To: Jamie Rose

From: Chad Gilpin, P.E., City Engineer; Laura Mueller, City Attorney

Date: May 2, 2024

RE: Takings Impact Assessment for Required Infrastructure for the Hardy Tract

INTRODUCTION

The City of Dripping Springs has required, due to site development and fire requirements, that the project commonly known as the Hardy Tract build a road as specified in Exhibit "A." The property owner has requested a Takings Impact Assessment related to this requirement. For the City to impose this requirement it must show that "the required dedication is related both in nature and extent to the project's anticipated impact, though a precise mathematical calculation is not required."[1] This assessment will show that the road requirement is roughly proportional to the impact of the Bunker Ranch/Hardy Tract project.

REQUIREMENTS

The City, in consultation with the Fire Department (North Hays County Fire – ESD), requires a minimum twenty-six (26) foot roadway and a five (5) foot sidewalk on one side. This was based on the representation by the developer that multi-family may be placed on the tract. If no multi-family is on the tract, the roadway only must be twenty-four (24) feet. This is a fire requirement. Section 11.3.4 of the City Subdivision Ordinance requires all subdivisions with fifty (50) or more lots or units have at least two points of vehicular access and must be connected via improved roadways. The standard is to require sidewalks on both sides of the roadway, but the City waived the requirement for the second side on request of the developer in return for payment of fee-in-lieu. In addition, drainage improvements are required, but are only those needed to meet the Water Quality and Drainage mitigation as required by the Water Quality Ordinance Article 22.05.[2] The extent of the drainage improvements are only those that directly affect the required roadway and the sidewalk. These improvements are not required to be oversized for any other development.

The purpose of requiring two points of vehicular access is to provide safety and adequate traffic circulation to the residents of the subdivision. The subdivision ordinance is attached as Exhibit "A." The requirement of adequate drainage and water quality is to ensure that any required or planned improvements do not burden other private or public parties with adverse stormwater flows. In addition, it aids in protecting all waterways in the area from pollutants. The Ordinance adopted Article 22.05 is attached to this assessment as Exhibit "C." The remoteness requirement is from the Fire Code Section D106.3. It is attached as Exhibit "B." These required improvements

[1] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).

[2] All references to Ordinances or Sections are to the City of Dripping Springs Code of Ordinances unless otherwise stated. City of Dripping Springs Code of Ordinances are available on the City's website and municode.com.

are reasonably related to and accomplish the legitimate municipal goal of public safety while ensuring that neighboring properties are not burdened by new development.

The roadway only needs to be twenty-four (24) feet in width unless multi-family is built adjacent to the roadway. This is the minimum for any subdivision within the City of Dripping Springs. Fire requires twenty-six (26) feet if there will be multi-family.

IMPACT OF DEVELOPMENT

The Hardy Tract will add an additional seventy-five lots. In addition, the development is seventy-eight acres. This roadway is only for the residents of this development and does not have to be open to the public. In addition, the City is not asking that it be oversized to meet the needs of the public in general, only to meet the minimum city and fire requirements. Detention and Water Quality are required by the Hardy Tract subdivision to mitigate increased flows to neighboring properties caused by the roadway. The issue of the expense of the drainage is the fact that the second access point, the roadway in question, is between two parcels that are currently not owned by the developer. This requires that the drainage, sidewalk, and roadway must be included in their owned property.

DISCUSSION AND ANALYSIS

The requirements the City and Fire require are the minimum for roads and drainage for any residential development. In addition, the minimum normally required for a sidewalk on a two-lane rural roadway (which is the roadway required by the City) is five feet on both sides. The City waived the requirement that the sidewalk be on both sides, instead only requiring it on one side. These requirements are required for safety and are also sized to an extent appropriate to a development of this size. The nature of a subdivision as proposed is a two-lane rural road with sidewalks including adequate drainage.

ALTERNATIVES

The development could build a second point of access in another part of the development. In addition, the City has offered to review the possibility of allowing drainage to be stored on an adjacent agricultural lot. Finally, the developer could also appeal the partial waiver of the sidewalk to the Planning & Zoning Commission.

CONCLUSION AND RECOMMENDATIONS

The City and Fire is open to limiting the roadway to twenty-four feet so long as no multi-family is built in this development or adjacent to this roadway. If any other variances or waivers are requested, or decisions to be appealed, the processes must be followed. The City is not requiring that the development pay for any additional city infrastructure or fees that are not the minimum required by the number of lots and acres within this subdivision. The Hardy Drive and related infrastructure is not for the public or the City, it is solely to benefit the safety of the future residents of the proposed development.

To: Jamie Rose

From: Chad Gilpin, P.E., City Engineer; Laura Mueller, City Attorney

Date: May 2, 2024

RE: Takings Impact Assessment for Required Infrastructure for the Hardy Tract

INTRODUCTION

The City of Dripping Springs has required, due to site development and fire requirements, that the project commonly known as the Hardy Tract build a road as specified in Exhibit "A." The property owner has requested a Takings Impact Assessment related to this requirement. For the City to impose this requirement it must show that "the required dedication is related both in nature and extent to the project's anticipated impact, though a precise mathematical calculation is not required."[1] This assessment will show that the road requirement is roughly proportional to the impact of the Bunker Ranch/Hardy Tract project.

REQUIREMENTS

The City, in consultation with the Fire Department (North Hays County Fire – ESD), requires a minimum twenty-six (26) foot roadway and a five (5) foot sidewalk on one side. This was based on the representation by the developer that multi-family may be placed on the tract. If no multi-family is on the tract, the roadway only must be twenty-four (24) feet. This is a fire requirement. Section 11.3.4 of the City Subdivision Ordinance requires all subdivisions with fifty (50) or more lots or units have at least two points of vehicular access and must be connected via improved roadways. The standard is to require sidewalks on both sides of the roadway, but the City waived the requirement for the second side on request of the developer in return for payment of fee-in-lieu. In addition, drainage improvements are required, but are only those needed to meet the Water Quality and Drainage mitigation as required by the Water Quality Ordinance Article 22.05.[2] The extent of the drainage improvements are only those that directly affect the required roadway and the sidewalk. These improvements are not required to be oversized for any other development.

The purpose of requiring two points of vehicular access is to provide safety and adequate traffic circulation to the residents of the subdivision. The subdivision ordinance is attached as Exhibit "A." The requirement of adequate drainage and water quality is to ensure that any required or planned improvements do not burden other private or public parties with adverse stormwater flows. In addition, it aids in protecting all waterways in the area from pollutants. The Ordinance adopted Article 22.05 is attached to this assessment as Exhibit "C." The remoteness requirement is from the Fire Code Section D106.3. It is attached as Exhibit "B." These required improvements

[1] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).

[2] All references to Ordinances or Sections are to the City of Dripping Springs Code of Ordinances unless otherwise stated. City of Dripping Springs Code of Ordinances are available on the City's website and municode.com.

are reasonably related to and accomplish the legitimate municipal goal of public safety while ensuring that neighboring properties are not burdened by new development.

The roadway only needs to be twenty-four (24) feet in width unless multi-family is built adjacent to the roadway. This is the minimum for any subdivision within the City of Dripping Springs. Fire requires twenty-six (26) feet if there will be multi-family.

IMPACT OF DEVELOPMENT

The Hardy Tract will add an additional seventy-five lots. In addition, the development is seventy-eight acres. This roadway is only for the residents of this development and does not have to be open to the public. In addition, the City is not asking that it be oversized to meet the needs of the public in general, only to meet the minimum city and fire requirements. Detention and Water Quality are required by the Hardy Tract subdivision to mitigate increased flows to neighboring properties caused by the roadway. The issue of the expense of the drainage is the fact that the second access point, the roadway in question, is between two parcels that are currently not owned by the developer. This requires that the drainage, sidewalk, and roadway must be included in their owned property.

DISCUSSION AND ANALYSIS

The requirements the City and Fire require are the minimum for roads and drainage for any residential development. In addition, the minimum normally required for a sidewalk on a two-lane rural roadway (which is the roadway required by the City) is five feet on both sides. The City waived the requirement that the sidewalk be on both sides, instead only requiring it on one side. These requirements are required for safety and are also sized to an extent appropriate to a development of this size. The nature of a subdivision as proposed is a two-lane rural road with sidewalks including adequate drainage.

ALTERNATIVES

The development could build a second point of access in another part of the development. In addition, the City has offered to review the possibility of allowing drainage to be stored on an adjacent agricultural lot. Finally, the developer could also appeal the partial waiver of the sidewalk to the Planning & Zoning Commission.

CONCLUSION AND RECOMMENDATIONS

The City and Fire is open to limiting the roadway to twenty-four feet so long as no multi-family is built in this development or adjacent to this roadway. If any other variances or waivers are requested, or decisions to be appealed, the processes must be followed. The City is not requiring that the development pay for any additional city infrastructure or fees that are not the minimum required by the number of lots and acres within this subdivision. The Hardy Drive and related infrastructure is not for the public or the City, it is solely to benefit the safety of the future residents of the proposed development.

Summary of Comments on Microsoft Word - Hardy Tract.Takings Assessment.2024 TC

Page: 1

Number: 1 Author: ChadGilpin Subject: Highlight Date: 7/25/2024 12:53:12 PM -05'00'

Section 11.3.4 of the City Subdivision Ordinance requires all subdivisions with fifty (50) or more lots or units have at least two points of vehicular access and must be connected via improved roadways.

Number: 2 Author: ChadGilpin Subject: Highlight Date: 7/25/2024 12:54:37 PM -05'00'

The standard is to require sidewalks on both sides of the roadway, but the City waived the requirement for the second side on request of the developer in return for payment of fee-in-lieu.

Number: 3 Author: ChadGilpin Subject: Highlight Date: 7/25/2024 12:56:08 PM -05'00'

The purpose of requiring two points of vehicular access is to provide safety and adequate traffic circulation to the residents of the subdivision. The subdivision ordinance is attached as Exhibit "A."

Number: 1 Author: ChadGilpin Subject: Highlight Date: 7/25/2024 12:58:25 PM -05'00'

In addition, the minimum normally required for a sidewalk on a two-lane rural roadway (which is the roadway required by the City) is five feet on both sides. The City waived the requirement that the sidewalk be on both sides, instead only requiring it on one side.

GT GreenbergTraurig

Jamie A Rose
Tel 512.320.7281
Fax 512.320.7210
Jamie.Rose@gtlaw.com

January 27, 2025

Planning@cityofdrippingsprings.com
c/o Laura Mueller
City Attorney
City of Dripping Springs, Texas
lmueller@cityofdrippingsprings.com

Re: Notice of Appeal – Takings/Rough Proportionality Assessment – Hardy Driveway and Hardy Subdivision.

