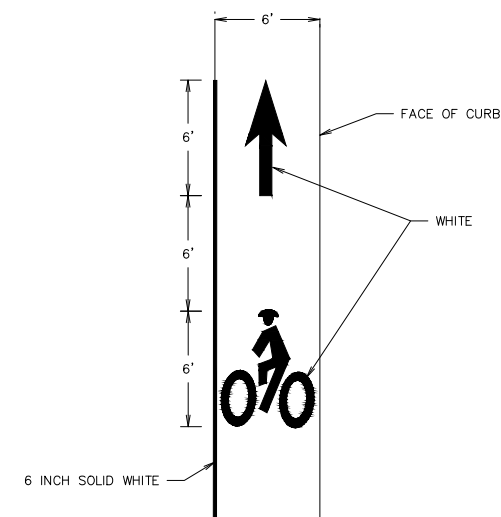
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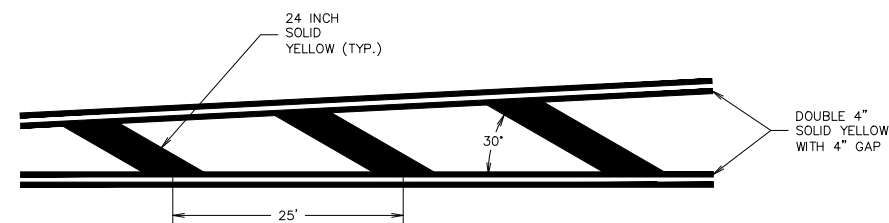
DETAIL "A"
DOUBLE YELLOW STRIPE DETAIL



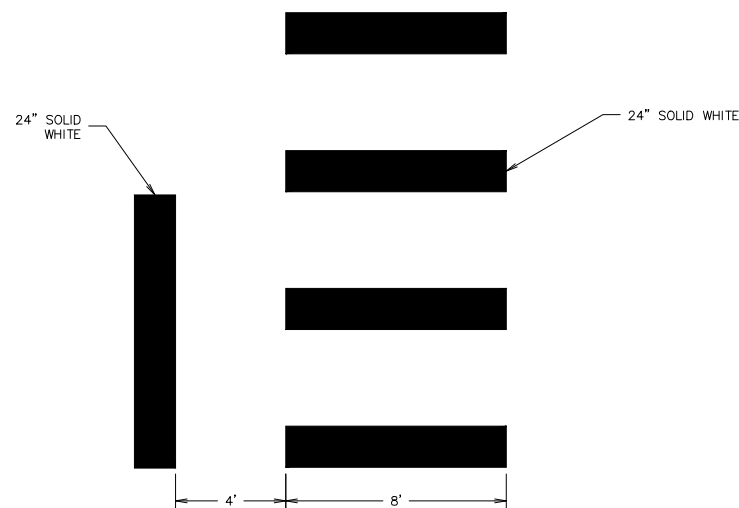
DETAIL "B"
YIELD LINE AND
CROSSWALK DETAIL



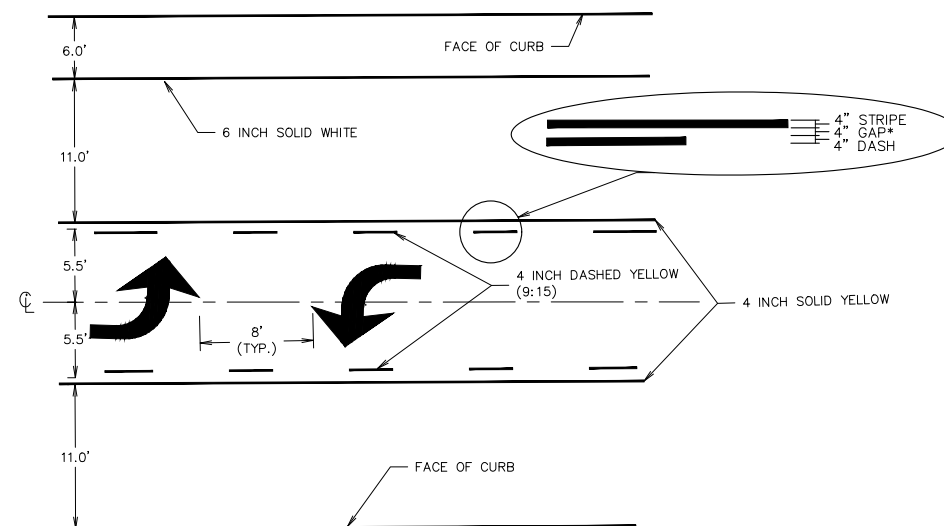
DETAIL "C"
BIKE LANE SYMBOL DETAIL
(CENTER IN BIKE LANE)



DETAIL "D"
HATCHED MEDIAN DETAIL



DETAIL "E"
STOP BAR AND CROSSWALK DETAIL



* LANE WIDTHS MEASURED TO FACE OF CURB, CENTER OF STRIPE, OR CENTER OF GAP BETWEEN STRIPES.

DETAIL "F"
3-LANE STREET SECTION DETAIL

NOTES

1. PROVIDE INTERIM AND FINAL PAVEMENT MARKINGS IN ACCORDANCE WITH THE MDT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" 2020 EDITION.
2. ALL FINAL PAVEMENT MARKINGS ARE EPOXY UNLESS OTHERWISE NOTED.
3. COMPLETELY REMOVE ALL EXISTING PAVEMENT MARKINGS THAT ARE IN CONFLICT WITH THE STRIPING SHOWN ON THESE PLANS. REMOVAL METHOD TO BE APPROVED BY THE ENGINEER.
4. NEW SIGN PANELS SHALL BE SHEET ALUMINUM TYPE XI HIGH INTENSITY REFLECTIVE SHEETING FOR THE BACKGROUND, LEGEND AND BORDER, EXCEPT THAT STREET NAME SIGNS SHALL REQUIRE TYPE IV REFLECTIVE SHEETING FOR THE BACKGROUND SHEETING.
5. SIGN LEGEND AND BACKGROUND COLORS SHALL BE IN ACCORDANCE WITH THE MUTCD (2009 EDITION).
6. PROVIDE A MINIMUM OF 5 DAYS ADVANCE NOTICE TO THE ENGINEER AND CHAD PANCAKE (406-552-6372) WHEN SIGNS WILL BE FIELD LOCATED AND WHEN SIGNS WILL BE INSTALLED.
7. SIGN MATERIALS AND CONSTRUCTION PROCEDURES SHALL CONFORM TO THE MDT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", 2020 EDITION.
8. PROVIDE SIGNS TO THE DIMENSIONS SHOWN.

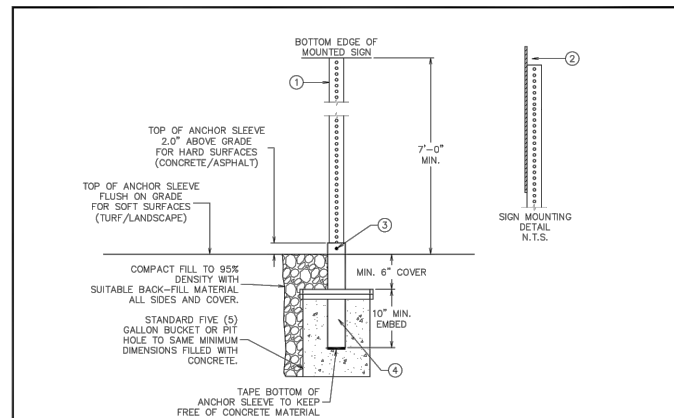


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PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/13/22

SIGNING DETAILS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA



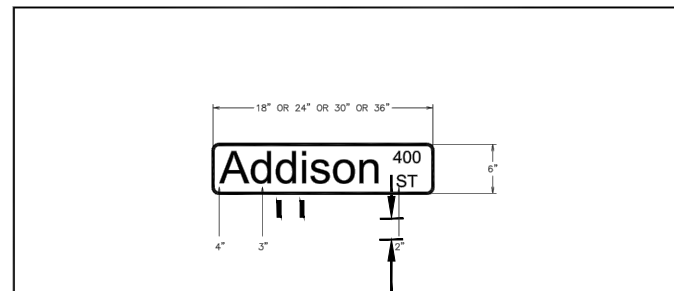
KEYED NOTES:

- 2" 12 GAUGE TELESPAR PERFORATED STEEL SQUARE TUBING SIGN POST, OR CITY ENGINEER APPROVED EQUIVALENT, SHALL BE USED FOR ALL SIGN INSTALLATIONS UPON/WITHIN THE PUBLIC RIGHT-OF-WAY (UNLESS SIGN AREA (SQ- FT) EXCEEDS YIELD ACCORDING TO AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS). TELESPAR @ 80R EQUAL MATERIAL SPECIFICATIONS: STEEL CONFORMING TO ASTM A-1011 GRADE 50 AND GALVANIZING CONFORMING TO ASTM A-853.
- SET SIGN FLUSH WITH OR ABOVE TOP OF POST. TOP OF SIGN SHALL NOT BE PLACED BELOW TOP OF POST. SIGN SHOULD BE FULLY SUPPORTED BY POST.
- FASTEN SIGN POST TO THROUGH-DRILLED ANCHOR SLEEVE WITH 5/16" X 3" GRADE 2 BOLT WITH FLAT WASHERS AND NYLON-INSERT LOCK NUT. PLACE BOLT 1" BELOW THE TOP OF ANCHOR SLEEVE.
- GALVANIZED 2-1/2" X 2-1/2" X 18" LONG (MIN.), 7 GAUGE NON-PERFORATED STEEL SQUARE TUBING ANCHOR SLEEVE. (GALVANIZED)

GENERAL NOTES:

- ALL SIGNS SHALL COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), MOST CURRENT VERSION, REVISION AND / OR SUPPLEMENT, FOR SIGN MATERIAL(S), SIZE, THICKNESS, SHAPE, COLOR(S), MESSAGE, SYMBOLOLOGY AND RETROREFLECTIVITY.
- ALL SIGNS LOCATED UPON/WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE SLEEVE-MOUNTED FOR BREAKAWAY AND REPLACEABILITY.
- FINAL SIGN LOCATION AND / OR PLACEMENT SHALL BE IN ACCORDANCE WITH THE MUTCD AND AS DETERMINED AND APPROVED BY THE CITY ENGINEER OR SIGN SHOP SUPERVISOR.
- 2-1/2" 12 GAUGE SHALL BE USED FOR LARGER SIGN AREA INSTALLATIONS. THE CITY ENGINEER MAY REQUIRE ALTERNATE SIZES, GAUGES, ETC, BASED ON SIGN SURFACE AREA.

	Typical Boulevard Sign Base Public Right-of-Way			
	Approved By City Engineer Kevin J. Slovorp	Adopted: 01/27/1999 Revised: 01/10/2017	STD - 720	
Engineering Division				



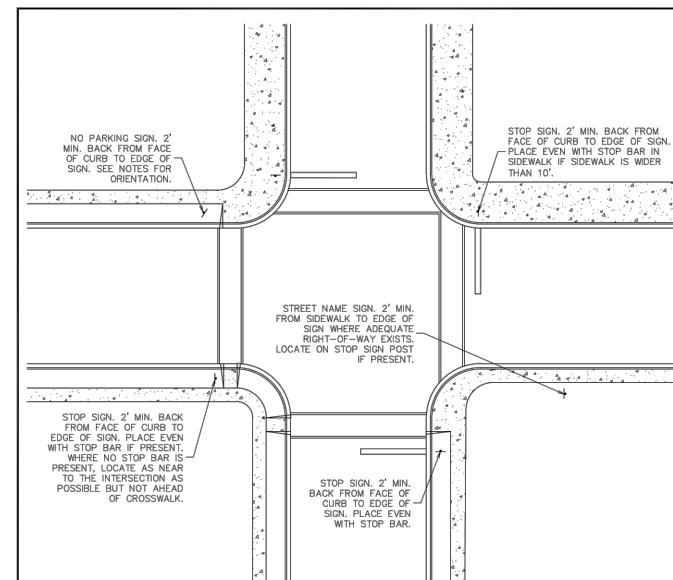
STREET NAME SIGN MATERIAL SPECIFICATIONS:

- ALUMINUM BLANKS
6" X 18", 24", 30", 36" X .08"
- MARKINGS SHALL BE PLACED ON ONE SIDE OF SIGN ONLY.
- TEXT SIZE SPECIFICATION:
3.1. 4" INITIAL UPPERCASE.
3.2. 3" NOMINAL LOOP LOWERCASE - NOT INCLUDING ASCENDING AND/OR DESCENDING TAIL.
3.3. 2" BLOCK NUMBER.
3.4. 2" ROUTE DESIGNATION - ALL CAPS - CENTER WITH BLOCK NUMBER.
- TWO SIGNS SHALL BE MOUNTED BACK TO BACK ON EITHER SIDE OF THE SIGN POST. 2 SIGNS ARE REQUIRED.
- GREEN BACKGROUND WITH WHITE TEXT FOR PUBLIC STREETS.
- WHITE BACKGROUND WITH GREEN TEXT FOR PRIVATE STREETS.
- PROVIDE 'T2000 HWY' FONT.

STREET NAME SIGN MATERIAL AND SPACING SPECIFICATIONS:

- ALL STREET NAME SIGNS SHALL COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), MOST CURRENT VERSION, REVISION AND/OR SUPPLEMENT, FOR SIGN MATERIAL(S), SIZE, THICKNESS, SHAPE, COLOR(S), MESSAGE, SYMBOLOLOGY AND RETROREFLECTIVITY.
- FINAL STREET NAME SIGN LOCATION AND/OR PLACEMENT SHALL BE IN ACCORDANCE WITH THE MUTCD AND AS DETERMINED AND APPROVED BY THE CITY ENGINEER OR SIGN SHOP SUPERVISOR.
- SPACING BETWEEN EACH SIGN ON A SINGLE POLE SHALL BE NO GREATER THAN 1" AND MUST NOT OVERLAP.
- ALL OTHER SIGNS SHALL DEFAULT TO MUTCD STANDARDS AND SPECIFICATIONS.

	Typical Street Name Sign Standard			
	Approved By City Engineer Kevin J. Slovorp	Adopted: 03/15/2006 Revised: 01/13/2017	STD - 721	
Engineering Division				



GENERAL NOTES:

- FINAL SIGN LOCATION, MOUNTING, BREAKAWAY, AND HEIGHT INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) INCLUDING THE MOST CURRENT REVISIONS AND SUPPLEMENTS. THIS DRAWING IS A GUIDELINE AND DOES NOT ADDRESS ALL SITUATIONS.
- "NO PARKING" SIGN ORIENTATION - WITH ARROWS SHALL BE SET AT 30° TO 45° TO THE STREET IN THE DIRECTION OF TRAVEL. WITHOUT ARROWS SHALL BE SET AT 90° TO THE STREET.
- INTERSECTIONS SHALL INCLUDE AT LEAST ONE STREET NAME SIGN AND THE SIGN IS TYPICALLY LOCATED AT ONLY ONE CORNER.

	Typical Sign Location Standard			
	Approved By City Engineer Kevin J. Slovorp	Adopted: 01/30/1980 Revised: 03/15/2017	STD - 722	
Engineering Division				

REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S2
SURVEYED: WGM
DESIGN: MDB
DRAFT: BMS/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET S2 OF S11

FILE: W:\Projects\170410\CAD_Data\Design\170410_SN.dwg



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PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/13/22

SIGNING AND STRIPING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

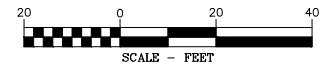
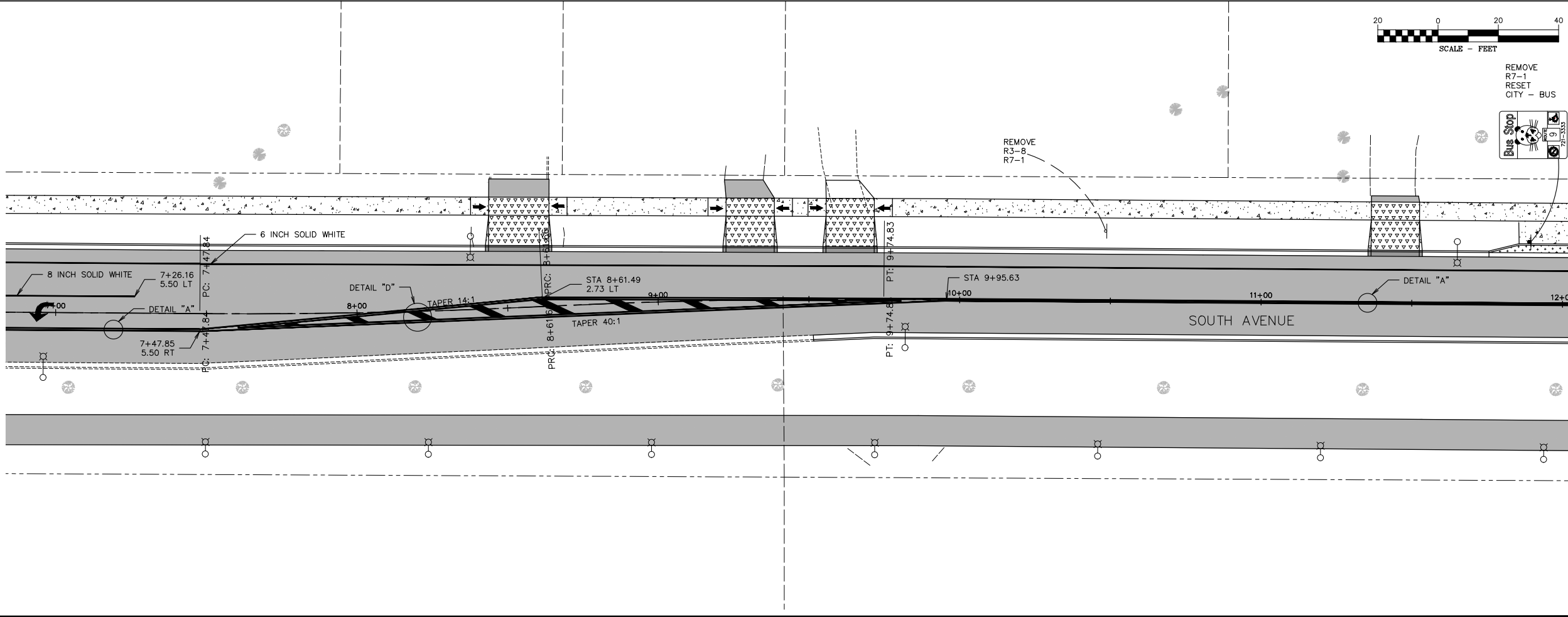
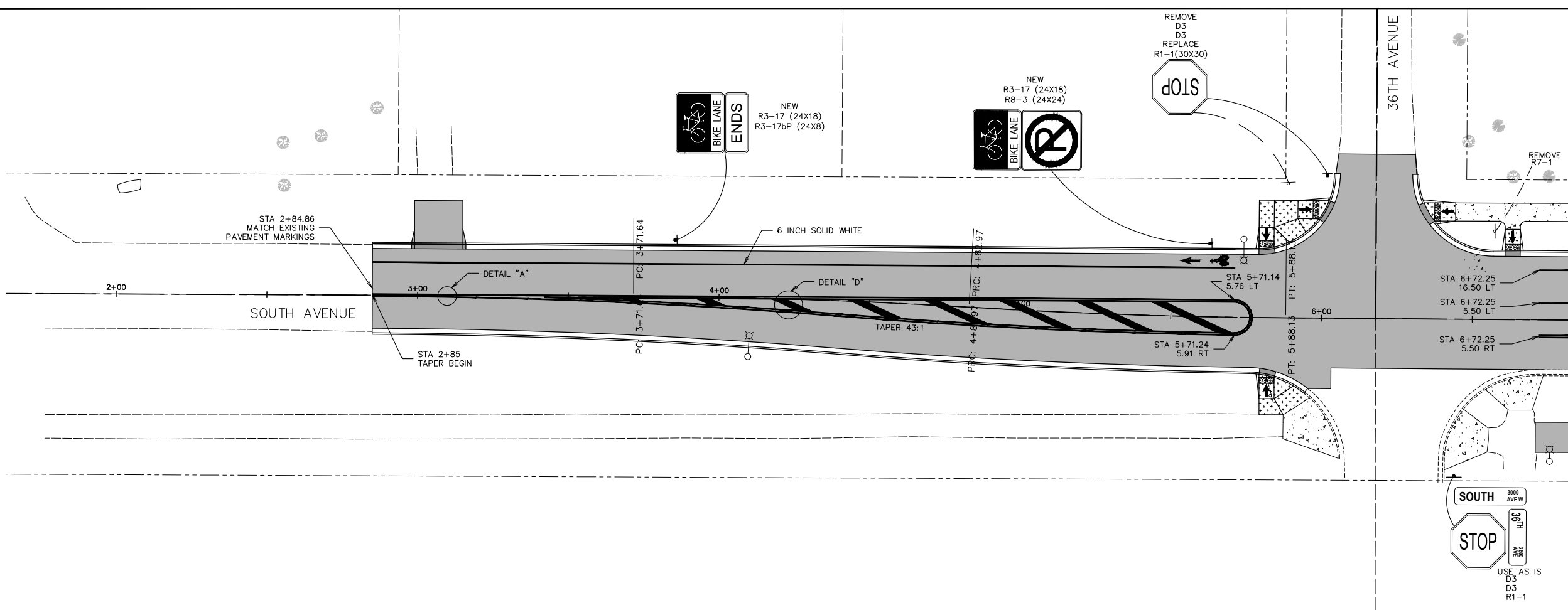
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S3
SURVEYED: WGM
DESIGN: MDB
DRAFT: BMS/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET S3 OF S11



FILE: W:\Projects\170410\CAD Data\Design\170410_S3.dwg



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PLOTTED: 9/13/22
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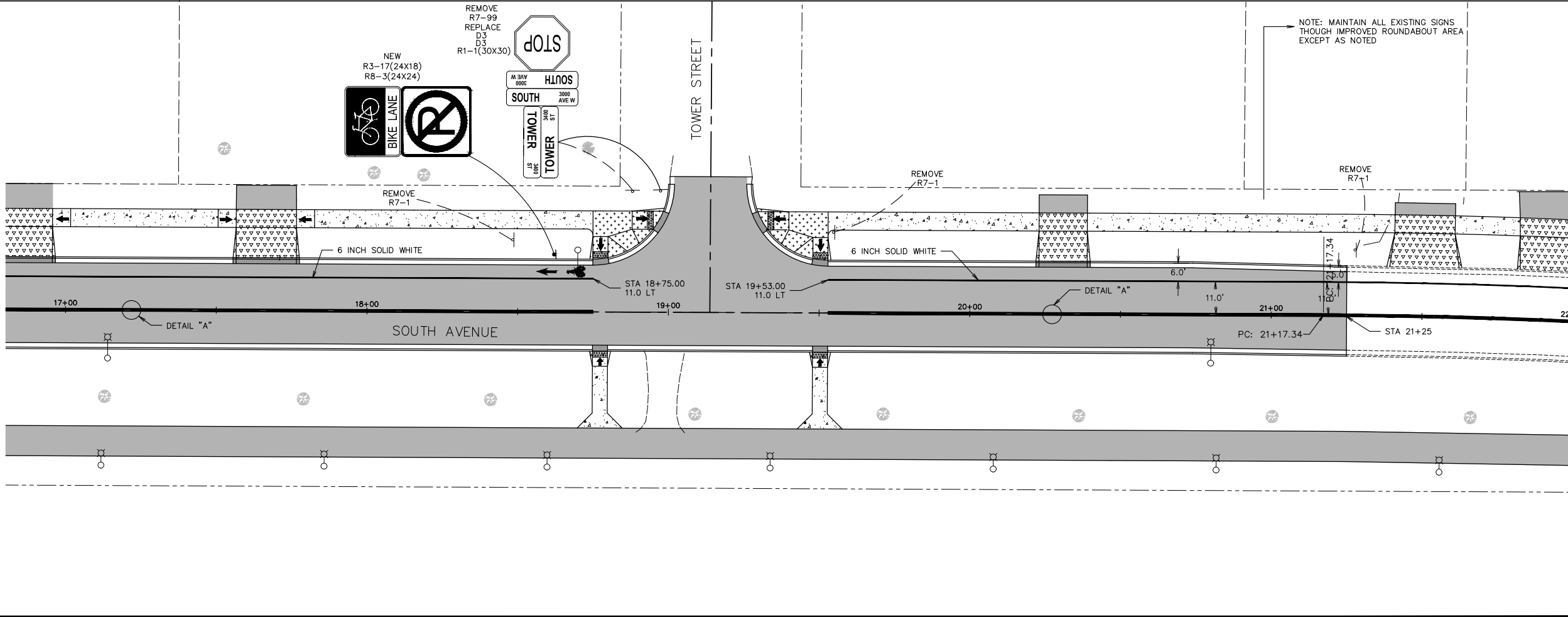
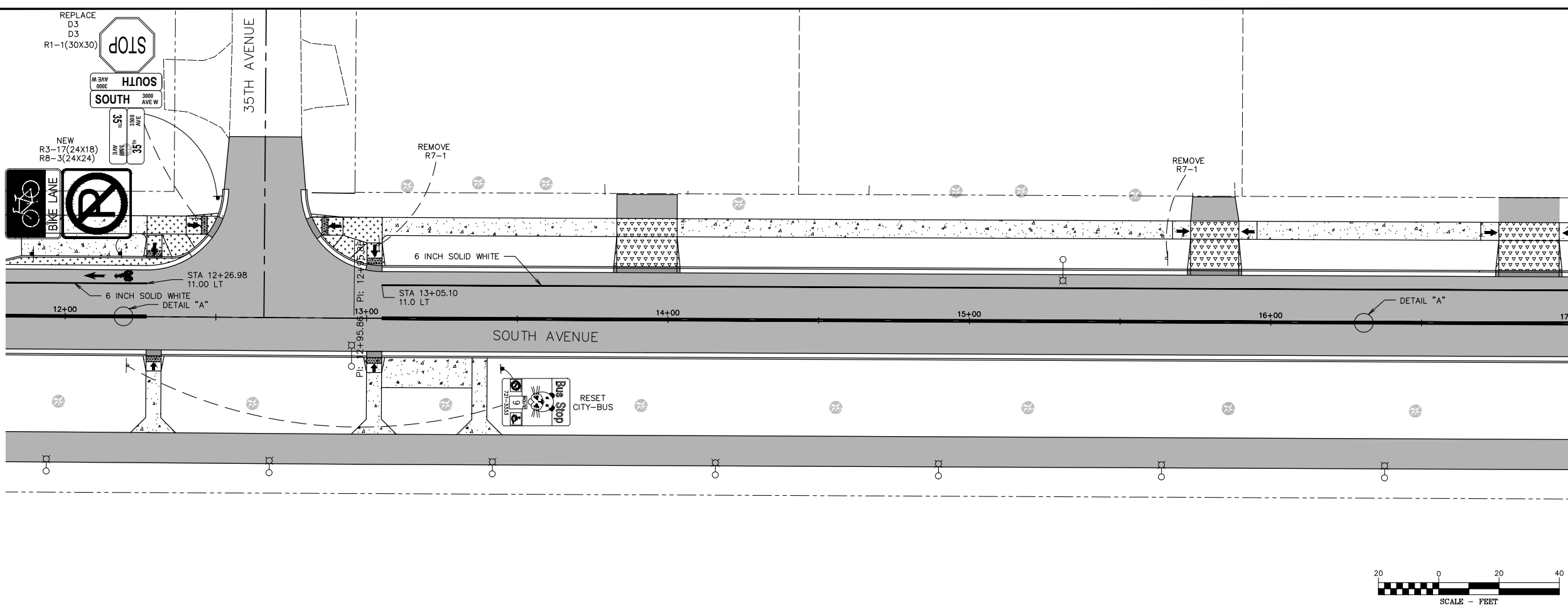
SIGNING AND STRIPING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S4
SURVEYED: WGM
DESIGN: MDB
DRAFT: BMS/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET S4 OF S11



FILE: W:\Projects\170410\CAD_Data\Design\170410_S4.dwg



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PLOTTED: 9/13/22
SAVED: 9/13/22

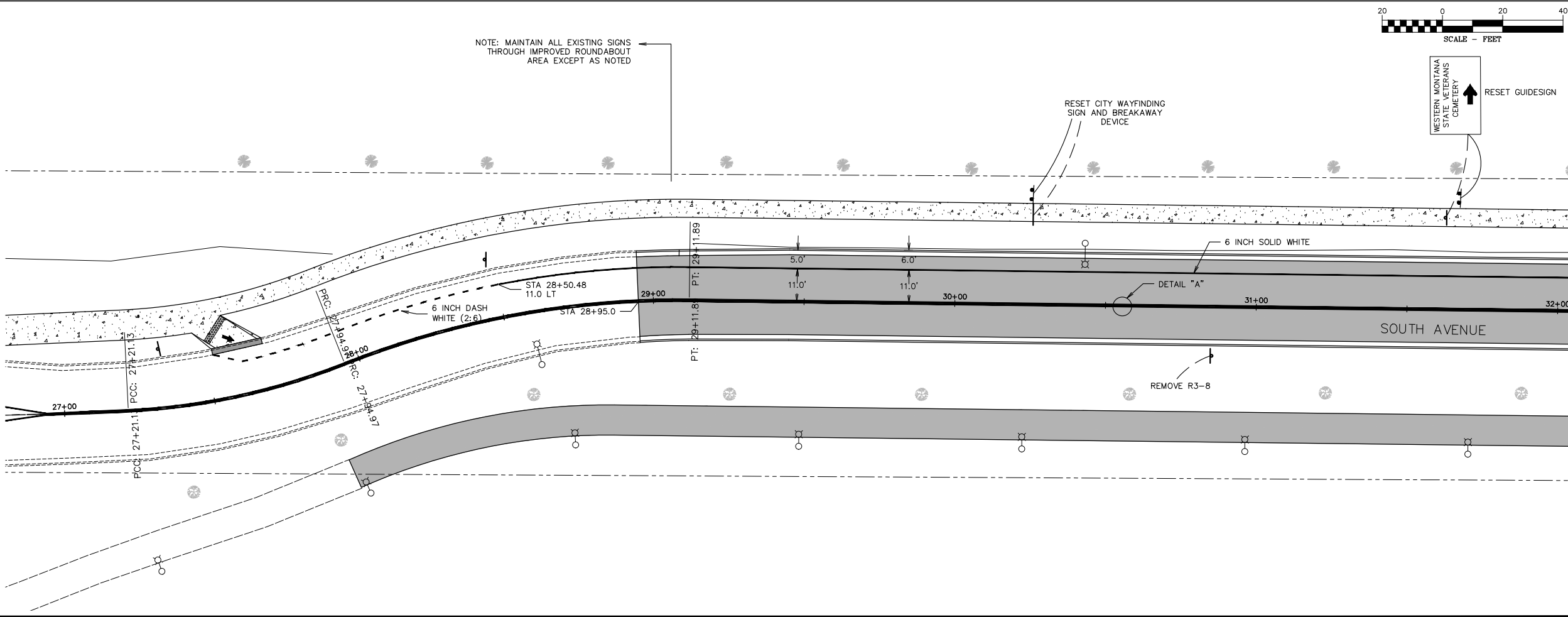
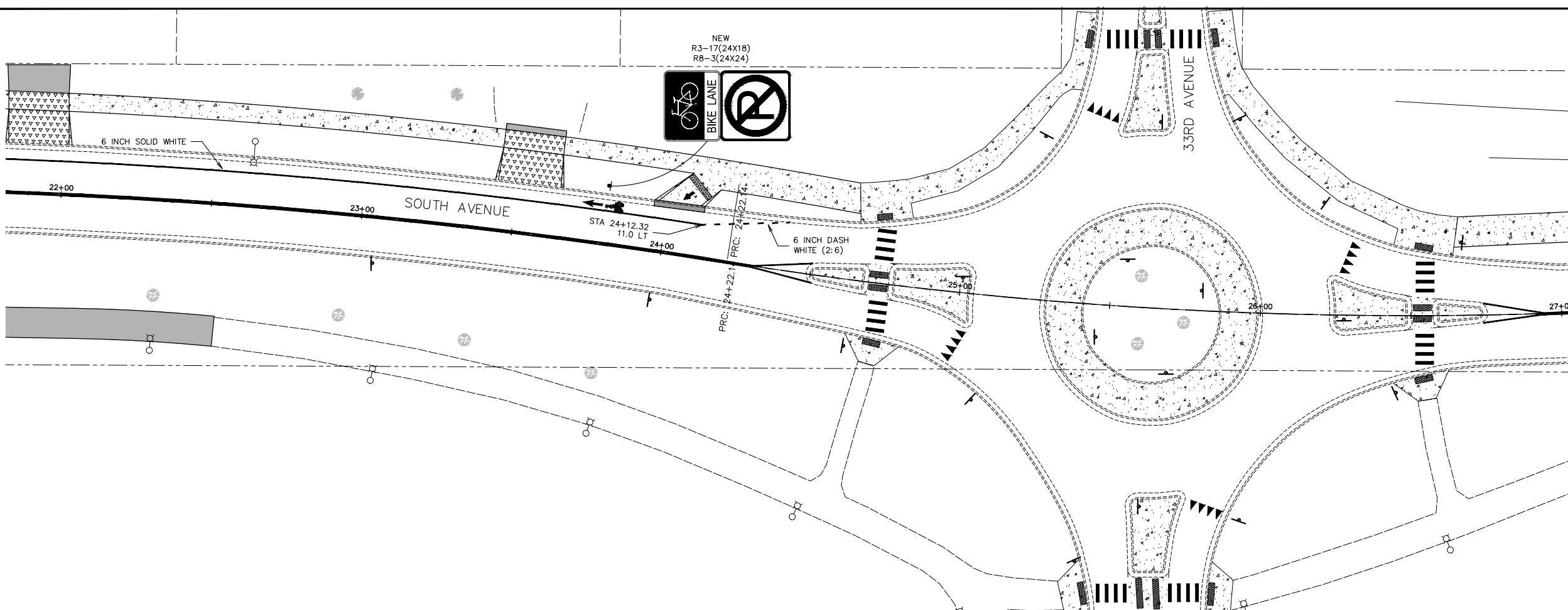
SIGNING AND STRIPING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S5
SURVEYED: WGM
DESIGN: MDB
DRAFT: BMS/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET S5 OF S11



FILE: W:\Projects\170410\CAD_Data\Design\170410_S5.dwg



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SIGNING AND STRIPING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

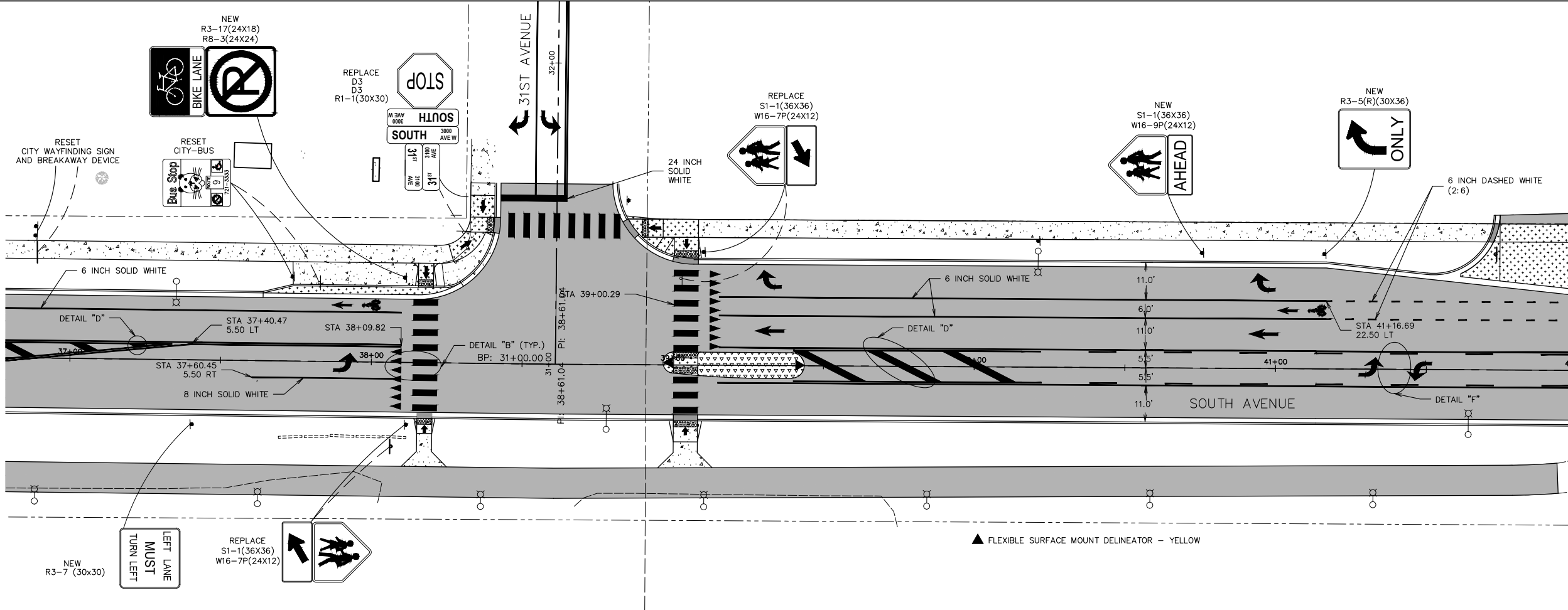
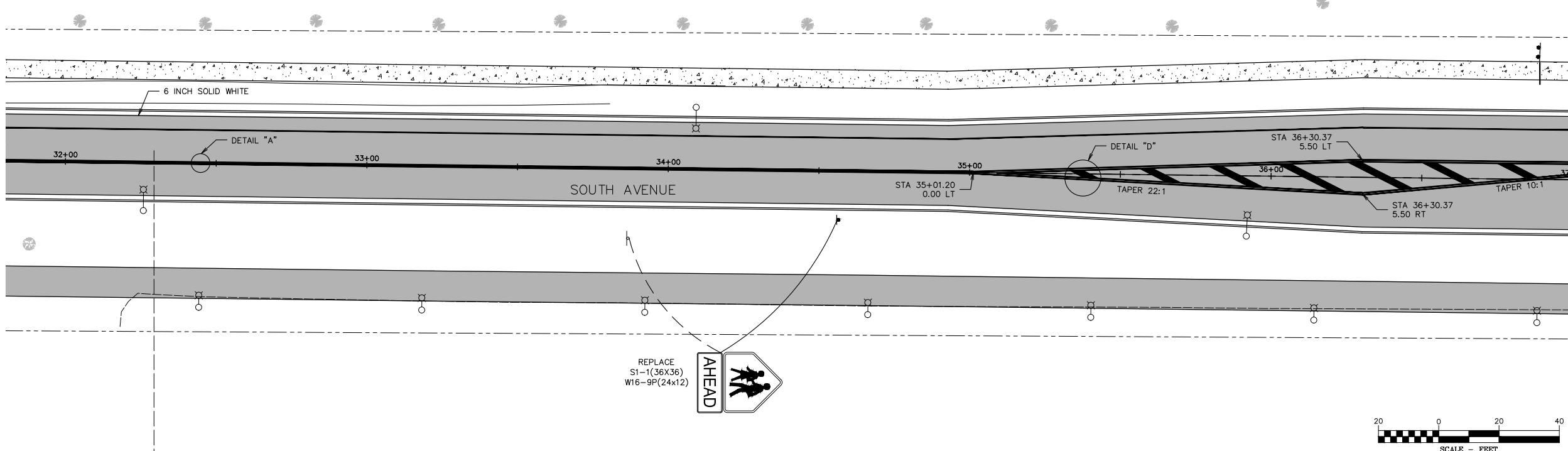
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S6
SURVEYED: WGM
DESIGN: MDB
DRAFT: BMS/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET
S6 OF S11



▲ FLEXIBLE SURFACE MOUNT DELINEATOR - YELLOW

FILE: W:\Projects\170410\CAD_Data\Design\170410_S6.dwg



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PLOTTED: 9/13/22
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SIGNING AND STRIPING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