Dear City of Dripping Springs, Texas,

This firm represents Hardy T. Land, LLC ("Appellant") regarding the Hardy Driveway (Project No. SD2022-0025) and the Hardy Subdivision (Project No. SUB2023-0042). On December 6, 2024, Hardy T Land gave its written notice of appeal of the May 2, 2024 Takings Impact Assessment for Requested Infrastructure for the Hardy Tract, from Chad Gilpin, P.E., City Engineer, and Laura Mueller, City Attorney, attached hereto as Exhibit A (the "Assessment"). Such matter was to be heard at prior meetings that were cancelled by the City, including the January 21, 2025 meeting that was cancelled due to inclement weather.

Appellants hereby request this appeal be placed on the agenda for the City of Dripping Spring's City Council meeting to be held on **February 18, 2025**.

Please let us know if you wish to discuss in advance of the meeting.

Best regards,

/s/ Jamie Rose

Jamie A. Rose
Shareholder

Exhibit A

To: Jamie Rose

From: Chad Gilpin, P.E., City Engineer; Laura Mueller, City Attorney

Date: May 2, 2024

RE: Takings Impact Assessment for Required Infrastructure for the Hardy Tract

INTRODUCTION

The City of Dripping Springs has required, due to site development and fire requirements, that the project commonly known as the Hardy Tract build a road as specified in Exhibit "A." The property owner has requested a Takings Impact Assessment related to this requirement. For the City to impose this requirement it must show that "the required dedication is related both in nature and extent to the project's anticipated impact, though a precise mathematical calculation is not required."[1] This assessment will show that the road requirement is roughly proportional to the impact of the Bunker Ranch/Hardy Tract project.

REQUIREMENTS

The City, in consultation with the Fire Department (North Hays County Fire – ESD), requires a minimum twenty-six (26) foot roadway and a five (5) foot sidewalk on one side. This was based on the representation by the developer that multi-family may be placed on the tract. If no multi-family is on the tract, the roadway only must be twenty-four (24) feet. This is a fire requirement. Section 11.3.4 of the City Subdivision Ordinance requires all subdivisions with fifty (50) or more lots or units have at least two points of vehicular access and must be connected via improved roadways. The standard is to require sidewalks on both sides of the roadway, but the City waived the requirement for the second side on request of the developer in return for payment of fee-in-lieu. In addition, drainage improvements are required, but are only those needed to meet the Water Quality and Drainage mitigation as required by the Water Quality Ordinance Article 22.05.[2] The extent of the drainage improvements are only those that directly affect the required roadway and the sidewalk. These improvements are not required to be oversized for any other development.

The purpose of requiring two points of vehicular access is to provide safety and adequate traffic circulation to the residents of the subdivision. The subdivision ordinance is attached as Exhibit "A." The requirement of adequate drainage and water quality is to ensure that any required or planned improvements do not burden other private or public parties with adverse stormwater flows. In addition, it aids in protecting all waterways in the area from pollutants. The Ordinance adopted Article 22.05 is attached to this assessment as Exhibit "C." The remoteness requirement is from the Fire Code Section D106.3. It is attached as Exhibit "B." These required improvements

[1] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).

[2] All references to Ordinances or Sections are to the City of Dripping Springs Code of Ordinances unless otherwise stated. City of Dripping Springs Code of Ordinances are available on the City's website and municode.com.

are reasonably related to and accomplish the legitimate municipal goal of public safety while ensuring that neighboring properties are not burdened by new development.

The roadway only needs to be twenty-four (24) feet in width unless multi-family is built adjacent to the roadway. This is the minimum for any subdivision within the City of Dripping Springs. Fire requires twenty-six (26) feet if there will be multi-family.

IMPACT OF DEVELOPMENT

The Hardy Tract will add an additional seventy-five lots. In addition, the development is seventy-eight acres. This roadway is only for the residents of this development and does not have to be open to the public. In addition, the City is not asking that it be oversized to meet the needs of the public in general, only to meet the minimum city and fire requirements. Detention and Water Quality are required by the Hardy Tract subdivision to mitigate increased flows to neighboring properties caused by the roadway. The issue of the expense of the drainage is the fact that the second access point, the roadway in question, is between two parcels that are currently not owned by the developer. This requires that the drainage, sidewalk, and roadway must be included in their owned property.

DISCUSSION AND ANALYSIS

The requirements the City and Fire require are the minimum for roads and drainage for any residential development. In addition, the minimum normally required for a sidewalk on a two-lane rural roadway (which is the roadway required by the City) is five feet on both sides. The City waived the requirement that the sidewalk be on both sides, instead only requiring it on one side. These requirements are required for safety and are also sized to an extent appropriate to a development of this size. The nature of a subdivision as proposed is a two-lane rural road with sidewalks including adequate drainage.

ALTERNATIVES

The development could build a second point of access in another part of the development. In addition, the City has offered to review the possibility of allowing drainage to be stored on an adjacent agricultural lot. Finally, the developer could also appeal the partial waiver of the sidewalk to the Planning & Zoning Commission.

CONCLUSION AND RECOMMENDATIONS

The City and Fire is open to limiting the roadway to twenty-four feet so long as no multi-family is built in this development or adjacent to this roadway. If any other variances or waivers are requested, or decisions to be appealed, the processes must be followed. The City is not requiring that the development pay for any additional city infrastructure or fees that are not the minimum required by the number of lots and acres within this subdivision. The Hardy Drive and related infrastructure is not for the public or the City, it is solely to benefit the safety of the future residents of the proposed development.

DECLARATION OF JIM BOUSHKA

Pursuant to Section 132.001 of the Texas Civil Practice and Remedies Code, Declarant Jim Boushka hereby makes the following declaration under penalty of perjury:

1. My name is James Boushka. I am over the age of eighteen and am fully competent to make this declaration. The facts stated in this declaration are true and correct and based upon my personal knowledge.

2. This Declaration is made on behalf of Hardy T Land, LLC in support of its Appeal of the May 2, 2024 Takings Impact Assessment for Requested Infrastructure for the Hardy Tract, from Chad Gilpin, P.E., City Engineer, relating to Project No. SUB2023-0042 (known as the "Hardy Subdivision") and Project No. SD2022-0025 (known as the "Hardy Driveway"). A copy of the Notice of Appeal is attached hereto as **Exhibit A.** We initially gave notice of our intent to be heard at the December 17, 2024 City Council Meeting, but we were notified that meeting had been cancelled by the City.

3. I am a manager of Bunker Ranch, LLC, Hardy T Land, LLC and the Overlook at Bunker Ranch, LLC. I have over 7 years of experience in residential real estate development and construction, including as the owner and developer of 7 residential subdivision projects, including Bunker Ranch.

4. Hardy T Land owns an approximately 79-acre tract (the "Hardy Tract") in the City of Dripping Springs (the "City") that has been approved by the City for development as a residential subdivision, being an extension to and comprising Phase 6 of Bunker Ranch Subdivision, in accordance with Project No. SUB2023-0042 (known as the "Hardy Subdivision"), on the condition that Hardy T Land also improve (to the City's specifications) a private caliche road located in the Dripping Springs extra territorial jurisdiction (the "ETJ") that runs from the proposed Hardy Subdivision to Highway 290 (the "Hardy Driveway"). Attached hereto are (i) the deed conveying the Hardy Tract and (as tenants in common) the Hardy Driveway to Hardy T Land (**Exhibit B**); (ii) the plans for the Hardy Subdivision (**Exhibit C**); (iii) the City's conditional approval of the Hardy Subdivision (**Exhibit D**); and (iv) the City's approval with conditions of the plans for the Hardy Driveway (**Exhibit E**).

5. Aerial photos depicting the Hardy Subdivision and Hardy Driveway locations are attached at **Exhibit F**. The Hardy Subdivision consists of 72 lots, which (like the existing, completed phases of Bunker Ranch Subdivision) are large lots, and with respect to the Hardy Subdivision, intended to be on average approximately .75 acre in size to accommodate the City's desire for reduced density. Primary access for the Hardy Subdivision will be via Bunker Ranch Boulevard, which a Traffic Impact Analysis ("TIA") determined to be sufficient to handle the traffic flow stemming from the Hardy Subdivision. A copy of the TIA is attached hereto as **Exhibit G**. The City is requiring, as a condition to approval of the Hardy Subdivision development, the improvement of the Hardy Driveway to serve as a fire apparatus road and a secondary point of vehicular access to the Hardy Subdivision. It is the secondary access requirement imposed by the City that has apparently also led the City to impose requirements for construction of a sidewalk

along one side of the Hardy Driveway and to require payment of a fee-in-lieu of construction of a sidewalk along the other side. *See* **Exhibit H**; *see also* City Code section 15.4.2. Hardy T Land sought from the Planning and Zoning Commission waivers of the secondary access and sidewalk requirements relating to the Hardy Driveway, as well as variances from the requirement to build sidewalks within the Hardy Subdivision, all of which were denied. It is noted that no prior phases of Bunker Ranch Subdivision were required to install sidewalks, and thus there are no sidewalks within Bunker Ranch Subdivision (as it is currently existing) to which sidewalks within the Hardy Subdivision could feasibly connect. The City staff has indicated that the denials of sidewalk variances by P&Z is not subject to administrative appeal. This is a separate question from the issue at hand, namely, whether the City must compensate Hardy T Land for the substantial costs associated with the sidewalk and fee-in lieu requirements based on the law relating to Takings and Rough Proportionality.

6. Hardy T Land LLC owns as tenants in common with a third party the approximately 3000 x 60 ft strip of land that is currently improved as a private caliche driveway and referred to herein as the "Hardy Driveway," which is located between two large approximately 80-acre privately-owned family tracts unrelated to the Hardy development, and which extends from the proposed Hardy Subdivision to Hwy 290. *See* **Exhibit B**. The fact that Hardy T Land owns the Hardy Driveway as tenants in common with a third party, prevents it as a matter of law from unilaterally dedicating the driveway and/or any sidewalk improvement associated with the driveway to the City as a public right-of-way. Thus, the conditionally approved site development plan contemplates that the Hardy Driveway and any sidewalk improvements will remain private property.

7. While Hardy T Land has challenged the necessity and extent of the required Hardy Driveway improvements, which Hardy T Land alleges far exceed those needed for a fire apparatus road and secondary access point, the subject of this appeal of the Takings Impact Assessment focuses on the City's requirements for the developer to (i) construct and pay for a ***sidewalk to nowhere*** along one side of the Hardy Driveway and (ii) pay a fee in lieu of a ***sidewalk to nowhere*** on the other side of this private drive, both of which—along with related increases in the construction costs associated with the private drive—constitute exactions for which the City must compensate Hardy T Land.

8. To put the City's requirements for the Hardy Driveway in context, I provide some background on the Hardy Tract and surrounding properties.

9. Bunker Ranch LLC owned and developed Phases 1-5 of the Bunker Ranch residential subdivision that is situated south of Hwy 290 and west of the Arrowhead subdivision. Consistent with maintaining its rural appeal, the Bunker Ranch residential subdivision includes large, approximately 1-acre lots, and was not required to build sidewalks. As mentioned above, the City waived the requirement for sidewalks within prior phases of the Bunker Ranch Subdivision. In 2020, Overlook at Bunker Ranch, LLC proposed to develop an additional 18.25 acres to the south of Bunker Ranch, as an extension of Bunker Ranch (known as the Overlook at Bunker Ranch or the "Florio Tract," Project No. SFL2021-0001)). The City waived sidewalks for

the Overlook at Bunker Ranch development due to sidewalks "not providing any beneficial pedestrian connectivity." *See* **Exhibit I.**

10. In 2021, Hardy T Land acquired the Hardy Tract, which is located to the west of the existing Bunker Ranch Subdivision and the proposed Florio Tract development, and which at the time of acquisition was located outside of the City limits. The Hardy Tract was acquired with the specific intent to develop a residential subdivision that would be an extension of Bunker Ranch Subdivision, and this plan was discussed at length with the City both before and after the acquisition of the Hardy Tract. *See* **Exhibit J**. Hardy T Land also acquired co-ownership of the Hardy Driveway extending from the new proposed Phase 6 of Bunker Ranch to Hwy 290. Prior to Hardy T Land's acquisition of the Hardy Tract and Hardy Driveway tract, principals of Hardy T Land (including me) participated in numerous and extensive meetings and calls with the City, during which it was discussed that this new addition would be an extension of Bunker Ranch Subdivision and that the Hardy Driveway might be required for secondary emergency fire access to satisfy the "remoteness" requirements of Fire Code Sec. D104.3. It is not disputed by the City that the fire code does not require sidewalks, and that the fire marshal did not determine that sidewalks must be built.

11. In 2021, Hardy T Land voluntarily annexed the Hardy Tract into the City in reliance on the City's representations that it would be an extension of (and treated like) prior phases of Bunker Ranch Subdivision. However, the Hardy Driveway tract remains in the EJT. Despite no public facilities, sidewalks, trails, or roads existing in the vicinity of the Hardy Driveway, and despite the City previously waiving sidewalk requirements in all prior phases of the Bunker Ranch Subdivision, as well as in the Florio Tract, the City is now requiring costly sidewalks both within the Hardy Subdivision (Phase 6 of Bunker Ranch) and along the Hardy Driveway. Again, this appeal of the Takings Impact Assessment focuses on the ***sidewalk to nowhere*** and fee in lieu requirements along the Hardy Driveway.

12. While *public* sidewalks can advance a legitimate state interest, they do not do so along the *private* Hardy Driveway. There is no evidence showing that the development of the Hardy Driveway will have any impact on existing (or future planned and funded) infrastructure, such that the City is permitted to force Hardy T Land to pay for the sidewalk improvements and fees-in-lieu. In addition, there is no evidence showing that a sidewalk along the Hardy Driveway will provide any pedestrian connectivity with the rest of Bunker Ranch Subdivision or surrounding properties at all.

13. First, Mr. Gilpin's Taking Impact Assessment refers, without any detail or engineering analysis, to the City's "standard of requiring sidewalks on both sides of a roadway" as supporting his (incorrect) conclusion that there is no municipal taking of property, and that the sidewalk requirements are roughly proportional to the impact of the subdivision development. He offers no information or individualized, engineering analysis at all, including any supporting documentation on the level of pedestrian traffic (or corresponding reduction in vehicle traffic) that could be anticipated on a sidewalk along the Hardy Driveway. Given that a half-mile sidewalk along the Hardy Driveway would go nowhere and connect with nothing at Hwy 290 or within the remainder of the Bunker Ranch Subdivision, it defies logic to suggest that the impact of the Hardy

Tract subdivision requires the sidewalk. A copy of the Takings Impact Assessment is attached hereto as **Exhibit K**.

14. Second, sidewalks along the private Hardy Driveway significantly impair—rather than promote—safety. The Takings Impact Assessment asserts that sidewalks are "solely to benefit the safety of the future residents of the proposed development." *Id*. But it does not explain how, why, or on what basis that statement is made. On the contrary, sidewalks along the private Hardy Driveway are *not required* by the Fire Code or the Fire Marshal—tasked with determining safety issues associated with developments. The Takings Impact Assessment does not address or attempt to address this fact and provides nothing to support its claim. Further, the required sidewalk would dead-end into Hwy 290's dangerous traffic, where there are no existing sidewalks, or any planned and funded sidewalks. To promote access via a sidewalk to nowhere will decrease safety for any pedestrians foolhardy enough to decide to walk to Hwy 290 along the Hardy Driveway. Encouraging pedestrian traffic to enter this dangerous area of Hwy 290, where there are no public improvements or safety measures in place or planned is simply negligent. And as shown in **Exhibit F** there are no existing or planned public or even private trail systems connecting to the Hardy Driveway. *See* ppt. 2-11. The existing trails within Bunker Ranch Subdivision dead end into a fence abutting private ranch property located adjacent to the east of the Hardy Driveway. In addition, there is currently fencing along both sides of the Hardy Driveway separating the driveway from the adjacent, privately-owned ranch properties, thus, without additional land grants by adjacent owners, there is no possibility of connectivity between Bunker Ranch, Hardy Tract and any public trails within the vicinity. The closest public sidewalk to the Hardy Driveway is in front of Walnut Springs Middle School, which is approximately 1 mile from the intersection of the Hardy Driveway/Hwy 290 and there are no existing, or planned and funded public sidewalks on Hwy 290 for that entire 1 mile.

15. Third, Mr. Gilpin makes a conclusory statement that the requirements of the Hardy Driveway are required to protect waterways or the environment. There is no explanation as to how that would support the City's requirement for the addition of a sidewalk, which by its very nature will increase impervious cover. During public comment at the P&Z hearing, neighbors and concerned citizens expressed their disapproval of adding more cement (i.e., from the sidewalks). Further, Mr. Gilpin did not even consider whether expanding the width of the road by requiring the sidewalk would necessitate the removal of additional large, native trees that currently line both sides of Hardy Driveway. Surely, removing these trees at the expense of cement sidewalks could not possibly be beneficial for the environment. *See* **Exhibit F**, p. 12-18.

16. Fourth, Mr. Gilpin does not offer nor address any reasonable alternatives to building sidewalks along the Hardy Driveway.

17. I am qualified by my years of experience in residential development and construction to determine the relative and reasonable costs of the Hardy Driveway with and without the City's sidewalk requirements. Attached as **Exhibit L** is a current estimate of the cost of the Hardy Driveway, based on the City's current approval with conditions. I believe that this is a reasonable cost estimate based on the current market and City's requirements, and the actual cost will continue to grow and is likely to be higher at the time of construction because of the passage

of time and delay caused by the disputes with the City relating to their excessive requirements for the Hardy Driveway. Attached as **Exhibit M** is a current estimate of the cost for the Hardy Driveway without the requirement for a sidewalk along one side. The compensation due to Hardy T Land is **$2,011,936**, which is the difference between the two estimates plus the fee in lieu on one side, and represents the costs associated with the ***sidewalks to nowhere***.

18. Attached hereto as **Exhibit N** is correspondence Greenberg Traurig, LLP sent on our behalf on April 3, 2024, and we have done everything possible to resolve this matter since, to no avail. We are asking the Council to make the right decision, and award compensation for this taking of private property. If we are unable to get compensation for the exactions that do not flow from the subdivision's impact, we intend to seek relief from the Courts. The extreme costs of the Hardy Driveway, due to the City staff's specifications, compared to the relatively small number of lots proposed for the Hardy Tract to meet City's desire for reduced density, essentially destroys the economic viability of the Hardy Subdivision project. We have even requested, and been denied, additional density within the Hardy Subdivision. After many years of trying to reach an acceptable compromise with the City on this issue, I note that if Hardy T Land is forced to build the required sidewalks and pay the fees in lieu as required by the City as a condition to development of the Hardy Tract, Hardy T Land may be left with no option but to abandon the development of the Hardy Tract with its limited density, as currently contemplated.

19. Hardy T. Land's counsel, Jamie Rose with Greenberg Traurig, LLP, has corresponded with Laura Mueller, City Attorney of Dripping Springs, regarding the procedures for this hearing. Apparently, the City had no procedures in place for this type of Appeal before January 7, 2025—just two weeks prior to our appeal hearing. Attached hereto as **Exhibit O** are email correspondence between Jamie Rose and Laura Mueller.

20. My name is Jim Boushka, my date of birth is March 29, 1961, and my address is 6836 FM 2244, Rd 3-302, Austin, Texas 78746. I declare under penalty of perjury that the foregoing is true and correct.

Executed in Travis County, State of Texas, on the 16th day of January 2025

Signed by:
73A7FDC58B02475...

Jim Boushka

Exhibit A

GT GreenbergTraurig

Jamie A Rose
Tel 512.320.7281
Fax 512.320.7210
Jamie.Rose@gtlaw.com

December 12, 2024

Planning@cityofdrippingsprings.com
c/o Laura Mueller
City Attorney
City of Dripping Springs, Texas
lmueller@cityofdrippingsprings.com

Re: Notice of Appeal – Takings/Rough Proportionality Assessment – Hardy Driveway and Hardy Subdivision.

Dear City of Dripping Springs, Texas,

On behalf of Hardy T. Land, LLC, and Bunker Ranch, LLC (collectively, "Appellants"), regarding the Hardy Driveway (Project No. SD2022-0025) and the Hardy Subdivision (Project No. SUB2023-0042), please consider this letter as a formal, written notice of appeal of the May 2, 2024 Takings Impact Assessment for Requested Infrastructure for the Hardy Tract, from Chad Gilpin, P.E., City Engineer, and Laura Mueller, City Attorney, attached hereto as Exhibit A (the "Assessment").

Appellants hereby request this appeal be placed on the agenda for the City of Dripping Spring's meeting to be held on January 21, 2025.

Please let us know if you wish to discuss in advance of the Planning & Zoning meeting.

Best regards,

/s/ Jamie Rose

Jamie A. Rose
Shareholder

To: Jamie Rose

From: Chad Gilpin, P.E., City Engineer; Laura Mueller, City Attorney

Date: May 2, 2024

RE: Takings Impact Assessment for Required Infrastructure for the Hardy Tract

INTRODUCTION

The City of Dripping Springs has required, due to site development and fire requirements, that the project commonly known as the Hardy Tract build a road as specified in Exhibit "A." The property owner has requested a Takings Impact Assessment related to this requirement. For the City to impose this requirement it must show that "the required dedication is related both in nature and extent to the project's anticipated impact, though a precise mathematical calculation is not required."[1] This assessment will show that the road requirement is roughly proportional to the impact of the Bunker Ranch/Hardy Tract project.