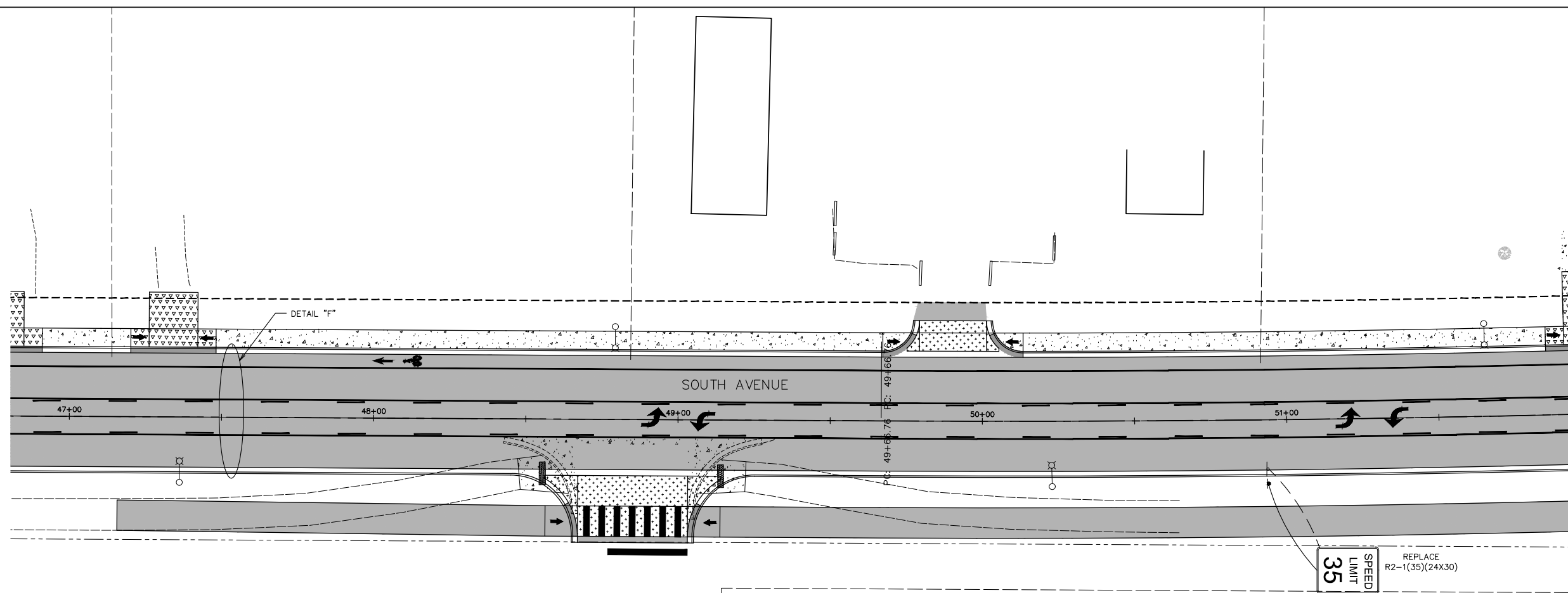
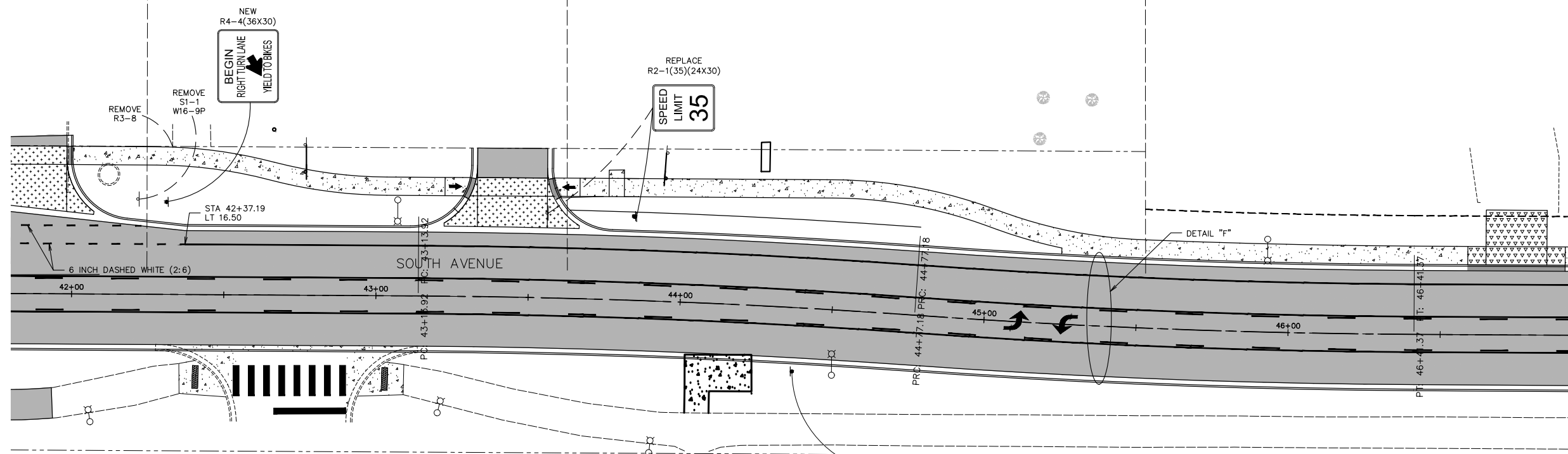
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S7
SURVEYED: WGM
DESIGN: SMM
DRAFT: BMS/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET S7 OF S11



FILE: W:\Projects\170410\CAD Data\Design\170410_S7.dwg



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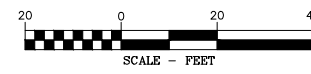
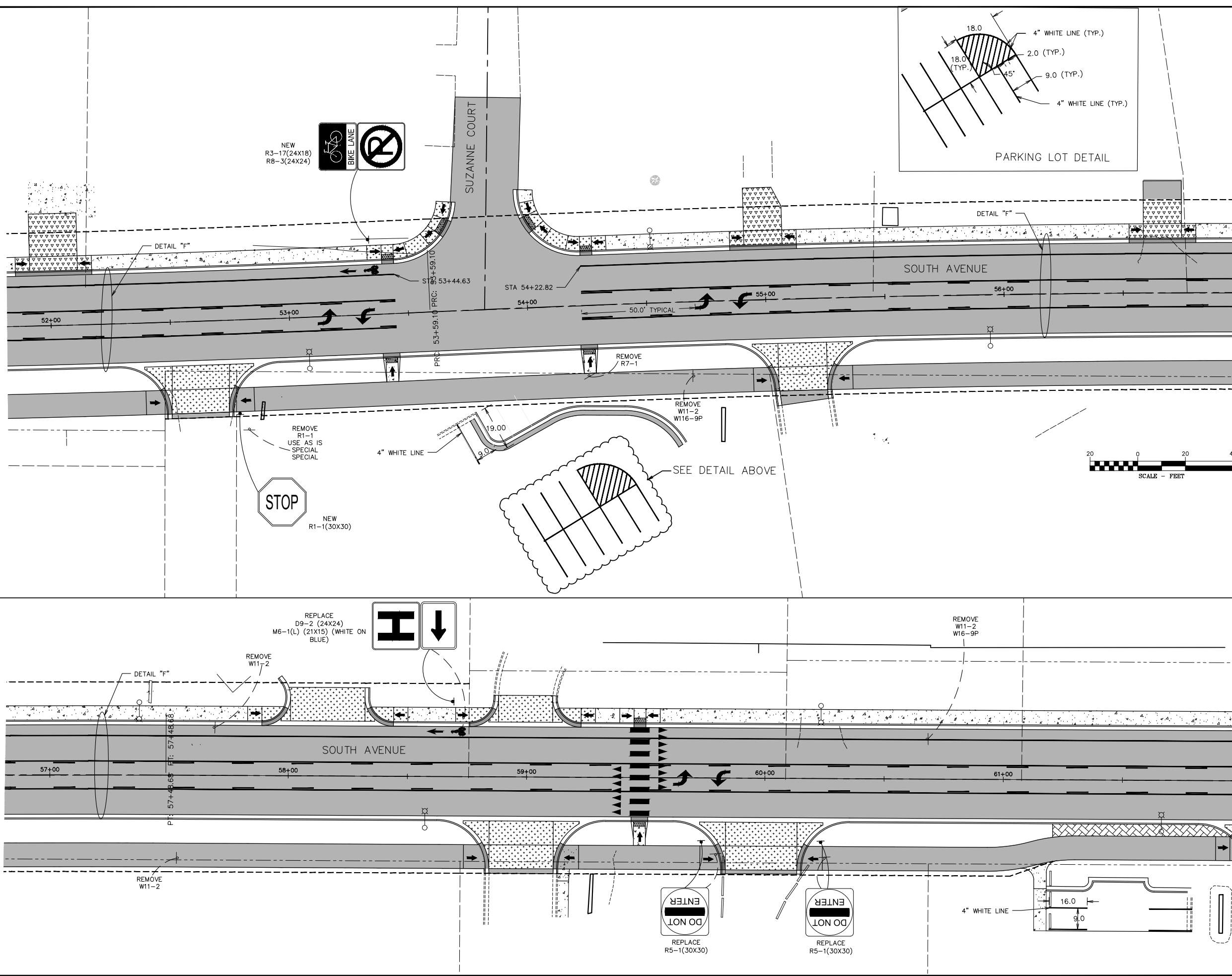
SIGNING AND STRIPING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S8
SURVEYED: WGM
DESIGN: MDB
DRAFT: BMS/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET S8 OF S11



FILE: W:\Projects\170410\CAD_Data\Design\170410_S8.dwg



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SAVED: 9/13/22

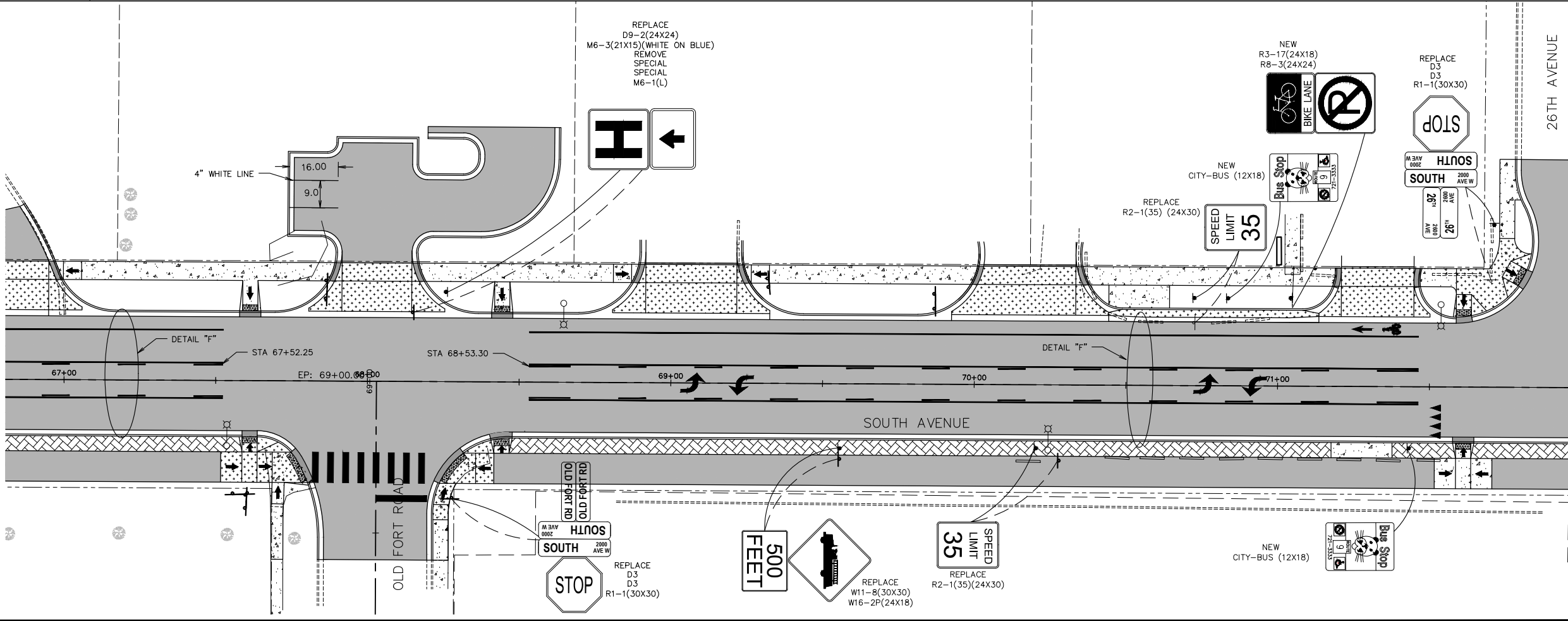
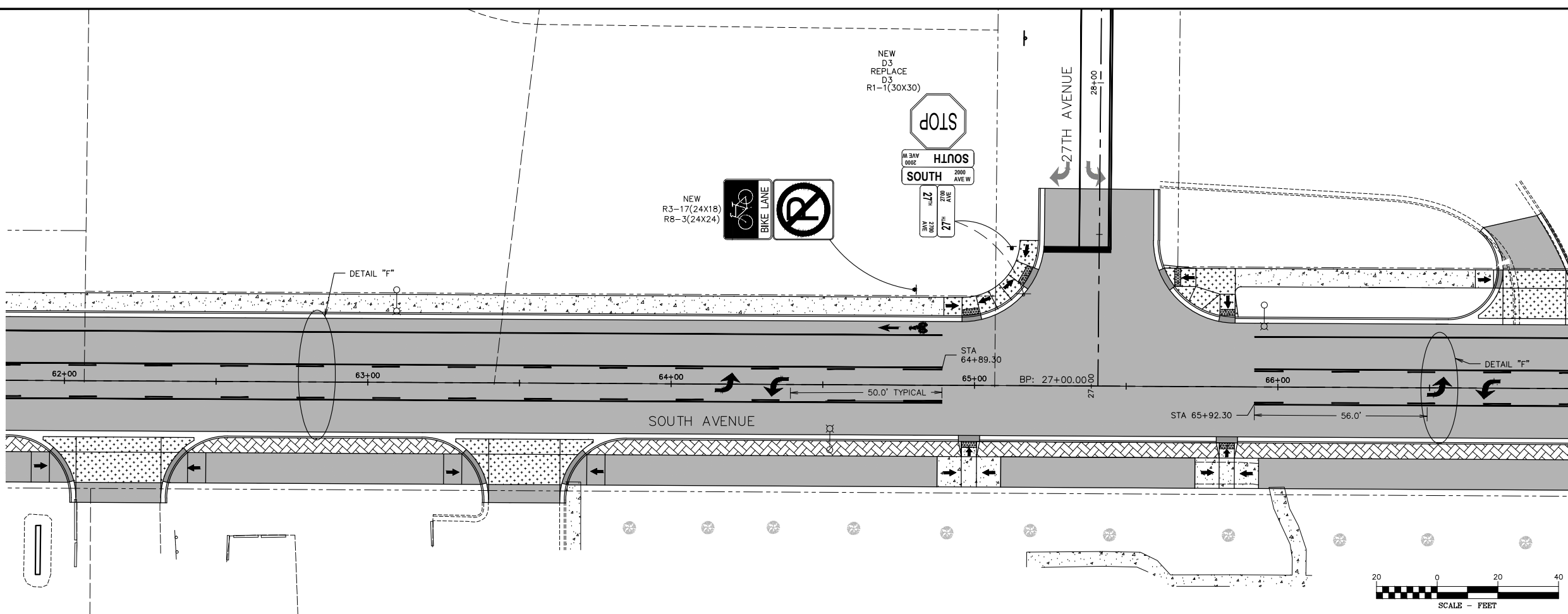
SIGNING AND STRIPING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S9
SURVEYED: WGM
DESIGN: MDB
DRAFT: BMS/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET S9 OF S11



FILE: W:\Projects\170410\CAD_Data\Design\170410_S9.dwg



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SIGNING AND STRIPING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

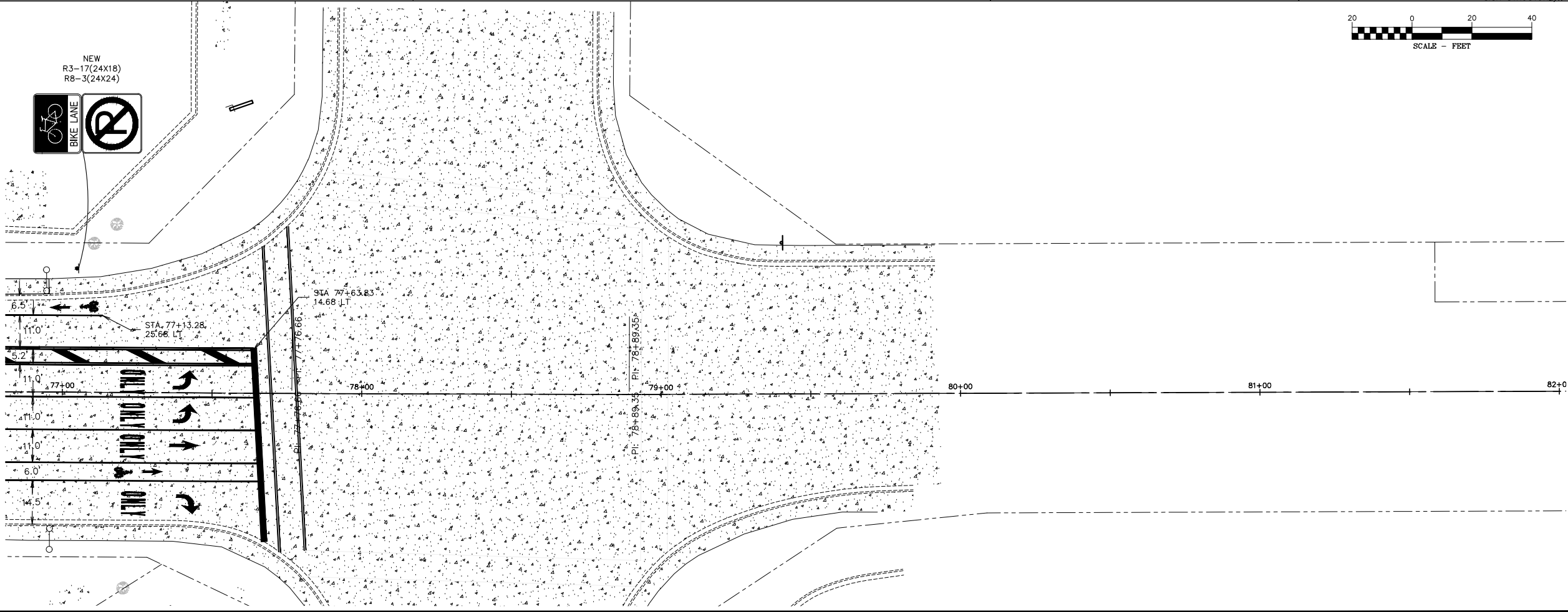
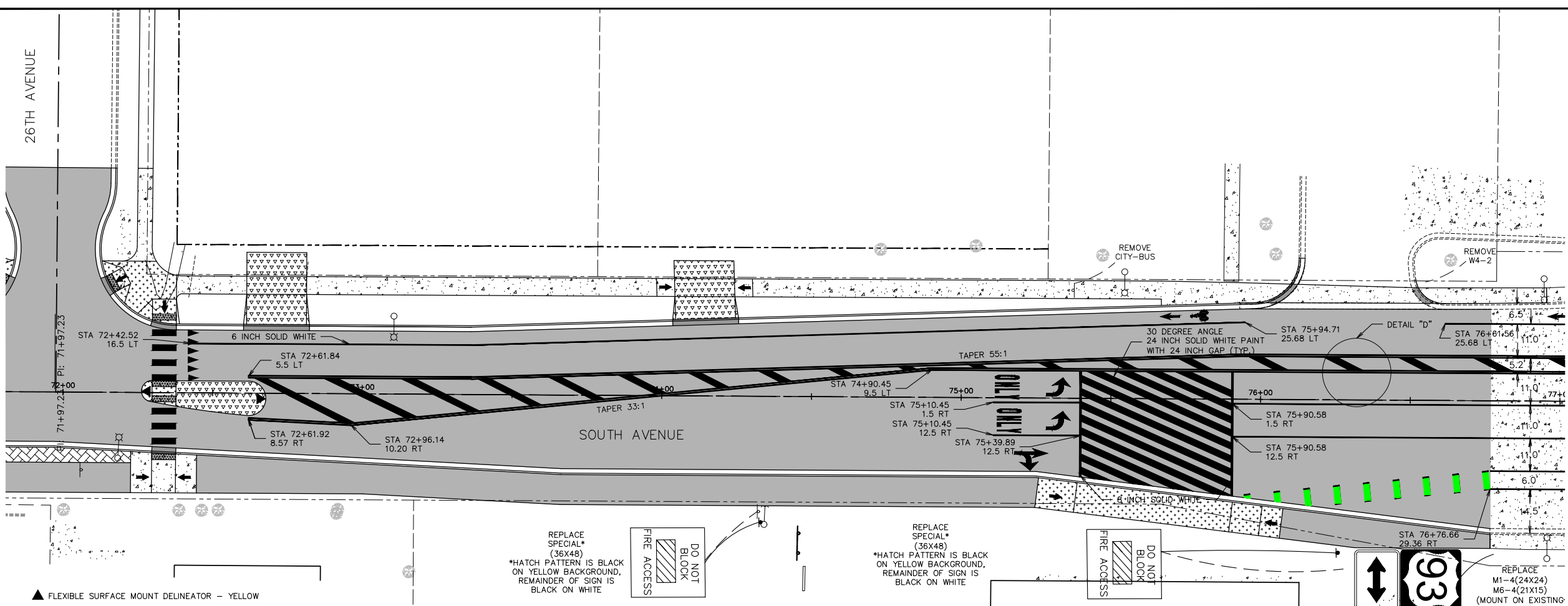
REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S10
SURVEYED: WGM
DESIGN: MDB
DRAFT: BMS/BEA
APPROVE: TDI
DATE:

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SHEET S10 OF S11

FILE: W:\Projects\170410\CAD Data\Design\170410_S10.dwg





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SIGNING AND STRIPPING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

REVISIONS:
NO. DESCRIPTION DATE

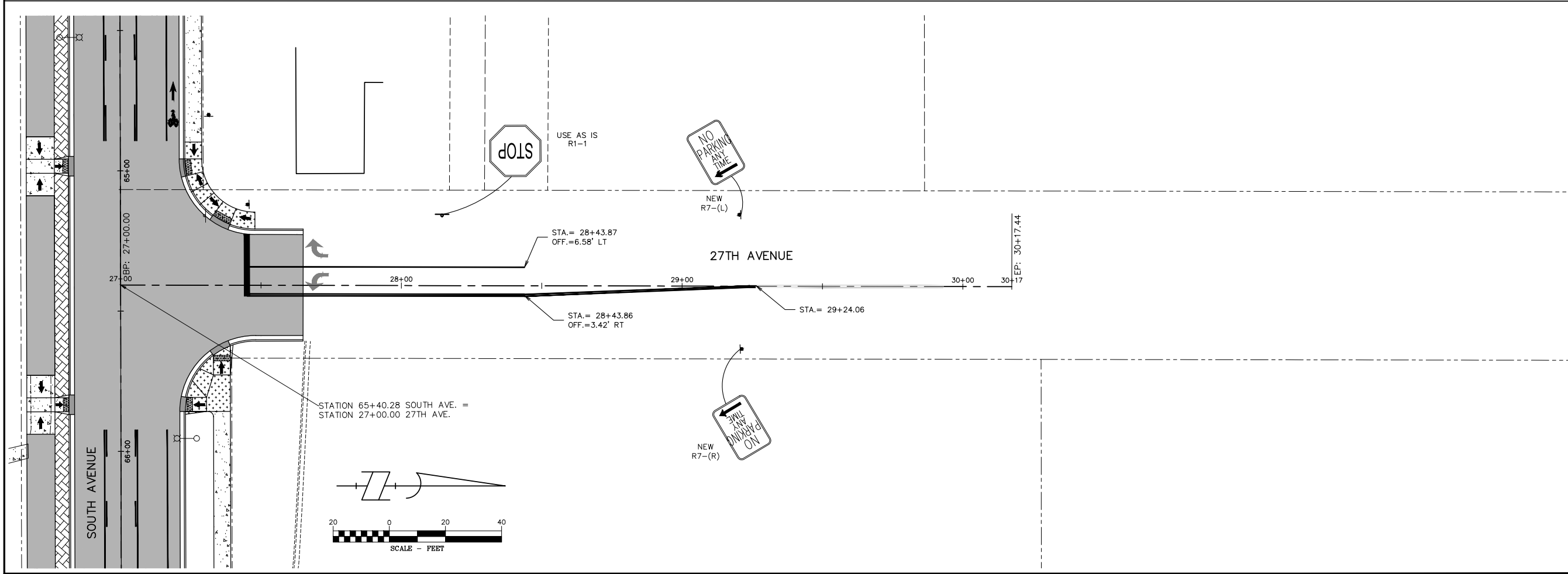
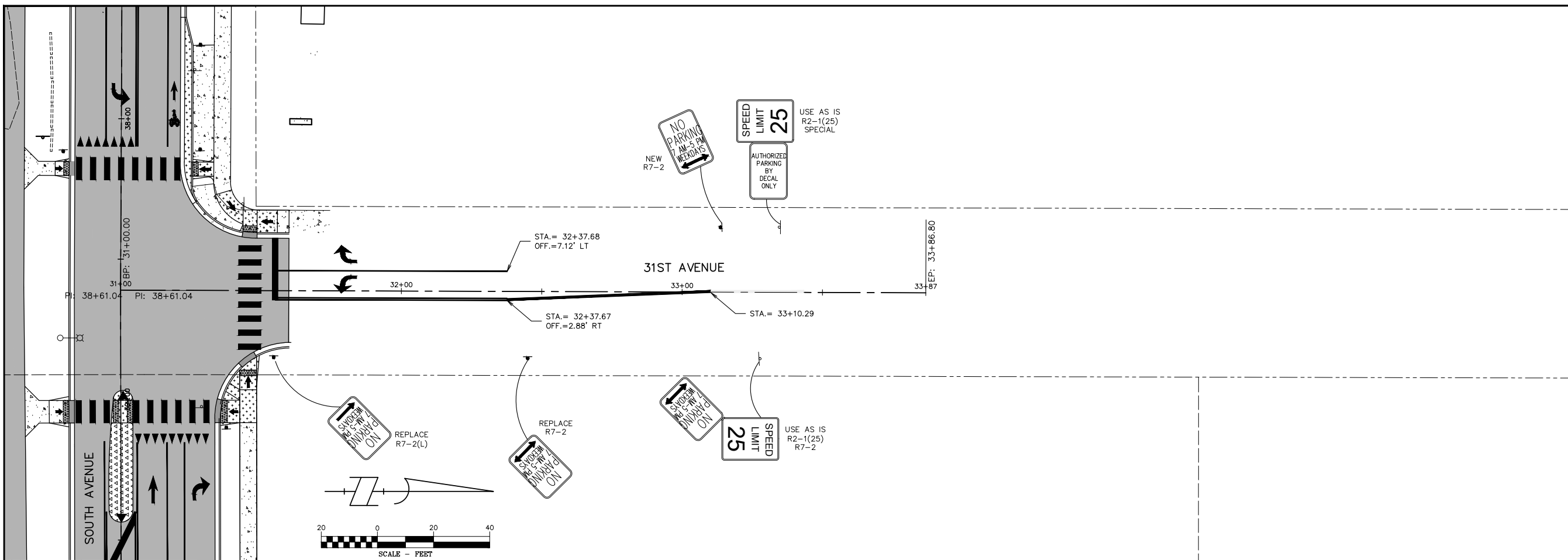
NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: S11
SURVEYED: WGM
DESIGN: MB
DRAFT: BEA
APPROVE:
DATE:

SEPTEMBER 2022

SHEET S11 OF S11

FILE: W:\Projects\170410\CAD Data\Design\170410_S11.dwg





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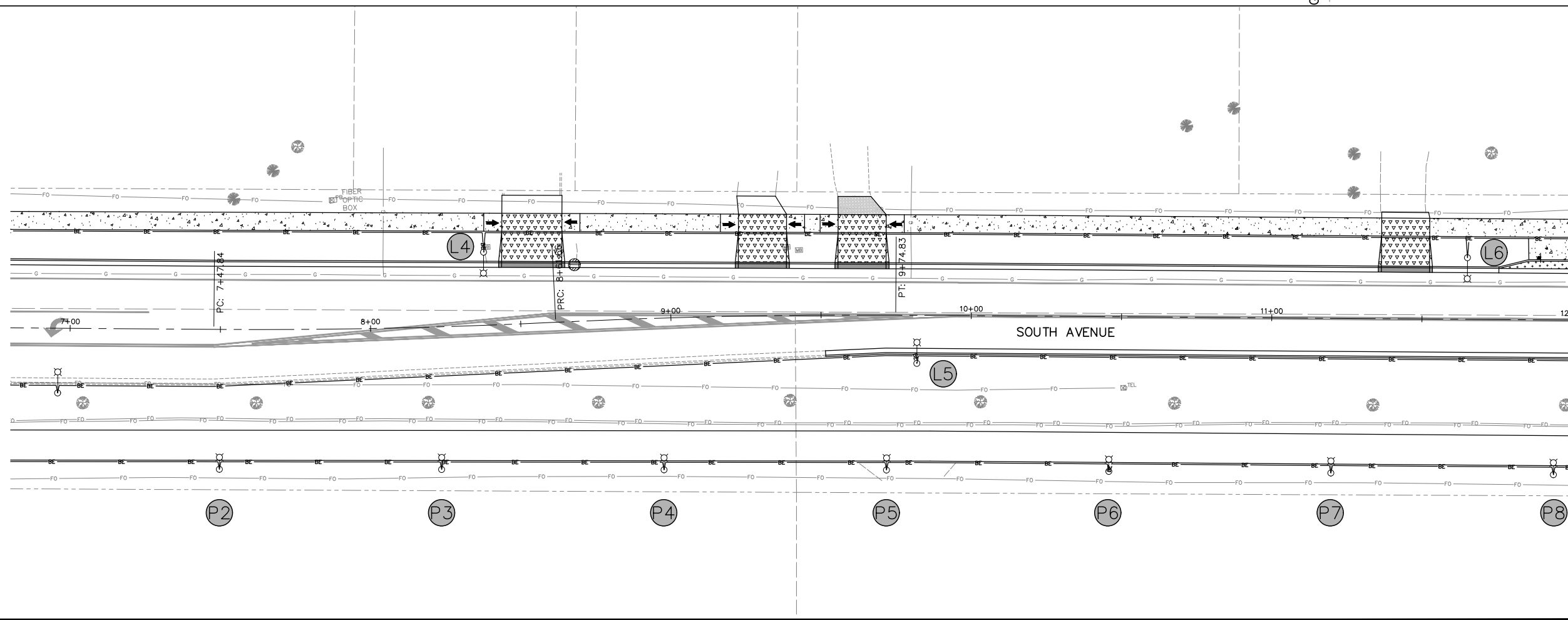
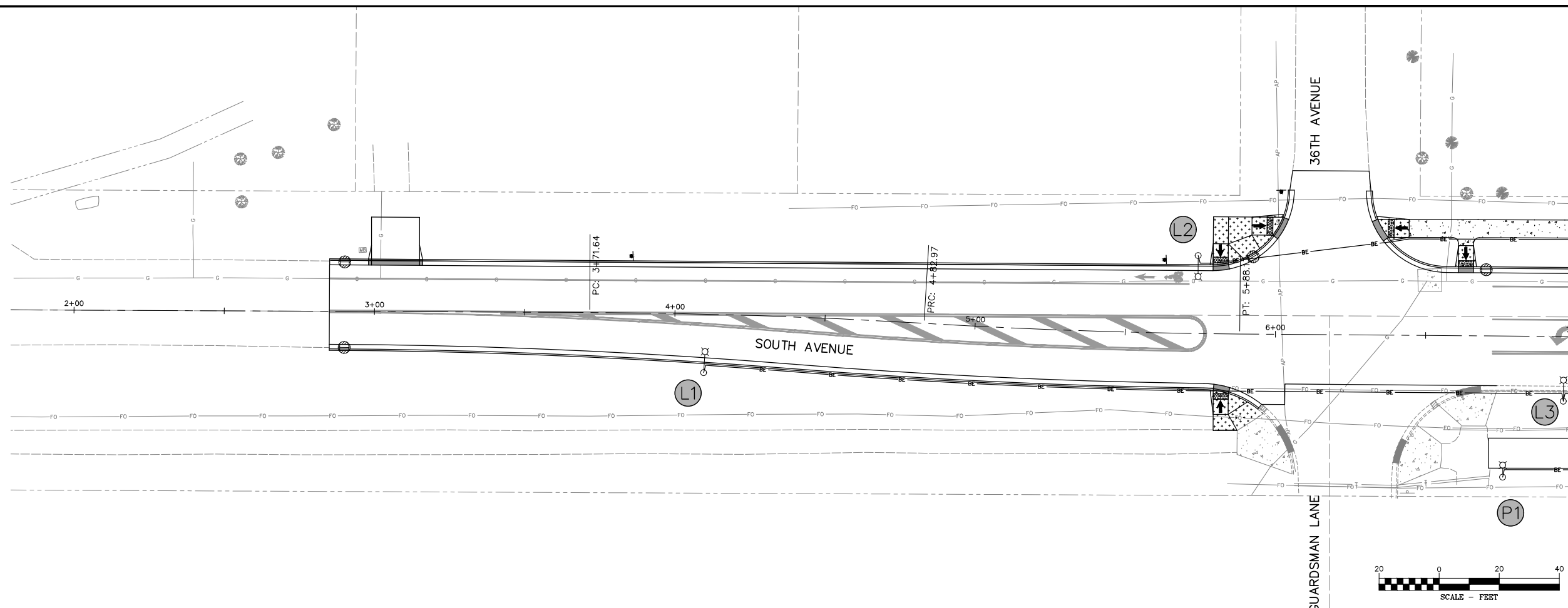
STREET LIGHTING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: EL6
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET E1 OF E8



FILE: W:\Projects\170410\CAD_Data\Design\170410_EL6.dwg



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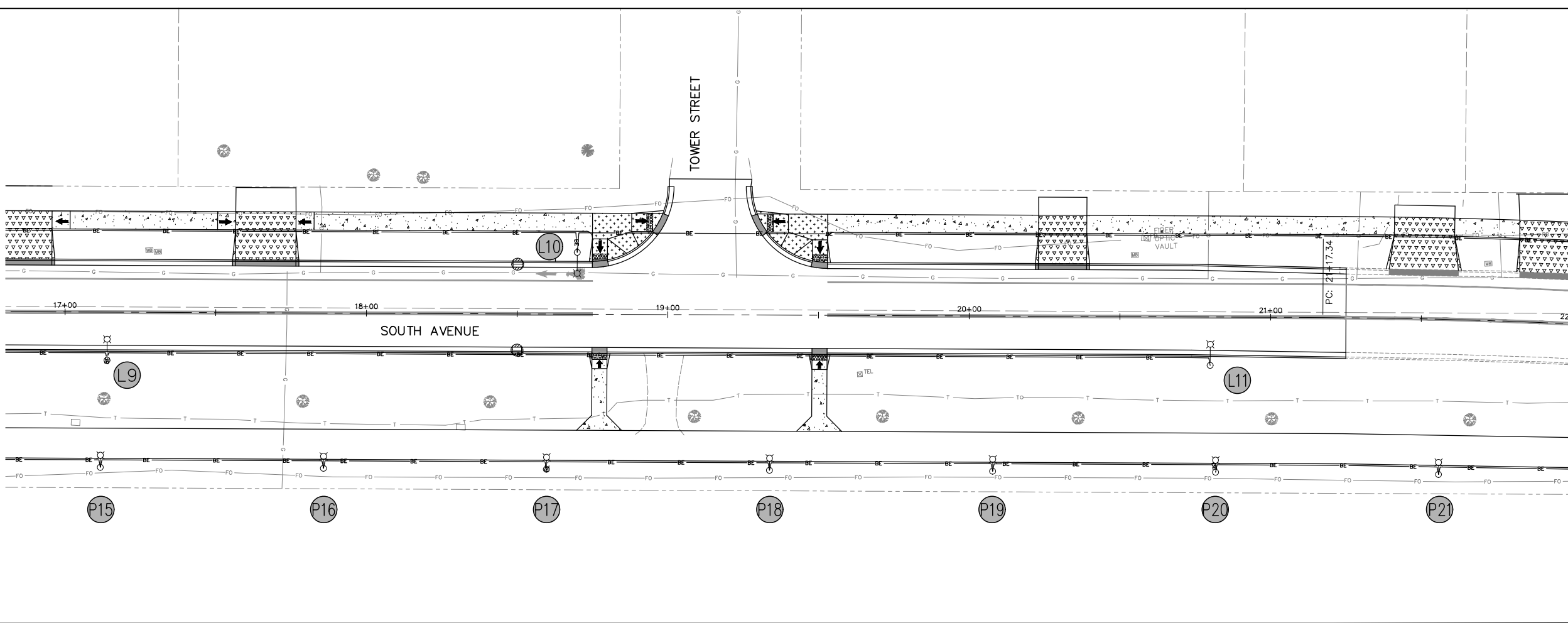
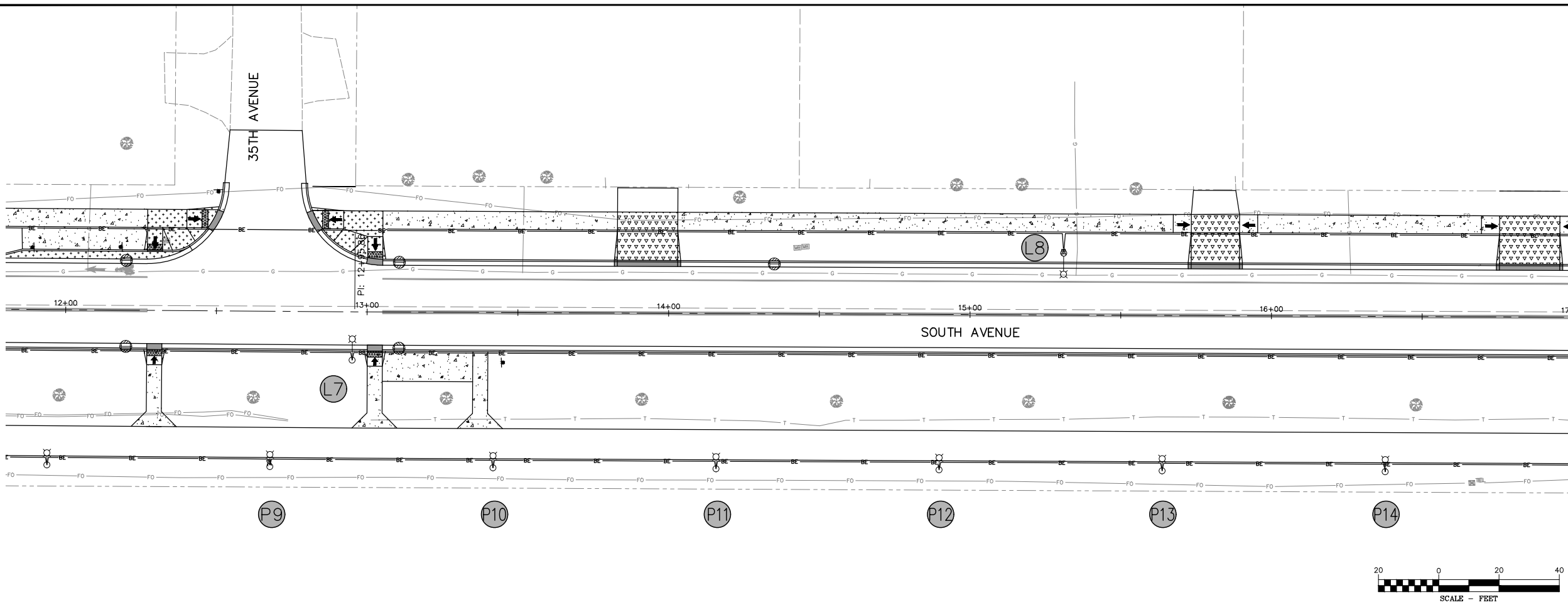
STREET LIGHTING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: EL7
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET E2 OF E8



FILE: W:\Projects\170410\CAD_Data\Design\170410_EL7.dwg



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STREET LIGHTING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