REQUIREMENTS

The City, in consultation with the Fire Department (North Hays County Fire – ESD), requires a minimum twenty-six (26) foot roadway and a five (5) foot sidewalk on one side. This was based on the representation by the developer that multi-family may be placed on the tract. If no multi-family is on the tract, the roadway only must be twenty-four (24) feet. This is a fire requirement. Section 11.3.4 of the City Subdivision Ordinance requires all subdivisions with fifty (50) or more lots or units have at least two points of vehicular access and must be connected via improved roadways. The standard is to require sidewalks on both sides of the roadway, but the City waived the requirement for the second side on request of the developer in return for payment of fee-in-lieu. In addition, drainage improvements are required, but are only those needed to meet the Water Quality and Drainage mitigation as required by the Water Quality Ordinance Article 22.05.[2] The extent of the drainage improvements are only those that directly affect the required roadway and the sidewalk. These improvements are not required to be oversized for any other development.

The purpose of requiring two points of vehicular access is to provide safety and adequate traffic circulation to the residents of the subdivision. The subdivision ordinance is attached as Exhibit "A." The requirement of adequate drainage and water quality is to ensure that any required or planned improvements do not burden other private or public parties with adverse stormwater flows. In addition, it aids in protecting all waterways in the area from pollutants. The Ordinance adopted Article 22.05 is attached to this assessment as Exhibit "C." The remoteness requirement is from the Fire Code Section D106.3. It is attached as Exhibit "B." These required improvements

[1] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).

[2] All references to Ordinances or Sections are to the City of Dripping Springs Code of Ordinances unless otherwise stated. City of Dripping Springs Code of Ordinances are available on the City's website and municode.com.

are reasonably related to and accomplish the legitimate municipal goal of public safety while ensuring that neighboring properties are not burdened by new development.

The roadway only needs to be twenty-four (24) feet in width unless multi-family is built adjacent to the roadway. This is the minimum for any subdivision within the City of Dripping Springs. Fire requires twenty-six (26) feet if there will be multi-family.

IMPACT OF DEVELOPMENT

The Hardy Tract will add an additional seventy-five lots. In addition, the development is seventy-eight acres. This roadway is only for the residents of this development and does not have to be open to the public. In addition, the City is not asking that it be oversized to meet the needs of the public in general, only to meet the minimum city and fire requirements. Detention and Water Quality are required by the Hardy Tract subdivision to mitigate increased flows to neighboring properties caused by the roadway. The issue of the expense of the drainage is the fact that the second access point, the roadway in question, is between two parcels that are currently not owned by the developer. This requires that the drainage, sidewalk, and roadway must be included in their owned property.

DISCUSSION AND ANALYSIS

The requirements the City and Fire require are the minimum for roads and drainage for any residential development. In addition, the minimum normally required for a sidewalk on a two-lane rural roadway (which is the roadway required by the City) is five feet on both sides. The City waived the requirement that the sidewalk be on both sides, instead only requiring it on one side. These requirements are required for safety and are also sized to an extent appropriate to a development of this size. The nature of a subdivision as proposed is a two-lane rural road with sidewalks including adequate drainage.

ALTERNATIVES

The development could build a second point of access in another part of the development. In addition, the City has offered to review the possibility of allowing drainage to be stored on an adjacent agricultural lot. Finally, the developer could also appeal the partial waiver of the sidewalk to the Planning & Zoning Commission.

CONCLUSION AND RECOMMENDATIONS

The City and Fire is open to limiting the roadway to twenty-four feet so long as no multi-family is built in this development or adjacent to this roadway. If any other variances or waivers are requested, or decisions to be appealed, the processes must be followed. The City is not requiring that the development pay for any additional city infrastructure or fees that are not the minimum required by the number of lots and acres within this subdivision. The Hardy Drive and related infrastructure is not for the public or the City, it is solely to benefit the safety of the future residents of the proposed development.

Exhibit B

21051171 DEED Total Pages: 23
Filed and Recorded: 09/17/2021 09:07:15 AM

NOTICE OF CONFIDENTIALITY RIGHTS: IF YOU ARE A NATURAL PERSON, YOU MAY REMOVE OR STRIKE ANY OR ALL OF THE FOLLOWING INFORMATION FROM ANY INSTRUMENT THAT TRANSFERS AN INTEREST IN REAL PROPERTY BEFORE IT IS FILED FOR RECORD IN THE PUBLIC RECORDS: YOUR SOCIAL SECURITY NUMBER OR YOUR DRIVER'S LICENSE NUMBER.

SPECIAL WARRANTY DEED WITH VENDOR'S LIEN

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS:
COUNTY OF HAYS §

Corridor Title GF# 20-4149-D

THAT **P & H FAMILY LIMITED PARTNERSHIP NO. 1.**, a Texas limited partnership, ("Grantor"), for the consideration herein provided, has **GRANTED, BARGAINED, SOLD** and **CONVEYED** and does hereby **GRANT, BARGAIN, SELL** and **CONVEY** unto **HARDY T LAND, LLC**, a Texas limited liability company, whose address is 317 Grace Lane, Austin, Texas 78746, all that certain real property comprising Tract 1, Tract 2, Tract 3, Tract 4 and Tract 5 situated in Hays County, Texas, and described on **EXHIBITS A, A-1, A-2 and A-3**, all attached hereto and incorporated herein by reference for all purposes (collectively, the "Land"), together with any and all improvements situated upon the Land, including specifically, but not by way of limitation, houses, barns, sheds, garages and other buildings and fences, fixtures, roads, paving, curbing, trees, shrubs, plants, hay, crops and other landscaping (the "Improvements"), and together with all rights, privileges and appurtenances pertaining thereto, including but not limited to: any right, title and interest of Grantor in and to any adjacent streets, alleys or rights-of-way adjoining the Land, any water rights, claims, strips and gores, and easements, whether of record or not (the "Appurtenances").

For the same consideration, Grantor has **GRANTED, SOLD** and **CONVEYED** and does hereby **GRANT, SELL** and **CONVEY**, unto Grantee, **WITHOUT WARRANTY, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT WITHOUT LIMITATION THERETO, ALL WARRANTIES THAT MIGHT ARISE BY COMMON LAW AND THE WARRANTIES IN SECTION 5.023 OF THE TEXAS PROPERTY CODE (OR ITS SUCCESSOR STATUTE),** all of Grantor's rights, title and interest in and to any development rights, entitlements, land use rights, and utility rights pertaining to the Land ("Entitlements") and to any permits, applications, plans, studies and warranties applicable to the Land ("Permits").

The Land, together with the Improvements, Appurtenances, Entitlements and Permits are herein collectively referred to as the "Property."

The consideration for this conveyance, the receipt of which is hereby acknowledged, is as follows:

1. $10.00 and other valuable consideration paid to Grantor for which no lien, either expressed or implied, is retained; and

2. Delivery and payment to Grantor by STEPHEN C. DUJKA PARTNERSHIP, LTD., a Texas limited partnership ("First Lien Lender"), at the instance and request of Grantee, of the proceeds from one certain promissory note dated on or about the date of this Deed (the "First Lien Note"), executed by Grantee, in the original principal

amount therein stated, bearing interest and payable to the order of First Lien Lender as therein provided, the payment of which First Lien Note to the extent of the funds advanced for the purchase of the Property (defined below) is secured by the vendor's lien herein retained and by a deed of trust (the "First Lien Deed of Trust") of even date herewith to Steve Dujka, Trustee; and

3. Delivery and payment to Grantor by JPH INVESTMENT HOLDINGS, LLC, a Texas limited liability company ("Second Lien Lender"), at the instance and request of Grantee, of the proceeds from one certain promissory note dated on or about the date of this Deed (the "Second Lien Note"), executed by Grantee, in the original principal amount therein stated, bearing interest and payable to the order of Second Lien Lender as therein provided, the payment of which Second Lien Note to the extent of the funds advanced for the purchase of the Property (defined below) is secured by a subordinate vendor's lien herein retained and by a subordinate deed of trust (the "Second Lien Deed of Trust") of even date herewith to James P. Hendricks, Trustee.

Grantor hereby EXCEPTS from the Property hereby conveyed and RESERVES UNTO ITSELF, its successors and assigns, all of the oil, gas and other minerals of every kind and character, whether similar or dissimilar, known or unknown, in, on, under and which may be discovered, mined, produced, or recovered from the Property, or any portion thereof, that are owned by Grantor as of the date of this instrument (hereinafter the "Mineral Reservation"). The Mineral Reservation expressly excluding water, sand, gravel, limestone, rock, building stone, caliche, surface shale, near surface lignite, iron, and similar materials considered part of the surface estate. In connection with the Mineral Reservation, Grantor hereby WAIVES AND RELEASES any and all rights of every kind on the part of itself and its successors and assigns, to use the surface of the Land between the natural surface thereof and a depth of five hundred feet (500') in connection with the exploration, prospecting, mining, drilling, producing, saving, transporting, storing, treating or otherwise dealing with the oil, gas and other minerals lying in, on and under the Land or which may be produced therefrom.

This conveyance and the warranties of title herein are expressly made subject to: a) *ad valorem* taxes for the year 2021, not yet due and payable, and all subsequent years, including any and all assessments for prior years due to changes in land usage; and b) the matters set forth on **EXHIBIT B**, attached hereto and incorporated herein by this reference for all purposes (collectively, the "Permitted Exceptions").