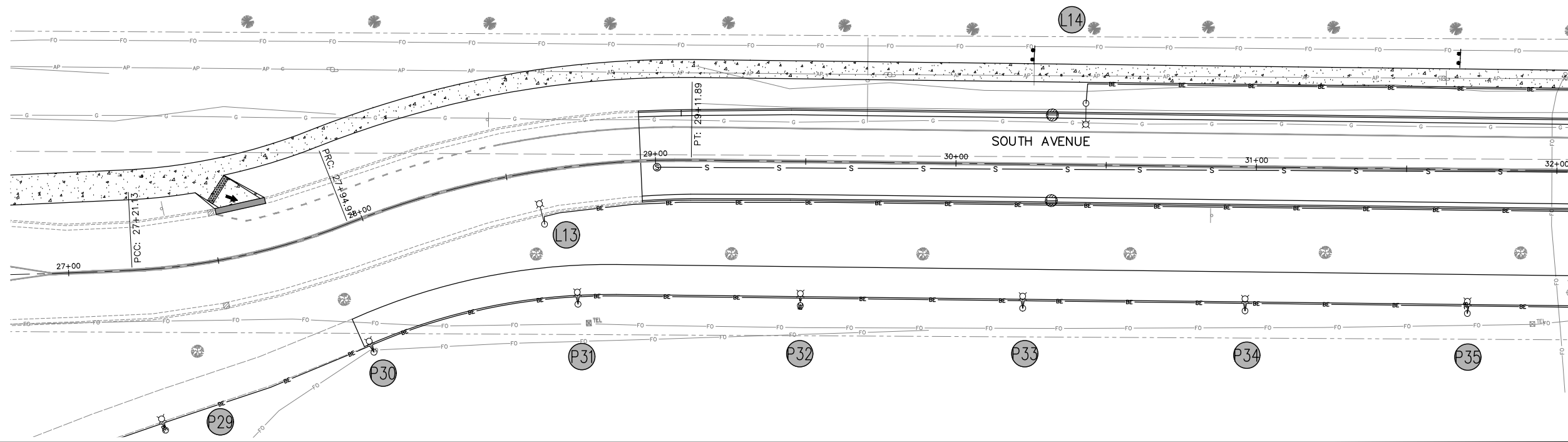
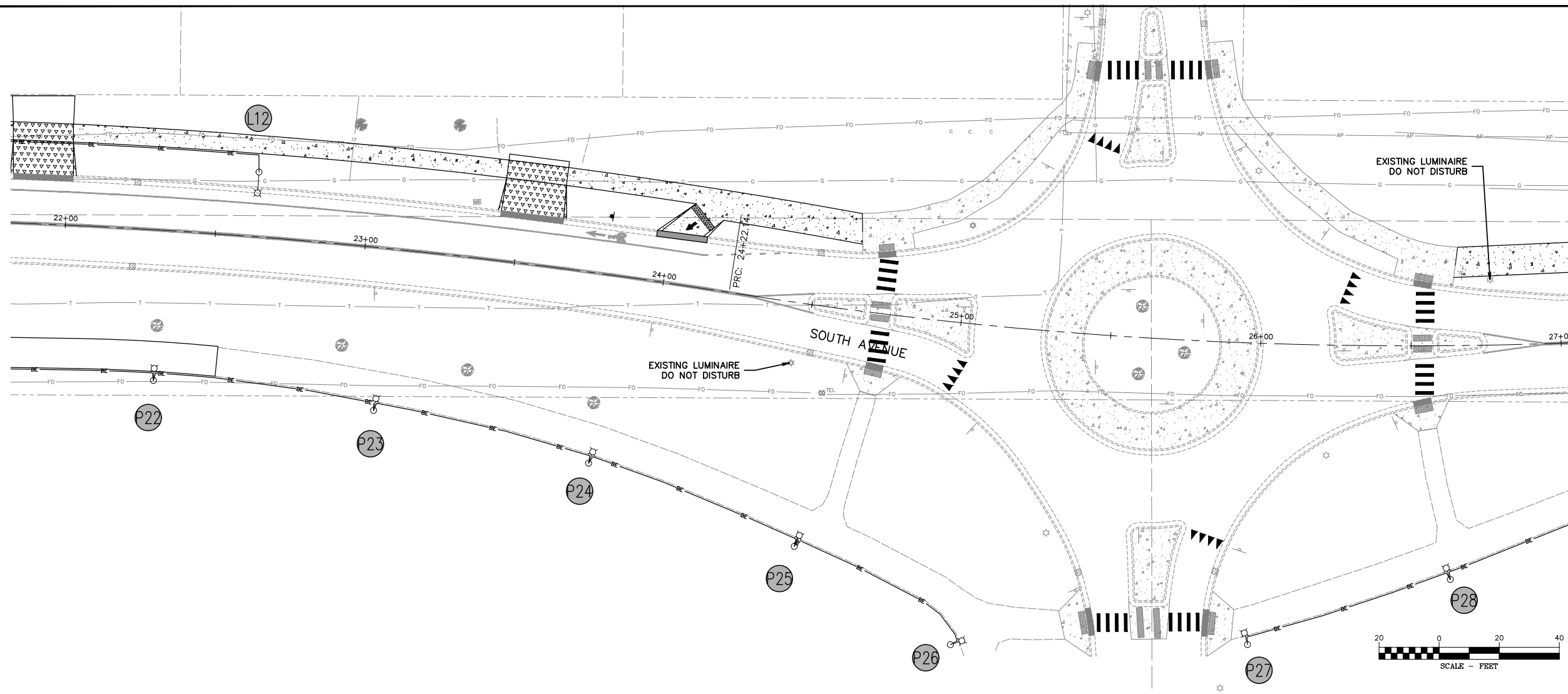
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: EL8
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET E3 OF E8



FILE: W:\Projects\170410\CAD_Data\Design\170410_EL8.dwg



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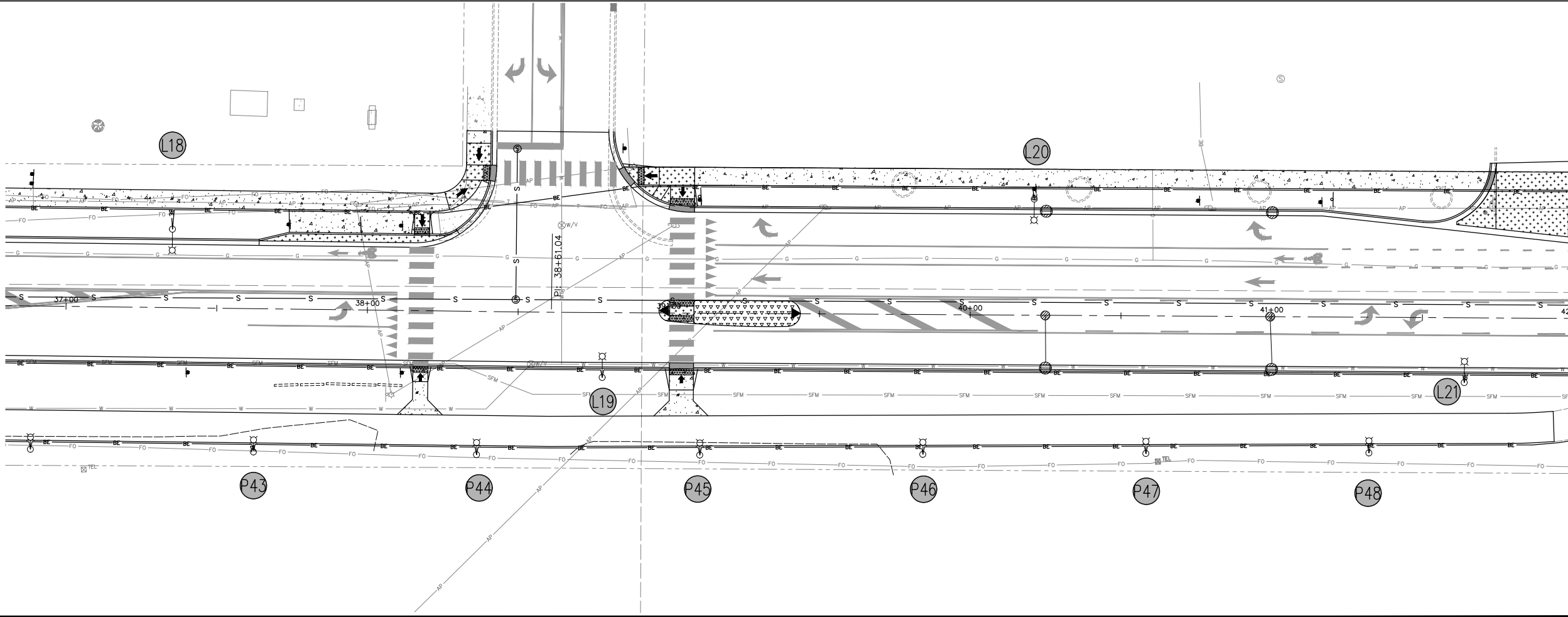
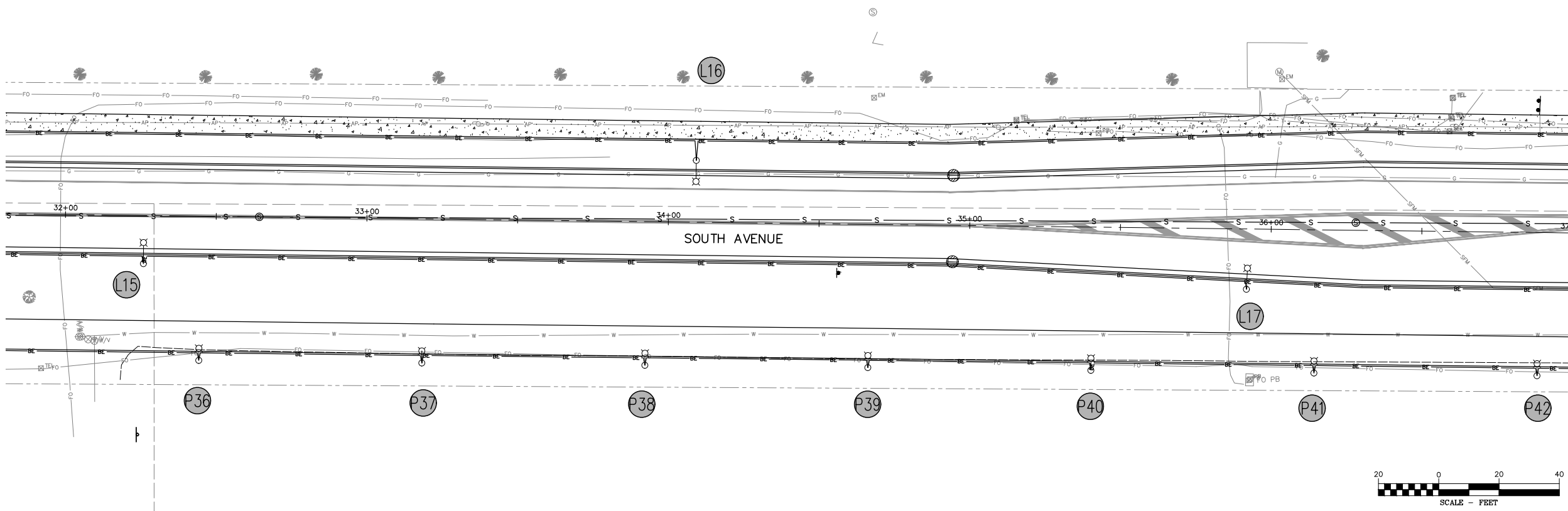
STREET LIGHTING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: EL-9
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET E4 OF E8



FILE: W:\Projects\170410\CAD_Data\Design\170410_EL.dwg



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STREET LIGHTING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

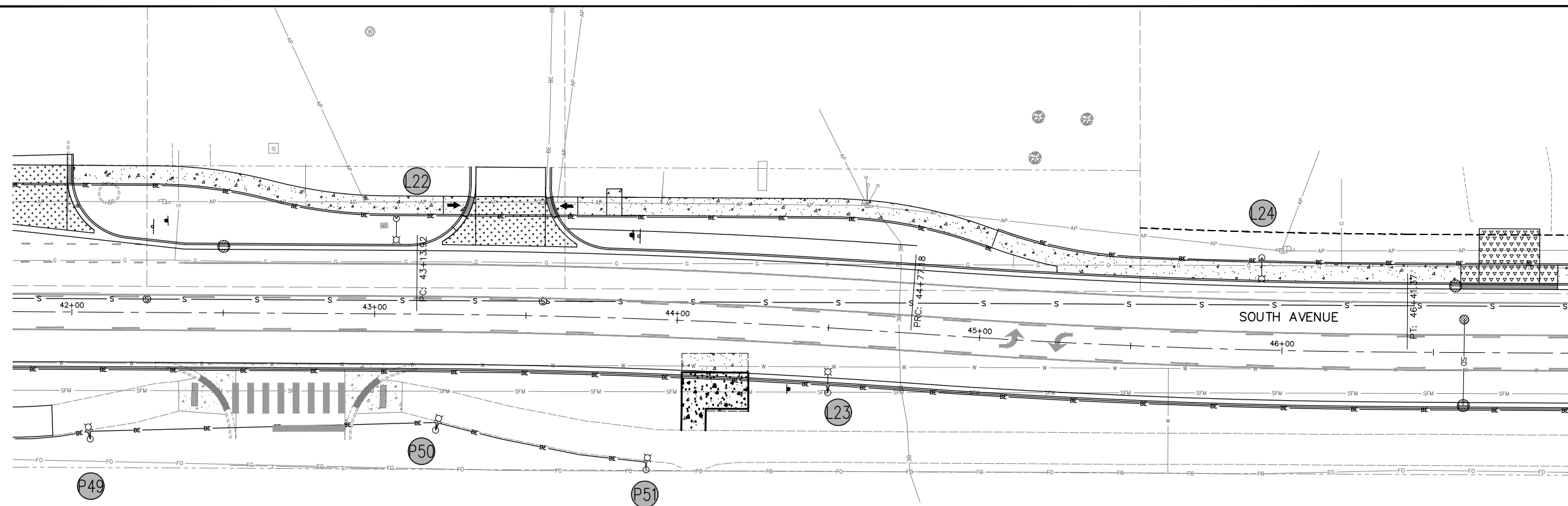
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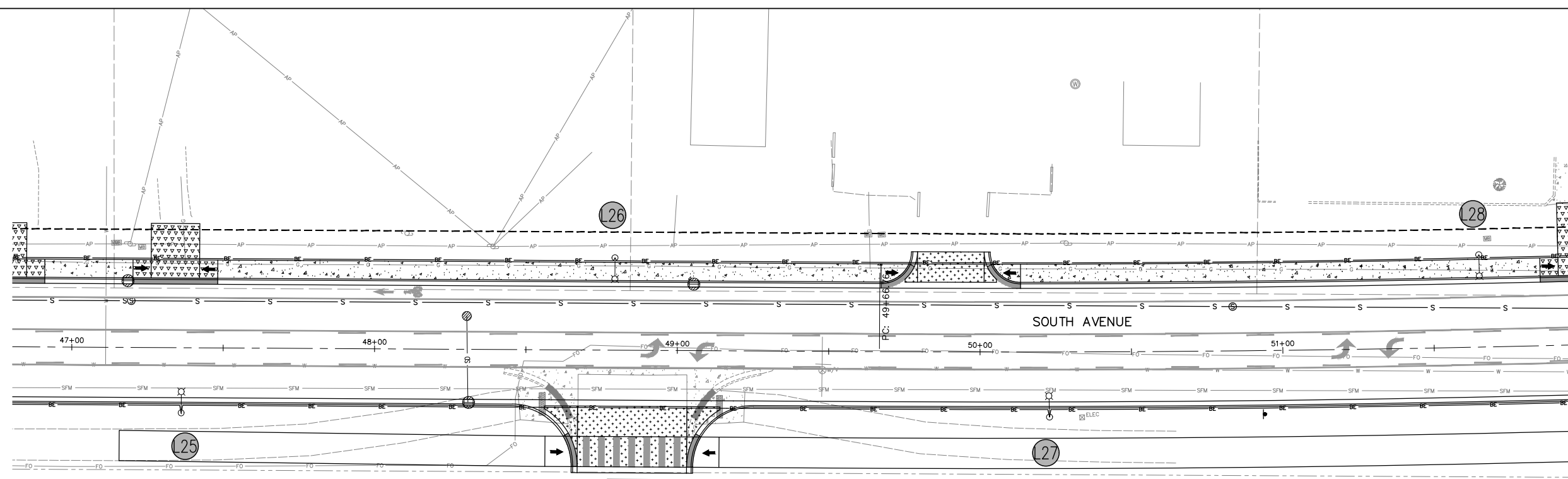
PROJECT: 17-04-10
LAYOUT: EL10
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET E5 OF E8



NOTE TO STEPHEN - CONFIRM WITH CITY THAT THEY ARE OK WITH POLE PARTIALLY ON COUNTY PROPERTY (P51- P55)



FILE: W:\Projects\170410\CAD_Data\Design\170410_EL10.dwg



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PLOTTED: 9/13/22
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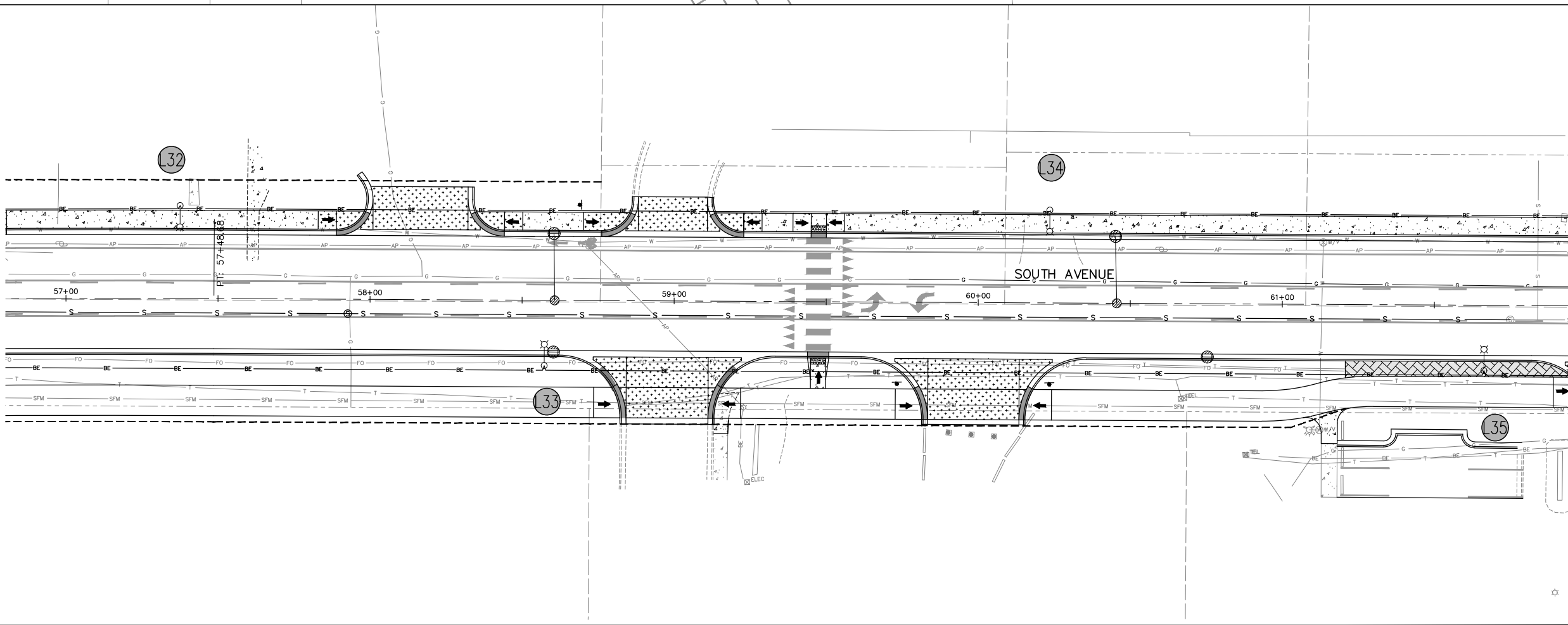
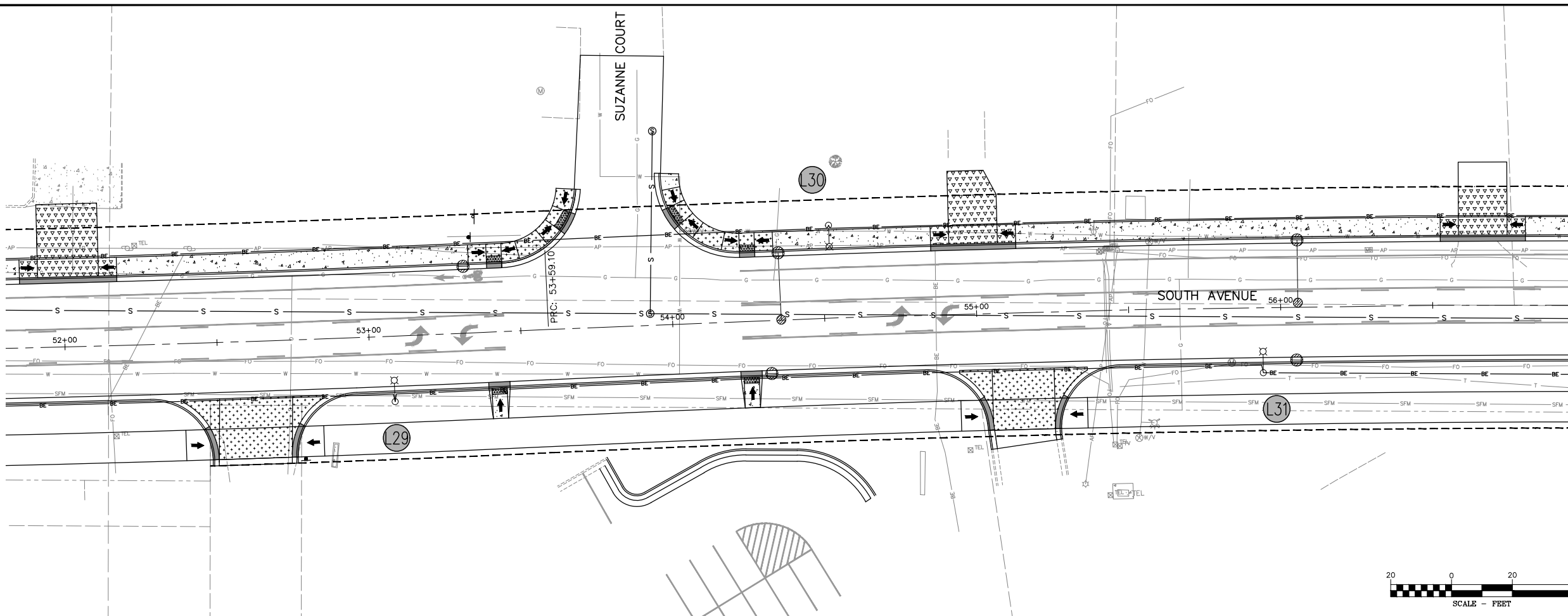
STREET LIGHTING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: EL11
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET **E6 OF E8**



FILE: W:\Projects\170410\CAD_Data\Design\170410_EL.dwg



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SAVED: 9/13/22

STREET LIGHTING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

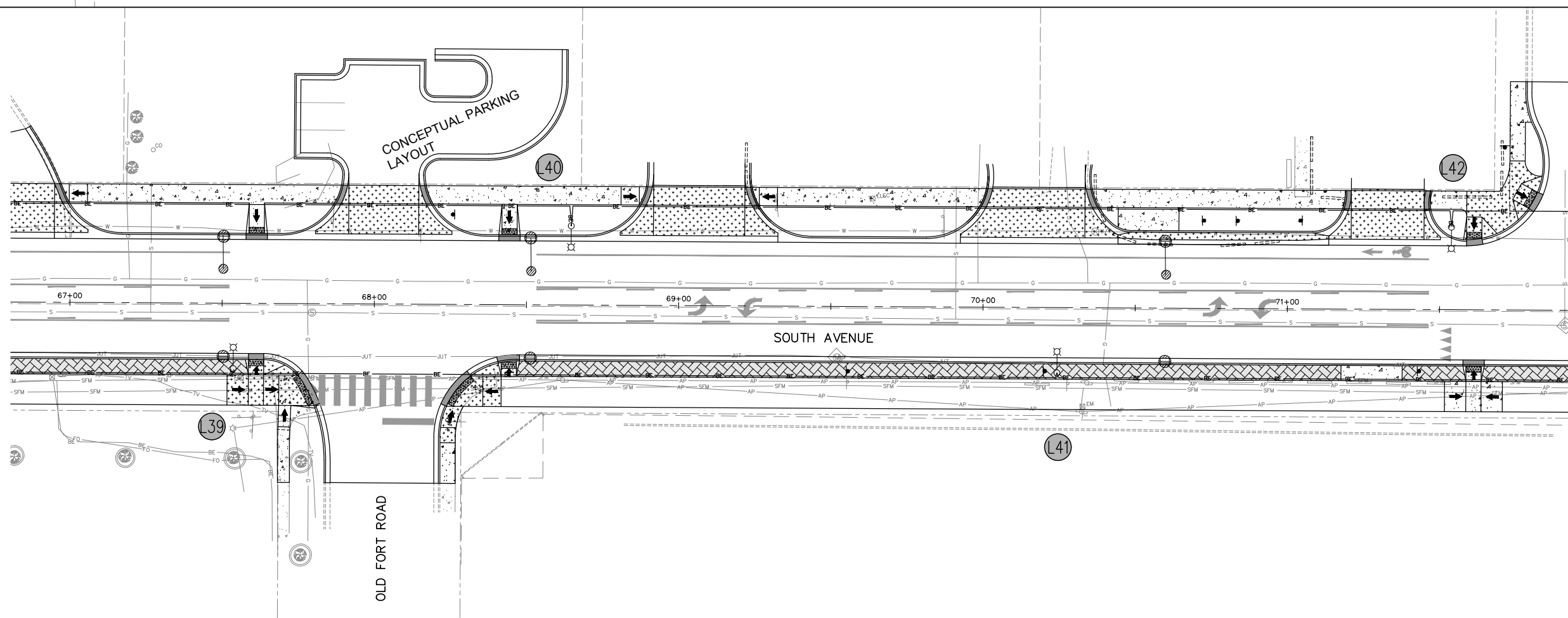
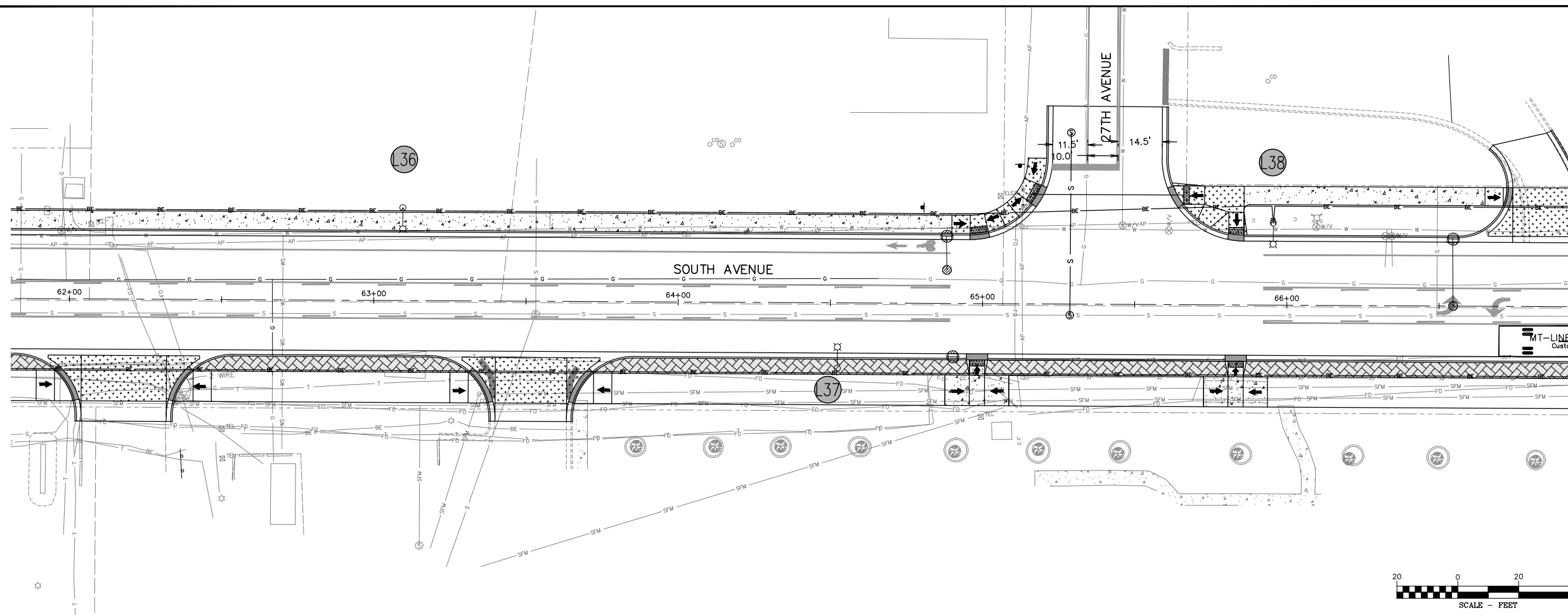
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: EL12
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET E7 OF E8



FILE: W:\Projects\170410\CAD_Data\Design\170410_EL12.dwg



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PLOTTED: 9/13/22
SAVED: 9/13/22

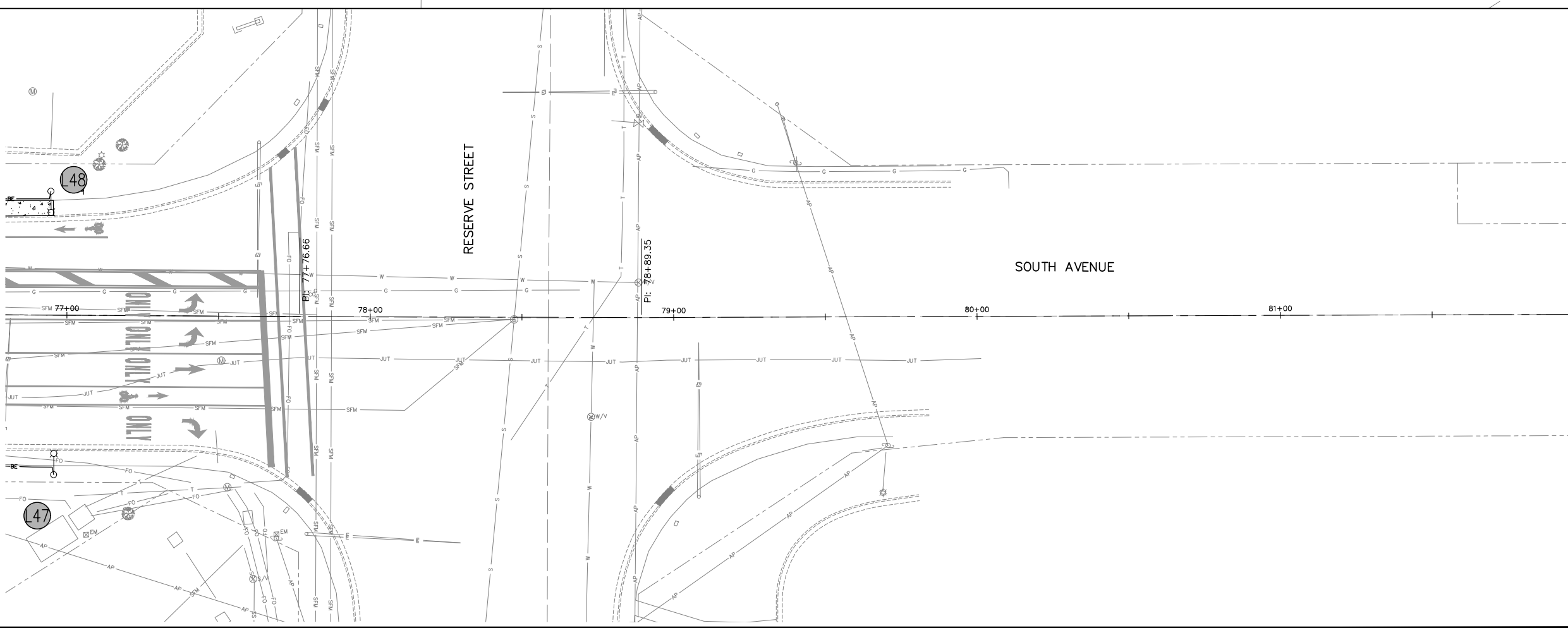
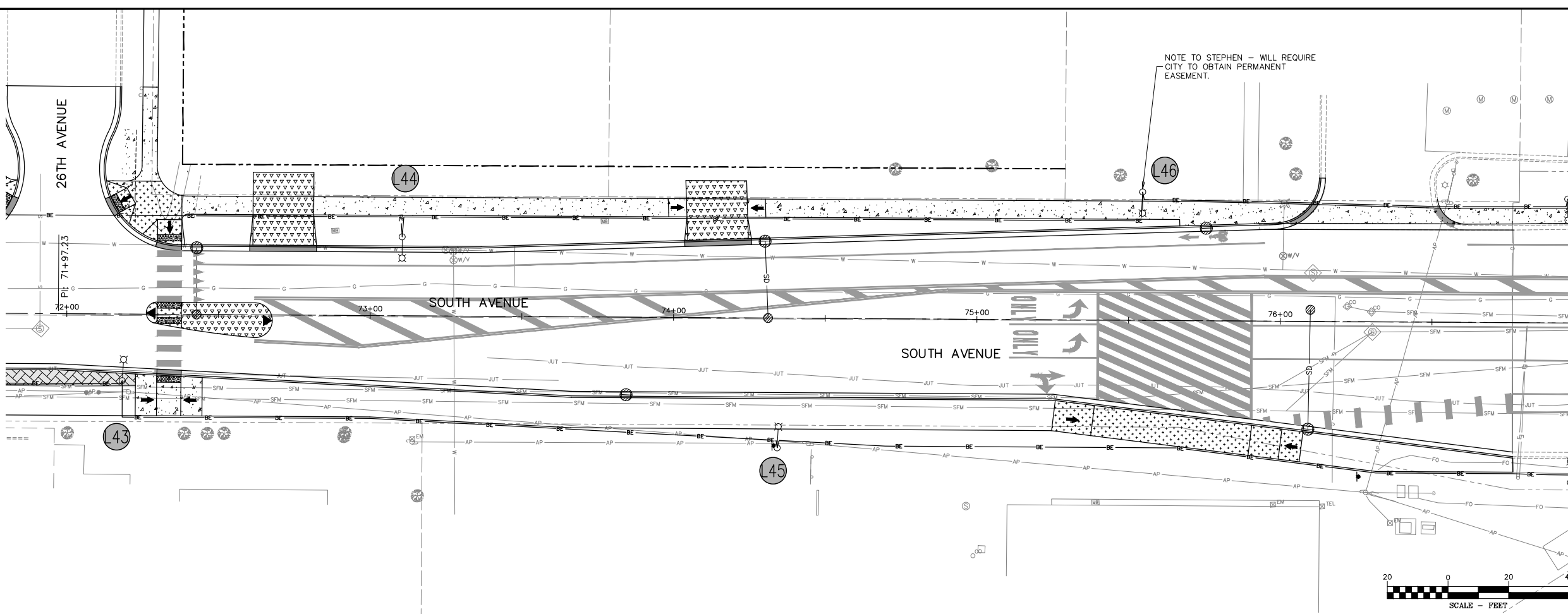
STREET LIGHTING PLANS
SOUTH AVENUE RECONSTRUCTION
MISSOULA, MONTANA

REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 17-04-10
LAYOUT: EL13
SURVEYED: WGM
DESIGN: SMM
DRAFT: DKD/BEA
APPROVE: TDI
DATE:

SEPTEMBER 2022

SHEET E8 OF E8



FILE: W:\Projects\170410\CAD_Data\Design\170410_EL13.dwg

SOUTH AVENUE CLEMENTS RD. TO 36TH AVE. PROJECT MISSOULA, MONTANA



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PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/12/22

COVER SHEET
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

LEGEND-EXISTING

---	RIGHT OF WAY
- - - -	EASEMENT LINE
---	LOT LINE
////	EXTERIOR BUILDING WALL
▨	CONCRETE SIDEWALK
---	EDGE OF ASPHALT
=====	CURB AND GUTTER
=====	CURB AND GUTTER W/DRIVEWAY OPENING
- - - -	EDGE OF GRAVEL
W	WATER MAIN
WS	WATER SERVICE
S	SANITARY SEWER MAIN
SS	SANITARY SEWER SERVICE
SD	STORM DRAIN
AP	AERIAL POWER LINE
BE	BURIED ELECTRIC LINE
AT	AERIAL TELEPHONE LINE
T	BURIED TELEPHONE LINE
FO	BURIED FIBER OPTIC
ATV	AERIAL CABLE TELEVISION
TV	BURIED CABLE TELEVISION
G	GAS MAIN
X - X	FENCE
- - - -	IRRIGATION DITCH
~~~~~	CONTOUR (1 FOOT INTERVAL)
⊕	CURB BOX/WATER SERVICE VALVE
⊗	WATER VALVE
⊕	FIRE HYDRANT
⊕	YARD HYDRANT
⊕	BLOW OFF
⊕	WATER METER
⊕	WELL
⊕	SANITARY SEWER MANHOLE
⊕	SANITARY SEWER CLEANOUT
⊕	GREASE TRAP MANHOLE
⊕	STORM DRAIN MANHOLE
⊕	ROOF DRAIN SUMP
⊕	DRAINAGE SUMP
⊕	UTILITY POLE
⊕	GUY WIRE
⊕	LIGHT POLE
⊕	ELECTRIC PEDESTAL
⊕	ELECTRIC METER
⊕	PULL BOX
⊕	TELEPHONE PEDESTAL
⊕	CABLE TELEVISION PEDESTAL
⊕	IRRIGATION CONTROL VALVE
⊕	GAS METER
⊕	GAS MAIN VALVE
⊕	EVERGREEN TREE (SIZE AS NOTED)
⊕	DECIDUOUS TREE (SIZE AS NOTED)
⊕	BUSH
⊕	DRIP LINE OF TREE
⊕	MAIL BOX
⊕	SIGN
⊕	SURVEY MONUMENT
⊕	CONTROL POINT
⊕	TEMPORARY BENCH MARK



### LEGEND-PROPOSED

---	EDGE OF ASPHALT
=====	CURB AND GUTTER (CATCH)
=====	CURB AND GUTTER (SPILL)
=====	CURB AND GUTTER LAYDOWN
▨	4" THICK CONCRETE SIDEWALK
▨	6" THICK CONCRETE SIDEWALK
▨	8" THICK CONCRETE SIDEWALK
---	2" MILL & FILL
---	ASPHALT
W	WATER MAIN
WS	WATER SERVICE
SD	STORM DRAIN
BE	BURIED ELECTRIC LINE
X - X	FENCE
- - - -	IRRIGATION DITCH
---	IRRIGATION LINE
---	SLEEVE
~~~~~	CONTOUR (1 FOOT INTERVAL)
---	IRRIGATION CULVERT
---	HANDRAIL
⊕	RRFB
⊕	STORM DRAIN MANHOLE
⊕	DRAINAGE SUMP
⊕	DRAINAGE INLET (CURB BACKED LID)
⊕	DRAINAGE SUMP (CURB BACKED LID)
⊕	LIGHT POLE
⊕	SIGN
⊕	DETECTABLE WARNING DEVICE

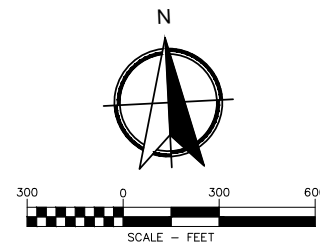
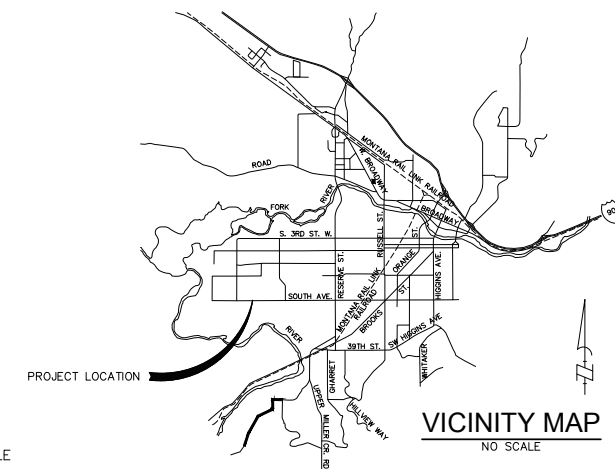
GENERAL NOTES: (CIVIL DRAWINGS)

- ALL WORK SHALL CONFORM TO THE MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS, SIXTH EDITION, APRIL 2010, AS AMENDED BY THE CITY OF MISSOULA.
- CONTRACTOR SHALL FIELD VERIFY THE LOCATION, SIZE, AND DEPTH OF ALL UTILITIES INCLUDING ALL SERVICES TO ALL PROPERTIES. THESE DRAWINGS MAY NOT SHOW ALL FACILITIES. THE DEPTHS OF ALL EXISTING UTILITIES ARE UNKNOWN. BURIED UTILITIES SHOWN ON THIS SITE ARE BASED ON AVAILABLE RECORDS AND UTILITY LOCATOR PAINT MARKS. CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES DURING CONSTRUCTION.
- CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS FROM CITY OF MISSOULA, STATE OF MONTANA, AND UTILITY COMPANIES PRIOR TO STARTING WORK.
- ALL CONCRETE AREAS ARE DESIGNED TO HAVE A 1.0% MAXIMUM CROSS SLOPE UNLESS OTHERWISE SHOWN ON THE PLANS.
- ALL MATERIALS AND WORKMANSHIP OF IMPROVEMENTS SHALL MEET OR EXCEED ADA AS WELL AS STATE AND LOCAL REGULATIONS. WHERE THERE IS A CONFLICT BETWEEN THESE PLANS AND THE SPECIFICATIONS, OR ANY APPLICABLE STANDARD, THE HIGHER QUALITY STANDARD SHALL APPLY.
- CONTRACTOR TO VERIFY EXISTING CONDITIONS PRIOR TO BIDDING THE PROJECT AND BEGINNING CONSTRUCTION.
- CONTRACTOR RESPONSIBLE FOR INSTALLING AND MAINTAINING ALL EROSION CONTROL MEASURES, AND PROTECTING HAUL OFF/DROP ON ONTO ADJACENT PARKING AREAS AND PUBLIC RIGHTS OF WAY. CONTRACTOR RESPONSIBLE FOR CLEANING ANY MATERIAL HAULED OFF/DROP ONTO ADJACENT PARKING AREAS OR PUBLIC RIGHTS OF WAY.
- CONTRACTOR RESPONSIBLE FOR LOCATING EXISTING IRRIGATION SYSTEM AND REPAIRING ANY CONTRACTOR DAMAGE TO SYSTEM.
- GRADING AND SLOPE INFORMATION PRESENTED IN THIS PLAN SET IS BASED ON DESIGN GRADES AND BEST AVAILABLE MAPPING INFORMATION. EXISTING ELEVATIONS AT TIE IN POINT ELEVATIONS SHALL BE VERIFIED PRIOR TO INSTALLATION OF EXTERIOR IMPROVEMENTS. NOTIFY ENGINEER IF DIFFERENT CONDITIONS ARE FOUND. CONTRACTOR RESPONSIBLE FOR ENSURING POSITIVE DRAINAGE AND ADA COMPLIANCE FOR CONSTRUCTED IMPROVEMENTS.
- THIS PLAN IS TO BE USED TO ASSIST THE CONTRACTOR IN HORIZONTAL LOCATION DURING THE STAKING AND LAYOUT. IF THE CONTRACTOR DISCOVERS ANY DISCREPANCY BETWEEN THE GIVEN DATA AND THE INTENT SHOWN BY THE DRAWINGS, THE CONTRACTOR SHALL CONTACT THE ENGINEER FOR CLARIFICATION.



SHEET INDEX

1	COVER SHEET
2	TYPICAL SECTIONS
3-13	STREET PLAN AND PROFILE
S1-S7	SIGNING AND STRIPPING PLANS



CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

WGM GROUP, INC. ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS (HORIZONTAL AND VERTICAL). THE EXISTING UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS HOWEVER, THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 220718
LAYOUT: SHT 1-COVER
SURVEYED: WGM GROUP
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

SEPTEMBER 2022

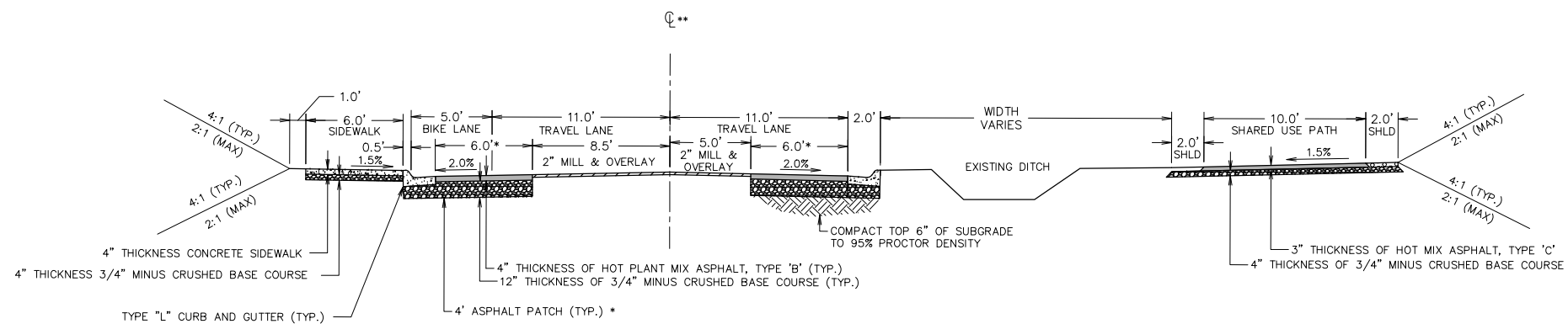
SHEET **1 OF 13**



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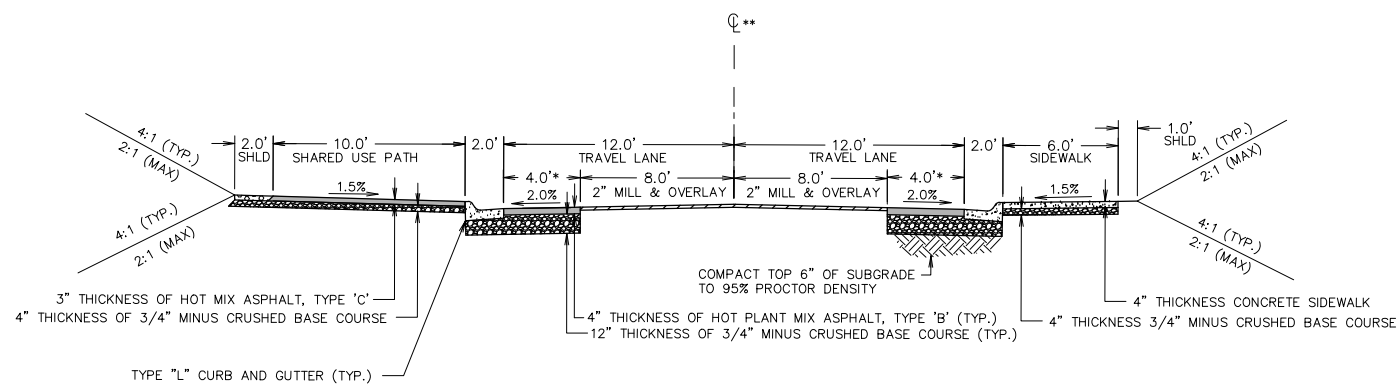
NOTE: END SIDEWALK AND PATH CONSTRUCTION AT INTERSECTION OF SOUTH AVENUE AND 36TH AVENUE.

* ASPHALT PATCH WIDTH VARIES, SEE PLANS.

** CL DIPPICED AS CROWN FOR REVIEW PURPOSES ONLY. ACTUAL CROWN LOCATION VARIES BASED ON ALIGNMENT SHIFTS.

TYPICAL SECTION 1

TWO LANE ROADWAY - SOUTH AVE.
NO SCALE



* ASPHALT PATCH WIDTH VARIES, SEE PLANS.

** CL DIPPICED AS CROWN FOR REVIEW PURPOSES ONLY. ACTUAL CROWN LOCATION VARIES BASED ON ALIGNMENT SHIFTS.

TYPICAL SECTION 2

TWO LANE ROADWAY - CLEMENTS ROAD
NO SCALE

TYPICAL SECTIONS

SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.

MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: TYPICAL
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

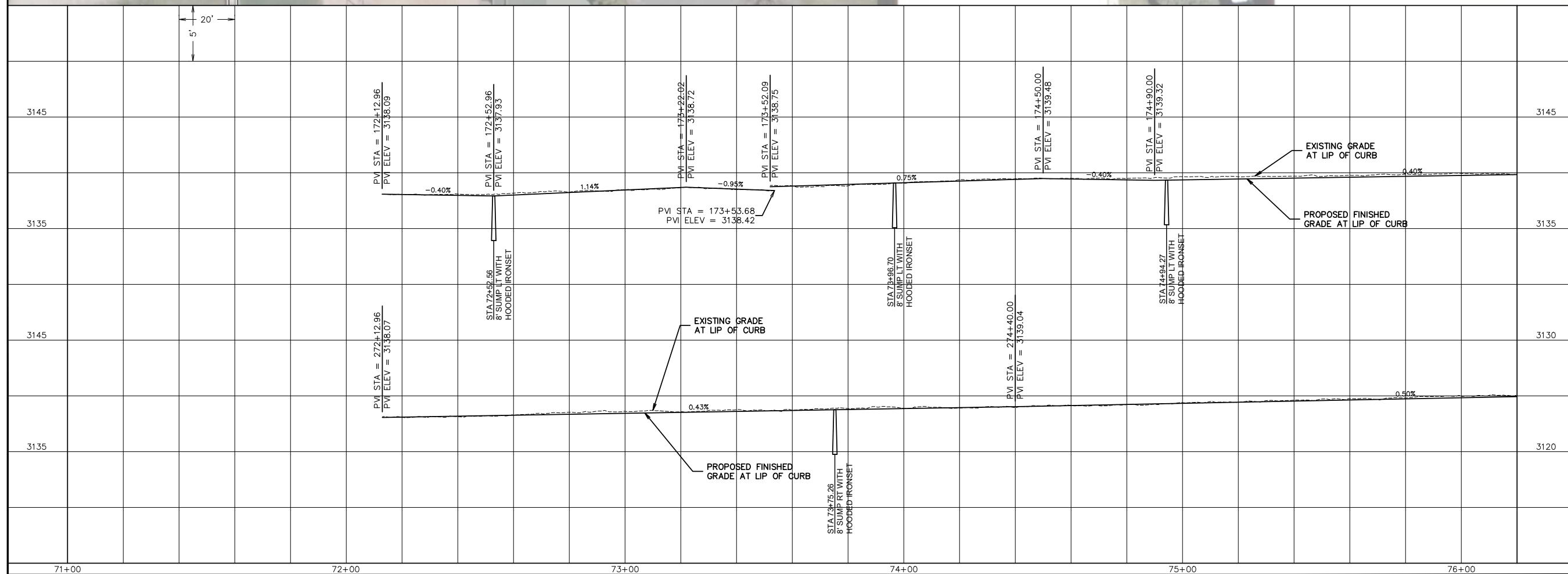
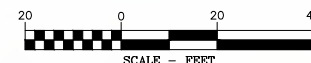
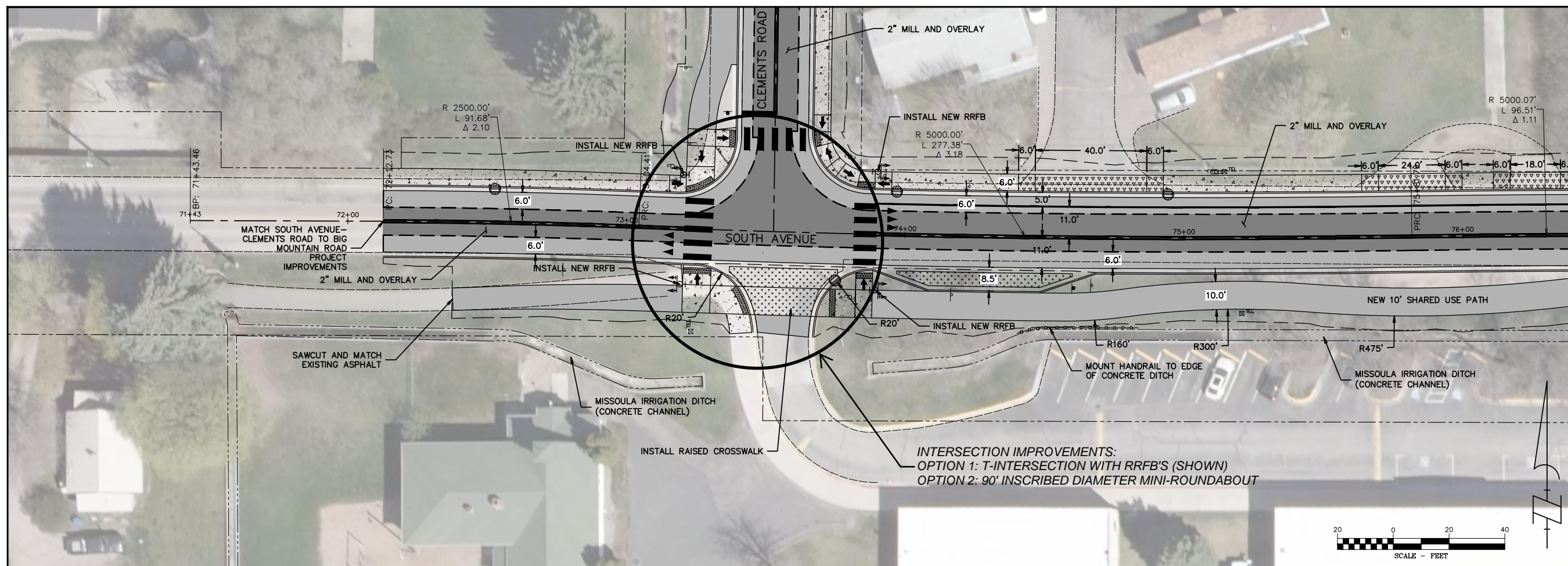
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PLOTTED: 9/13/22
SAVED: 9/13/22



STREET PLAN AND PROFILE

SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.

MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
 LAYOUT: PLP-1
 SURVEYED: WGM
 DESIGN: DG
 DRAFT: BEA
 APPROVE: SM
 DATE:

AUGUST 2022

SHEET

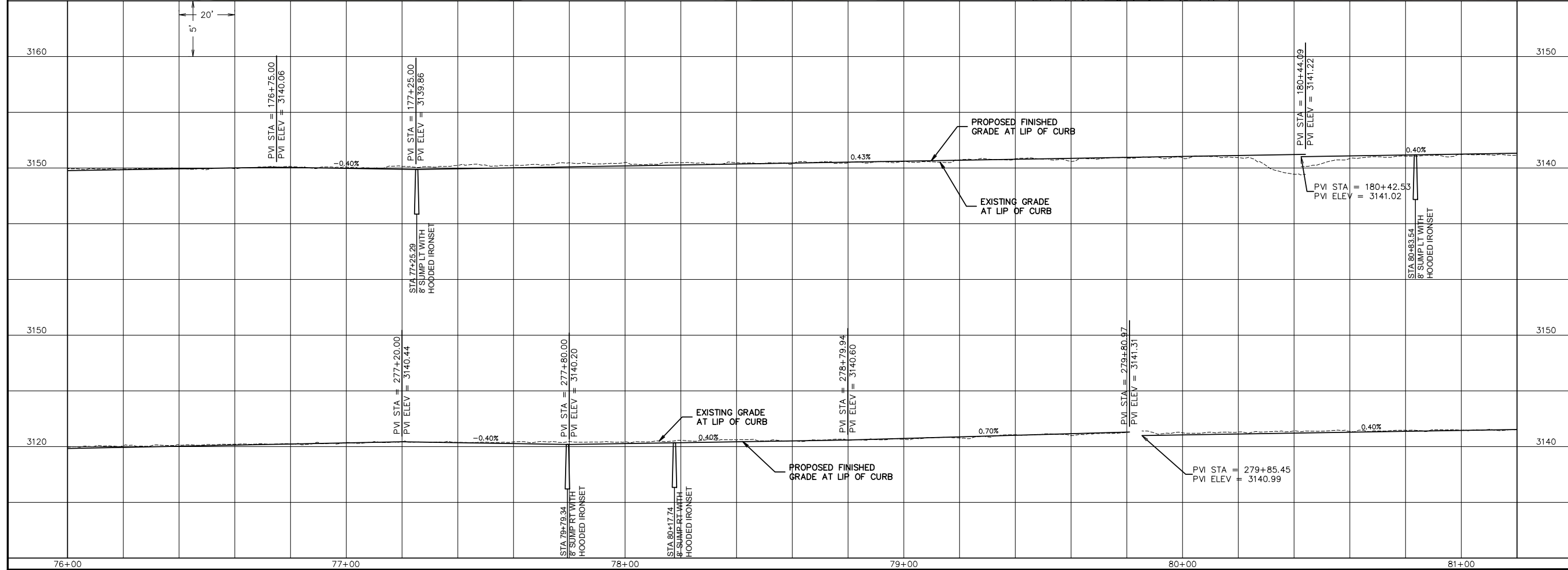
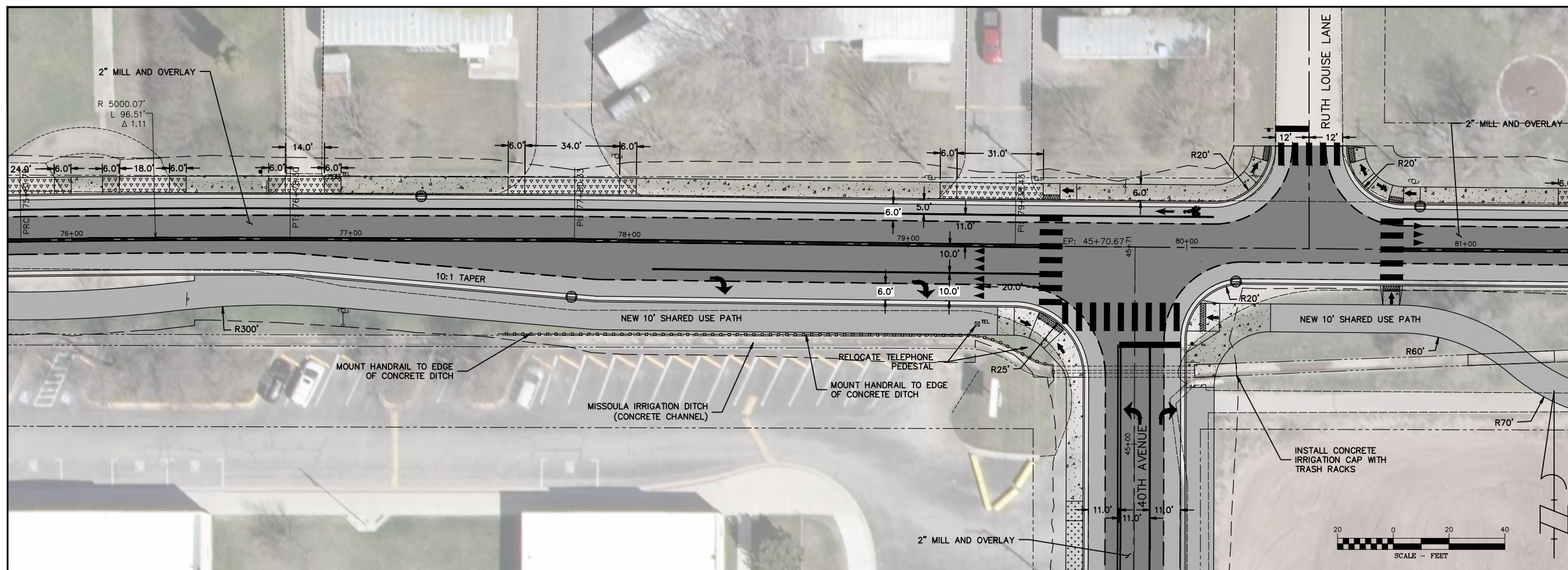
3 OF 13



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PLOTTED: 9/13/22
SAVED: 9/13/22



STREET PLAN AND PROFILE
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

REVISIONS:

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
 LAYOUT: PLP-2
 SURVEYED: WGM
 DESIGN: DG
 DRAFT: BEA
 APPROVE: SM
 DATE:

AUGUST 2022

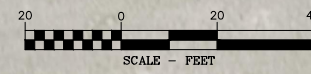
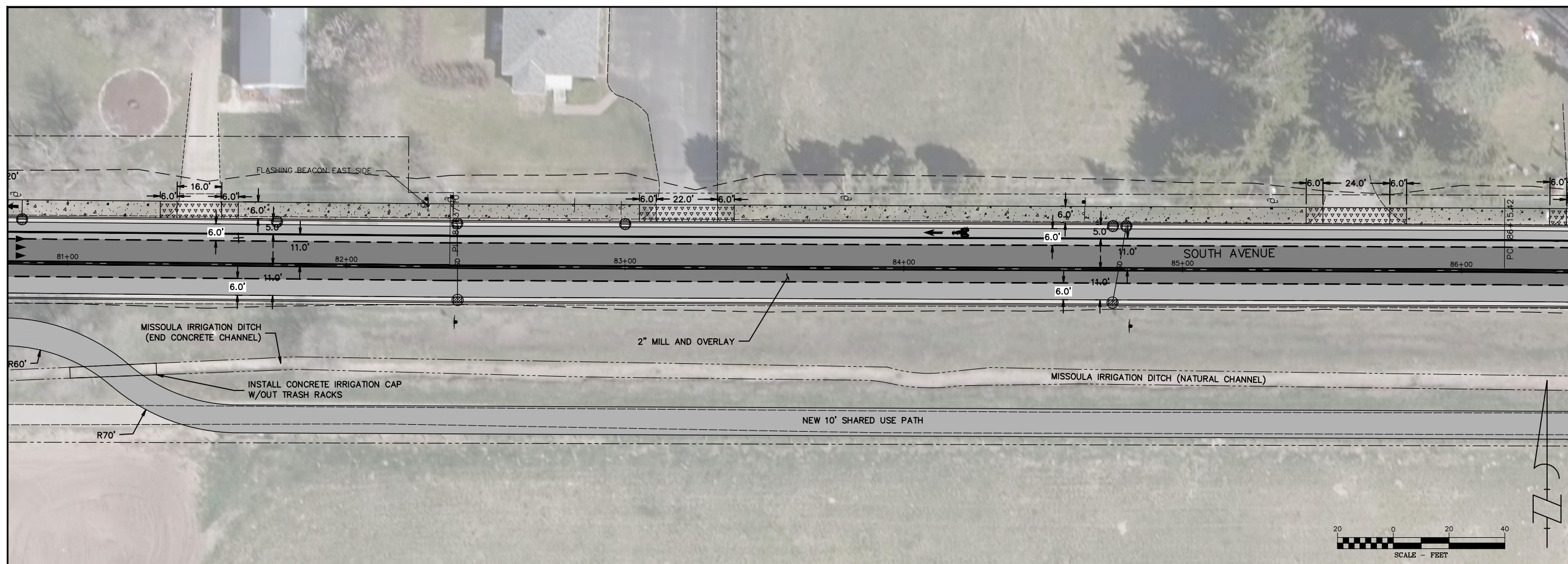
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PLOTTED: 9/13/22
SAVED: 9/13/22



STREET PLAN AND PROFILE
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: PLP-3
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

AUGUST 2022

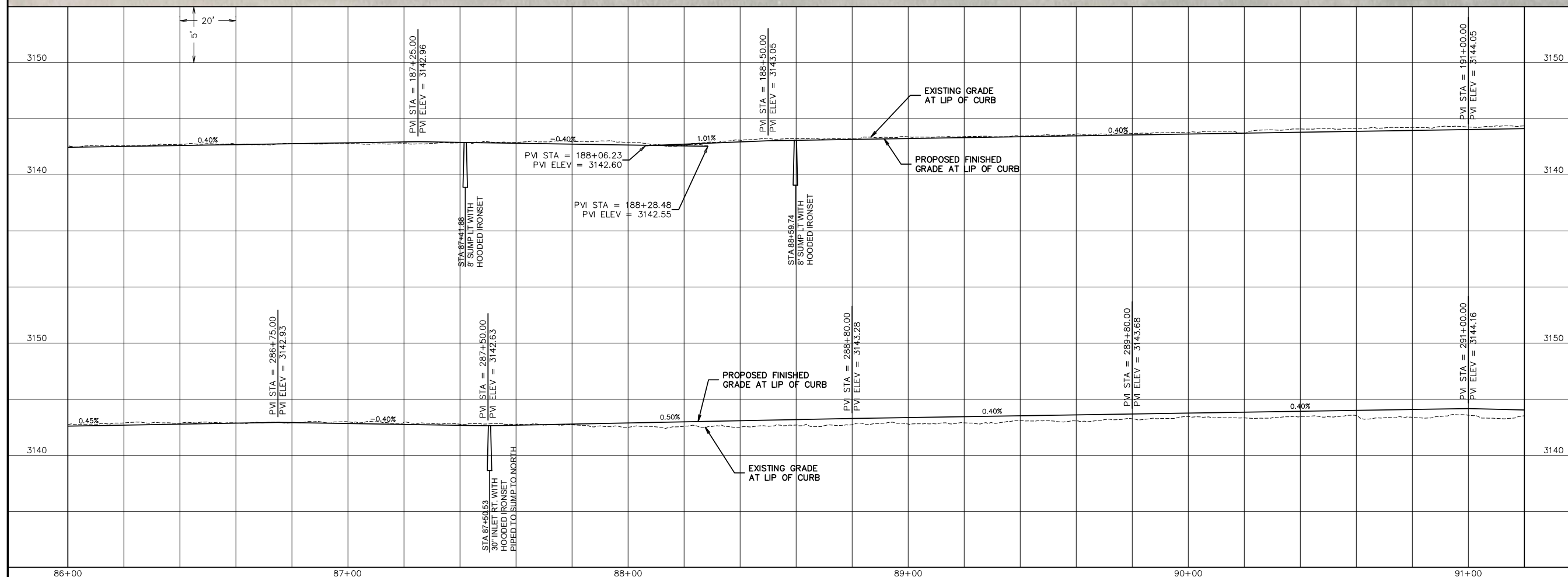
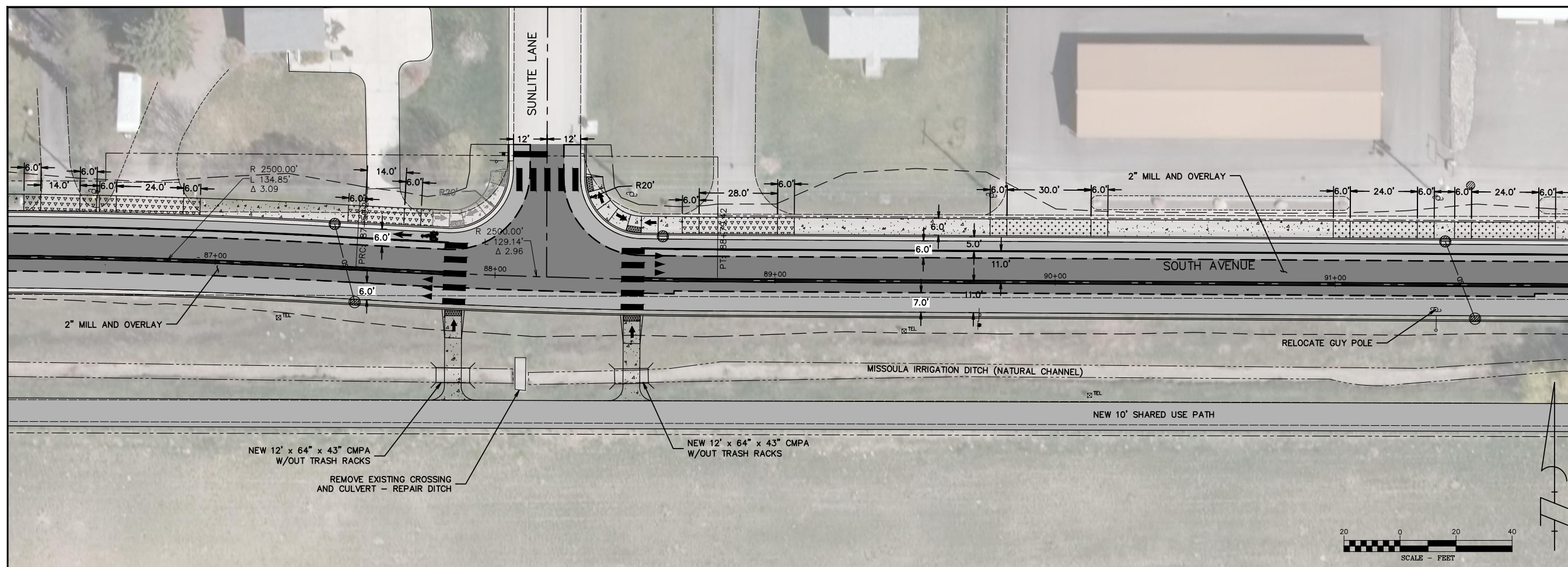
SHEET 5 OF 13



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PLOTTED: 9/13/22
SAVED: 9/13/22



STREET PLAN AND PROFILE

SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
 LAYOUT: PLP-4
 SURVEYED: WGM
 DESIGN: DG
 DRAFT: BEA
 APPROVE: SM
 DATE:

AUGUST 2022

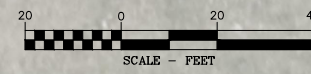
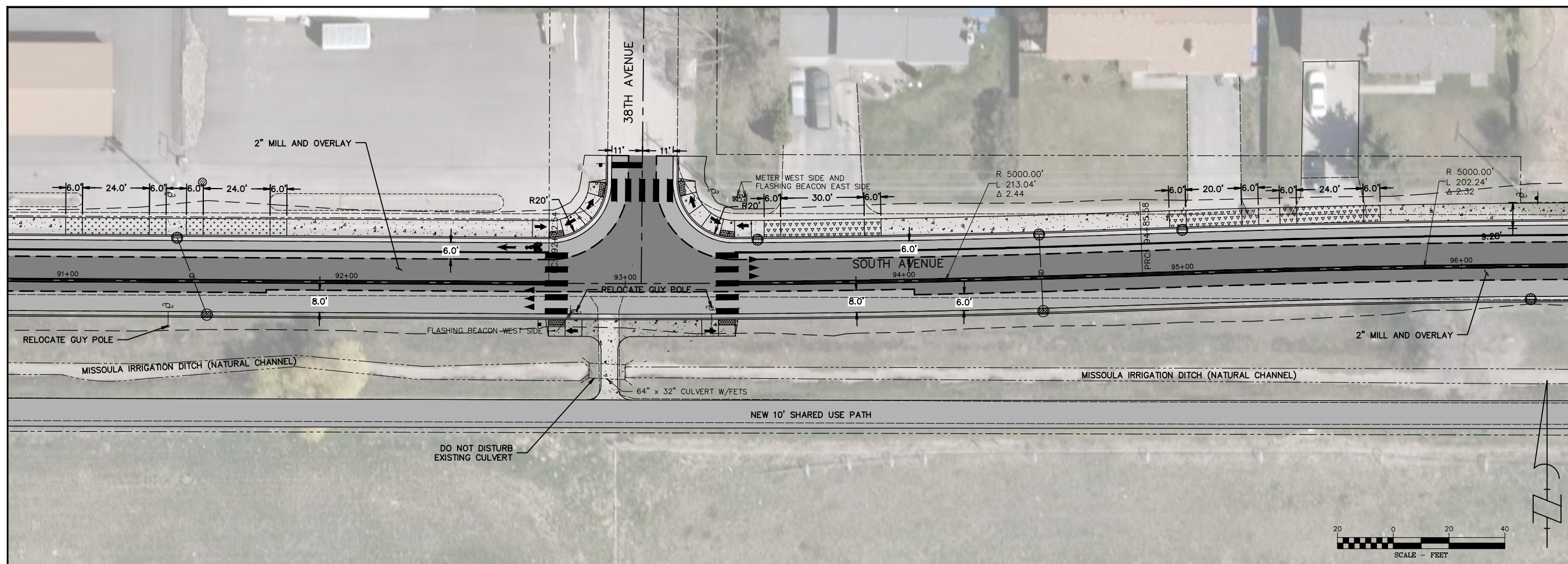
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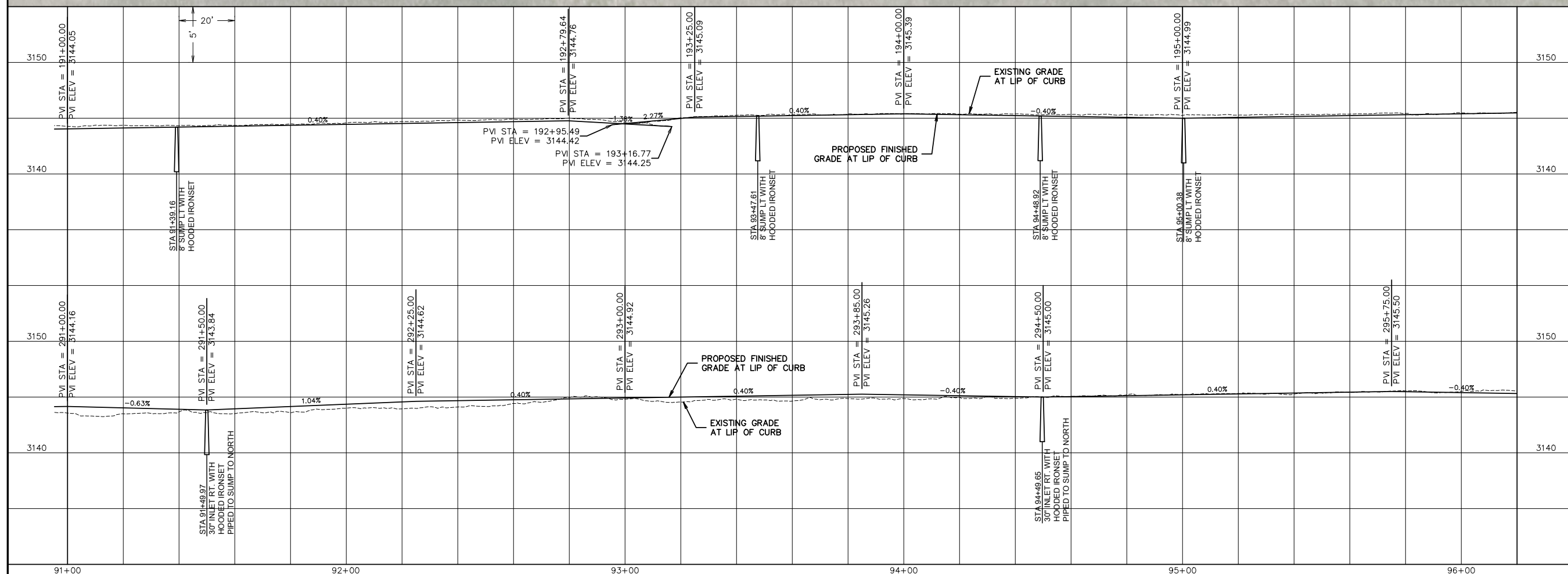
PLOTTED: 9/13/22
SAVED: 9/13/22



STREET PLAN AND PROFILE

SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.

MISSOULA, MONTANA



NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
 LAYOUT: PLP-5
 SURVEYED: WGM
 DESIGN: DG
 DRAFT: BEA
 APPROVE: SM
 DATE: AUGUST 2022

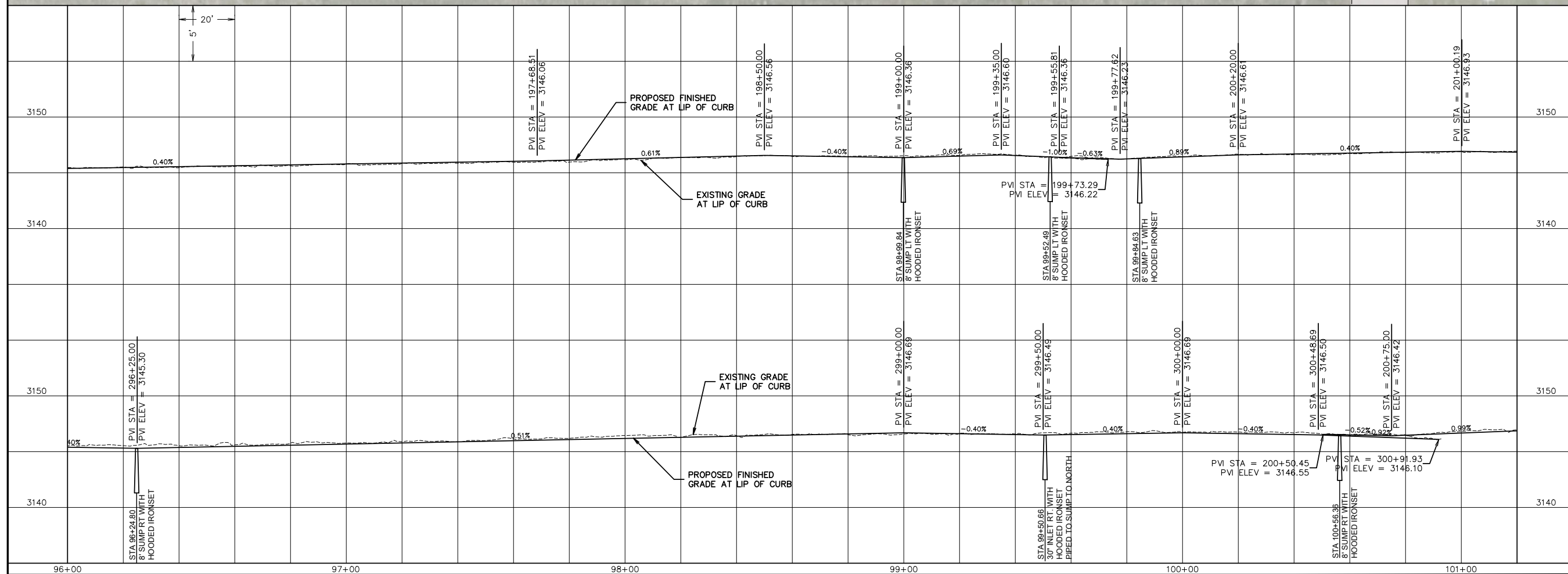
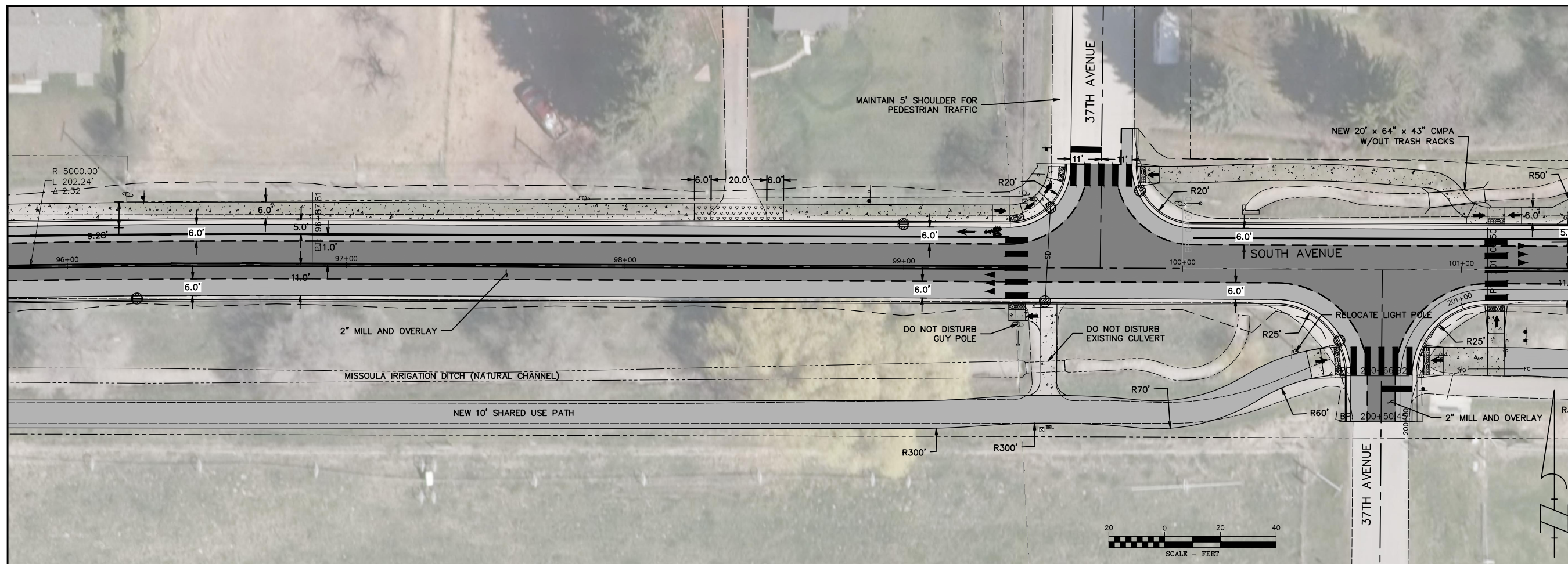
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STREET PLAN AND PROFILE
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: PLP-6
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