BY ITS ACCEPTANCE OF THIS SPECIAL WARRANTY DEED, GRANTEE ACKNOWLEDGES AND AGREES THAT, EXCEPT FOR THE SPECIAL WARRANTY OF TITLE SET FORTH HEREIN AND THOSE REPRESENTATIONS AND WARRANTIES IN THAT CERTAIN FARM AND RANCH CONTRACT BETWEEN GRANTOR AND STEVE HARRAN AND JIM BOUSHKA, PREDECESSORS IN INTEREST TO GRANTEE, DATED MARCH 5, 2021 AS AMENDED BY THAT CERTAIN FIRST AMENDMENT TO FARM AND RANCH CONTRACT DATED JUNE 17, 2021 AND THAT CERTAIN SECOND AMENDMENT TO FARM AND RANCH CONTRACT DATED AUGUST 23, 2021 (COLLECTIVELY, THE "GRANTOR REPRESENTATIONS AND WARRANTIES"), GRANTEE ACKNOWLEDGES AND AGREES THAT GRANTOR HAS NOT MADE, DOES NOT MAKE AND SPECIFICALLY DISCLAIMS ANY REPRESENTATIONS, WARRANTIES,

PROMISES, COVENANTS, AGREEMENTS OR GUARANTIES OF ANY KIND OR CHARACTER WHATSOEVER, WHETHER EXPRESS OR IMPLIED, ORAL OR WRITTEN, PAST, PRESENT OR FUTURE, OF, AS TO, CONCERNING OR WITH RESPECT TO: (A) THE NATURE, QUALITY OR CONDITION OF THE PROPERTY, INCLUDING, WITHOUT LIMITATION, THE WATER, SOIL AND GEOLOGY; (B) THE INCOME TO BE DERIVED FROM THE PROPERTY OR THE PROPERTY'S INCOME POTENTIAL; (C) THE SUITABILITY OF THE PROPERTY FOR ANY AND ALL ACTIVITIES AND USES WHICH GRANTEE MAY CONDUCT THEREON; (D) THE COMPLIANCE OF OR BY THE PROPERTY OR ITS OPERATION WITH ANY LAWS, RULES, ORDINANCES OR REGULATIONS OF ANY APPLICABLE GOVERNMENTAL AUTHORITY OR BODY; (E) THE HABITABILITY OR MERCHANTABILITY OF THE PROPERTY OR ITS FITNESS FOR ANY PARTICULAR PURPOSE; (F) THE PRESENCE OF ANY ENDANGERED OR THREATENED SPECIES ON THE PROPERTY, AS WELL AS THE SUITABILITY OF THE PROPERTY AS HABITAT FOR ANY OF THOSE SPECIES; (G) THE PRESENCE OF ANY HISTORICAL OR ARCHEOLOGICALLY SIGNIFICANT SITE ON THE PROPERTY; (H) THE AVAILABILITY, CAPACITY OR LOCATION OF UTILITIES TO SERVE THE PROPERTY; (I) THE IMPACT UPON OR PRECISE NATURE OF OPERATIONS CONDUCTED UPON THE PROPERTY IN CONNECTION WITH ANY OIL, GAS AND MINERAL OPERATIONS WHICH MAY HAVE BEEN PREVIOUSLY CONDUCTED UPON OR NEAR THE PROPERTY OR (J) ANY OTHER MATTER WITH RESPECT TO THE PROPERTY OTHER THAN AS MAY BE SPECIFICALLY REPRESENTED IN THE GRANTOR REPRESENTATIONS AND WARRANTIES.

WITHOUT LIMITING THE FOREGOING, EXCEPT AS SET FORTH IN GRANTOR'S REPRESENTATIONS AND WARRANTIES, GRANTOR DOES NOT AND HAS NOT MADE ANY REPRESENTATION OR WARRANTY REGARDING THE PRESENCE OR ABSENCE OF ANY HAZARDOUS SUBSTANCES (defined below) OR SOLID WASTE (defined at 40 C.F.R., Part 261) ON, UNDER OR ABOUT THE PROPERTY OR THE COMPLIANCE OF THE PROPERTY WITH ANY OF THE FOLLOWING ENVIRONMENTAL LAWS AND GRANTEE FURTHER RELEASES GRANTOR FROM ANY CLAIMS, DEMANDS OR CHARGES THAT MAY BE BROUGHT BY IT WITH RESPECT TO THE FOLLOWING ENVIRONMENTAL LAWS - THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT ("CERCLA"), THE SUPERFUND AMENDMENT AND REAUTHORIZATION ACT, THE RESOURCE CONSERVATION RECOVERY ACT, THE FEDERAL WATER POLLUTION CONTROL ACT, THE FEDERAL ENVIRONMENTAL PESTICIDES ACT, THE CLEAN WATER ACT, THE CLEAN AIR ACT, THE TEXAS NATURAL RESOURCES CODE, THE TEXAS WATER CODE, THE TEXAS SOLID WASTE DISPOSAL ACT, THE TEXAS HAZARDOUS SUBSTANCES SPILL PREVENTION AND CONTROL ACT, ANY SO CALLED FEDERAL, STATE OR LOCAL "SUPERFUND" OR "SUPERLIEN" STATUTE, OR ANY OTHER STATUTE, LAW, ORDINANCE, CODE, RULE, REGULATION, ORDER OR DECREE REGULATING, RELATING TO OR IMPOSING LIABILITY (INCLUDING STRICT LIABILITY) OR STANDARDS OF CONDUCT CONCERNING ANY HAZARDOUS SUBSTANCES (COLLECTIVELY, THE "ENVIRONMENTAL LAWS"). FOR PURPOSES OF THIS INSTRUMENT, THE TERM "HAZARDOUS SUBSTANCES" SHALL MEAN AND INCLUDE THOSE ELEMENTS OR COMPOUNDS WHICH ARE CONTAINED ON THE LIST OF HAZARDOUS SUBSTANCES ADOPTED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND THE LIST OF TOXIC POLLUTANTS DESIGNATED BY

CONGRESS OR THE ENVIRONMENTAL PROTECTION AGENCY OR UNDER ANY ENVIRONMENTAL LAWS. (49 CFR 172.101 AND 40 CFR PART 301) AND AMENDMENTS THERETO OR ANY SUBSTANCES, MATERIALS OR WASTES WHICH ARE OR BECOME REGULATED UNDER ANY APPLICABLE ENVIRONMENTAL LAW, INCLUDING, WITHOUT LIMITATION, ANY MATERIAL, WASTE, OR SUBSTANCE WHICH IS (i) PETROLEUM, (ii) ASBESTOS, (iii) POLYCHLORINATED BIPHENS, (iv) DESIGNATED AS A "HAZARDOUS SUBSTANCE" UNDER SECTION 331 OF THE CLEAN WATER ACT OR LISTED PURSUANT TO SECTION 307 OF THE CLEAN WATER ACT OR (v) DEFINED AS A "HAZARDOUS WASTE" PURSUANT TO SECTION 101 OF CERCLA.

GRANTEE FURTHER ACKNOWLEDGES AND AGREES THAT: (i) GRANTEE HAS BEEN GIVEN FREE AND FULL OPPORTUNITY TO INSPECT THE PROPERTY; (ii) GRANTEE IS A SOPHISTICATED BUYER OF REAL PROPERTY, (iii) GRANTEE WILL BE PURCHASING THE PROPERTY PURSUANT TO ITS INDEPENDENT EXAMINATION, STUDY, INSPECTION AND KNOWLEDGE OF THE PROPERTY; (iv) GRANTEE IS RELYING UPON ITS OWN DETERMINATION OF THE VALUE OF THE PROPERTY AND USES TO WHICH THE PROPERTY MAY BE PUT, AND NOT ON ANY INFORMATION PROVIDED OR TO BE PROVIDED BY GRANTOR OR ITS AGENTS; AND (v) THE PURCHASE PRICE REFLECTS THE "AS IS" NATURE OF THIS INTENDED TRANSACTION. GRANTEE SPECIFICALLY ACKNOWLEDGES AND AGREES THAT, EXCEPT AS OTHERWISE SPECIFICALLY SET FORTH IN THE GRANTOR REPRESENTATIONS AND WARRANTIES, GRANTOR IS SELLING THE PROPERTY AND GRANTEE IS PURCHASING THE PROPERTY ON AN "AS IS", "WHERE IS" AND " WITH ALL FAULTS" BASIS.

TO HAVE AND TO HOLD the Land, subject to the Mineral Reservation and the Permitted Exceptions, unto Grantee, and Grantee's successors and assigns forever, and Grantor does hereby bind Grantor, and Grantor's successors and assigns, to WARRANT and FOREVER DEFEND, all and singular the Land unto Grantee and Grantee's successors and assigns, against every person whomsoever lawfully claiming or to claim the same or any part thereof, by, through, or under Grantor, but not otherwise, but subject, however, to the Mineral Reservation and the Permitted Exceptions.

Ad valorem taxes for the current year have been prorated as of the Effective Date of this instrument.

First Lien Lender, at Grantee's request, has paid in cash to Grantor that certain portion of the purchase price of the Property as is evidenced by the above referenced First Lien Note. It is expressly agreed and stipulated that a first and superior vendor's lien against and superior title (to the extent of the portion of the First Lien Note advanced for the purchase of the Property), is hereby retained by Grantor against the Property for the benefit of First Lien Lender until the above-described First Lien Note, and all interest accruing thereon, have been fully paid in accordance with their terms. Grantor does hereby TRANSFER, ASSIGN and CONVEY unto First Lien Lender said vendor's lien and superior title to the Property, WITHOUT RECOURSE against Grantor. Upon the full and complete payment of the First Lien Note and satisfaction and performance of all covenants, conditions, obligations and liabilities under the First Lien Deed of Trust, then this conveyance shall

become absolute and the vendor's lien and superior title herein reserved shall be automatically released and discharged.

In addition, Second Lien Lender, at Grantee's request, has paid in cash to Grantor that certain portion of the purchase price of the Property as is evidenced by the above referenced Second Lien Note. It is expressly agreed and stipulated that a subordinate vendor's lien (to the extent of the portion of the Second Lien Note advanced for the purchase of the Property), is hereby retained by Grantor against the Property for the benefit of Second Lien Lender until the above-described Second Lien Note, and all interest accruing thereon, have been fully paid in accordance with their terms. Grantor does hereby TRANSFER, ASSIGN and CONVEY unto Second Lien Lender said vendor's lien, WITHOUT RECOURSE against Grantor. Upon the full and complete payment of the Second Lien Note and satisfaction and performance of all covenants, conditions, obligations and liabilities under the Second Lien Deed of Trust, then this conveyance shall become absolute and the vendor's lien and superior title herein reserved shall be automatically released and discharged.

(Signature page follows)

EXECUTED effective as of this 16th day of September, 2021 (the "Effective Date").

GRANTOR:

P & H FAMILY LIMITED PARTNERSHIP NO. 1
a Texas limited partnership

By: Pathar No. 1, L.L.C.
Its: General Partner

By: Hardy E. Thompson III
Name: Hardy E. Thompson, III
Title: President

GRANTEE:

HARDY T LAND, LLC
a Texas limited liability company

By: _____
Name: Steve G. Harren
Title: Manager

THE STATE OF TEXAS §
§
COUNTY OF Hays §

This instrument was acknowledged before me on the 16th day of September, 2021, by Hardy E. Thompson, III, in his capacity as President of Pathar No. 1, L.L.C., a Texas limited liability company, general partner to P & H Family Limited Partnership No. 1, a Texas limited partnership, for and on behalf of said limited partnership.