AUGUST 2022

SHEET

8 OF 13

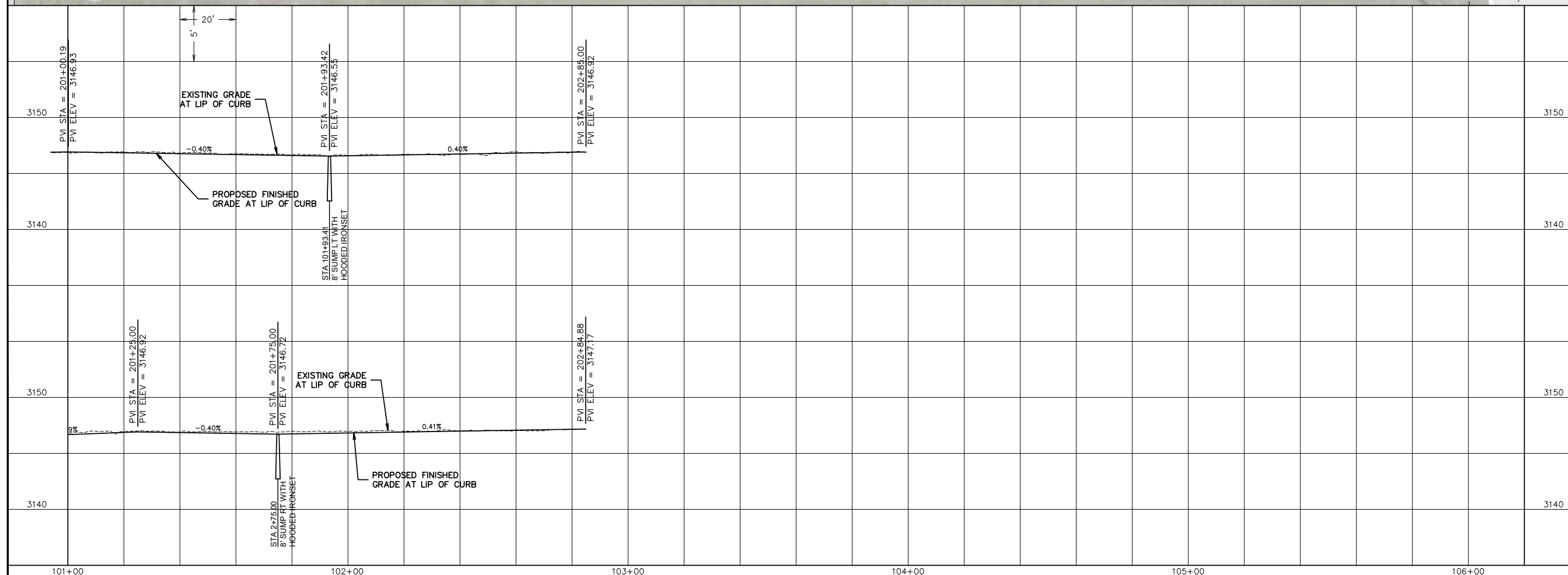
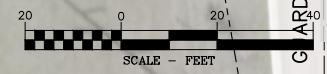
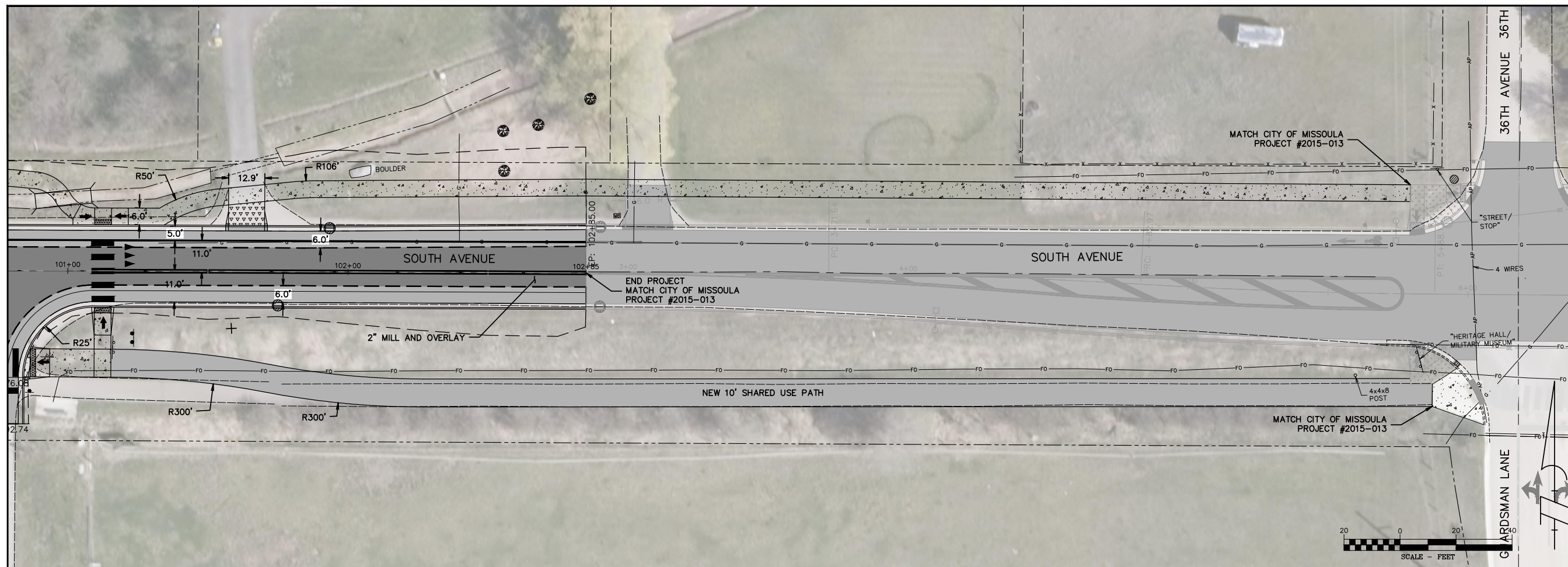


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PLOTTED: 9/13/22
SAVED: 9/13/22

STREET PLAN AND PROFILE
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA



REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: PLP-7
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

AUGUST 2022

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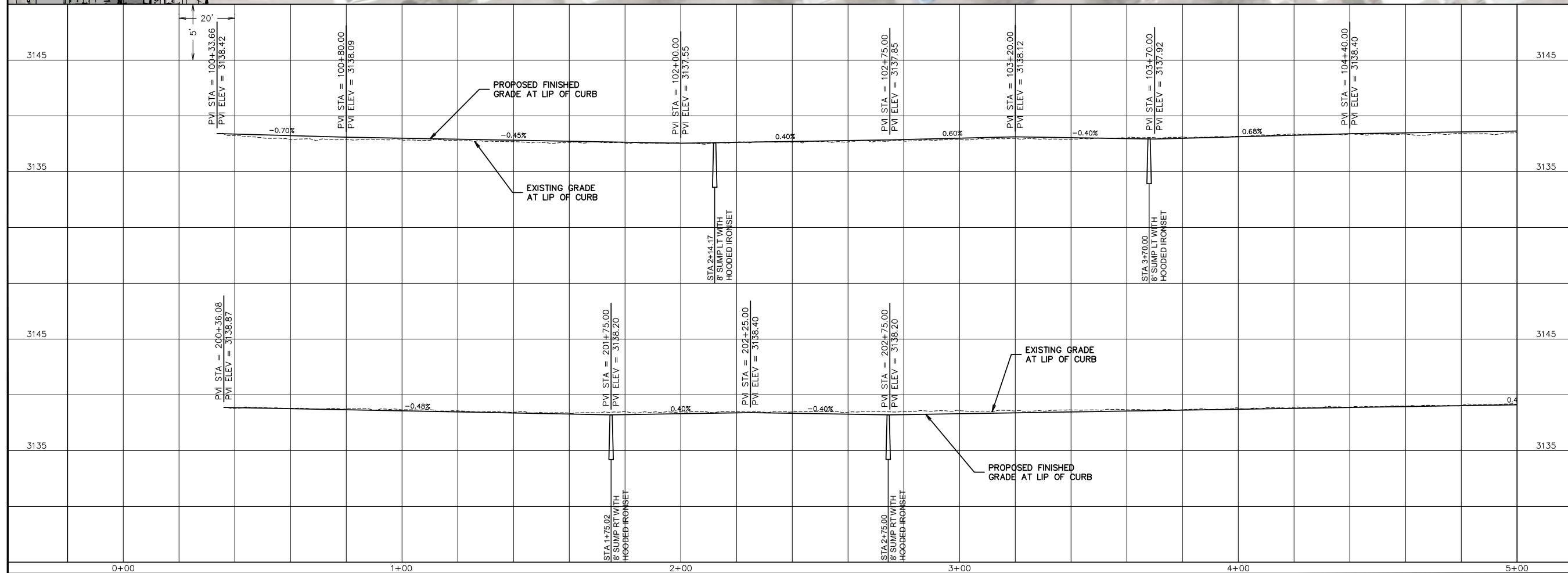
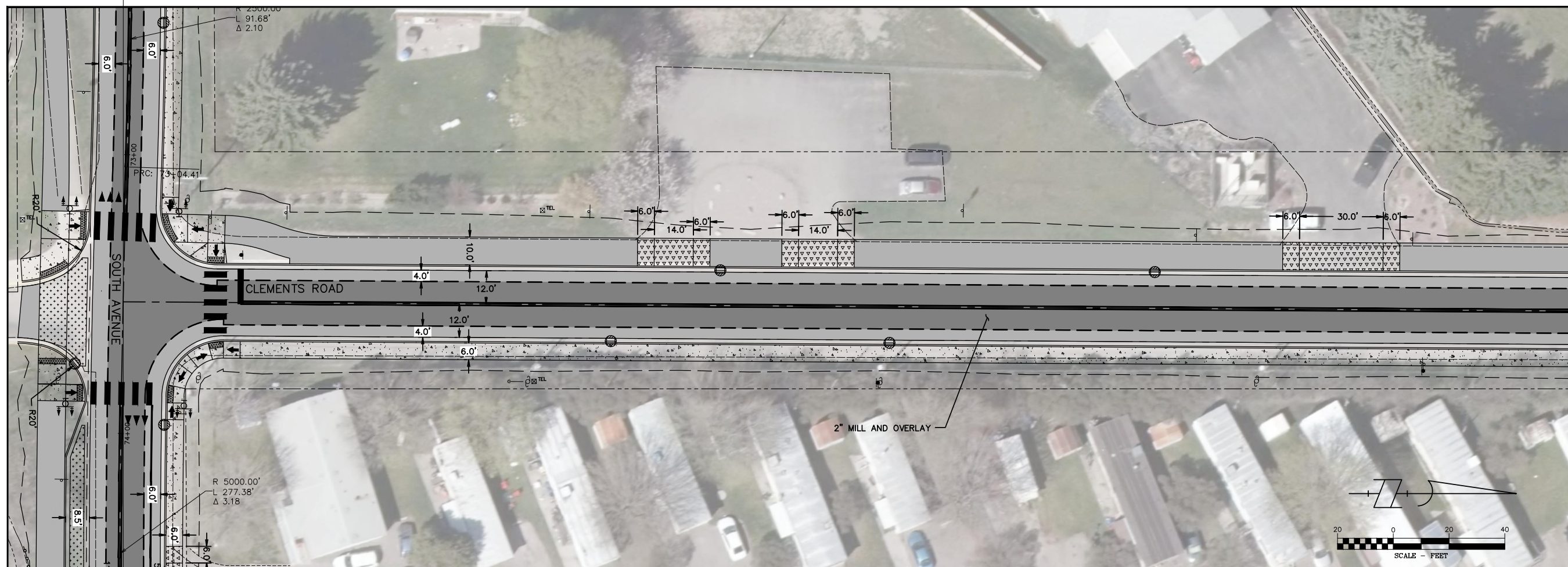


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PLOTTED: 9/13/22
SAVED: 9/13/22

STREET PLAN AND PROFILE
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA



REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT:	22-07-18
LAYOUT:	PLP-8
SURVEYED:	WGM
DESIGN:	DC
DRAFT:	BEA
APPROVE:	SM
DATE:	AUGUST 2022

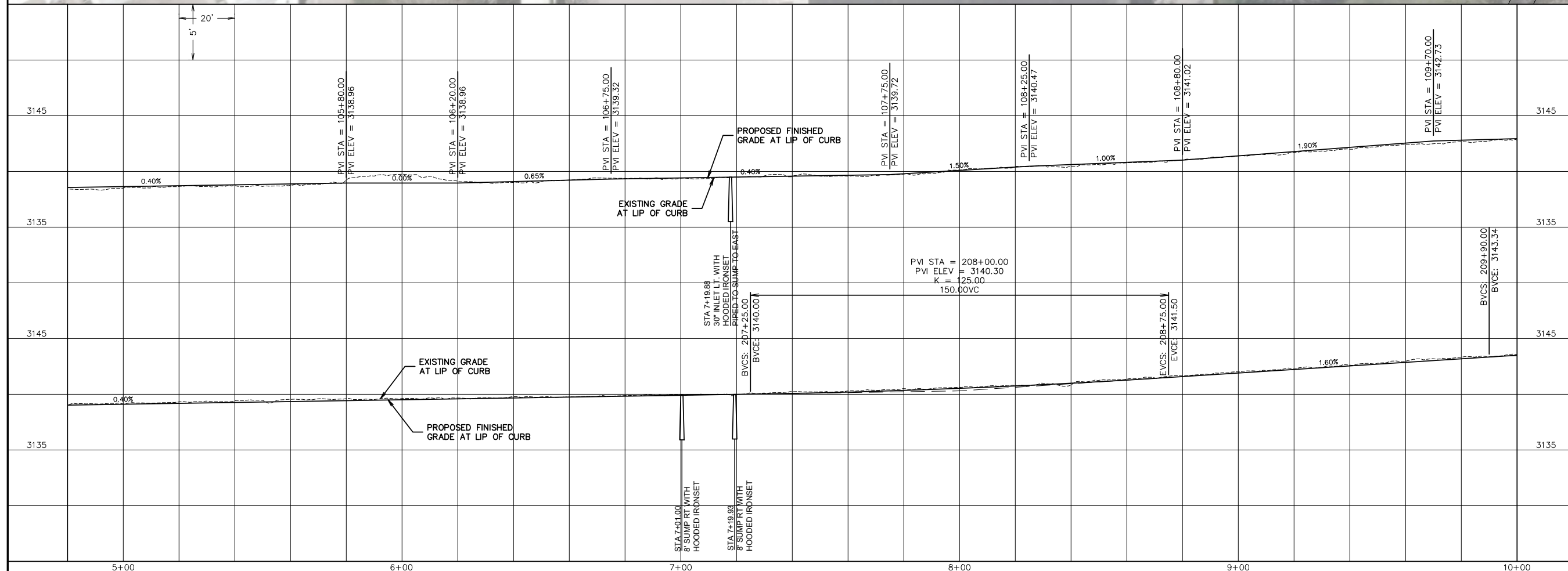
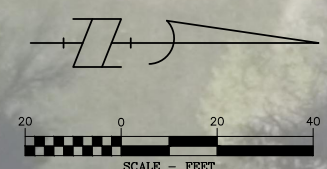
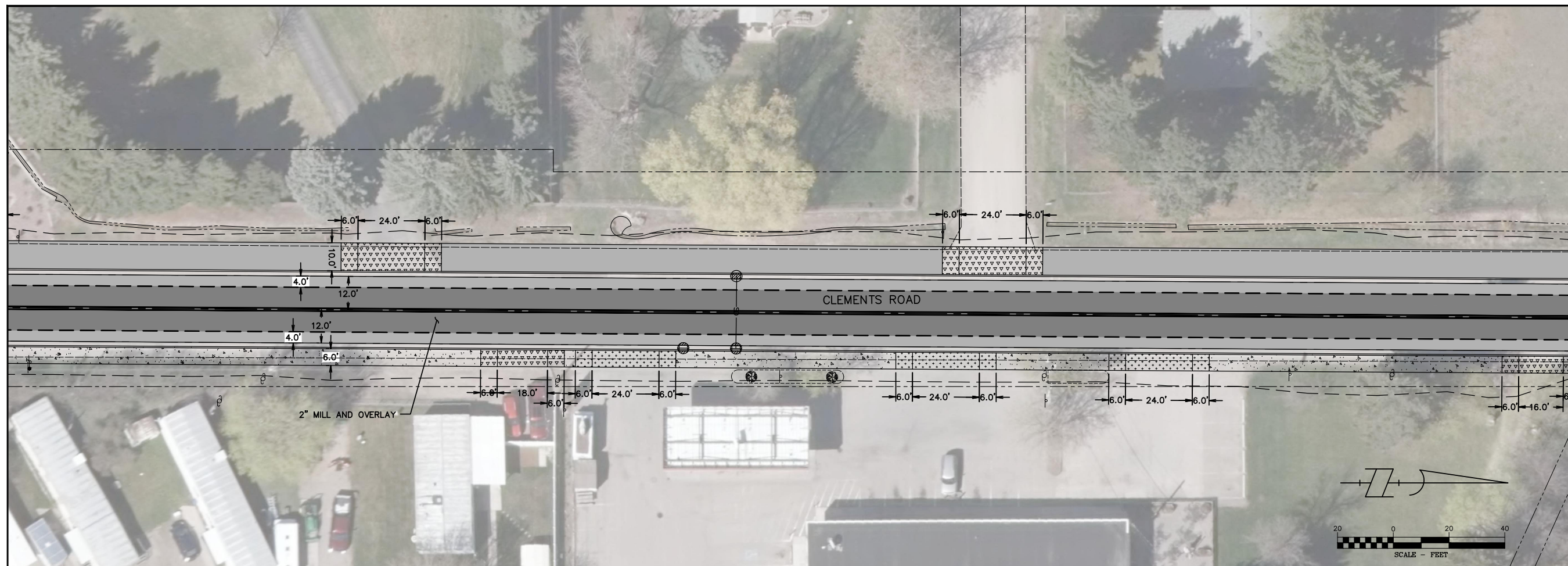
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SAVED: 9/13/22



STREET PLAN AND PROFILE
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: PLP-9
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

AUGUST 2022

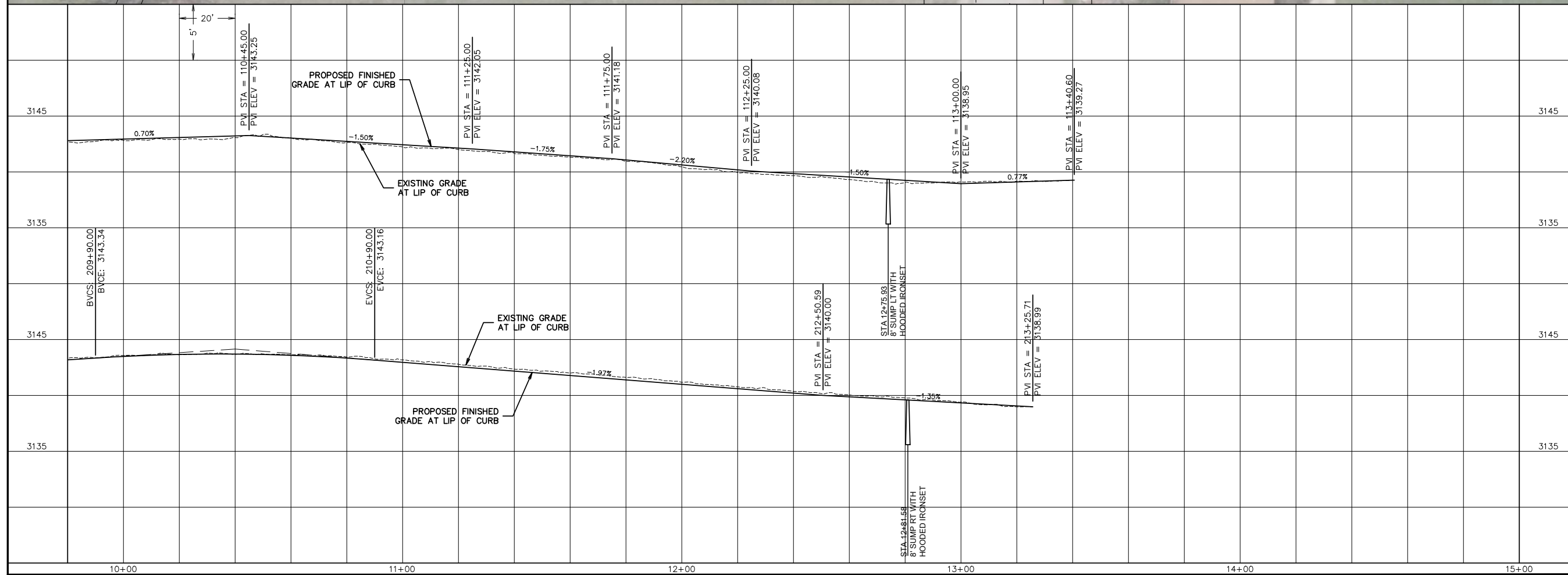
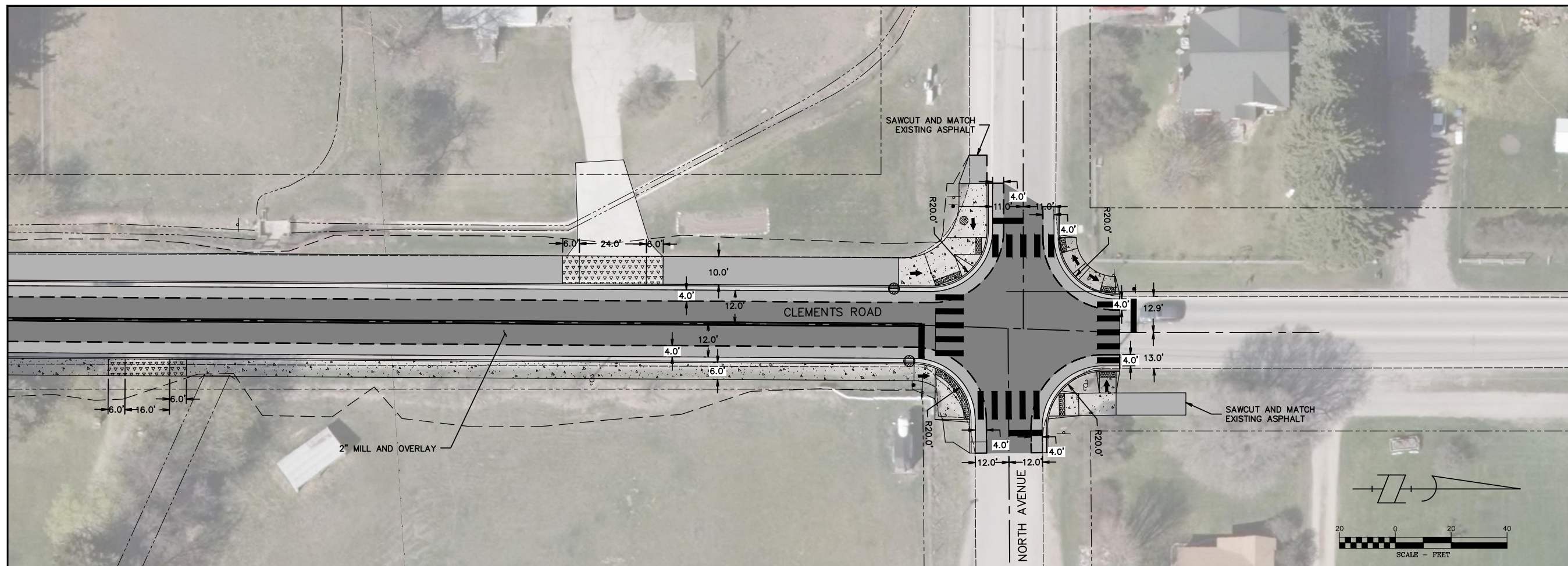
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SAVED: 9/13/22



STREET PLAN AND PROFILE
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: PLP-10
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE: AUGUST 2022

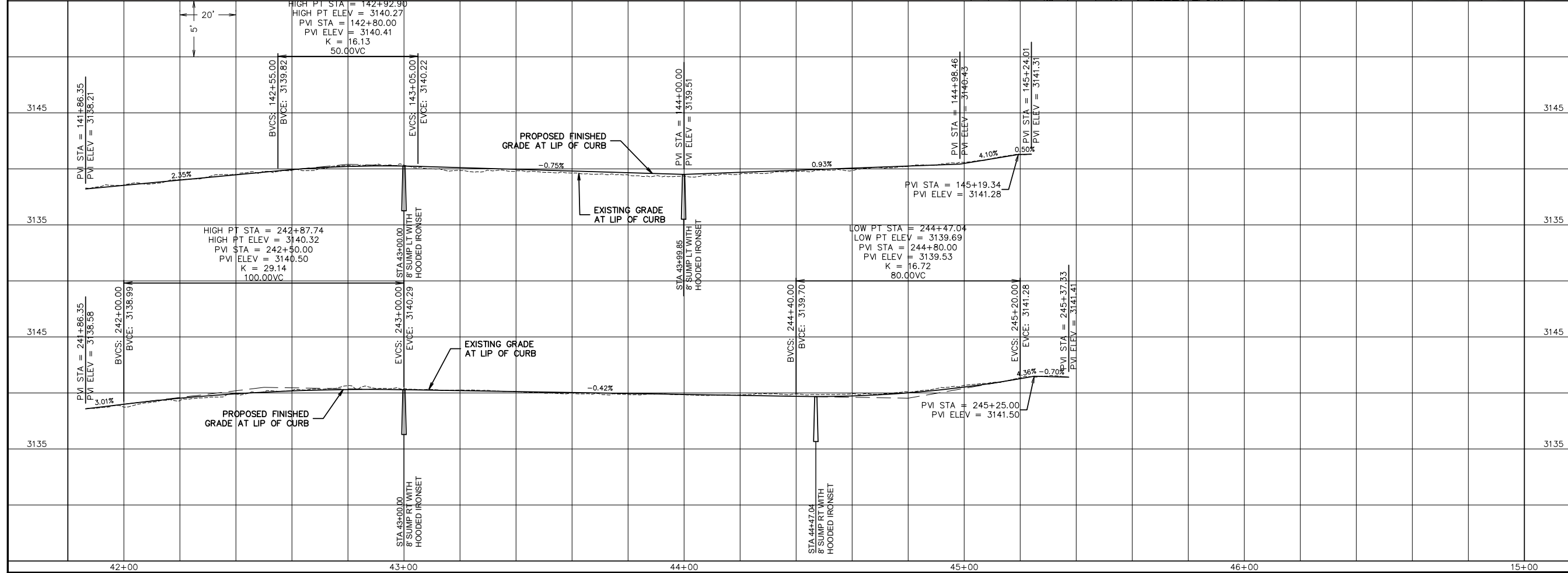
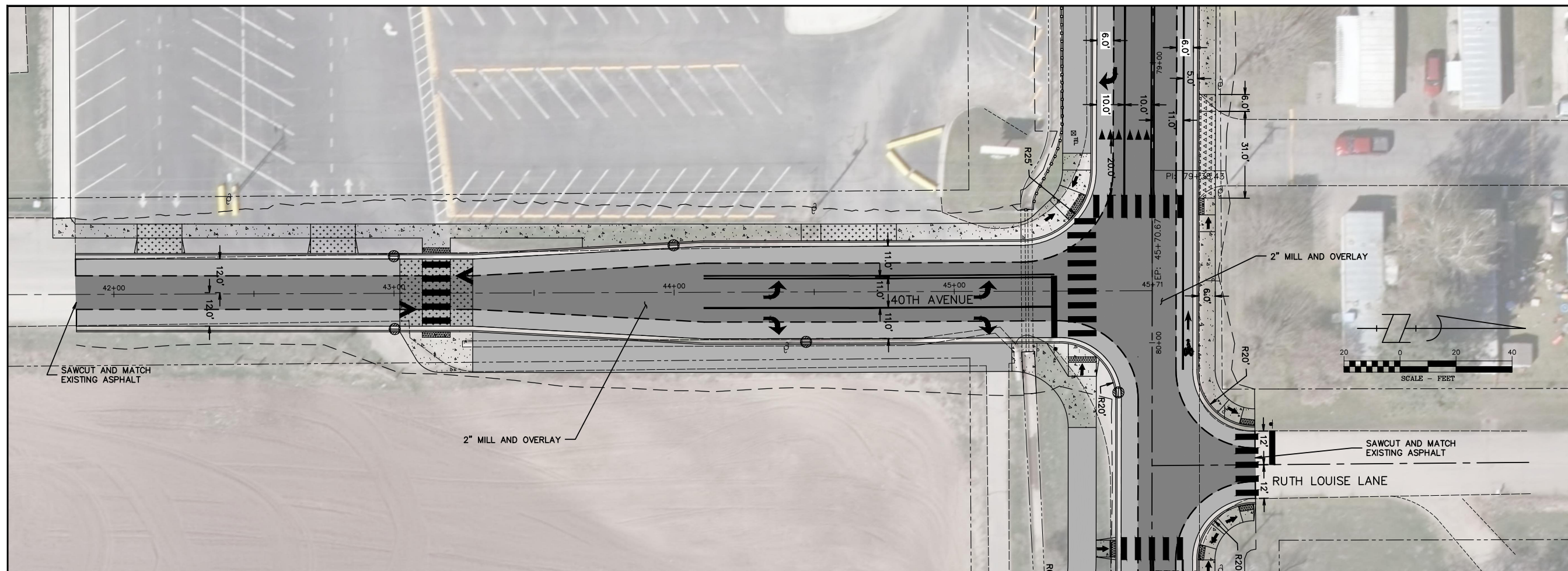
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PLOTTED: 9/13/22
SAVED: 9/13/22



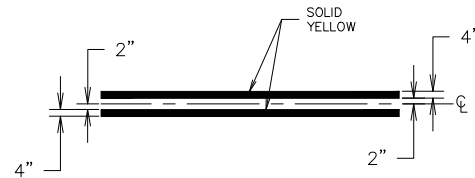
STREET PLAN AND PROFILE
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

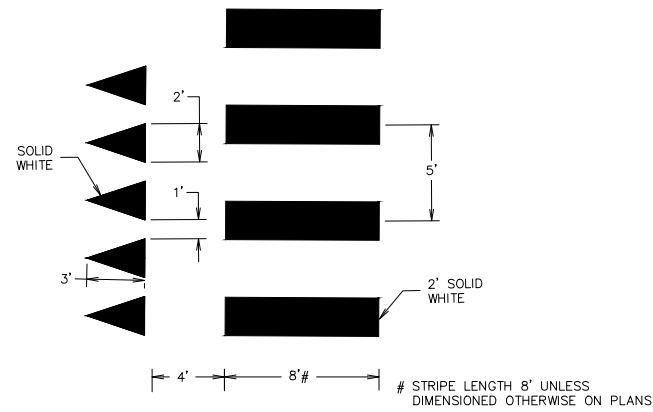
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LAYOUT: PLP-11
SURVEYED: WGM
DESIGN: DG
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APPROVE: SM
DATE:

AUGUST 2022

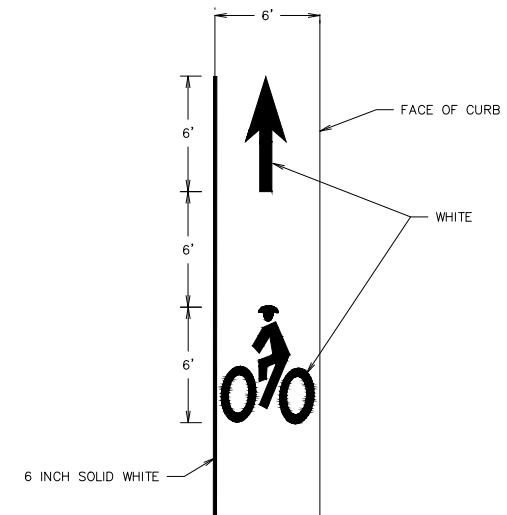
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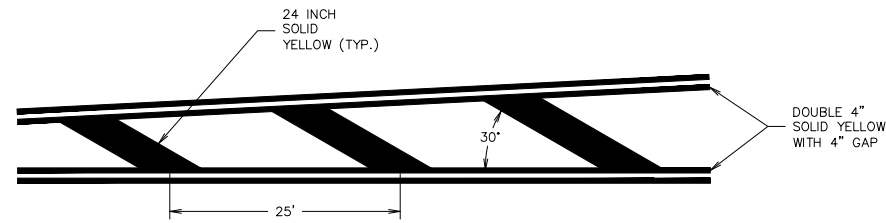
DETAIL "A"
DOUBLE YELLOW STRIPE DETAIL



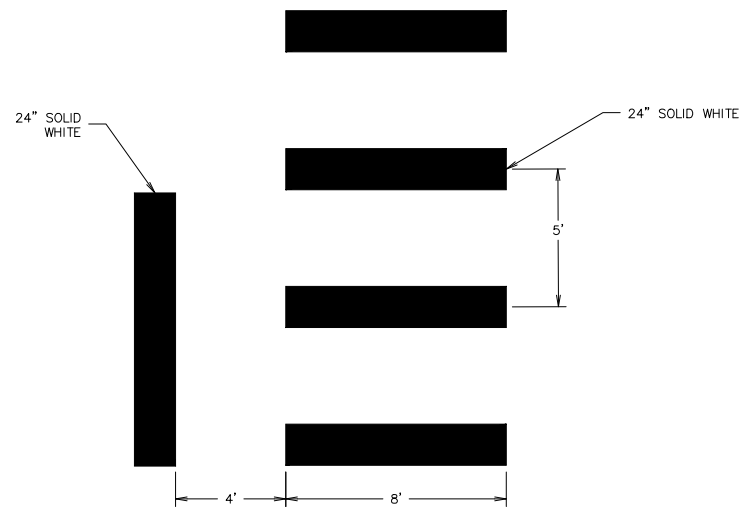
DETAIL "B"
YIELD LINE AND
CROSSWALK DETAIL



DETAIL "C"
BIKE LANE SYMBOL DETAIL
(CENTER IN BIKE LANE)



DETAIL "D"
HATCHED MEDIAN DETAIL



DETAIL "E"
STOP BAR AND CROSSWALK DETAIL

NOTES

1. PROVIDE INTERIM AND FINAL PAVEMENT MARKINGS IN ACCORDANCE WITH THE MDT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" 2020 EDITION.
2. ALL FINAL PAVEMENT MARKINGS ARE EPOXY UNLESS OTHERWISE NOTED.
3. COMPLETELY REMOVE ALL EXISTING PAVEMENT MARKINGS THAT ARE IN CONFLICT WITH THE STRIPING SHOWN ON THESE PLANS. REMOVAL METHOD TO BE APPROVED BY THE ENGINEER.
4. NEW SIGN PANELS SHALL BE SHEET ALUMINUM TYPE XI HIGH INTENSITY REFLECTIVE SHEETING FOR THE BACKGROUND, LEGEND AND BORDER, EXCEPT THAT STREET NAME SIGNS SHALL REQUIRE TYPE IV REFLECTIVE SHEETING FOR THE BACKGROUND SHEETING.
5. SIGN LEGEND AND BACKGROUND COLORS SHALL BE IN ACCORDANCE WITH THE MUTCD (2009 EDITION).
6. PROVIDE A MINIMUM OF 5 DAYS ADVANCE NOTICE TO THE ENGINEER AND CHAD PANCAKE (406-552-6372) WHEN SIGNS WILL BE FIELD LOCATED AND WHEN SIGNS WILL BE INSTALLED.
7. SIGN MATERIALS AND CONSTRUCTION PROCEDURES SHALL CONFORM TO THE MDT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", 2020 EDITION.
8. PROVIDE SIGNS TO THE DIMENSIONS SHOWN.



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PLOTTED: 9/13/22
SAVED: 9/12/22

PAVEMENT MARKING DETAILS
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

REVISIONS:

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: S1
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

SEPTEMBER 2022

SHEET **S1** OF **S7**



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PLOTTED: 9/13/22
SAVED: 9/12/22

SIGNING AND STRIPING PLANS

SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.

MISSOULA, MONTANA

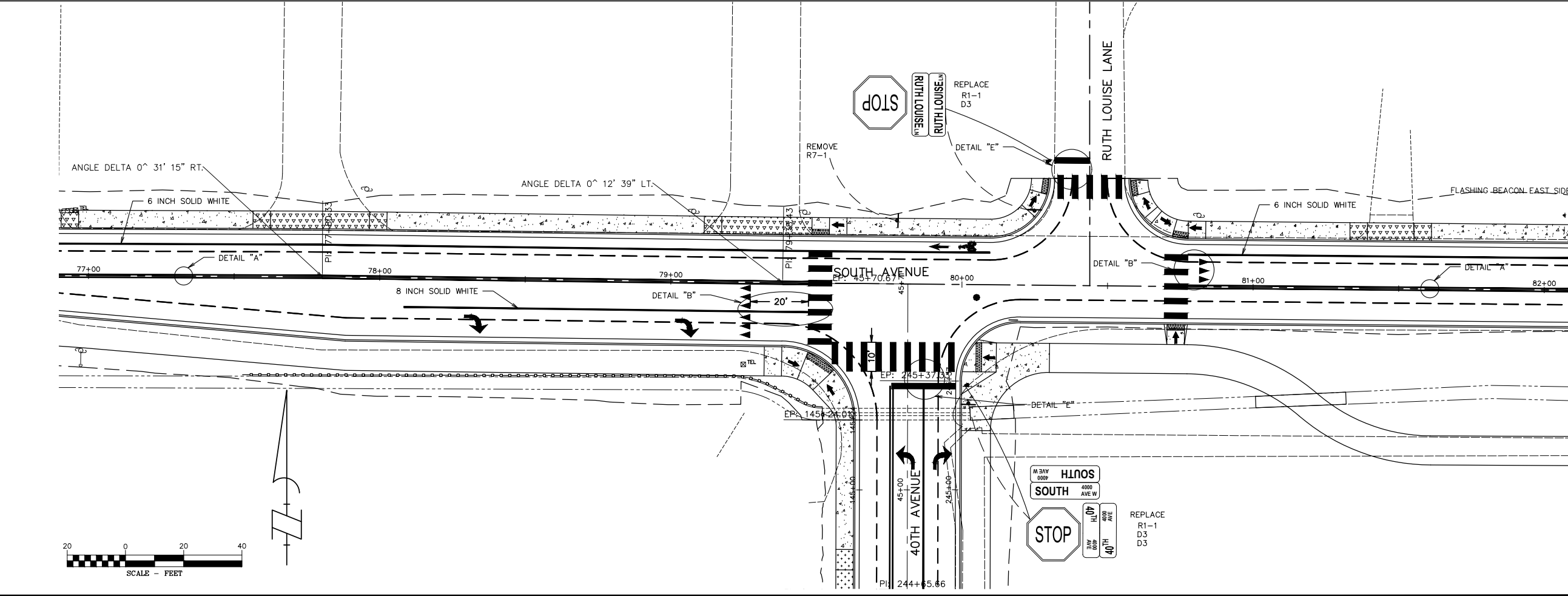
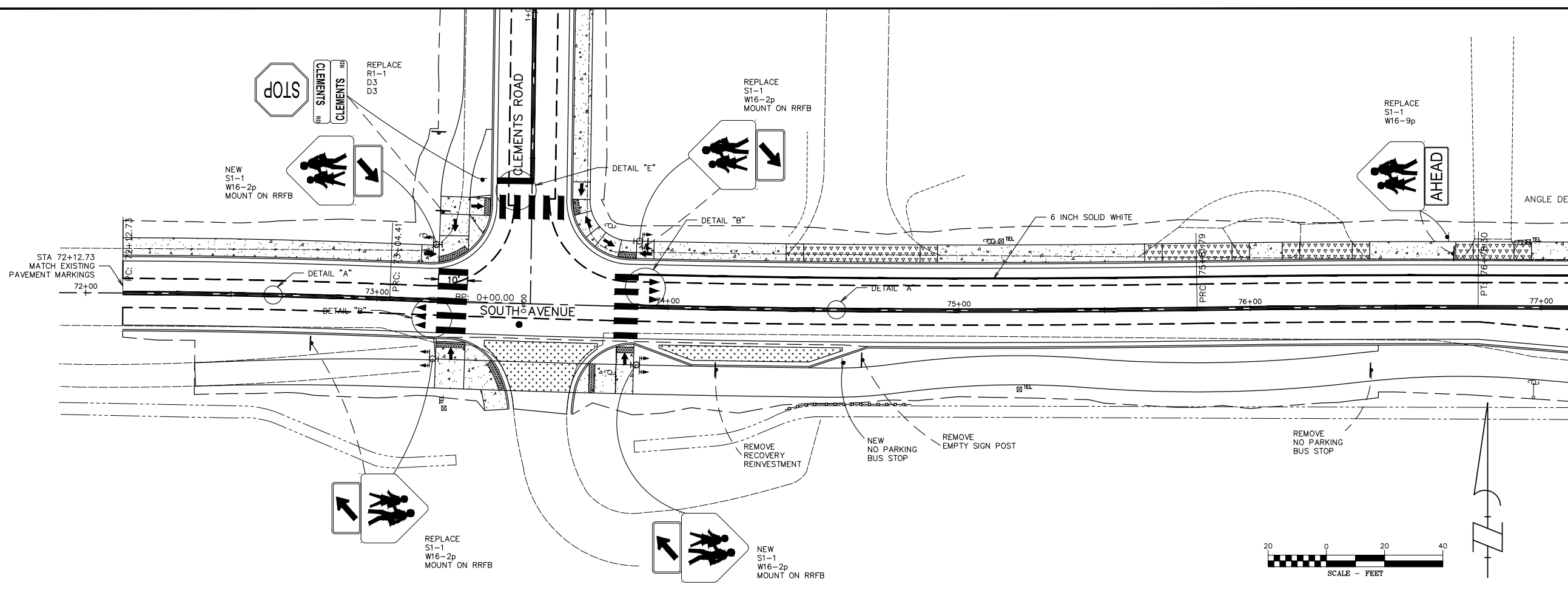
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: S2
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

SEPTEMBER 2022

SHEET S2 OF S7



FILE: W:\Projects\220718_V20_Data\CAD_01_Design\220718S2.dwg



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PLOTTED: 9/13/22
SAVED: 9/12/22