VICTORIA L. HEAFNER
My Notary ID # 11916965
Expires April 30, 2025

_____
Notary Public in and for the State of Texas

THE STATE OF TEXAS §
§
COUNTY OF Hays §

This instrument was acknowledged before me on the 16th day of September, 2021, by Steve G. Harren, in his/her capacity as Manager of Hardy T Land, LLC, a Texas limited liability company, for and on behalf of said limited liability company.

VICTORIA L. HEAFNER
My Notary ID # 11916965
Expires April 30, 2025

_____
Notary Public, State of Texas

The following individuals join in the execution of this Special Warranty Deed to reflect the relinquishment of their homestead rights, if any, in and to the Property.

Hardy E. Thompson, III

Susan S. Thompson

THE STATE OF TEXAS §
§
COUNTY OF Hays §

This instrument was acknowledged before me on the 16th day of September, 2021 by Hardy E. Thompson, III.

VICTORIA L. HEAFNER
My Notary ID # 11916965
Expires April 30, 2025

Notary Public, State of Texas

THE STATE OF TEXAS §
§
COUNTY OF Hays §

This instrument was acknowledged before me on the 16th day of September, 2021 by Susan S. Thompson.

VICTORIA L. HEAFNER
My Notary ID # 11916965
Expires April 30, 2025

Notary Public, State of Texas

After recording, please return to:
GF No. 20-4146-D
Attn: Vicki Heafner
Corridor Title Company
171 Benney Lane, Bldg. 1
Dripping Springs, Texas 78620

EXHIBIT A

LEGAL DESCRIPTION OF THE LAND

Tract 1: Being 78.021 acres of land, more or less, out of the B. F. HANNA LEAGUE, in Hays County, Texas, being a portion of that certain 79.61 acre tract conveyed in Deed recorded in Volume 1733, Page 755, Official Public Records, Hays County, Texas. Said 78-021 acre tract being more particularly described by metes and bounds in **Exhibit "A-1"** attached hereto and made a part hereof.

Tract 2: A one-half undivided interest in and to that certain 3.706 acres of land, more or less, out of the B.F. HANNA LEAGUE, in Hays County, Texas, being all of a called 4.25 acre tract conveyed to P & H Family Limited Partnership No. 1 in Exhibit C by deed of record in Volume 1733, Page 755, Official Public Records, Hays County, Texas. Said 3.706 acre tract being more particularly described by metes and bounds in **Exhibit "A-2"** attached hereto and made a part hereof.

Tract 3: A one-half undivided interest in and to that certain 1.507 acre tract of land, more or less, out of the BENJAMIN F. HANNA SURVEY NO. 28, ABSTRACT NO. 222, in Hays County, Texas, being a portion of a called 79.61 acre tract conveyed to P & H Family Limited Partnership No. 1 as Tract A by Deed of record in Volume 1733, Page 755, Official Public Records, Hays County, Texas. Said 1.507 acre tract being more particularly described by metes and bounds in **Exhibit "A-3"** attached hereto and made a part hereof.

Tract 4: Being all of Grantor's right, title and interest in and to that certain non-exclusive easement for ingress and egress sixty (60) feet in width, lying south of and adjacent to the northern boundary of that certain 79.39-acre tract being out of and a part of quarter section No. 15. of the B. F. HANNA LEAGUE and a portion of the A. J. Holford Survey, in Hays County, Texas, said 79.39 acre-tract being more particularly described on Exhibit B to that certain Special Warranty Deed dated October 23, 2000 recorded at Document No. 00025537, Volume 1733, Page 748 in the Official Public Records of Hays County, Texas (the "FLP 2 Tract"); said easement over the FLP 2 Tract being created and described as Item #4 in that Special Warranty Deed dated October 23, 2000, executed by Hardy E. Thompson, Jr. and Patty King Thompson, to P & H Family Limited Partnership No. 1, a Texas limited partnership, recorded in Volume 1733, Page 755, Official Public Records, Hays County, Texas.

Tract 5: Being all of Grantor's right, title and interest in and to a one-half undivided interest in any other easements of ingress and egress appurtenant to Tract 1 or to the FLP 2 Tract, as described as Item #3 in that Special Warranty Deed dated October 23, 2000, executed by Hardy E. Thompson, Jr. and Patty King Thompson, to P & H Family Limited Partnership No. 1, a Texas limited partnership, recorded in Volume 1733, Page 755, Official Public Records, Hays County, Texas.

EXHIBIT A-1

METES AND BOUNDS DESCRIPTION AND SURVEY PLAT OF TRACT 1

[SEE ATTACHED]

EXHIBIT A-1

78.021 ACRES
BUNKER RANCH
DRIPPING SPRINGS, TX

PROJECT NO.: 304-065
MARCH 4, 2021

LEGAL DESCRIPTION

BEING A 78.021 ACRE TRACT OF LAND (INCLUDING A 60 SQUARE FOOT AREA IN CONFLICT) OUT OF THE BENJAMIN F. HANNA SURVEY NO. 28, ABSTRACT NO. 222, SITUATED IN HAYS COUNTY, TEXAS, BEING A PORTION OF A CALLED 79.61 ACRE TRACT CONVEYED TO P & H FAMILY LIMITED PARTNERSHIP NO. 1 AS TRACT A BY DEED OF RECORD IN VOLUME 1733, PAGE 755, OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS (O.P.R.H.C.T.); SAID 78.021 ACRE TRACT OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

COMMENCING, at a ½ inch iron rod with "CEC" cap set at the northeast corner of the remainder of said 79.61 acre tract, being an interior "ell" corner of a called 4.25 acre tract described in Exhibit C of said deed recorded in Volume 1733, Page 755, O.P.R.H.C.T.;

THENCE, along the common line of said remainder of 79.61 acre tract and of said 4.25 acre tract, S00°25'57"W, a distanced of 60.03 feet to a ½ inch iron rod with "CEC" cap set for the easterly common corner of said 78.021 acre tract and of said remainder of 79.61 acre tract and the **POINT OF BEGINNING,** hereof.

THENCE, along the common line of said 78.021 acre tract and partially of said 4.25 acre tract and then partially of a called 44.123 acre tract conveyed to the Elry and Barbara Hudson Living Trust by deed of record in Volume 2851, Page 80, O.P.R.H.C.T., S00°25'57"W, passing at distance of 39.91 feet, a ½ inch iron rod found at the westerly common corner of said 4.25 acre tract and of said 44.123 acre tract, continuing for a total distance of 652.82 feet to a ½ inch iron rod found at the westerly common corner of said 44.123 acre tract and of Bunker Ranch Phase 2, a subdivision of record in Document No. 20017197, O.P.R.H.C.T.;

THENCE, along the common line of said 78.021 acre tract and partially of said Bunker Ranch Phase 2 and then partially of the remainder of a called 111.67 acre tract conveyed to Bunker Ranch, LLC by deed of record in Document No. 16020931, O.P.R.H.C.T., S00°21'25"W, passing at 629.14 feet, a ½ inch iron rod with "CEC" cap set at the westerly common corner of said Bunker Ranch Phase 2 and the said remainder of 111.67 acre tract, continuing for a total distance of 2,259.99 feet to a ½ inch iron rod found at the westerly common corner of said remainder of 111.67 acre tract of a called 18.250 acre tract conveyed to The Overlook at Bunker Ranch, LLC by deed of record in Document No. 20061246, O.P.R.H.C.T.;

THENCE, bounding the area of conflict, the following two (2) courses and distances:

1. S05°53'31"E, a distance of 10.82 feet to a found ½ inch iron rod;
2. S86°15'32"W, a distance of 5.94 feet to an 8 inch cedar fence post found at the northerly common corner of said 18.250 acre tract and of a called 603.70 acre tract conveyed to Anna Marie Widen Speir, et al, by deed of record in Volume 1734, Page 427, O.P.R.H.C.T.;

THENCE, along the common line of said 78.021 acre tract and of said 603.70 acre tract, S88°42'30"W, a distance of 1,237.34 feet to a ½ inch iron rod with "CEC" cap set at the southerly common corner of said 78.021 acre tract and of a called 79.39 acre tract conveyed to P & H Family Limited Partnership No. 2 by deed of record in Volume 1733, Page 748, O.P.R.H.C.T.;

78.021 ACRES
BUNKER RANCH
DRIPPING SPRINGS, TX

PROJECT NO.: 304-065
MARCH 4, 2021

THENCE, along the common line of said 78.021 acre tract and of said 79.39 acre tract, the following three (3) courses and distances:

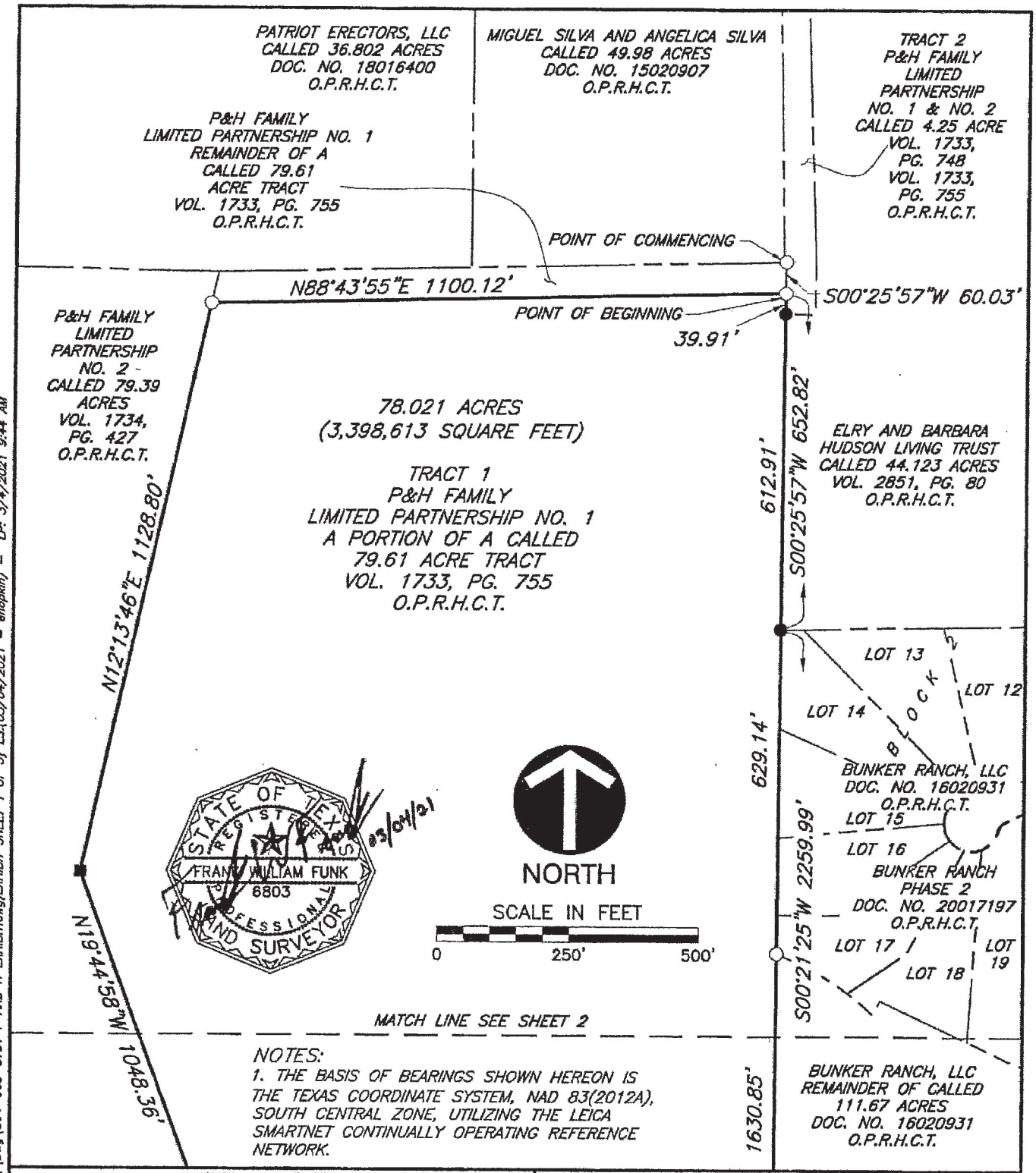
1. N18°14'48"E, a distance of 881.92 feet to a found ½ inch iron rod;
2. N19°44'58"W, a distance of 1,048.36 feet to a found 8 inch cedar fence post;
3. N12°13'46"E, a distance of 1,128.80 feet to a ½ inch iron rod set at the westerly common corner of said 78.021 acre tract and said remainder of 79.61 acre tract;