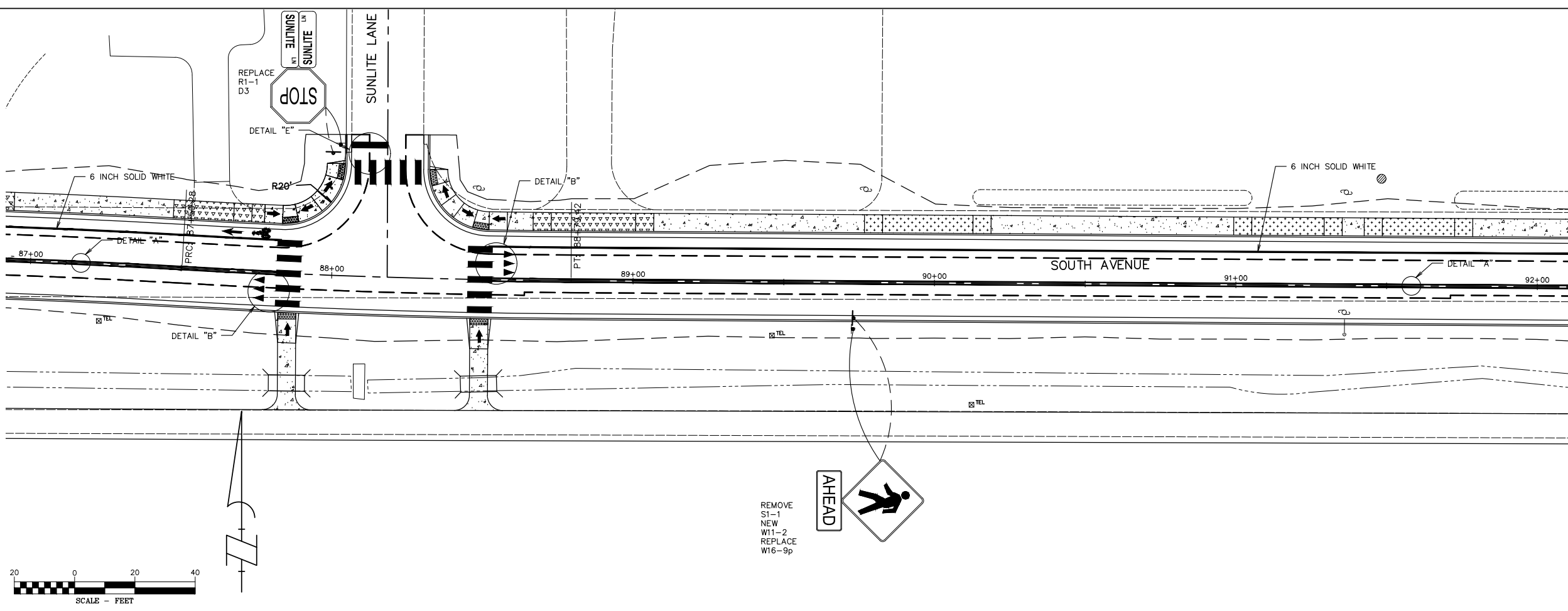
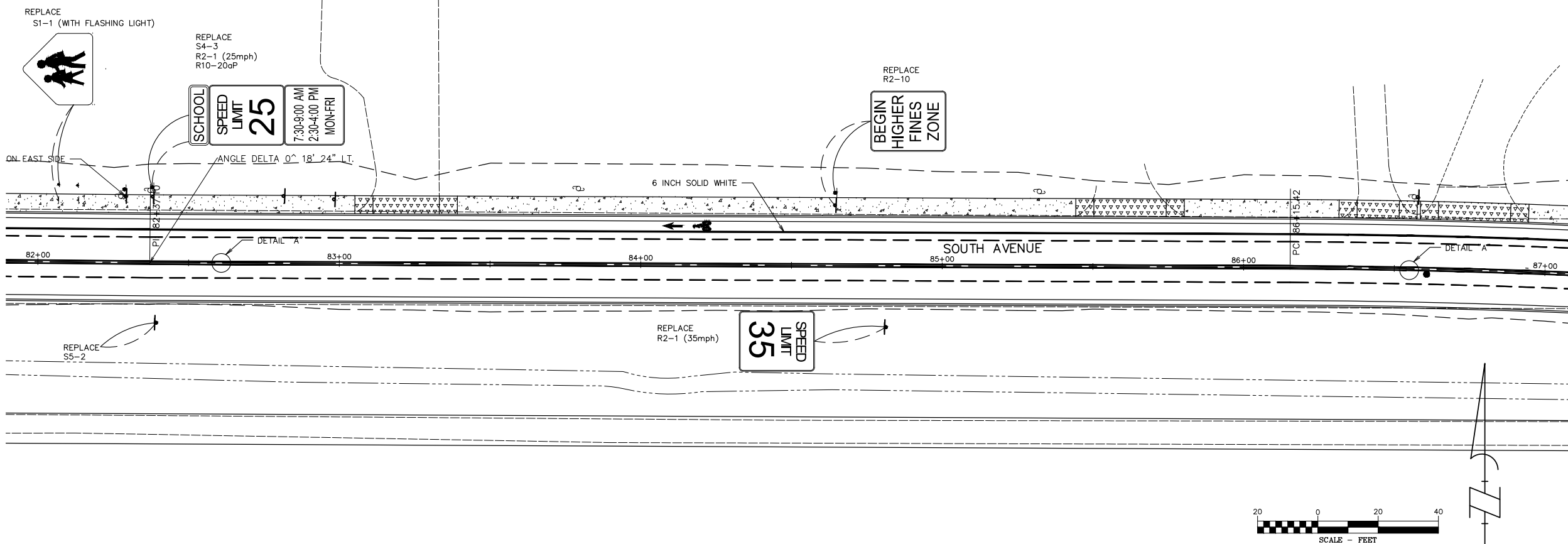
SIGNING AND STRIPING PLANS
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: S3
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

SEPTEMBER 2022

SHEET S3 OF S7



FILE: W:\Projects\220718_V20_Data\CAD_01_Design\220718S3.dwg



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PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/12/22

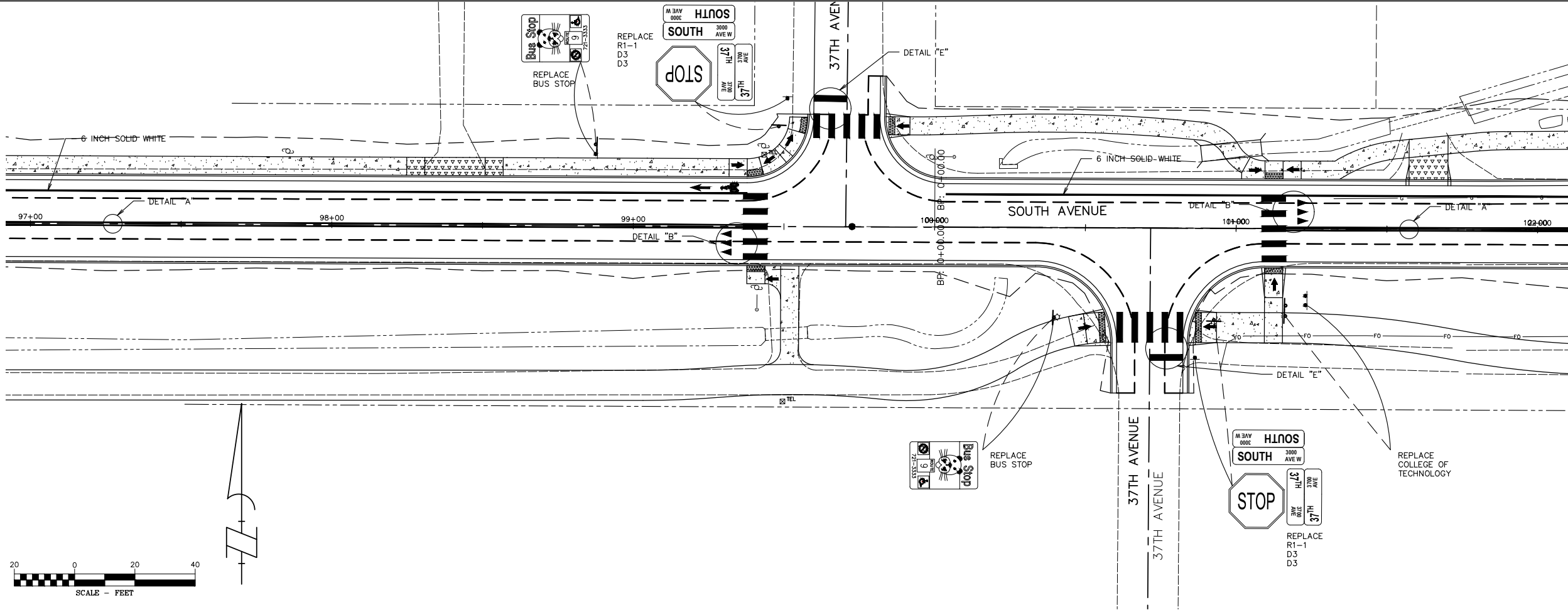
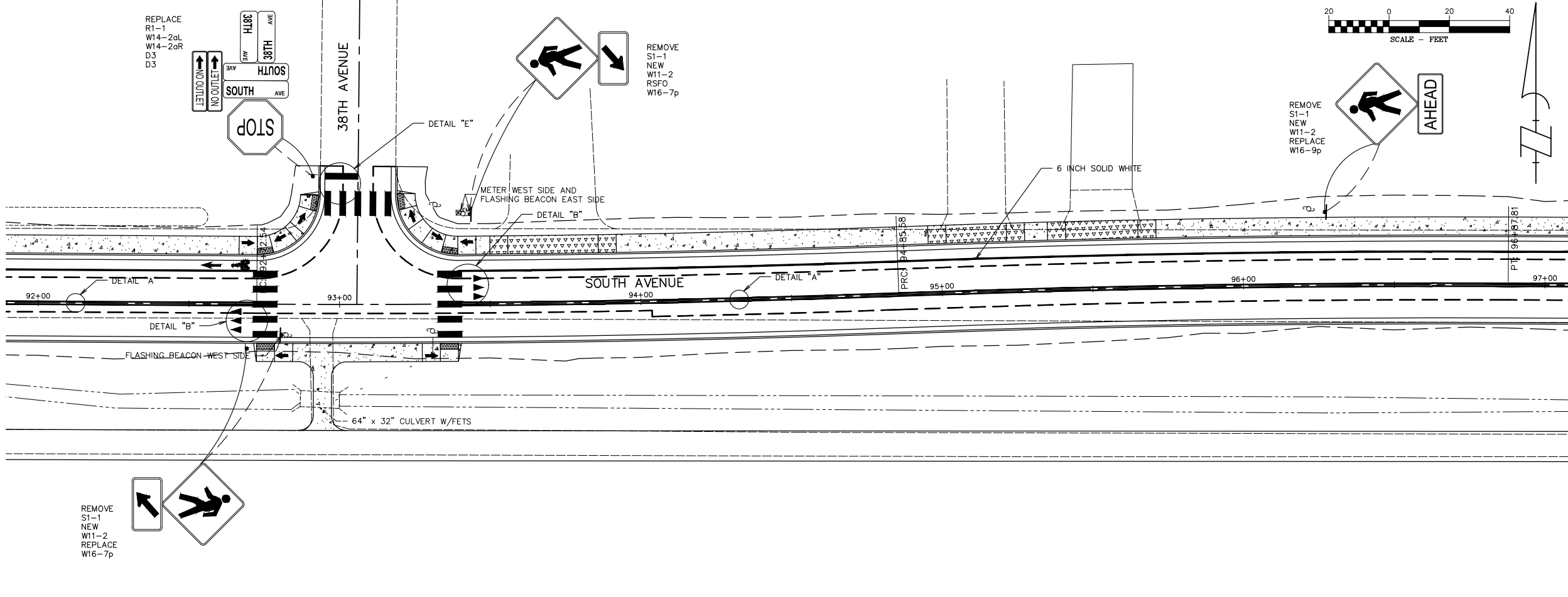
SIGNING AND STRIPING PLANS
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: S4
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

SEPTEMBER 2022

SHEET
S4 OF S7



FILE: W:\Projects\220718_V20_Data\CAD_01_Design\220718S4.dwg



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PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/12/22

SIGNING AND STRIPING PLANS
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

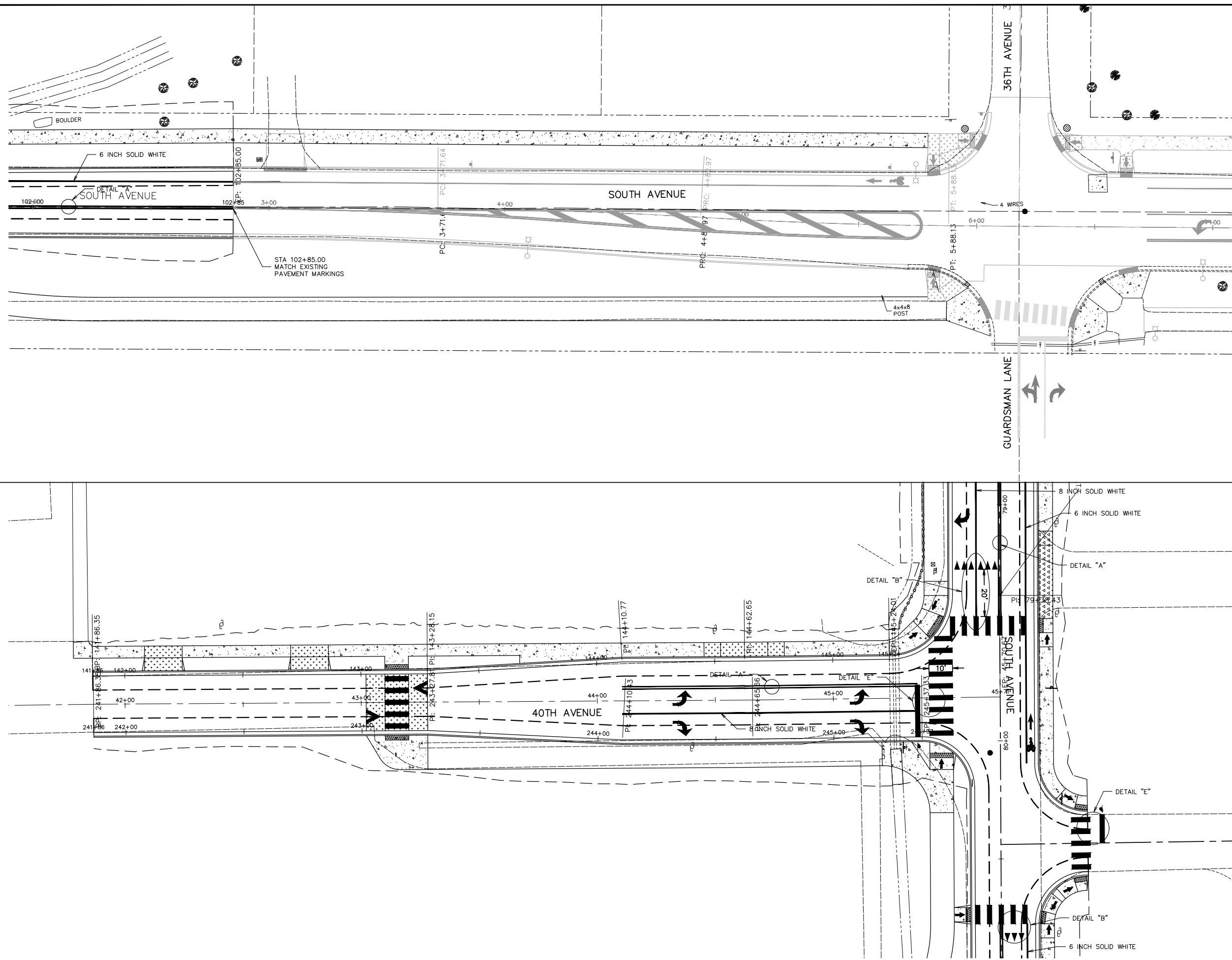
REVISIONS:
NO. DESCRIPTION DATE

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: S5
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

SEPTEMBER 2022

SHEET **S5 OF S7**



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PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/12/22

SIGNING AND STRIPING PLANS

SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.

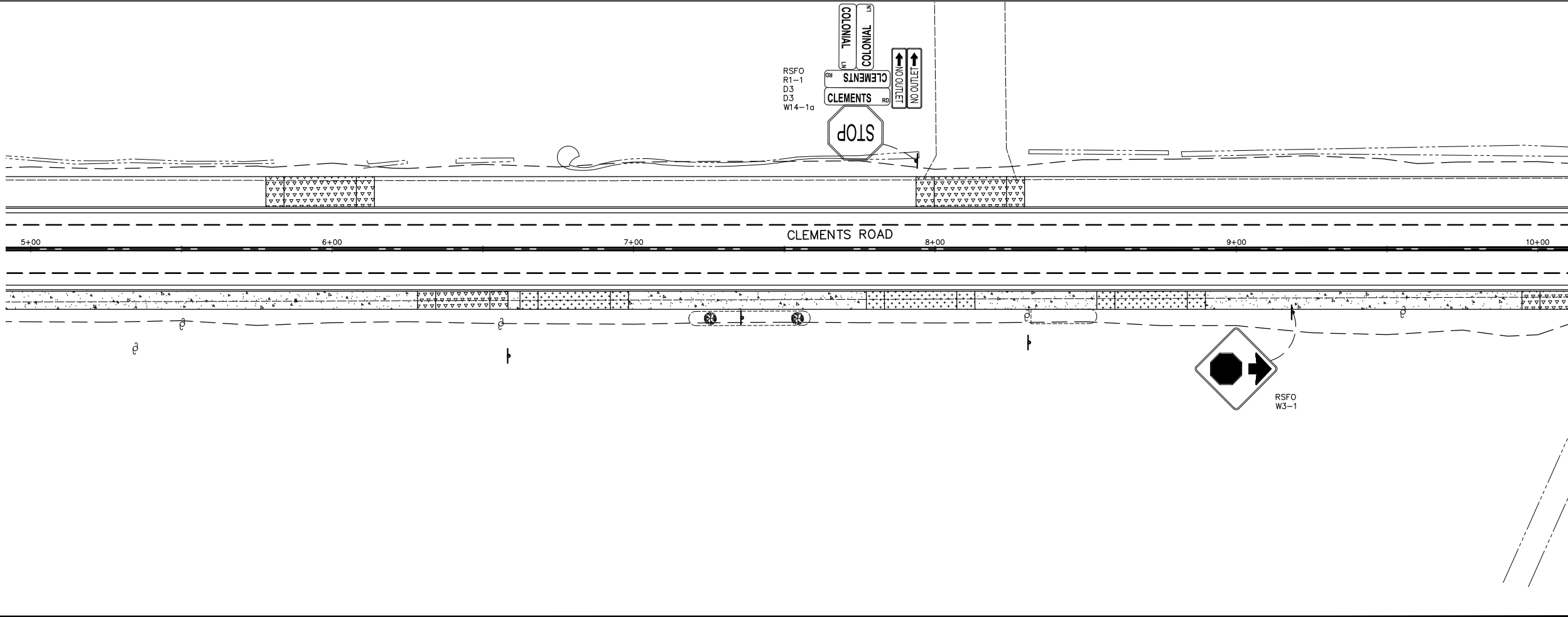
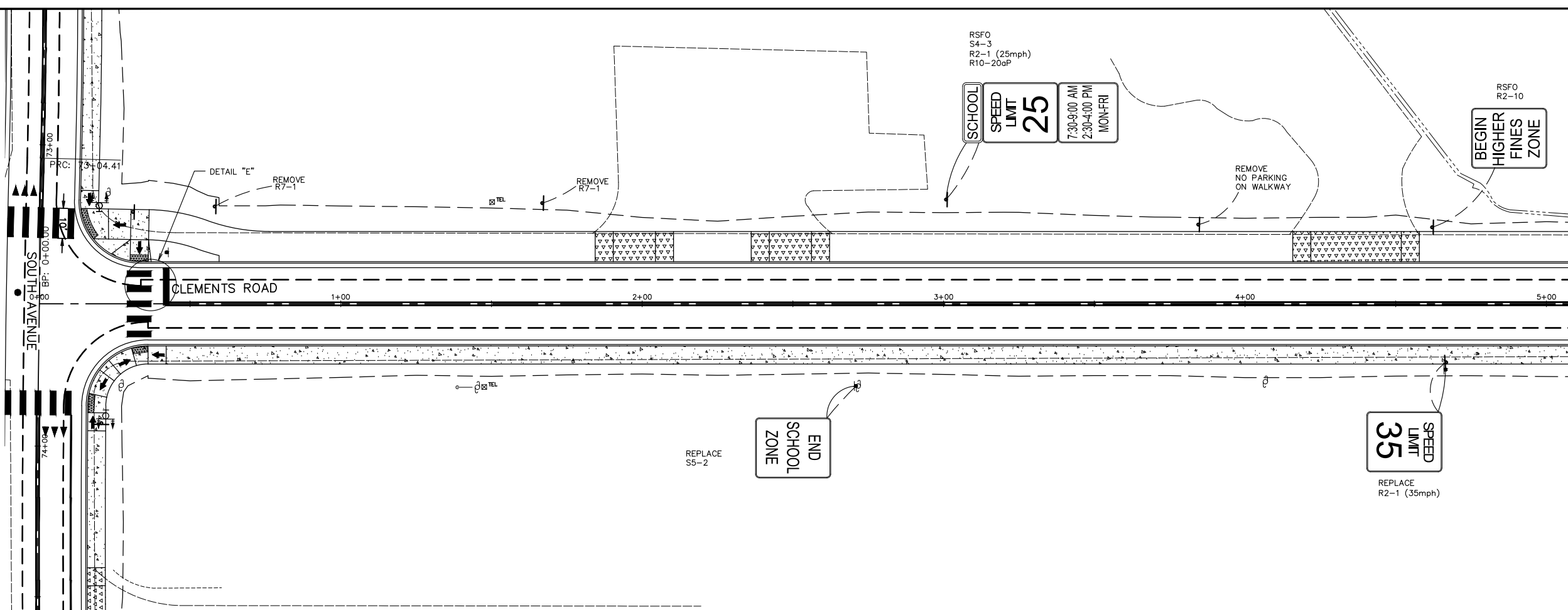
MISSOULA, MONTANA

REVISIONS:		
NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: S6
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

SEPTEMBER 2022

SHEET S6 OF S7



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PRELIMINARY

PLOTTED: 9/13/22
SAVED: 9/12/22

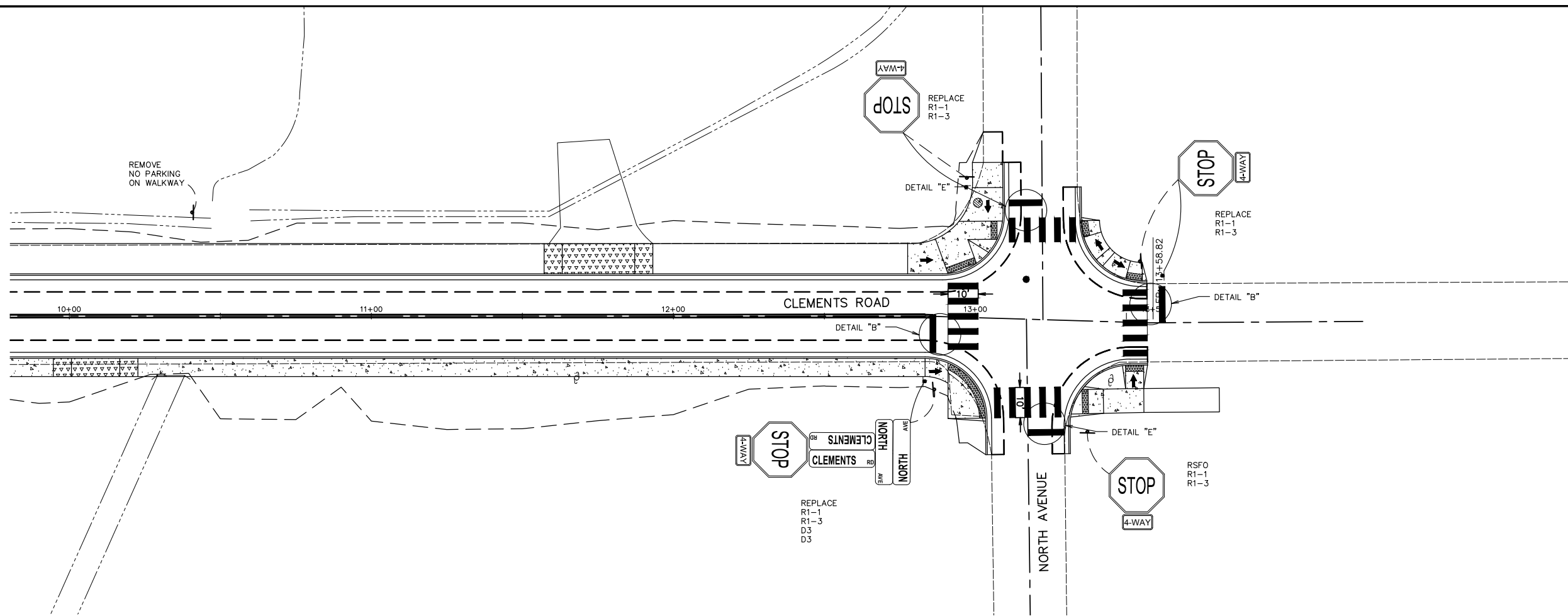
SIGNING AND STRIPING PLANS
SOUTH AVENUE CLEMENTS RD. TO 36TH AVE.
MISSOULA, MONTANA

NO.	DESCRIPTION	DATE

PROJECT: 22-07-18
LAYOUT: S7
SURVEYED: WGM
DESIGN: DG
DRAFT: BEA
APPROVE: SM
DATE:

SEPTEMBER 2022

SHEET
S7 OF S7



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Appendix C - Safety

MEMORANDUM

DATE: 09/13/2022

TO: City of Missoula

FROM: Danae Giannetti, P.E.

RE: South Avenue Safe Streets for All (SS4A) Implementation Grant - Safety Impact Assessment Summary

The purpose of this memo is to summarize findings from a safety impact assessment and benefit cost analysis completed for the South Avenue Safe Streets for All (SS4A) implementation grant application. Infrastructure improvements are proposed along South Avenue from Clements Road to west of Reserve Street and along Clements Road from South Avenue to North Avenue. Findings from the assessment are presented below in accordance with the “Safety Impact” selection criterion outlined in the SS4A Notice of Funding Opportunity (NOFO). The attached file titled “Appendix XX - Safety Impact Assessment and Benefit Cost Analysis.xlsx” contains all supporting documentation and computations.

Description of the Safety Problem

Crash data provided by the Missoula MPO and the Montana Department of Transportation (MDT) for the most current 5-year time period of January 1, 2016 to December 31, 2020 were reviewed for South Avenue from Clements Road to west of Reserve Street as well as for Clements Road from South Avenue to North Avenue. The Missoula MPO coordinated with the Missoula Police Department to determine whether any collisions resulting in serious injuries or fatalities occurred since December 31, 2020 and obtained information regarding a pedestrian fatality. While this historical crash data is used to build an understanding of historical trends, the objective of this project remains to proactively identify and address risks within the project limits in accordance with the Safe System approach.

South Avenue

Historical Trends: During the five-year period of reviewed crash data, 107 crash incidents were documented on South Avenue from Clements Road to west of the intersection with Reserve Street and a total of 272 people were involved in the crashes. The crash rate for this nearly 2-mile segment of South Avenue is 10.9 annual crashes per mile or 458.3 to 638.4 annual crashes per 100 million vehicle-miles of travel (VMT). In comparison, the Missoula County crash rate is 53 crashes per 100 million VMT. Therefore, the South Avenue crash rate is more than 8 times higher than the County-level annual crash rate.

Fatal and Serious Injury Crash Locations & Contributing Factors: In January 2022, a pedestrian fatality occurred near South Avenue and 26th Street after the person was struck by a vehicle. Although no specific contributing factors were provided by the Missoula Police Department, the following context was given: “There is no sidewalk area in this block, and the side of the road had snow build up, forcing the pedestrian to walk in the roadway...”

Two rear-end crashes resulting in serious injuries occurred between 26th Street and Old Fort Road. No contributing factors were provided in the crash incident data. However, there are numerous closely spaced approaches in this area and there are no dedicated turning facilities. This roadway deficiency likely increases the risk of rear end collisions involving turning vehicles.

Crash Types by Category of Road User: A summary table of vehicular crash types is provided in this Appendix C below. Two crashes in the most current 5-year period of data involved people on bicycles and the 2022 fatality was a person walking in the roadway. There were no crashes involving transit users for the period of reviewed data. Given the relatively low volume of pedestrians and bicyclists, partially due to the lack of space to walk or bike, the crashes involving bicyclists and pedestrians are a troubling trend in crash history. Of the vehicular crashes, the three most common crash types were rear end (36% of all crashes), right angle (21%), and collisions with fixed objects (16%).

Clements Road

Historical Trends: During the 5-year period of reviewed crash data, there were eight crash incidents on Clements Road between South Avenue and North Avenue involving motorists only. Although there were no reported serious injuries or fatalities, the crash rate for this segment of Clements Road is 6.4 annual crashes per mile or 546.7 annual crashes per 100 million VMT, which is more than ten times higher than the Missoula County crashes per 100 million VMT. This corridor lacks safe, separated facilities for vulnerable roadway users despite this segment of roadway frequently being used as a route to school for many of the area's children and their families. The proposed improvements for Clements Road adheres to the Safe System approach of proactively identifying and addressing risks. By providing separated and connected non-motorized facilities on both Clements Road and South Avenue, a safe route to school is now provided for some of the community's youngest and most vulnerable roadway users.

Serious Injury & Fatality Hot Spot Analysis; Identification of High-Risk Roadway Features

South Avenue from 26th Street to Old Fort Road is considered the corridor segment's "hot spot" for serious injuries and fatalities based on historical crash data. This segment of South Avenue also has the highest annual crashes per 100 million VMT. However, the nearly 2-mile section of South Avenue and 0.25-mile segment of Clements Road from South Avenue to North Avenue have similar high-risk roadway features as this hot spot location. The primary differentiator of the hot spot location and the rest of the project limits is the larger volume in vehicular traffic. It is anticipated that other hot spot locations for serious injuries and fatalities could occur due to similar high-risk roadway features in the future unless the proposed infrastructure improvements are constructed.

High-risk roadway features of South Avenue and Clements Road are best described in terms of the roadway's deficiencies. For example, South Avenue lacks adequate roadway lighting, non-motorized facilities on the north side of the corridor, and left turn lanes for closely spaced driveways and intersections. The volume and speed of vehicular traffic is considered high risk for vulnerable roadway users with respect to their chance of survival upon impact. This project seeks to proactively address the infrastructure deficiencies before additional serious injury and fatality hot spots emerge.

Safety Impact Assessment

Proposed infrastructure improvements were thoughtfully selected to address the identified safety problems resulting from the roadway's deficiencies. This Safety Impact Assessment focuses on estimating the proposed infrastructure improvements' impact on reducing serious injuries and

fatalities based on South Avenue's historical crashes. Since Clements Road has similar high-risk roadway features, it is reasonable to assume that similar safety impacts will be expected for that corridor segment. Rather than relying solely on a traditional road safety evaluation of only reactively addressing safety problems, this project seeks to holistically address historical problems and proactively address the risks in a more holistic manner.

The proposed infrastructure improvements' ability to reduce roadway fatalities and serious injuries is predicted using Crash Modification Factors (CMF). CMFs for proposed infrastructure improvement are considered evidence for the improvement's ability to significantly reduce or eliminate serious injuries and fatalities for all roadway users. Proposed infrastructure improvements to South Avenue with corresponding CMFs used in this safety impact assessment are:

- Constructing a two-way left turn lane (TWLTL) east of 31st Street to 26th Street;
- Continuous 6' sidewalk on the north side of South Avenue from Clements Road to west of Reserve Street and on the east side of Clements Road from South Avenue to North Avenue;
- Pedestrian refuge islands on South Avenue at the intersections with 26th Street and 31st Street; and
- 6' bicycle lane on the north side of South Avenue from Clements Road to Reserve Street
- Roadway lighting between 36th Street and 26th Street where there is currently no lighting.

Additional proposed infrastructure improvements include constructing curb & gutter, upgrading storm water conveyance, widening the existing separated path on the south side of South Ave to 10', improving numerous existing bus stops along the corridor, adding high-visibility crosswalk markings at crosswalks on South Avenue between Clements Road and 26th Street, installing an RRFB at Clements Road and South Avenue, and constructing a new separated path segment on the south side of South Avenue from Clements Road to 40th Avenue. The proposed segment of new separated path will move commuter traffic away from the Target Range School property rather than utilizing the school's parking lot for non-motorized travel. School faculty and parents have expressed concerns in the past about members of the public not affiliated with the school walking through school property. This proposed segment of path addresses their concerns regarding the safety of students.

Measured Safety Impact for Reducing Serious Injuries & Fatalities: From January 1, 2016 to May 1, 2022 there was an average of 0.635 serious injuries per year on the subject segment of South Avenue. The TWLTL is estimated to provide an annual serious injury reduction of 0.395 serious injuries per year. During the same time period, there was an average of 0.159 fatalities per year. The installation of sidewalk is estimated to result in at least 0.140 annual lives saved per year.

Consideration was also given to the safety impact of the proposed improvements on the crashes that did not result in serious injuries or fatalities. The most current 5-year period of crash data was used to estimate crash rate reductions resulting from the proposed improvements.

Measured Safety Impact of Proposed Bicycle Lane: From January 1, 2016 to December 31, 2020, there was an average of 0.400 bicycle crashes per year. The proposed bicycle lane is estimated to result in a reduction of 0.177 bicycle crashes per year. The bicycle lane on the north side of South Avenue provides bicycling facilities on both sides of the road thereby reducing the crossing instances and reducing the risk of bicycles mixing with vehicular traffic. While there were no documented crashes involving bicyclist resulting in serious injuries or fatalities, bicyclists are

considered vulnerable roadway users with a higher risk of serious injury or fatality upon collision with a vehicle. The proposed bicycle lane seeks to proactively address this higher risk for vulnerable roadway users.

Furthermore, the selected bicycle lane CMF is applicable to all crash types and injury severities. During the five-year period of reviewed crash data, there was an annual average rate of 21 crashes per year on South Avenue between Clements Road and just west of Reserve Street (excluding bicycle crashes). The estimated annual crash reduction for the installation of a bicycle lane is 9.282 crashes per year.

Measured Safety Impact of Raised Median Islands: During the 5-year period of reviewed crash data, there was an average of 0.800 rear end or sideswipe crashes per year on South Avenue at the intersections with 26th Street and 31st Street where raised median islands are proposed. Historically, these crashes have not involved pedestrians but raised median islands are a proven countermeasure for reducing pedestrian-involved crashes and increasing side friction which results in lower vehicular travel speeds. To quantify the predicted safety benefit of the proposed raised median islands with respect to historical crashes, a CMF was applied to the rear end and sideswipe crashes. The estimated annual crash reduction is at least 0.207 crashes per year.

Measured Safety Impact of Roadway Lighting: Crash incidents occurring in “dark-not lighted” conditions were reviewed to assess the safety impact of improving roadway lighting. Historically, an average of 2.000 crashes in “dark-not lighted” conditions occurred per year. It was estimated that installing roadway lighting along South Avenue not currently lit between 36th Street and west of Reserve Street may reduce crashes occurring in dark conditions by 0.640 crashes per year.

Measured Safety Impact of Two-Way Left Turn Lane Installation: An assessment on the safety benefit of constructing a TWLTL from 31st Street to 26th Street was also completed due to the large number of crashes that could be partially attributed to the lack of turn lane facilities, such as rear-end and right angle collisions. Historically, this segment of South Avenue has an average of 8.400 crashes per year. It is estimated that this annual crash rate will be reduced by 3.682 crashes per year.

Safe System Approach

The scope of this proposed project was developed through the Safe System lens by putting safety at the forefront of the project objectives, accommodating human mistakes, and acknowledging the low injury tolerances of vulnerable roadway users.

System Redundancies: In addition to providing dedicated turn lane facilities, the TWLTL offers a safe route for emergency vehicles to utilize thereby reducing response times for emergency vehicles entering and exiting the hospital adjacent to South Avenue. The proposed sidewalk, bicycle lane, and separated path are infrastructure redundancies in that if one is not available to use, vulnerable roadway users are not subsequently forced into the roadway.

Benefit Cost Analysis

As previously mentioned, greater attention is given to the proposed infrastructure improvements' safety impact on reducing serious injuries and fatalities rather than the traditional focus of only reducing crashes. A benefit cost analysis (BCA) was developed to monetize the predicted safety benefit, pertaining only to these types of safety risks, and compare it to the overall construction and long-term operations and maintenance costs. The U.S. Department of Transportation's *Benefit-Cost Analysis Guidance for Discretionary Grant Programs* (March 2022) was referenced

to complete the BCA. While this guidance offers monetized values for all KABCO crash severity types as well as additional project benefits such as environmental and user-based costs, the BCA for this project focuses only on the SS4A grant program objective of reducing serious injuries and fatalities for all roadway users by excluding all other crash types/injury severities in the BCA.

For the 20-year analysis period, the expected benefit-cost ratio is 2.3. This demonstrates that not only will the project have safety benefits that will persist over time, the monetized value of the safety benefits and residual value of the project after 20 years is more than twice as much as the project's construction and long-term operations and maintenance costs.

Appendix XX - Table of Contents



Tab Name	Description
TableofContents	This tab
Safety Impact Assessment Calculations	
Project Limits Crash Rates	Computations for South Avenue & Clements Road Annual Crash Rates per Mile & Annual Crash Rates per 100 Million VMT
Missoula County Crash Rate	Computations for Missoula County Annual Crash Rate per 100 Million VMT
SeriousInj&Fatalities	Safety Impact Assessment - Serious Injuries & Fatalities; Calculations for measuring project's predicted safety impact on reducing serious injury & fatal crashes using CMFs
RaisedMedianSafetyImp	Safety Impact Assessment - Raised Median Island; Calculations for measuring the proposed raised median/pedestrian refuge island on reducing rear end and sideswipe crashes using CMFs
BikeLaneSafetyImp	Safety Impact Assessment - Bicycle Lane; Calculations for measuring proposed bicycle lane's predicted safety impact on reducing crashes using CMFs
LightingSafetyImp	Safety Impact Assessment - Lighting; Calculations for measuring proposed lighting improvements predicted safety impact on reducing crashes that occurred in dark conditions using CMFs
TWLTLSafetyImp	Safety Impact Assessment - Two Way Left Turn Lane Improvement (TWLTL); Calculations for measuring proposed TWLTL predicted safety impact on reducing crashes in area of proposed improvement using CMFs
Crash Data Summary	Tabulated summary of crashes occurring on selected segments of South Avenue and Clements; tabulated by crash severity, injury severity, and crash types
MPO_CrashData-ClementsRd	01/01/2016-12/31/2019 Crash incident reports for Clements Road from South Avenue to North Avenue as provided by the Missoula MPO
MDT_CrashData-ClementsRd	12/31/2019-12/31/2020 Crash incident reports for Clements Road from South Avenue to North Avenue as provided by the Montana Department of Transportation
MPO_CrashData-SouthAve	01/01/2016-12/31/2020 Crash incident reports for South Avenue from Clements Road to just west of Reserve Street as provided by the Missoula MPO
Benefit Cost Analysis Calculations	
BCA Summary	Summary of Benefit Cost Analysis; include calculations for net present value and benefit-cost ratio (BCR)
Safety Benefit	Monetization calculations of safety impact calculated in "SeriousInj&Fatalities" tab
Residual Value	Monetization calculations of infrastructure's residual value at the end of the 20 year BCA time period
Maintenance Cost	Estimated incremental increase in annual operations & maintenance costs for proposed infrastructure
Job Creation	Calculations for jobs created as a result of proposed infrastructure improvement

Project Limits Crash Rate Calculations



- Reference: 1) https://safety.fhwa.dot.gov/local_rural/training/fhwasa1210/s3.cfm
 2) <https://www.mdt.mt.gov/publications/datastats/traffic-maps.aspx>

The crash rate for **road segments** is calculated as:

$$R = \frac{100,000,000 \times C}{365 \times N \times V \times L}$$

Where:

- R = Crash rate for the road segment expressed as crashes per 100 million vehicle-miles of travel (VMT).
- C = Total number of crashes in the study period.
- N = Number of years of data.
- V = Number of vehicles per day (both directions).
- L = Length of the roadway segment in miles.

	100,000,000 VMT factor
	365 VMT factor
N =	5 years

Annual Crashes per 100 million vehicle-miles of travel (VMT)					
Segment #1	Segment Location	Total Number of Crashes (C)	2021 AADT Data (V) (ref #2)	Length of Segment (L) (mile)	Crash Rate (R)
South Ave					
1	west of Reserve to 27th	28	10,924	0.22	638.4
2	27th to 33rd	42	6,567	0.75	467.3
3	33rd to Clements	37	4,468	0.99	458.3
Clements Rd					
4	South Ave to North Ave	8	3,207	0.25	546.7

Annual Crashes per Mile	
South Ave	
Crashes per Mile	10.9
Clements Rd	
Crashes per Mile	6.4

A "crashes per mile" rate for road segments is calculated as:

$$R = \frac{C}{N \times L}$$

Where:

- R = Crashes per mile for the road segment expressed as crashes per each 1 mile of roadway per year.
- C = Total number of crashes in the study period.
- N = Number of years of data.
- L = Length of the roadway segment in miles.

Missoula County Crash Rate



- Reference:
- 1) <https://www.mdt.mt.gov/publications/datastats/traffic-maps.aspx>
 - 2) <https://www.mdt.mt.gov/publications/datastats/crashdata.aspx>

The crash rate for **road segments** is calculated as:

$$R = \frac{100,000,000 \times C}{365 \times N \times V \times L}$$

Where:

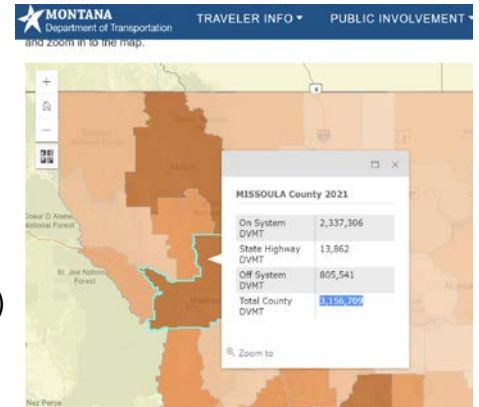
- R = Crash rate for the road segment expressed as crashes per 100 million vehicle-miles of travel (VMT).
- C = Total number of crashes in the study period.
- N = Number of years of data.
- V = Number of vehicles per day (both directions).⁹
- L = Length of the roadway segment in miles.

$N = \frac{100,000,000 \text{ VMT factor}}{365 \text{ VMT factor} \times 5 \text{ years}}$
--

Missoula County 2021 daily vehicle miles traveled (per ref #1): 3,156,709 (V X L)
 2016-2020 all crashes (per ref #2, "All Montana Crashes" file): 3,038 (C)

R = 53 Crashes per 100 million VMT

The crash rate for Missoula County is 53 crashes per 100 million vehicle-miles of travel.



Serious Injury & Fatality Safety Impact Assessment



Crash Modification Factor (CMF) Selection								
CMFs were reviewed to determine the most suitable factor for estimating the safety impacts of proposed improvements. The following CMFs were selected based on star quality rating, applicability to the roadway segment under consideration, and that it is applicable for the documented crash types occurring on the existing roadway geometry.								
CMF Description	CMF ID	CMF Value	CMF Clearinghouse Star Quality Rating	Crash Type	Crash Severity	Applicable Location	Minimum AADT	Link
Install TWLTL (Two-Way Left Turn Lane) on Two Lane Road	2348	0.506	4	Rear End	All	South Ave - 31st Street to 26th Street	Not specified	https://www.cmfclearinghouse.org/detail.cfm?facid=2348
Install Sidewalk	N/A	0.12	N/A	Pedestrian	All	South Ave - west of Reserve St to Clements Rd	Not specified	https://safety.fhwa.dot.gov/ped_bike/tools_solve/fhwasa18041/fhwasa18041.pdf https://rosap.ntl.bts.gov/view/dot/50265

CMF Calculations - Estimated Annual Serious Injury Reduction					
The most current available 5 year time period of crash data (01/01/2016 to 12/31/2020) provided by the Montana Department of Transportation and Missoula MPO was reviewed. Also, the Missoula MPO collaborated with the Missoula Police Department regarding collisions between 12/31/2020 and 05/01/2022. Therefore, the time period for this crash rate is 6.3 years (01/01/2016 to 05/01/22). Crash data was sorted by injury severity to filter serious injury crashes recorded within the limits of proposed improvements, as summarized below.					
Record #	Crash Date	Collision Type	Approximate Location	Number of Injuries	
1708100650904	9/7/2017	Rear-End	South Avenue - Between 26th Ave and Old Fort Road	3	
2008100650202	2/10/2020	Rear-End	South Avenue & Old Fort Road	1	
Average Annual Affected Injury Rate = total number of injuries/years of reported data Average Annual Affected Injury Rate = 0.635 serious injuries/year					
The CMF associated with the TWLTL is the most appropriate improvement for estimating the injury reduction for the rear-end collisions. Estimated Annual Injury Reduction = Average Annual Affected Injury Rate x [1 - CMF ID #2348] Estimated Annual Injury Reduction = 0.314 serious injuries/year					

CMF Calculations - Estimated Annual Lives Saved					
Crash data for incidents occurring after 12/31/2020 are not yet available from the Montana Department of Transportation. The Missoula MPO collaborated with the Missoula Police Department to obtain information regarding a fatality involving a pedestrian in 2022. A review of the police report indicated that the pedestrian was walking on the roadway in an area that does not have sidewalk and was struck by a motor vehicle. A time period of 6.3 years (01/01/2016 to 05/01/2022) is used to determine the average annual fatality rate.					
Crash Date	Collision Type	Approximate Location	Number of Fatalities	Lighting Condition	
1/29/2022	N/A	South Avenue & 26th Street	1 (Pedestrian)	Dark	
Average Annual Fatality Estimate = total number of fatalities/years of reported data Average Annual Fatality Rate = 0.159 fatalities/year					
The CMF associated with the sidewalk is the most appropriate improvement for estimating the average annual lives saved of pedestrians. Estimated Annual Lives Saved = Average Annual Fatality Estimate x [1 - CMF for sidewalk installation] Estimated Annual Lives Saved = 0.140 lives/year					

Safety Impact Assessment - Raised Median Island



Crash Modification Factor (CMF) Selection

CMFs were reviewed to determine the most suitable factor for estimating the safety impacts of proposed improvements. The following CMFs were selected based on star quality rating, applicability to the roadway segment under consideration, and that it is applicable for the documented crash types occurring on the existing roadway geometry.

CMF Description	CMF ID	CMF Value	CMF Clearinghouse Star Quality Rating	Crash Type	Crash Severity	Applicable Location	AADT Range	Link
Install Raised Median With or Without Marked Crosswalk (Uncontrolled)	9015	0.741	4	Rear End, Sideswipe	All	South Avenue & 26th Street South Avenue & 31st Street	1,245 to 46,000	https://www.cmfclearinghouse.org/detail.cfm?facid=9015
<p>Note: the base condition of CMF # 10736 was 12' lanes, 6' shoulder, no median, and two-lane urban arterial road. This base condition is similar to the north side of South Avenue where a bicycle lane is proposed.</p>								

CMF Calculations - Raised Median Island Safety Impact

The most current available 5 year period of crash data (01/01/2016 to 12/31/2020) provided by the Montana Department of Transportation and Missoula MPO was reviewed. After filtering the data to only rear end or sideswipe at the applicable locations, the following four incidents were identified:

Record #	Crash Date	Approximate Location	Crash Severity	Collision Type
1708103260902	9/6/2017	South Ave & 31st Street	No apparent Injury (property damage only crash)	Sideswipe, same direction
1908103300401	4/28/2019	South Ave & 31st Street	No apparent Injury (property damage only crash)	Sideswipe, same direction
1808100650911	9/6/2018	South Ave & 26th Street	Possible Injury Crash	Rear End
1808100261028	10/24/2018	South Ave & 26th Street	No apparent Injury (property damage only crash)	Sideswipe, same direction

Average Annual Crash Rate = total number of crashes/years of reported data
 Average Annual Crash Rate = 0.800 crashes/year

Estimated Crash Reduction = Average Annual Crash Rate x [1 - CMF ID #9015]
 Estimated Annual Crash Reduction = 0.207 crashes/year

Safety Impact Assessment - Bicycle Lane



Crash Modification Factor (CMF) Selection								
CMFs were reviewed to determine the most suitable factor for estimating the safety impacts of proposed improvements. The following CMFs were selected based on star quality rating, applicability to the roadway segment under consideration, and that it is applicable for the documented crash types occurring on the existing roadway geometry.								
CMF Description	CMF ID	CMF Value	CMF Clearinghouse Star Quality Rating	Crash Type	Crash Severity	Applicable Location	AADT Range	Link
Install Bicycle Lanes	10736	0.558	3	All	All	South Ave - Clements Rd to west of Reserve St	10 to 92,462	https://www.cmfclearinghouse.org/detail.cfm?facid=10736
Note: the base condition of CMF # 10736 was 12' lanes, 6' shoulder, no median, and two-lane urban arterial road. This base condition is similar to the north side of South Avenue where a bicycle lane is proposed.								

CMF Calculations - Bicycle Lane Safety Impact on Bicycle Crashes				
The most current available 5 year period of crash data (01/01/2016 to 12/31/2020) provided by the Montana Department of Transportation and Missoula MPO was reviewed. After filtering the data to only incidents involving bicyclist, the following two incidents were identified:				
Record #	Crash Date	Approximate Location	Crash Severity	
1708100650814	8/8/2017	South Avenue - Between 26th Ave and Old Fort Road	Property Damage Only	
2008100260711	7/14/2020	South Avenue & Old Fort Road	Suspected Minor Injury	
Average Annual Bicycle Crash Rate = total number of crashes/years of reported data Average Annual Bicycle Crash Rate = 0.400 bicycle crash/year				
Note: for the purposes of this assessment, "bicycle crashes" are defined as crashes involving a motor vehicle and bicyclist.				
The CMF associated with the bicycle lanes is the most appropriate improvement for estimating a bicycle crash reduction. Estimated Bicycle Crash Reduction = Average Annual Bicycle Crash Rate x [1 - CMF ID #10736] Estimated Annual Bicycle Crash Reduction = 0.177 bicycle crash/year				

CMF Calculations - Bicycle Lane Safety Impact on All Other Crashes										
The most current available 5 year period of crash data (01/01/2016 to 12/31/2020) provided by the Montana Department of Transportation and Missoula MPO was reviewed. The following table summarizes all other crash types (excluding bicycle crashes) that occurred on South Avenue from Clements Road to west of Reserve Street.										
South Avenue - Clements Road to west of Reserve Street (Crash Types)										
Year	Fixed Object	Head On	Left Turn, Opposite Direction	Lost Control	Other	Rear-End	Right Angle	Sideswipe, Opposite Direction	Sideswipe, Same Direction	Wild Animal
2016	3	0	3	1	1	14	8	0	1	1
2017	2	0	0	0	1	8	4	1	2	0
2018	3	1	1	0	4	6	5	0	1	0
2019	4	0	1	0	1	5	3	0	2	0
2020	5	0	0	0	2	6	2	0	2	1
Total	17	1	5	1	9	39	22	1	8	2
Average Annual Crash Rate = total number of crashes/years of reported data Average Annual Crash Rate = 21.000 crashes/year										
The CMF associated with the bicycle lanes is used to predict the crash rate reduction for all other crashes (excluding bicycle crashes). Estimated Crash Reduction = Average Annual Crash Rate x [1 - CMF ID #10736] Estimated Annual Crash Reduction = 9.282 crashes/year										

Safety Impact Assessment - Lighting



Crash Modification Factor (CMF) Selection

CMFs were reviewed to determine the most suitable factor for estimating the safety impacts of proposed improvements. The following CMFs were selected based on star quality rating, applicability to the roadway segment under consideration, and that it is applicable for the documented crash types occurring on the existing roadway geometry.

CMF Description	CMF ID	CMF Value	CMF Clearinghouse Star Quality Rating	Crash Type	Crash Severity	Applicable Location	AADT Range	Link
Install Lighting	7776	0.68	4	All	All	South Ave - 26th St to 36th St	Not specified	https://www.cmfclearinghouse.org/detail.cfm?facid=7776

CMF Calculations - Lighting Installation Safety Impact

The most current available 5 year period of crash data (01/01/2016 to 12/31/2020) provided by the Montana Department of Transportation and Missoula MPO was reviewed. After filtering the data to incidents occurring in dark lighting conditions and between Reserve and 36th (excluding South Ave & 31st St and South Ave & 33rd St where lighting exists), the following 10 crashes were identified. Note, incident locations coded with lighting condition "dark - lighted" were checked in street view and determined that the lighting condition should have been coded as "dark - not lighted" based on existing street lighting locations.

Record #	Crash Date	Collision Type	Approximate Location	Crash Severity
50084227	1/25/2016	Sideswipe, Same Direction	west of South Ave & 31st St	No apparent Injury (property damage only crash)
50083625	2/2/2016	Right Angle	east of South Ave & 31st St	Suspected Minor Injury
1608102620401	4/1/2016	Rear-End	South Ave & 27th St	Possible injury crash
50088513	6/6/2016	Wild Animal	west of South Ave & 35th St	No apparent Injury (property damage only crash)
50090654	9/3/2016	Fixed Object	South Ave & 27th St	No apparent Injury (property damage only crash)
50098086	1/30/2017	Sideswipe, Opposite Direction	east of South Ave & Tower St	No apparent Injury (property damage only crash)
1908103830201	2/8/2019	Right Angle	South Ave & 26th St	Possible injury crash
2008101100104	1/31/2020	Rear-End	South Ave & Suzanne Court	No apparent Injury (property damage only crash)
2008103880301	3/2/2020	Fixed Object	South Ave & 35th St	No apparent Injury (property damage only crash)
2008101220802	8/28/2020	Fixed Object	west of South Ave & 27th St	No apparent Injury (property damage only crash)

Average Annual Crash Rate = total number of crashes/years of reported data
 Average Annual Affected Injury Rate = 2.000 crashes/year (in dark conditions)

The CMF associated with installing lighting is the most appropriate improvement for estimating the crash reduction.

Estimated Crash Reduction = Average Annual Crash Rate x [1 - CMF ID#7776]
Estimated Crash Reduction = 0.640 crashes/year

Crash Modification Factor (CMF) Selection								
CMFs were reviewed to determine the most suitable factor for estimating the safety impacts of proposed improvements. The following CMFs were selected based on star quality rating, applicability to the roadway segment under consideration, and that it is applicable for the documented crash types occurring on the existing roadway geometry.								
CMF Description	CMF ID	CMF Value	CMF Clearinghouse Star Quality Rating	Crash Type	Crash Severity	Applicable Location	AADT Range	Link
Install TWLTL (Two-Way Left Turn Lane) on Two Lane Road	2348	0.506	4	Rear End	All	South Ave - 31st Street to 26th Street	Not specified	https://www.cmfclearinghouse.org/detail.cfm?facid=2348
Install TWLTL (Two-Way Left Turn Lane) on Two Lane Road	2338	0.686	4	All	All	South Ave - 31st Street to 26th Street	Not specified	https://www.cmfclearinghouse.org/detail.cfm?facid=2338

CMF Calculations - Two-Way Left Turn Lane (TWLTL) Safety Impact							
The most current available 5 year period of crash data (01/01/2016 to 12/31/2020) provided by the Montana Department of Transportation and Missoula MPO was reviewed. After filtering the data to incidents occurring between 26th Street and east of 31st (excluding collision involving bicyclist), the following crashes were identified:							
South Avenue - 31st Street to 26th Street (Crash Types)							
Year	Fixed Object	Head On	Other	Rear-End	Right Angle	Sideswipe, Same Direction	
2016	1	0	0	12	3	0	
2017	0	0	0	4	0	0	
2018	1	1	0	2	0	0	
2019	0	0	0	5	1	0	
2020	1	0	2	6	1	2	
Total	3	1	2	29	5	2	
Note: crash types are tabulated here to apply crash-type specific CMFs to the estimated crash reduction calculation. See crash incidents list at the bottom.							
Average Annual Rear-End Crash Rate = Total number of rear-end crashes/years of reported data Average Annual Rear-End Crash Rate = 5.800 rear-end crashes/year							
The CMF associated with TWLTL and for rear-end crashes is the most appropriate improvement for estimating the rear-end crash reduction. Estimated rear-end crash reduction = average annual rear-end crash rate x [1 - CMF ID #2348] Estimated rear-end crash rate reduction = 2.8652 crashes/year							
Average Annual Crash Rate (excluding rear-end collisions) = Total number of crashes/years of reported data Average Annual Crash Rate (excluding rear-end collisions) = 2.600 crashes/year							
The CMF associated with TWLTL and for all crash types is the most appropriate improvement for estimating this crash reduction. Estimated crash rate reduction = average annual crash rate x [1 - CMF ID #2338] Estimated crash rate reduction = 0.816 crashes/year							
Total average annual crash rate = 8.400 crashes/year Total estimated crash rate reduction = estimated rear-end crash rate reduction + estimated rate reduction of all other crashes Total estimated crash rate reduction = 3.682 crashes/year							

Crash Incidents List					
Record #	Crash Date	Collision Type	Approximate Location	Crash Severity	
50083625	2/2/2016	Right Angle	South Ave - between 31st & Suzanne Court	Suspected Minor Injury	
1608103430205	2/23/2016	Rear-End	South Ave - between 27th St & Suzanne	Possible injury crash	
50085068	3/24/2016	Rear-End	east of South Ave & 27th St	No apparent Injury (property damage only crash)	
1608100650326	3/25/2016	Rear-End	west of South Ave & 26th St	No apparent Injury (property damage only crash)	
1608102620401	4/1/2016	Rear-End	South Ave & 27th St	Possible injury crash	
1608103480402	4/8/2016	Rear-End	South Ave & 27th St	No apparent Injury (property damage only crash)	
1608103650402	4/8/2016	Rear-End	west of South Ave & 27th St	Possible injury crash	
1608103740402	4/22/2016	Rear-End	South Ave - between 27th St & Suzanne	No apparent Injury (property damage only crash)	
1608100110611	6/3/2016	Rear-End	South Ave & Old Fort Rd	No apparent Injury (property damage only crash)	
50090654	9/3/2016	Fixed Object	South Ave & 27th St	No apparent Injury (property damage only crash)	
1608103430901	9/15/2016	Rear-End	South Ave - between 31st & Suzanne Court	No apparent Injury (property damage only crash)	
1608100110920	9/19/2016	Rear-End	east of South Ave & 27th St	No apparent Injury (property damage only crash)	
1608102711002	10/14/2016	Right Angle	east of South Ave & 27th St	No apparent Injury (property damage only crash)	
1608102071006	10/31/2016	Rear-End	east of South Ave & 27th St	No apparent Injury (property damage only crash)	
1608100191131	11/17/2016	Rear-End	east of South Ave & Suzanne Court	No apparent Injury (property damage only crash)	
1608103651201	12/1/2016	Right Angle	South Ave - between 31st & Suzanne Court	No apparent Injury (property damage only crash)	
1708100650410	4/10/2017	Rear-End	west of South Ave & 27th St	No apparent Injury (property damage only crash)	
1708103540602	6/9/2017	Rear-End	east of South Ave & Suzanne Court	Possible injury crash	
1708100650812	8/8/2017	Rear-End	South Ave & Suzanne Court	Possible injury crash	
1708100650904	9/7/2017	Rear-End	west of South Ave & 26th St	Suspected Serious Injury	
1808100110316	3/21/2018	Fixed Object	west of South Ave & 27th St	No apparent Injury (property damage only crash)	
1808100650915	9/19/2018	Rear-End	east of South Ave & Old Fort Rd	Suspected Minor Injury	
1808100260929	9/26/2018	Head On	west of South Ave & 27th St	No apparent Injury (property damage only crash)	
1808100111125	11/29/2018	Rear-End	South Ave - between 27th St & Suzanne	Possible injury crash	
1908103830201	2/8/2019	Right Angle	South Ave & 26th St	Possible injury crash	
1908100260408	4/19/2019	Rear-End	west of South Ave & 26th St	No apparent Injury (property damage only crash)	
1908103890803	8/27/2019	Rear-End	South Ave - between 27th St & Suzanne	No apparent Injury (property damage only crash)	
1908100110842	8/29/2019	Rear-End	South Ave - between 27th St & Suzanne	No apparent Injury (property damage only crash)	
1908100111134	11/21/2019	Rear-End	South Ave & Old Fort Rd	No apparent Injury (property damage only crash)	
1908102761235	12/20/2019	Rear-End	east of South Ave & Old Fort Rd	Possible injury crash	
2008101100104	1/31/2020	Rear-End	South Ave & Suzanne Court	No apparent Injury (property damage only crash)	
2008100650202	2/10/2020	Rear-End	South Ave & Old Fort Rd	Suspected Serious Injury	
2008100650206	2/13/2020	Rear-End	South Ave & Suzanne Court	No apparent Injury (property damage only crash)	
2008100260513	5/19/2020	Other	South Ave & 27th St	No apparent Injury (property damage only crash)	
2008103870701	7/7/2020	Other	east of South Ave & Suzanne Court	No apparent Injury (property damage only crash)	
2008103650704	7/17/2020	Rear-End	South Ave - between 27th St & Suzanne	No apparent Injury (property damage only crash)	
2008101220802	8/28/2020	Fixed Object	South Ave - between 27th St & Suzanne	No apparent Injury (property damage only crash)	
2008103020815	8/31/2020	Sideswipe, Same	east of South Ave & Suzanne Court	No apparent Injury (property damage only crash)	
2008100260907	9/8/2020	Sideswipe, Same	South Ave & Old Fort Rd	No apparent Injury (property damage only crash)	
2008100111019	10/20/2020	Rear-End	South Ave & Old Fort Rd	Possible injury crash	
2008103351002	10/30/2020	Right Angle	South Ave & 26th St	No apparent Injury (property damage only crash)	
2008103651209	12/10/2020	Rear-End	South Ave & 27th St	No apparent Injury (property damage only crash)	

Crash Data Summary

Data Source: Montana Department of Transportation (MDT) & Missoula Metropolitan Planning Organization (MPO)
 Data Timeframe: 01/01/2016 to 12/31/2020



For full incident reports see tabs "MPO_CrashData-ClementsRd", "MDT_CrashData-ClementsRd", and "MPO_CrashData-SouthAve"

South Avenue - Clements Road to west of Reserve Street (Crash Severity)						
Year	Property Damage Only (PDO) Crashes	KABCO C - POSSIBLE INJURY	KABCO B - NON- INCAPACITATING	KABCO A - INCAPACITATING	KABCO K - KILLED*	KABCO U - INJURED (SEVERITY UNKNOWN)
2016	24	6	1	0		0
2017	13	3	3	1		0
2018	14	5	2	0		0
2019	12	4	0	0		0
2020	13	3	1	1		1
Total	76	21	7	2	0	1

South Avenue - Clements Road to west of Reserve Street(Injuries)						
Year	KABCO O - NO INJURY	KABCO C - POSSIBLE INJURY	KABCO B - NON- INCAPACITATING	KABCO A - INCAPACITATING	KABCO K - KILLED	KABCO U - INJURED (SEVERITY UNKNOWN)
2016	74	8	1	0	0	1
2017	50	5	3	1	0	1
2018	43	7	2	0	0	1
2019	29	6	0	0	0	1
2020	31	3	1	1	0	3
Total	227	29	7	2	0	7

* April 29 2022 fatality not included as full crash report not yet available.

South Avenue - Clements Road to west of Reserve Street (Crash Types)												
Year	Bicycle	Fixed Object	Head On	Left Turn, Opposite Direction	Lost Control	Other	Rear-End	Right Angle	Sideswipe, Opposite Direction	Sideswipe, Same Direction	Wild Animal	
2016	0	3	0	3	1	1	14	8	0	1	1	
2017	1	2	0	0	0	1	8	4	1	2	0	
2018	0	3	1	1	0	4	6	5	0	1	0	
2019	0	4	0	1	0	1	5	3	0	2	0	
2020	1	5	0	0	0	2	6	2	0	2	1	
Total	2	17	1	5	1	9	39	22	1	8	2	

Clements Road - South Ave to North Ave (Crash Severity)						
Year	Property Damage Only (PDO) Crashes	KABCO C - POSSIBLE INJURY	KABCO B - NON- INCAPACITATING	KABCO A - INCAPACITATING	KABCO K - KILLED*	KABCO U - INJURED (SEVERITY UNKNOWN)
2016	1	1	0	0	0	0
2017	3	0	0	0	0	0
2018	1	0	0	0	0	0
2019	0	0	0	0	0	0
2020	1	1	0	0	0	0
Total	6	2	0	0	0	0

Clements Road - South Ave to North Ave (Injuries)						
Year	KABCO O - NO INJURY	KABCO C - POSSIBLE INJURY	KABCO B - NON- INCAPACITATING	KABCO A - INCAPACITATING	KABCO K - KILLED	KABCO U - INJURED (SEVERITY UNKNOWN)
2016	2	1	1	0	0	3
2017	3	0	0	0	0	1
2018	2	0	0	0	0	0
2019	0	0	0	0	0	0
2020	7	1	0	0	0	0
Total	14	2	1	0	0	4

Clements Road - South Ave to North Ave (Crash Types)					
Year	Rear to Front	Fixed Object	Rear to Side	Right Angle	Wild Animal
2016				1	1
2017	1	2			
2018			1		
2019					
2020		1		1	
Total	1	3	1	2	1

Benefit-Cost Analysis - South Avenue SS4A Application (Safety Impact Assessment) Summary



		Benefits				Costs				
Year		Safety (2020 \$)	Residual Value (2020 \$)	Undiscounted Benefits (2020 \$)	Discounted Benefits at 7% (B)	Construction Cost (2020 \$)	Increase in Annual Maintenance Cost (2020 \$)	Undiscounted Costs (2020 \$)	Total Discounted Costs at 7%	Net Present Value
-2	2024					\$ 571,758		\$ 571,758	\$ 436,192	\$ (436,192)
-1	2025					\$ 3,863,368		\$ 3,863,368	\$ 2,754,528	\$ (2,754,528)
0	2026	\$ 1,794,331		\$ 1,794,331	\$ 1,195,638	\$ 3,863,368	\$ 9,300	\$ 3,872,668	\$ 2,580,522	\$ (1,384,884)
1	2027	\$ 1,794,331		\$ 1,794,331	\$ 1,117,419		\$ 9,300	\$ 9,300	\$ 5,792	\$ 1,111,628
2	2028	\$ 1,794,331		\$ 1,794,331	\$ 1,044,317		\$ 9,300	\$ 9,300	\$ 5,413	\$ 1,038,904
3	2029	\$ 1,794,331		\$ 1,794,331	\$ 975,997		\$ 9,300	\$ 9,300	\$ 5,059	\$ 970,939
4	2030	\$ 1,794,331		\$ 1,794,331	\$ 912,147		\$ 9,300	\$ 9,300	\$ 4,728	\$ 907,419
5	2031	\$ 1,794,331		\$ 1,794,331	\$ 852,474		\$ 9,300	\$ 9,300	\$ 4,418	\$ 848,055
6	2032	\$ 1,794,331		\$ 1,794,331	\$ 796,704		\$ 9,300	\$ 9,300	\$ 4,129	\$ 792,575
7	2033	\$ 1,794,331		\$ 1,794,331	\$ 744,584		\$ 9,300	\$ 9,300	\$ 3,859	\$ 740,724
8	2034	\$ 1,794,331		\$ 1,794,331	\$ 695,872		\$ 9,300	\$ 9,300	\$ 3,607	\$ 692,266
9	2035	\$ 1,794,331		\$ 1,794,331	\$ 650,348		\$ 9,300	\$ 9,300	\$ 3,371	\$ 646,977
10	2036	\$ 1,794,331		\$ 1,794,331	\$ 607,802		\$ 9,300	\$ 9,300	\$ 3,150	\$ 604,652
11	2037	\$ 1,794,331		\$ 1,794,331	\$ 568,039		\$ 9,300	\$ 9,300	\$ 2,944	\$ 565,095
12	2038	\$ 1,794,331		\$ 1,794,331	\$ 530,878		\$ 9,300	\$ 9,300	\$ 2,752	\$ 528,126
13	2039	\$ 1,794,331		\$ 1,794,331	\$ 496,147		\$ 9,300	\$ 9,300	\$ 2,572	\$ 493,576
14	2040	\$ 1,794,331		\$ 1,794,331	\$ 463,689		\$ 9,300	\$ 9,300	\$ 2,403	\$ 461,286
15	2041	\$ 1,794,331		\$ 1,794,331	\$ 433,354		\$ 9,300	\$ 9,300	\$ 2,246	\$ 431,108
16	2042	\$ 1,794,331		\$ 1,794,331	\$ 405,004		\$ 9,300	\$ 9,300	\$ 2,099	\$ 402,905
17	2043	\$ 1,794,331		\$ 1,794,331	\$ 378,509		\$ 9,300	\$ 9,300	\$ 1,962	\$ 376,547
18	2044	\$ 1,794,331		\$ 1,794,331	\$ 353,746		\$ 9,300	\$ 9,300	\$ 1,833	\$ 351,913
19	2045	\$ 1,794,331		\$ 1,794,331	\$ 330,604		\$ 9,300	\$ 9,300	\$ 1,714	\$ 328,890
20	2046	\$ 1,794,331	\$ 1,250,083	\$ 3,044,413	\$ 524,234		\$ 9,300	\$ 9,300	\$ 1,601	\$ 522,633
Total		\$ 35,886,618	\$ -	\$ 35,886,618	\$ 13,553,274	\$ 8,298,494	\$ 186,000	\$ 8,484,494	\$ 5,835,291	\$ 7,717,982

Notes

- 1) \$9,500,946 Total Project Cost in 2022 (\$654,606 assigned for Design Engineering)
- 2) \$8,298,494 Total Project Cost (in 2020 \$)
- 3) \$571,758 Design Engineering (in 2020 \$)
- 4) Design anticipated to begin in 2024
- 5) Construction anticipated to begin in 2025 and completed by 2026

Benefit-Cost Ratio (BCR) = 2.3

Safety Benefit



CMF Calculations - Predicted Safety Impact	
The predicted safety impact is based on 6.3 years of crash data (01/01/2016 to 05/01/2022) and only on the project's ability to reduce serious injuries and fatalities.	
The ability of proposed infrastructure improvements to reduce vehicular crashes are only reported qualitatively elsewhere in this assessment.	
Based on the South Avenue SS4A Safety Impact Assessment, the following estimated safety impacts are expected to persist into the future.	
Estimated Annual Serious Injury Reduction =	0.314 serious injuries/year
Estimated Annual Lives Saved =	0.140 lives/year

Safety Benefit Computations													
From 2022 USDOT BCA Guidance, Table A-1: Value of Reduced Fatalities and Injuries (Recommended Monetized Values, 2020 \$)													
KABCO Level A - Incapacitating = \$	554,800												
KABCO Level K - Killed = \$	11,600,000												
Safety benefit of serious injury reduction = estimated serious injury reduction x monetized value													
Safety benefit of annual lives saved = estimated annual lives saved x monetized value													
<table border="1"> <thead> <tr> <th colspan="3">Total Annual Safety Benefit</th> </tr> <tr> <th></th> <th><i>KABCO A - INCAPACITATING</i></th> <th><i>KABCO K - KILLED</i></th> </tr> </thead> <tbody> <tr> <td>Annual Safety Benefit=</td> <td>\$174,013</td> <td>\$1,620,317</td> </tr> <tr> <td>Total Annual Safety Benefit (2020 \$)=</td> <td colspan="2" style="text-align: center;">\$1,794,331</td> </tr> </tbody> </table>		Total Annual Safety Benefit				<i>KABCO A - INCAPACITATING</i>	<i>KABCO K - KILLED</i>	Annual Safety Benefit=	\$174,013	\$1,620,317	Total Annual Safety Benefit (2020 \$)=	\$1,794,331	
Total Annual Safety Benefit													
	<i>KABCO A - INCAPACITATING</i>	<i>KABCO K - KILLED</i>											
Annual Safety Benefit=	\$174,013	\$1,620,317											
Total Annual Safety Benefit (2020 \$)=	\$1,794,331												

Residual Value



Assumptions		
1)	30 Years	Useful service life of roadway surfacing section
2)	50 Years	Useful service life of luminaire poles
3)	50 Years	Useful service life of concrete sidewalk and curb & gutter
4)	Roadway & path surfacing section residual value based on sub-base course, crushed base course, and asphalt surface course.	
5)	Asphalt will be pulverized and reused thereby extending its useful service life (as justification for 30 year useful service life)	

Residual Value (RV) Equation		
$RV = \left(\frac{U - Y}{U}\right) \times Project\ Cost$	U = Useful Service Life of Project	
	Y = Years of Analysis Period Project Operation =	20 years
Note: separate calculations for varying useful service lives completed rather than assuming 1 overall useful service of life project		

Roadway & Path Surfacing Section Residual Value	
U =	30 years
Y =	20 years
Surfacing Costs =	\$2,171,570
RV (2022 \$) =	\$723,857

Luminaire Pole Residual Value	
U =	50 years
Y =	20 years
Luminaire Pole Costs =	\$460,000
RV (2022 \$) =	\$276,000

Concrete Sidewalk and Curb & Gutter Residual Value	
U =	50 years
Y =	20 years
Concrete Sidewalk and Curb & Gutter Costs =	\$718,938
RV (2022 \$) =	\$431,363

Project Residual Value = Roadway Surfacing Section RV + Luminaire Pole RV + Concrete Sidewalk and Curb & Gutter RV
Project RV (2022 \$) = \$1,431,219
Project RV (2020 \$) = \$1,250,083 discounted at 7%

Operations & Maintenance Computations



Assumptions/Notes	
	41% Increase in roadway width from east of 31st Street to 26th Street; assume proportional incremental increase in annual roadway maintenance
	12% Increase in roadway width from Clements Road to east of 31st Street; assume proportional incremental increase in annual roadway maintenance
\$	22,563 per mile - Annual roadway maintenance costs (includes operations & maintenance, signing & striping, and communications & signals)
	0.58 mile (length of TWLTL from east of 31st Street to 26th Street)
	1.29 mile (length of bicycle lane from Clements Road to east of 31st Street)
	20% Contingency (Includes incremental increase in maintenance of stormwater facilities and trees)

Historical Operations & Maintenance Costs (Source: City of Missoula FY22 Budget Allocation)		
Infrastructure	Incremental Increase in Maintenance Cost (2022 \$)	Incremental Increase in Maintenance Cost (2020 \$)
Roadway	\$8,902	\$7,775
Total Annual Operations & Maintenance Cost Increase (w/ contingency and rounded to nearest \$100) (2020 \$)		\$9,300

Benefit-Cost Analysis - South Avenue SS4A Application (Safety Impact Assessment)
Direct Job Creation



Description		Design/Construction Costs (1)	Jobs Created (2)
2024	Engineering Design, NEPA	\$ 654,606	7.1
2025	Construction	\$ 4,423,170	48.1
2026	Construction	\$ 4,423,170	48.1
Total (in 2022 dollars)		\$ 9,500,946	103.3

Project Cost (With Contingency)	\$	9,500,946
Design Engineering Fees	\$	654,606
Construction Engineering Fees	\$	794,454
Admin Fees	\$	309,688
Construction Cost	\$	7,742,198
Note: These amounts are in 2022 \$		

Notes:

- (1) Transportation Infrastructure costs only - does not include right-of-way dedication
- (2) Assumes one job per year for every \$92,000 of transportation infrastructure spending



Figure 3.6: Intersection Crash Density

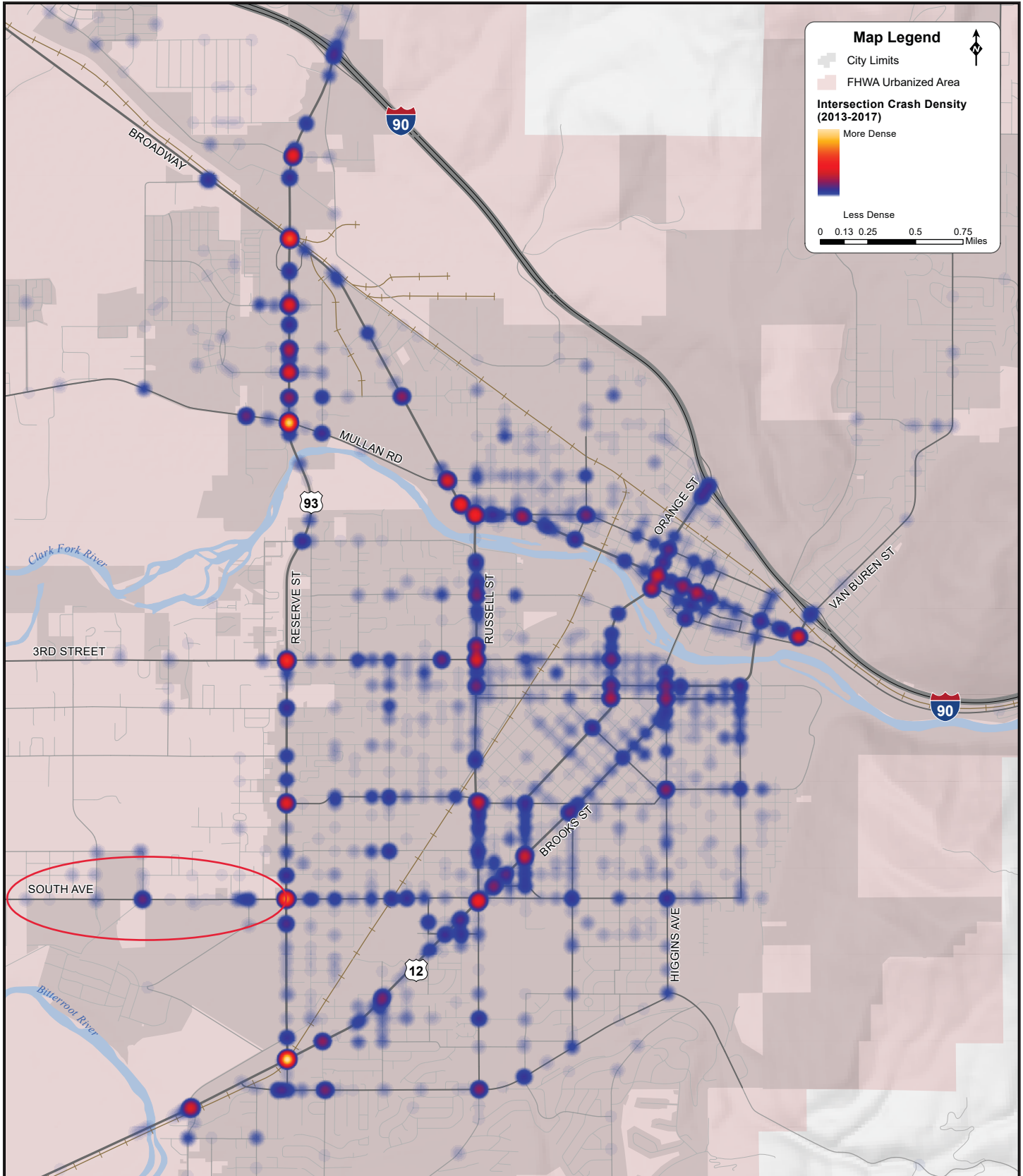
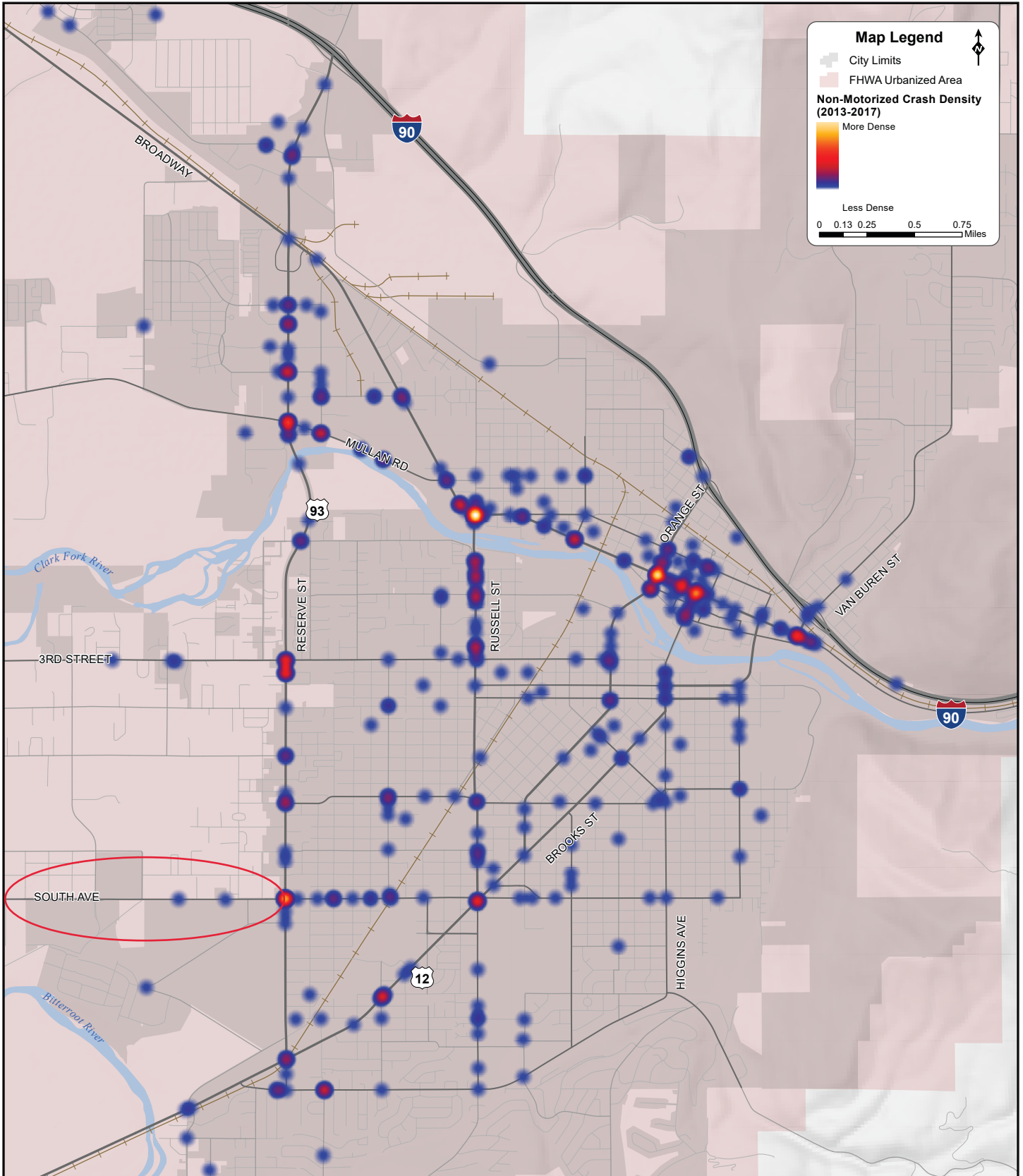


Figure 3.8: Non-Motorized Crash Density



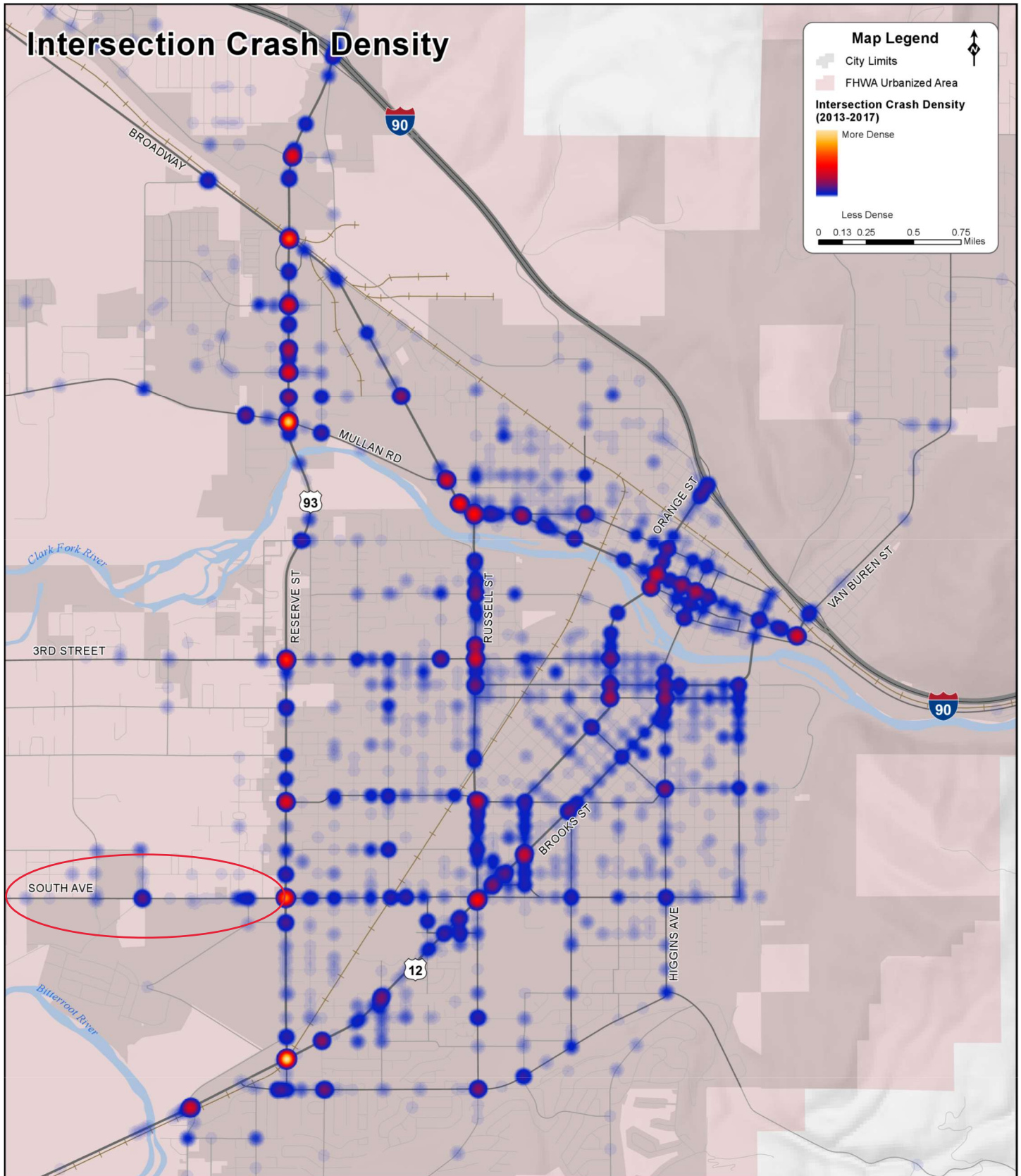


Figure 4.3: Intersection Crash Density

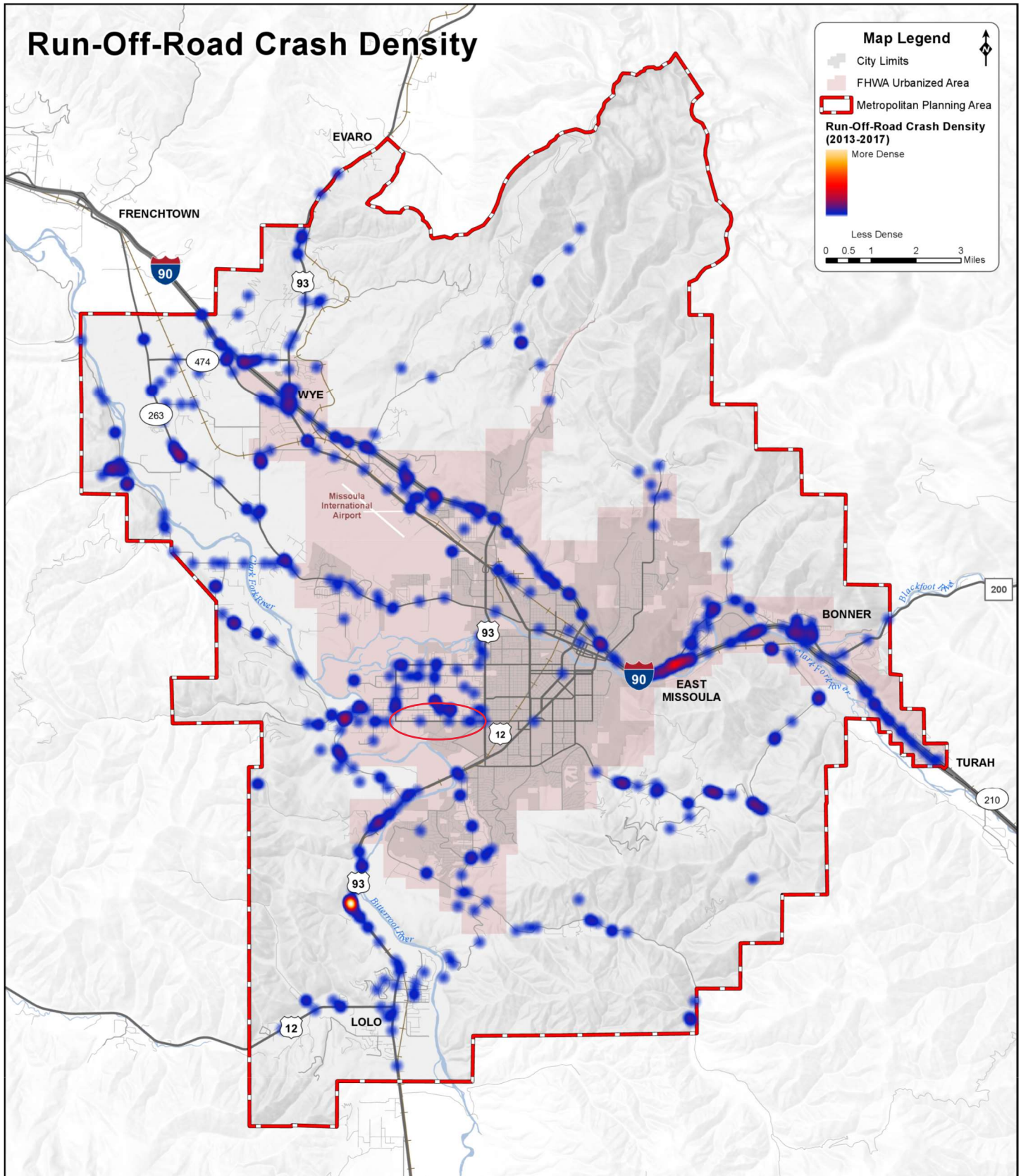


Figure 4.11: Run-off-Road Crash Density

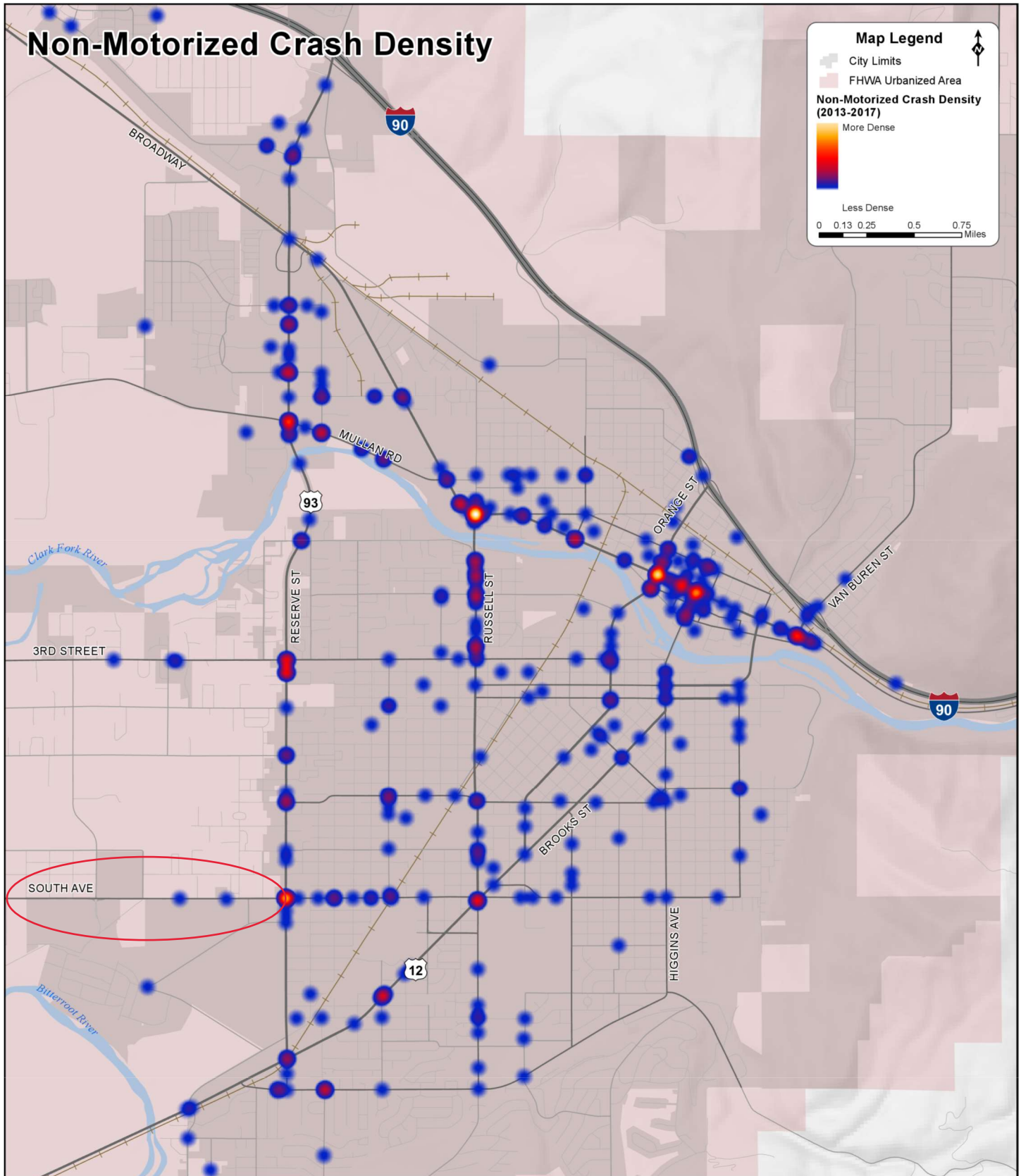


Figure 4.13: Non-Motorized Crash Locations

Appendix D - Letters of Support

Appendix D - Letters of Support

Safe Streets and Roads for All Grant

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United States Senate

September 1, 2022

The Honorable Pete Buttigieg
Secretary
United States Department of Transportation (USDOT)
1200 New Jersey Ave. SE
Washington, D.C. 20590

Dear Secretary Buttigieg:

I write to you in support of the City of Missoula in conjunction with the County of Missoula's application for the Safe Streets and Roads for All grant for the South Avenue Safe Street Project.

The City of Missoula and the County of Missoula are joining efforts to redesign portions of Missoula's South Avenue and Clements Road location through the South Avenue Safe Street Project. This project will address the documented high crash incidence involving automobiles, bicyclists, and pedestrians by using proven transportation engineering approaches. The project area contains various attractions that include several schools, a community hospital and surrounding medical campus, a regional park with numerous sports fields, worship centers, senior living and other group homes, as well as businesses, and approximately 7,104 residents. Given the high utilization and crash incidence of this area, there is significant need for improved transportation design to safely and effectively transport commuters and residents.

If successful, the funding will support the redesign of transportation infrastructure by utilizing proven transportation engineering approaches. This project will greatly enhance the safety and accessibility of residents and commuters of the South Avenue and Clement Road area by decreasing crash incidence through improving transportation infrastructure.

I trust you will give this application fair and thoughtful consideration.

Sincerely,



Steve Daines
United States Senator

United States Senate

September 13, 2022

Honorable Pete Buttigieg
U.S. Secretary of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Buttigieg:

I write in support of the City of Missoula and Missoula County's grant application for the Federal Highway Administration's Safe Streets and Roads for All for their South Avenue project. They are applying for a construction implementation grant to fund a reconstruction project on Missoula's South Avenue - \$7.7 million over a five year period. This project will redesign parts of South Avenue and Clements Road to address the area's documented crash history, and provide needed safety and accessibility improvements to a busy corridor that serves schools, medical facilities, a large regional park, senior living and other group homes, worship centers, and multiple other businesses and residences.

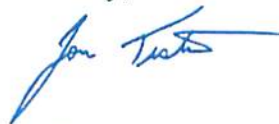
South Avenue lacks basic safety features such as curbs and sidewalks. It has an alarming crash history, including pedestrian fatalities, which needs to be addressed. Providing funded would allow for the city and county to make the necessary changes to ensure the safety of its residents, while also allowing a multitude of additional benefits, including:

- Providing safe and convenient spaces for people biking and walking through installation of sidewalks, bike lanes, and a shared use path
- Modernized sections of road to better fit the surrounding destinations
- Increasing access for all users to major destinations along the corridor
- Adding safe crossings to connect the neighborhood north of the street to the attractions south of the street
- Enticing residents to commute to surrounding destinations sustainably

This South Avenue project has a long history of development; The Missoula Metropolitan Planning Organization (MPO) has produced a Community Transportation Safety Plan that has a data driven safety effort identifying this project for scoring on the Missoula MPO's Long-Range Transportation Plan. The project has had multiple stages of engineering design work and public engagement phases making for a strong history of project development.

Thank you for your attention to this application. If I can provide any additional information, please do not hesitate to contact me. I would also appreciate you informing my office of the eventual decision on this application.

Sincerely,



Jon Tester
United States Senator

Missoula County Commissioners

Mailing Address: 200 West Broadway
Physical Address: 199 West Pine
Missoula, MT 59802-4292

P: 406.258.4877 | F: 406.258.3943
E: bcc@missoulacounty.us



BCC 2022-216
September 6, 2022

Pete Buttigieg
U.S. Secretary of Transportation
1200 New Jersey Ave. S.E.
Washington, DC 20590

Dear Secretary Buttigieg,

The Missoula Board of County Commissioners supports the City of Missoula and Missoula County's South Avenue Safe Street Project application to the Safe Streets and Roads for All Discretionary Grant Program. This project will provide much-needed safety and accessibility improvements to a busy corridor that serves several schools, a hospital and medical campus, a large regional park, senior living and other group homes, worship centers, and multiple other businesses and residences.

Despite serving all these destinations, much of the street lacks basic safety features like curbs and sidewalk. South Avenue has an alarming crash history, including pedestrian fatalities, that must be addressed. Missoula County will be funding portions of the project on South Avenue from 36th Street to Clements Road, a short segment of 4th Avenue adjacent to Target Range School, and Clements Road from South Avenue to North Avenue.

Safe Streets and Roads for All funding for the South Avenue project would:

- provide safe and convenient space for people biking and walking through installation of sidewalks, bike lanes and a shared-use path
- increase access for all users to major destinations along the corridor
- provide safer access to those seeking medical care by bus, foot or bicycle
- add safe crossings to connect the neighborhood north of the street to the amenities south of the street
- improve visibility and predictability at intersections and driveways
- make it easier for children and families to bike and walk to school
- modernize this section of road to better fit the surrounding destinations
- address public safety in an equitable manner
- entice residents to commute to surrounding destinations sustainably

Missoula County will fund the match on the portions of the project on South Avenue from 36th Street to Clement Road, a short segment of 40th Avenue adjacent to Target Range School, and Clements Road from South Avenue to North Avenue. The County local match is described in the appendices of the application.

Thank you for providing this opportunity and for considering awarding funding for much-needed safety improvements along this important corridor in Missoula.

Sincerely,

BOARD OF COUNTY COMMISSIONERS

Juanita Vero

6F45D36DCC41E9C2B2D512DC93A576B2 readysign

Juanita Vero, Chair

Josh Slotnick

137D51ED69FA2244FFA409545EBDD56F readysign

Josh Slotnick, Commissioner

Not Available

David Strohmaier, Commissioner

BCC/ac

RESOLUTION NUMBER 8618

A RESOLUTION OF THE MISSOULA CITY COUNCIL IN SUPPORT OF THE CITY OF MISSOULA'S SAFE STREETS AND ROADS FOR ALL GRANT APPLICATION, *SOUTH AVENUE SAFE STREET FOR ALL*

WHEREAS, the City of Missoula, in partnership with Missoula County, is applying for up to \$10 million in funding from the US Department of Transportation Safe Streets for All (SS4A) grant in order to provide complete streets improvements along South Avenue between Reserve and Clements, including sidewalks, bike lanes, shared-use paths, and turn lanes; and

WHEREAS, this project is identified in the Metropolitan Planning Organization's Long Range Transportation Plan and portions of the project are within the City's 5-year Capital Improvement Program; and

WHEREAS, there is demonstrated need in the aforementioned documents for additional sources of funding to complete these needed safety improvements along South Avenue in both the City and County; and

WHEREAS, the project will address a need for improvements to key networks that will provide attractive, active and connected urban to rural transportation facilities within an existing mixed-use community area, reducing the need for future vehicle trips on congested roadways; and

WHEREAS, proposed improvements will enhance multi-modal transportation by providing safer, more convenient options for walking, biking and transit; and

WHEREAS, the project will alleviate areas of known transportation crash trends, including vehicle and non-motorized road users, and reduce the need for non-local funding of regional road systems by improving safety and providing enhanced multi-modal transportation connections; and

WHEREAS, the project will provide critical infrastructure in an area experiencing growth, and will reduce the cost of development, supporting the City of Missoula and Missoula County affordable housing policies; and

WHEREAS, the SS4A funds in combination with local contributions will fund the project; and

WHEREAS, the SS4A federal grant application requires a minimum match of 20 percent of the total project cost; and

WHEREAS, Missoula County is committed to providing local funds sufficient to cover the requirements for match on federal funds necessary to construct the segments of the project outside of City limits; and

WHEREAS, the City of Missoula is committed to matching up \$1,500,000, consisting of a mix of transportation impact fees, park district, and gas taxes ; and

WHEREAS, this cross-jurisdictional project will ensure collaboration between the City of Missoula and Missoula County to provide connectivity, safety and accessibility for residents along South Ave regardless of whether they live within City limits, and in order to create a consistent design of the corridor.

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Missoula, Montana that the City Council and Acting Mayor support the intent of and project contained in the 2022 South Avenue Safe Streets for All grant application, and commit to providing up to \$1,500,000 in local funds as match necessary to complete the project elements located within the current City limits.

PASSED AND ADOPTED this 29th day of August, 2022

ATTEST:

APPROVED:


Martha L. Rehbein (Aug 30, 2022 13:44 MDT)

Martha L. Rehbein
City Clerk

 Gwen E. Jones, Acting Mayor

Gwen Jones
Acting Mayor

(SEAL)



September 6, 2022

Honorable Secretary Pete Buttigieg
U.S. Secretary of Transportation
1200 New Jersey Ave. S.E.
Washington, DC 20590

Subject: 2022 Safe Streets for All – City of Missoula and Missoula County – South Avenue

Dear Secretary Buttigieg,

The Montana Department of Transportation is pleased to support the City of Missoula and Missoula County's South Avenue Safe Streets and Roads for All Program grant application.

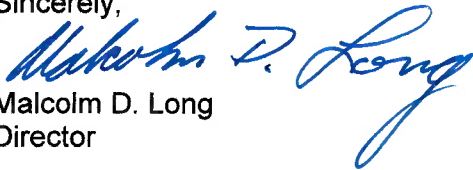
This project will provide much needed safety and accessibility improvements to a busy corridor that serves several schools, a hospital and medical campus, a large regional park, senior living and other group homes, worship centers, and multiple other businesses and residences.

Despite serving all these destinations, much of the street lacks basic safety features like curb and sidewalk. South Avenue has an alarming crash history, including pedestrian fatalities, that must be addressed. If South Avenue is awarded Safe Streets and Roads for All funding, it will:

- Provide safe and convenient space for people biking and walking through installation of sidewalks, bike lanes, and a shared use path;
- Increase access for all users to major destinations along the corridor;
- Add safe crossings to connect the neighborhood north of the street to the attractions south of the street;
- Make it easier for children and families to bike and walk to school; and
- Address public safety in an equitable manner.

Thank you for providing this opportunity and for considering awarding funding for much needed safety improvements along this important corridor in Missoula.

Sincerely,



Malcolm D. Long
Director



August 16, 2022

Missoula MPO
435 Ryman St.
Missoula, MT 59802

RE: City of Missoula and Missoula County's Safe Streets for All Grant Application, *South Avenue Transportation Safety Improvements*

To Whom It May Concern:

On behalf of the Missoula Metropolitan Planning Organization (MPO) and the Transportation Policy Coordinating Committee, please accept this letter in strong support of the City of Missoula and Missoula County's Safe Streets for All (SS4A) grant application for transportation improvements to the South Ave, west of Reserve Street. As the regional transportation planning body for the Missoula urban area, we have a vested interest in projects that improve access, connectivity and especially safety for all different modes of transportation. In particular, given upcoming improvements to the Fort Missoula Regional Park (FMRP), expansion of federal agency offices at Historic Fort Missoula, and continued operation of Community Medical Center, this project will promote active, healthy and sustainable trip choices to mitigate expected increases in traffic.

The section of roadway proposed for improvement already accommodates traffic accessing residential areas, schools (Big Sky H.S., Target Range School), Fort Missoula ball fields, Historic Museum, federal agency offices, and the many medical offices within the Community Medical Center campus. However, there is a significant gap in access and safety for non-motorized mode choices. There is a separated trail on the south side of the roadway, however a lack of sidewalks and bike lanes on the north side contributes to an unsafe and uncomfortable environment for people who want to walk or bike to their destination. In addition to children accessing schools in the area, there is a large concentration of elderly and other vulnerable populations surrounding the medical campus, and bus riders are forced to depart onto an unimproved shoulder, with few marked crossings from north to south.

As a whole, the Missoula region enjoys a relatively high rate of bicycle and pedestrian commuters at 6% and 7% respectively, yet within the neighborhood along South Avenue west of Reserve St, those percentages drop to 1% and 2% (American Community Survey data, 2013). We have demonstrated throughout our Active Transportation Plan implementation and traffic count programs that if you build facilities, the people will use them. If this Safe Streets for All Grant request is awarded, the connectivity and access improvements will be considerable. Schools, from C.S. Porter one block north on Reserve Street, to Big Sky H.S. and Target Range, will have the opportunity to safely and securely walk or bike to and from the surrounding neighborhoods, school and to the future recreational opportunities at FMRP and the Lolo 2



Missoula Trail. Other users such as patients and employees of Community Medical Center will have a safe way to commute to appointments and their jobs or wait for the bus.

In addition to the direct gains to safety, connectivity and access for active transportation modes, this project will support goals and objectives within our Long Range Transportation (LRTP) and Active Transportation Plans (ATP). South Ave. complete streets improvements between Reserve St and Clements Road are listed in the LRTP under several projects, and providing adequate bicycle and pedestrian facilities access to schools, parks and employment centers is a key goal of the ATP.

We know people are using South Ave to walk and bike already. We also know that the lack of facilities creates risk for those users, with several reported incapacitating injuries to pedestrians over the last 5 years and likely numerous close calls. We also know that bike lanes and sidewalks/trails exist to the east and the west of this section of South Ave, that new trail and recreation opportunities are quickly being realized to the south, west and east. It would be a serious deficit to our transportation network to allow this final barrier to remain.

Timing is critical for this project in order to serve the FMRP and Lolo 2 Missoula trail, protect the safety of non-motorized modes, and to connect our schools to neighborhoods and recreational opportunities. We sincerely believe this grant has the opportunity to help construct projects to make a busy traffic corridor become safer, better connected, and more efficiently move all users.

Sincerely,

David Strohmaier

A6ACE081F2505A3A08967F7E8BB8C312

readysign

Dave Strohmaier

Chair, Transportation Policy Coordinating Committee

August 12, 2022

To Whom it May Concern:

I am writing on behalf of 5-2-1-0 Let's Move! Missoula, an initiative of the Missoula City-County Health Department, to strongly support the City of Missoula and Missoula County's South Avenue Safe Streets and Roads for All Program grant application. This project will provide critical safety and accessibility improvements to a busy corridor that serves several schools, a hospital and medical campus, a large regional park, senior living, group homes, worship centers, and more.

Despite serving these destinations, much of the street lacks basic safety features like curbs and sidewalks. South Ave has an alarming crash history, including pedestrian fatalities, that must be addressed. 5-2-1-0 Let's Move! Missoula is dedicated to creating access to physical activity for all residents, and we see many benefits to this project. If South Ave is awarded Safe Streets and Roads for All funding, it will:

- Provide safe and convenient space for people biking and walking through installation of sidewalks, bike lanes, and a shared use path
- Increase access for all users to destinations along the corridor
- Provide safer access to those seeking medical care by bus, foot or bicycle
- Add safe crossings to connect the neighborhood north of the street to amenities on the south of the street
- Make it easier for children and families to bike and walk to school
- Address public safety in an equitable manner
- Entice residents to commute to surrounding destinations sustainably

Thank you for providing this opportunity and for considering awarding funding for much needed safety improvements along this important corridor in Missoula.

Sincerely,



Peggy Schmidt, MS
She / her / hers
5-2-1-0 Let's Move! Missoula Coordinator
Missoula City-County Health Department
www.5210letsmovemissoula.org



Pete Buttigieg
U.S. Secretary of Transportation
1200 New Jersey Ave. S.E.
Washington, DC 20590

Dear Secretary Buttigieg,

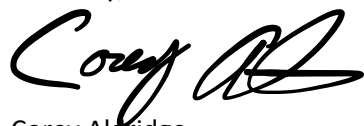
I am writing on behalf of the Missoula Urban Transportation District to strongly support the City of Missoula and Missoula County's South Avenue Safe Streets and Roads for All Program grant application. This project will provide much needed safety and accessibility improvements to a busy corridor that serves several schools, a hospital and medical campus, a large regional park, senior living and group homes, worship centers, and multiple other businesses and residences.

Despite serving all these destinations, much of the street lacks basic safety features like curbs and sidewalks. South Ave has an alarming crash history, including pedestrian fatalities, that must be addressed. MUTD operates fixed-route and paratransit service along this corridor seven days a week. These safety improvements will benefit riders using 11 bus stops along three different fixed routes, allowing for safer first- and last-mile travel. If South Ave is awarded Safe Streets and Roads for All funding, it will:

- Provide safe and convenient space for people bussing, biking and walking through the installation of sidewalks, bike lanes, and a shared-use path.
- Provide safer access to those seeking medical care by bus, foot or bicycle.
- Add safe crossings to connect the neighborhood north of the street to the attractions and bus stop infrastructure south of the street.
- Improve visibility and predictability at intersections and driveways for buses and personal vehicles, improving overall road safety.
- Make it easier for children and families to bus, bike and walk to school.
- Address public safety in an equitable manner.
- Entice residents to commute to surrounding destinations sustainably.

Thank you for providing this opportunity and for considering awarding funding for much needed safety improvements along this important corridor in Missoula.

Sincerely,

A handwritten signature in black ink, appearing to read "Corey Aldridge". The signature is stylized and cursive.

Corey Aldridge
CEO & General Manager
Missoula Urban Transportation District

Pete Buttigieg
U.S. Secretary of Transportation
1200 New Jersey Ave. S.E.
Washington, DC 20590

Dear Secretary Buttigieg,

I am writing on behalf of the Missoula Institute for Sustainable Transportation (MIST) and the Free Cycles community bicycle program to strongly support the City of Missoula and Missoula County's South Avenue Safe Streets and Roads for All Program grant application. This project will provide much needed safety and accessibility improvements to a busy corridor that serves several schools, a hospital and medical campus, a large regional park, senior living and other group homes, worship centers, and multiple other businesses and residences.

Despite serving all these destinations, much of the street lacks basic safety features like curb and sidewalk. South Ave has an alarming crash history, including pedestrian fatalities, that must be addressed. MIST and Free Cycles serve 20,000 people a year to help them fix or build their own free bicycle and we see many benefits to this project. If South Ave is awarded Safe Streets and Roads for All funding, it will:

- Provide safe and convenient space for people biking and walking through installation of sidewalks, bike lanes, and a shared use path
- Increase access for all users to major destinations along the corridor
- Provide safer access to those seeking medical care by bus, foot or bicycle
- Add safe crossings to connect the neighborhood north of the street to the attractions south of the street
- Improve visibility and predictability at intersections and driveways
- Make it easier for children and families to bike and walk to school
- Modernize this section of road to better fit the surround destinations
- Address public safety in an equitable manner

Thank you for providing this opportunity and for considering awarding funding for much needed safety improvements along this important corridor in Missoula.

Sincerely,

Robert Giordano, Executive Director
Missoula Institute for Sustainable Transportation



Missoula Bicycle & Pedestrian Advisory Board



Jessica Tuberty
Board Chair

James Walter
Board Vice Chair

Eugene Schmitz

Erin Montgomery

Nick Furlong

Matthew Thome

Kelly Sager

Kate Whittle

Brandon Wasser

Letter of Support: South Ave Safe Streets and Roads for All Grant Application

We strongly support the City of Missoula's Safe Streets and Roads for All grant application for improvements along South Avenue. South Avenue is a busy road that links teenagers at Big Sky High School, middle school children at C.S. Porter, vulnerable populations at Community Medical Center, and families at Mountain Home Montana to the places they learn, work, play, and shop. It is the main thoroughfare connecting the Target Range neighborhood with their school, and nearby park. New sidewalks and shared use path connections will provide for safe continuity of travel while offering multi-modal choices for all ages and abilities. The traffic on South Avenue increased after Fort Missoula Regional Park was built and now hosts large softball and soccer tournaments and the associated traffic that brings. The Park is a tremendous asset to the community and region, but without improving South Avenue, we have simultaneously increased the risk of a bicycle or pedestrian versus car collision. The designs for a reimagined South Avenue provide users with safety and connection, regardless of their mode of travel. Thank you for your consideration.

Respectfully,

Jessica Tuberty, Chair
The Missoula Bicycle and Pedestrian Board

September 7, 2022

Secretary Pete Buttigieg
U.S. Secretary of Transportation
1200 New Jersey Ave. S.E.
Washington, DC 20590



Dear Secretary Buttigieg,

Climate Smart Missoula is a local not-for-profit organization that works to reduce our greenhouse gas emissions, advocates for a variety of smart land use planning and transportation activities, and builds community health and resiliency. On behalf of our organization, I write in strong support of the City of Missoula and Missoula County's *South Avenue Safe Streets and Roads for All Program* grant application.

This project will provide much needed safety and accessibility improvements to a busy centrally located corridor that serves several schools, a hospital and medical campus, a large regional park, senior living and other group homes, worship centers, and multiple other businesses and residences. Despite serving all these destinations, much of the street lacks basic safety features like curbs and sidewalks. South Ave has an alarming crash history, including pedestrian fatalities, that must be addressed.

If awarded *Safe Streets and Roads for All* funding it will allow Missoula to build the critical infrastructure that will undoubtedly help more people travel and commute safely and sustainably, helping us meet important equity, transportation, and climate goals. It will:

- Provide safe and convenient space for pedestrian and bikers through the needed installation of sidewalks, bike lanes, and a shared use path;
- Provide safer access to those seeking medical care who will be able to walk, bike or take the bus;
- Add safe crossings that connect the neighborhood north of South Ave to the amenities to the south of the street;
- Make it easier and more equitable for children and families to bike and walk to school and parks;
- Support residents who will be able to commute to surrounding destinations sustainably.

Our community has long looked for opportunities to improve South Avenue and this grant opportunity comes at a crucial juncture. Thank you for providing this opportunity and for considering awarding funding for much needed safety and accessibility improvements along this important corridor in the heart of Missoula.

Sincerely,

A handwritten signature in purple ink that reads "Amy Cilimburg".

Amy Cilimburg
Executive Director, Climate Smart Missoula



**TARGET RANGE
SCHOOL**

Learn - Grow - Succeed

September 8, 2022

Pete Buttigieg
U.S. Secretary of Transportation
1200 New Jersey Ave. S.E.
Washington, DC 20590

Dear Secretary Buttigieg,

I am writing on behalf of Target Range School District to strongly support the City of Missoula and Missoula County's South Avenue Safe Streets and Roads for All Program grant application. This project will provide much needed safety and accessibility improvements to a busy corridor that serves our school, along with several other important businesses and our neighborhood.

Despite serving multiple important destinations, much of the street lacks basic safety features like curb and sidewalk. South Ave has an alarming crash history, including pedestrian fatalities, that must be addressed. As the Superintendent of Target Range School District, a PK-8 school serving nearly 600 students daily at 4095 South Avenue West, we see many benefits to this project. If South Ave is awarded Safe Streets and Roads for All funding, it will:

- Provide safe and convenient space for our students to bike and walk to school through installation of sidewalks, bike lanes, and a shared use path – making healthy choices safer, easier and more likely
- Add safe crossings to connect the neighborhood north of the street to the school located on the south side of the street
- Improve visibility and predictability at intersections and driveways

Thank you for providing this opportunity and for considering awarding funding for much needed safety improvements along this important corridor in Missoula and creating safe routes to school for all of our students.

Sincerely,

Heather Davis Schmidt
Superintendent

Mrs. Barbara Droessler
Principal

Dr. Heather Davis Schmidt
Superintendent

Ms. Megan Hopper
Assistant Principal

4095 South Avenue West, Missoula, MT

406.549.9239

www.targetrangeschool.org

W E R T R



Big Sky High School

3100 South Avenue West

Missoula, MT 59804

(406) 728-2401 Fax 549-4616

Jennifer Courtney Principal – BJ Ihde Assistant Principal – Sabrina Beed Assistant Principal – Crissina Quinn Interim Administrative T.O.S.A

August 14, 2022

To whom it may concern,

I am writing on behalf of Big Sky High School and the parent of a Target Range student who walks daily from Target Range to Big Sky to strongly support the City of Missoula and Missoula County's South Avenue Safe Streets and Roads for All Program grant application. This project will provide much needed safety and accessibility improvements to a busy corridor that serves several schools, a hospital and medical campus, a large regional park, senior living and other group homes, worship centers, and multiple other businesses and residences.

Additionally, as a parent of a 5th grader who walks daily from Target Range to Big Sky High School, we have to often discuss safety and dangers of South Ave, which she has to cross and there are occasions that I meet her out at the cross walk to ensure she safely makes it.

Despite serving all these destinations, much of the street lacks basic safety features like curb and sidewalk. South Ave has an alarming crash history, including pedestrian fatalities, that must be addressed. Big Sky High School students and families will see many benefits to this project. If South Ave is awarded Safe Streets and Roads for All funding, it will:

Pick the bullets that resonate the most with you, adapt or expand on them as you see fit

- Provide safe and convenient space for people biking and walking through installation of sidewalks, bike lanes, and a shared use path
- Increase access for all users to major destinations along the corridor
- Add safe crossings to connect the neighborhood north of the street to the attractions south of the street
- Improve visibility and predictability at intersections and driveways
- Make it easier for children and families to bike and walk to school
- Modernize this section of road to better fit the surround destinations
- Address public safety in an equitable manner

Thank you for providing this opportunity and for considering awarding funding for much needed safety improvements along this important corridor in Missoula.

Sincerely,

Jennifer Courtney
Principal, Big Sky High School

8-31-'22

TO: AARON Wilson - City of Missoula, Engineering
From: Gerald Hicks

RE- 2826 South Avenue and Suzanne Mobile Home Park.

Aaron, Thanks for the meeting last week about the South Avenue street projects.

Because of the heavy traffic on that street, I am in favor of what you showed me. I think it is a project to go ahead with.

I do not want to be annexed into the City of Missoula, and I do not want to ^{do} anything that would cause my taxes to go up to where I could not continue to operate a mobile home park and provide my tenants with "Low-income" housing.

If you want to use E-mail, a good address is brentabur@yahoo.com - This is Brent Reimer my operations mgr.

Sincerely,
Gerald Hicks

September 7, 2022

To Missoula County and City of Missoula Safe Streets and Roads for All grant committee:

I am so glad to hear that steps are being taken to fund pedestrian infrastructure improvements in the Target Range school and Trough/Olde Dairy area and to have the opportunity to submit written comments. Currently these areas are not designed for pedestrian safety. The area is unpredictable for both auto traffic and pedestrians which greatly increases the risk for traffic accidents, particularly for school-aged children.

Unpredictability with Crossing to the Olde Dairy/Trough - for vehicles and people

When pedestrians want to cross from the shoulder to the convenience store or restaurant or vice-versa, vehicles are unable to predict this since no crosswalk exists. Likewise, when backing out of the restaurant lot or gas station it is also hard to know where a pedestrian could pop out. In the photo below the truck parked on the shoulder blocked the view of the south bound traffic to any pedestrians ready to cross. Some people even walk on the opposite side of the road where there is no space which also makes them hard to see and predict.

Auto movements are also unpredictable to the pedestrians. When the people in the photo crossed into the Trough property they had to watch for backing out traffic as well as pull-through traffic from the gas station and anyone turning into either of those facilities from Clements. For a school kid or other pedestrian walking on the wide shoulder there are also unknowns. There is a spot near the power pole where people stand while waiting for the Mountain Line bus. When the bus stops it blocks part of the lane. The northbound vehicles then go around the bus which puts them in the southbound lane, and then the south bound traffic drives in the shoulder where the pedestrians walk. I've walked along the walkway to the bus and to the school and have watched people swerve into it, park in it, and use it as a way to pull a U-turn. Pedestrians and kids don't know where they should cross over to the store/restaurant from the shoulder and



All this movement of people and cars is dangerous. The lack of safe pedestrian infrastructure, crosswalks, sidewalks, and connectivity from the walkway to the Trough/Olde Dairy and the ingress and egress design of the Trough/Olde Dairy leads to unpredictability for both automobiles and pedestrians. Unpredictability leads to accidents.



Suggestions to increase predictability near the Olde Dairy/Trough and Target Range School

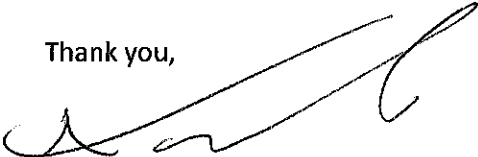
Walking to and from school should be safe. The Olde Dairy/Trough also has a responsibility to provide safe pedestrian access for their paying customers.

- 1) Sidewalks. The installation of curb and sidewalks along Clements Ave to connect the school, businesses, and existing buffered walkways will provide a safer pedestrian travel corridor.
- 2) Trough/Olde Dairy landscaping. A consultant should help the property owners assess and improve visibility upon entry and egress. The landscaping, trees and signage at the roadside section of the Trough property as well as the parking lot for the Trough (with virtually no buffer to the road) obscures the visibility of pedestrians and vehicles upon entry and egress.
- 3) Raised Crosswalk installation connected to a Trough/Olde Dairy sidewalk. As cars advance from the 4-way stop at North Ave/Clements to South Ave the upward pitch of the road obscures pedestrians that may be crossing over to the Trough and Olde Dairy from the west shoulder. Pedestrians also have many potential locations where they could cross over to the store/restaurant from the shoulder and some even walk on the opposite side of the road where there is no space for pedestrians. If a raised crosswalk from Colonial Ave was connected to a curbed sidewalk on the Olde Dairy property, it could allow cars to see them earlier and make passage safer for pedestrians all the way into the store and restaurant. A raised crosswalk could also function as a traffic calming device. If the crosswalk was not raised, it would be good to at least have a button activated or radar activated flashing lights to alert southbound vehicles earlier to a pedestrian in the roadway.
- 4) A 4-way stop at South and Clements. Even though no walkways exist along the north side of South Ave, pedestrians cross from here to the other side of South Ave, as well as from one side of Clements to the other. Vehicles do not slow down when traveling along South Ave and do not consistently stop for pedestrians. This may be due in part to poorly marked crosswalks and lack of driver education. With a future build of the South Ave bridge, this road is expected to receive increased traffic volume. That volume could mean congestion as Clements gets backed up, and less safe conditions for pedestrians trying to cross throughout the year. A pedestrian/transportation consultant should assess the best method that achieves a balance between traffic flow and pedestrian safety but enhanced crossing signals, radar detection, sidewalks and curbing (to help elevate the pedestrian), a 4-way stop or blinker, or a round-about could all potentially help with east-west traffic as well as crossing.

I don't think anyone is going to argue that sidewalks are safer than walking on a depressed road shoulder or object to making crosswalks well marked, especially in school zones. There is no shortage of data on the safety benefits of sidewalks, designated crossing areas, increased visibility, slower auto speeds, etc. for pedestrians. The National Highway Transportation Safety website lists **predictability** and **walking on sidewalks** as the top two safety improvements for pedestrians on roadways. The Montana Dept of Transportation has set goals to make pedestrian safety (outlined in the 2019 Pedestrian and Bicycle Plan) a priority. To reach those goals they have committed to strategies including improving safety at intersections through design standards and new technology, collaborating across jurisdictions to improve safety and predictability, and providing safer access to schools, to name a few.

We don't wait until we get into an auto accident at an intersection to install seatbelts and stop signs. These things exist because it would be irresponsible for them not to. The same goes for these basic improvements in pedestrian safety infrastructure near the school. I would encourage the owner of the Olde Dairy to partner with MDT, county public works, county commissioners, the school, and any other entity to provide matching funds and help improve this problem area.

Thank you,



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