THENCE, along the common line of said 78.021 acre tract and of said remainder of 79.61 acre tract, N88°43'55"E, 1,100.12 feet to the **POINT OF BEGINNING,** and containing 78.021 acres (3,398,613 square feet) of land, more or less.

THE BASIS OF BEARING OF THIS SURVEY IS TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NSRS 2011(2012A), UTILIZING THE LEICA SMARTNET CONTINUALLY OPERATING REFERENCE NETWORK.

Witness my hand and seal this 4th day of March, 2021.

Frank William Funk, R.P.L.S. 6803
Civil & Environmental Consultants, Inc.
3711 S. MoPac Expressway, Building 1, Suite 550
Austin, TX 78746
Texas Registered Surveying Firm No. 10194419



P:\300-000\304-065\-Survey\Dwg\304-065-SVD1 P AND H EXHIBIT.dwg[EXHIBIT SHEET 1 OF 3] LS:(03/04/2021 - ehopkin) - LP: 3/4/2021 9:44 AM

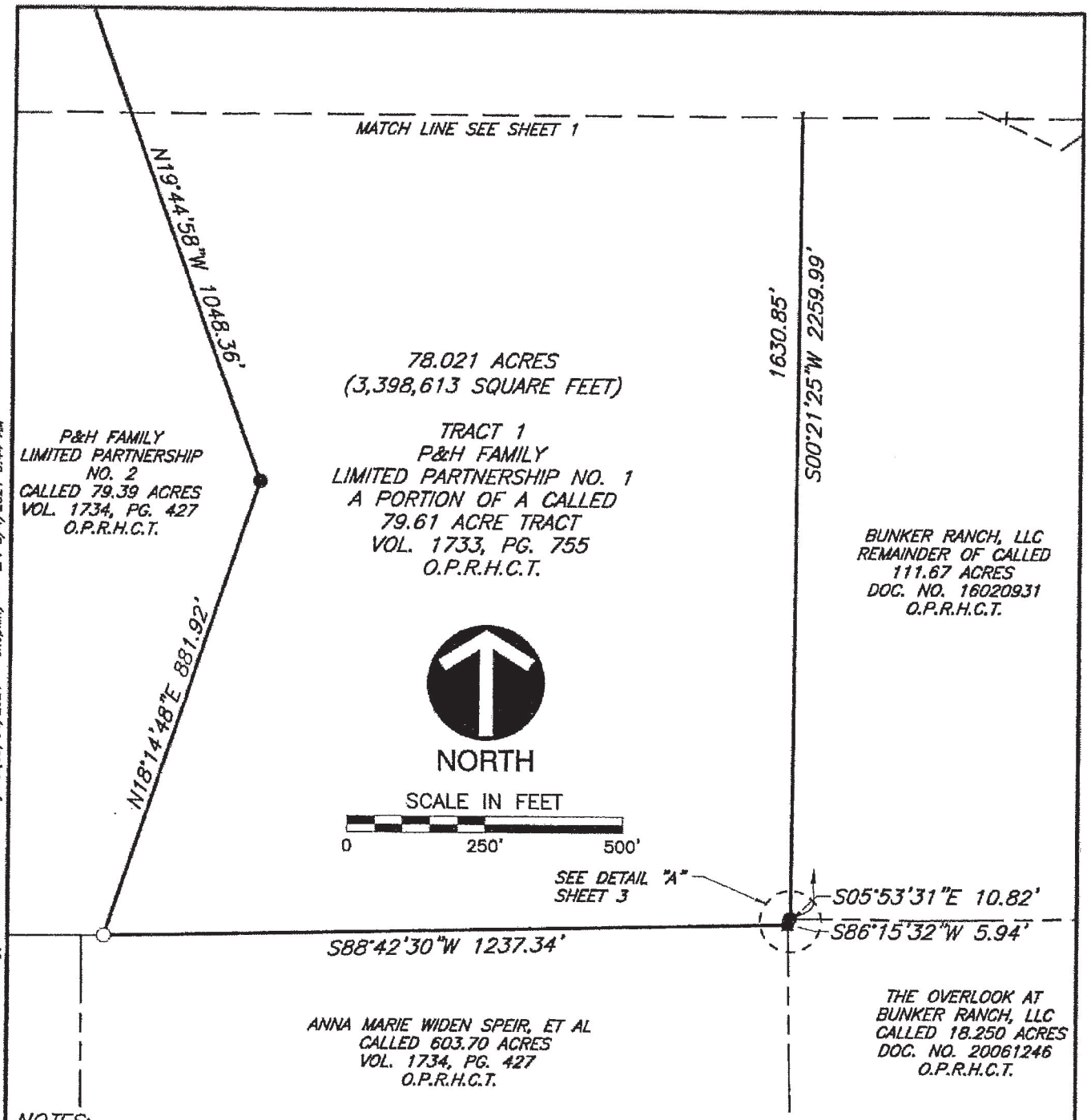
Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
Texas Registered Surveying Firm 10194419 www.cecinc.com Texas Registered Engineering Firm F-38

STEVE HARREN

CITY OF DRIPPING SPRINGS,
HAYS COUNTY, TEXAS

P & H TRACT
EXHIBIT

DRAWN BY:	ESH	CHECKED BY:	FWF	APPROVED BY:	FWF	SHEET NO.:	1 OF 3
DATE:	MARCH, 2021	DWG SCALE:	1"=250'	PROJECT NO:	304-065		



NOTES:

1. THE BASIS OF BEARINGS SHOWN HEREON IS THE TEXAS COORDINATE SYSTEM, NAD 83(2012A), SOUTH CENTRAL ZONE, UTILIZING THE LEICA SMARTNET CONTINUALLY OPERATING REFERENCE NETWORK.

P:\300-000\304-065\-Survey\Dwg\304-065-SUD1 P AND H EXHIBIT.dwg[EXHIBIT SHEET 2 OF 3] LS:(03/04/2021 - shopkin) - LP: 3/4/2021 9:44 AM

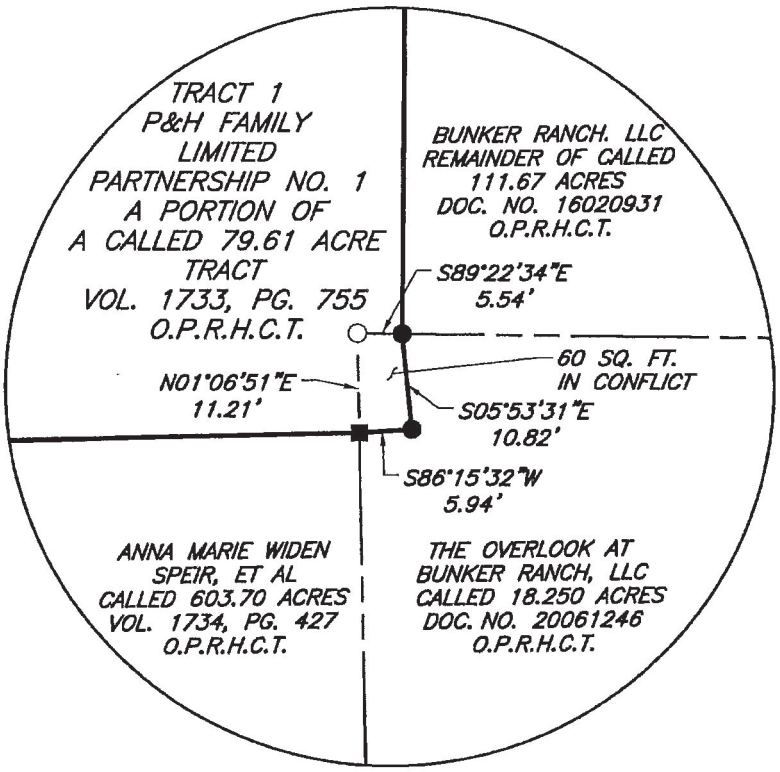
Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
Texas Registered Surveying Firm 10194419
www.ceciinc.com
Texas Registered Engineering Firm F-38

STEVE HARREN

CITY OF DRIPPING SPRINGS,
HAYS COUNTY, TEXAS

P & H TRACT
EXHIBIT

DRAWN BY:	ESH	CHECKED BY:	FWF	APPROVED BY:	FWF	SHEET NO.:
DATE:	MARCH, 2021	DWG SCALE:	1"=250'	PROJECT NO:	304-065	2 OF 3



NORTH

DETAIL "A"
SCALE 1" = 20'

LEGEND:

●	1/2" IRON ROD FOUND
■	FENCE POST FOUND
○	1/2" IRON ROD SET W/ "CEC" CAP
———	SUBJECT PROPERTY LINE
——— — — ———	ADJACENT PROPERTY LINE
O.P.R.H.C.T.	OFFICIAL PUBLIC RECORDS, HAYS COUNTY, TEXAS
DOC. NO.	DOCUMENT NUMBER
VOL.	VOLUME
PG.	PAGE

Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
Texas Registered Surveying Firm 10194419
www.cecinc.com
Texas Registered Engineering Firm F-38

STEVE HARREN

CITY OF DRIPPING SPRINGS,
HAYS COUNTY, TEXAS

P & H TRACT
EXHIBIT

DRAWN BY:	ESH	CHECKED BY:	FWF	APPROVED BY:	FWF	SHEET NO.:	3 OF 3
DATE:	MARCH, 2021	DWG SCALE:	1"=250'	PROJECT NO:	304-065		

P:\300-000\304-065\-Survey\Dwg\304-065-SV01 P AND H EXHIBIT.dwg[EXHIBIT SHEET 3 OF 3] LS:(03/04/2021 - ehopkin) - LP: 3/4/2021 2:00 PM

EXHIBIT A-2

METES AND BOUNDS DESCRIPTION AND SURVEY PLAT OF TRACT 2

[SEE ATTACHED]

EXHIBIT A-2

3.706 ACRES
BUNKER RANCH
DRIPPING SPRINGS, TX

PROJECT NO.: 304-065
APRIL 29, 2021

LEGAL DESCRIPTION

BEING A 3.706 ACRE TRACT OF LAND OUT OF THE BENJAMIN F. HANNA SURVEY NO. 28, ABSTRACT NO. 222, SITUATED IN HAYS COUNTY, TEXAS, BEING ALL OF A CALLED 4.25 ACRE TRACT CONVEYED TO P & H FAMILY LIMITED PARTNERSHIP NO. 1 IN EXHIBIT C BY DEED OF RECORD IN VOLUME 1733, PAGE 755, OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS (O.P.R.H.C.T.); SAID 3.706 ACRE TRACT OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING, at a ½ inch iron rod with "CEC" cap set at an interior "ell" corner of said 3.706 acre tract, being the northeast corner of a called 79.61 acre tract, being described in Exhibit A of said deed recorded in Volume 1733, Page 755, O.P.R.H.C.T., for the **POINT OF BEGINNING,** hereof;

THENCE, along the common line of said 3.706 acre tract and of said 79.61 acre tract, S88°43'55"W, a distance of 3.37 feet to a found cotton spindle in a fence post at the southerly common corner of said 3.706 acre tract and of a called 49.98 acre tract conveyed to Miguel Silva and Angelica Silva by deed of record in Document No. 15020907, O.P.R.H.C.T.;

THENCE, along the common line of said 3.706 acre tract and of said 49.98 acre tract, generally following the fence, the following six (6) courses and distances:

1. N01°03'57"W, a distance of 453.05 feet to a calculated point;
2. N01°56'10"W, a distance of 547.42 feet to a calculated point;
3. N01°13'49"W, a distance of 182.02 feet to a calculated point;
4. N01°27'10"W, a distance of 445.20 feet to a calculated point;
5. N02°33'10"W, a distance of 563.42 feet to a calculated point;
6. N02°40'11"W, a distance of 802.30 feet to a ½ inch iron rod found in the southerly right-of-way line of U.S. Highway 290 at the northerly common corner of said 3.706 acre tract and of said 49.98 acre tract;

THENCE, along the common line of said 3.706 acre tract and of the southerly right-of-way line of U.S. Highway 290, N89°24'56"E, a distance of 60.00 feet to a ½ inch iron rod with "CEC" cap set at the northerly common corner of said 3.706 acre tract and of a called 18.340 acre tract conveyed to Nelda Kyle by deed of record in Volume 1264, Page 812, O.P.R.H.C.T;

THENCE, along the common line of said 3.706 acre tract and partially of said 18.340 acre tract, and then partially of a called 44.123 acre tract conveyed to the Elry and Barbara Hudson Living Trust in Volume 2851, Page 80, O.P.R.H.C.T., S02°00'08"E, a distance of 2995.00 feet to a found ½ inch iron rod;

THENCE, along the common line of said 3.706 acre tract and of said 44.123 acre tract, the following two (2) courses and distances:

1. S00°49'45"W, a distance of 99.68 feet to a found ½ inch iron rod;

3.706 ACRES
BUNKER RANCH
DRIPPING SPRINGS, TX

PROJECT NO.: 304-065
APRIL 29, 2021

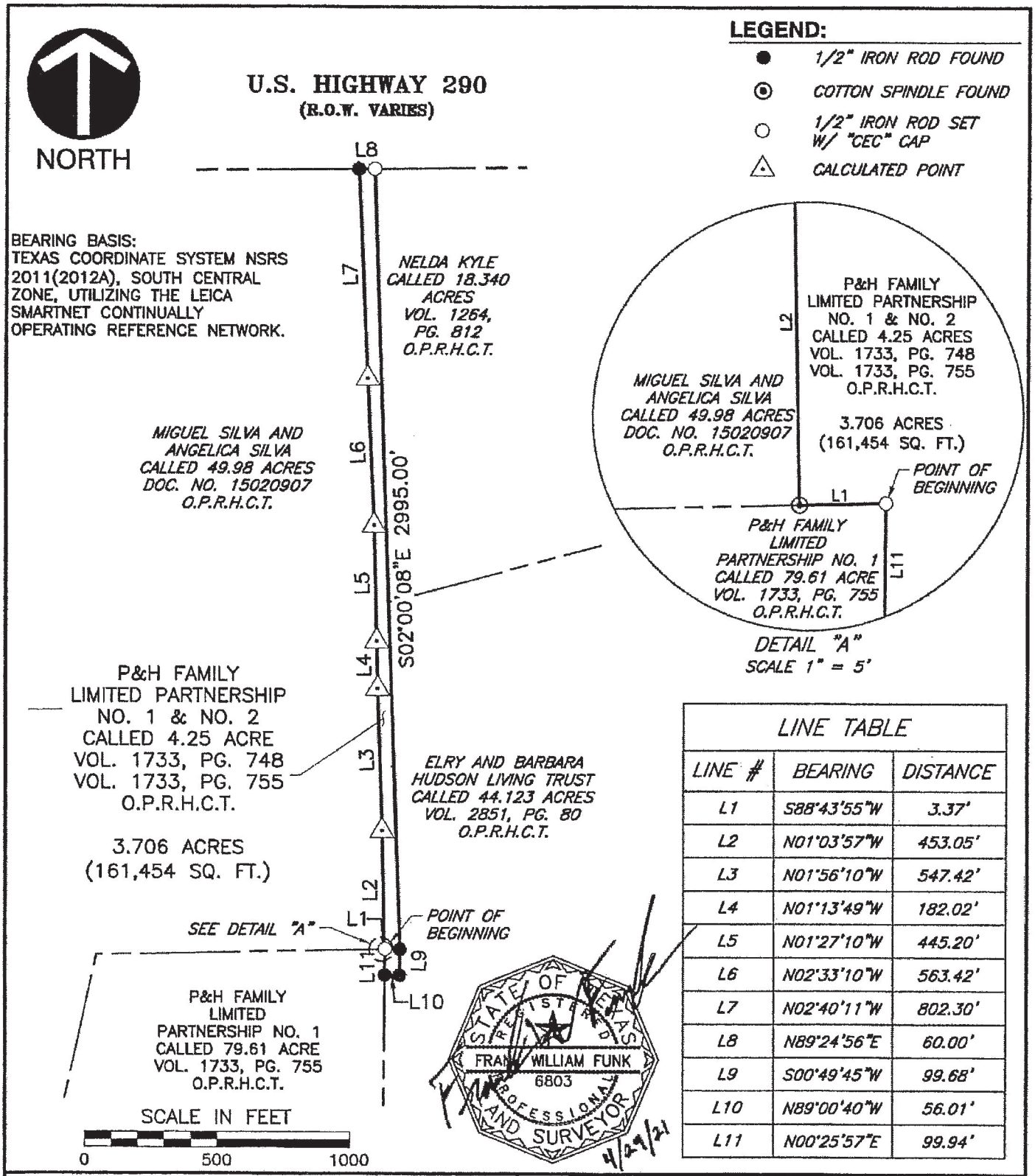
2. N89°00'40"W, a distance of 56.01' feet to a ½ inch iron rod found in the easterly line of said 79.61 acre tract found at the westerly common corner of said 3.706 acre tract and of said 44.123 acre tract;

THENCE, along the common line of said 3.706 acre tract and of said 79.61 acre tract, N00°25'57"E, a distance of 99.94 feet to the **POINT OF BEGINNING,** and containing 3.706 acres (161,454 square feet) of land, more or less.

THE BASIS OF BEARING OF THIS SURVEY IS TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NSRS 2011(2012A), UTILIZING THE LEICA SMARTNET CONTINUALLY OPERATING REFERENCE NETWORK.

Witness my hand and seal this 29th day of April, 2021.

Frank William Funk, R.P.L.S. 6803
Civil & Environmental Consultants, Inc.
3711 S. MoPac Expressway, Building 1, Suite 550
Austin, TX 78746
Texas Registered Surveying Firm No. 10194419



LINE TABLE		
LINE #	BEARING	DISTANCE
L1	S88°43'55"W	3.37'
L2	N01°03'57"W	453.05'
L3	N01°56'10"W	547.42'
L4	N01°13'49"W	182.02'
L5	N01°27'10"W	445.20'
L6	N02°33'10"W	563.42'
L7	N02°40'11"W	802.30'
L8	N89°24'56"E	60.00'
L9	S00°49'45"W	99.68'
L10	N89°00'40"W	56.01'
L11	N00°25'57"E	99.94'

Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
Texas Registered Surveying Firm 10194419
www.cecinc.com
Texas Registered Engineering Firm F-38

STEVE HARREN

CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

P&H TRACT
U.S. 290 ACCESS

DRAWN BY:	CEC	CHECKED BY:	FWF	APPROVED BY:	FWF	SHEET NO.:	
DATE:	APRIL, 2021	DWG SCALE:	1"=500'	PROJECT NO:	304-065		1 OF 1

P:\300-000\304-065\-Survey\Dwg\304-065-SV01 P&H Tract 2 Boundary.dwg[LAYOUT1] LS:(4/29/2021 - ffrank) - LP: 4/29/2021 6:14 PM

EXHIBIT A-3

METES AND BOUNDS DESCRIPTION AND SURVEY PLAT OF TRACT 3

[SEE ATTACHED]

EXHIBIT A-3

1.507 ACRES
BUNKER RANCH
DRIPPING SPRINGS, TX

PROJECT NO.: 304-065
APRIL 29, 2021

LEGAL DESCRIPTION

BEING A 1.507 ACRE TRACT OF LAND OUT OF THE BENJAMIN F. HANNA SURVEY NO. 28, ABSTRACT NO. 222, SITUATED IN HAYS COUNTY, TEXAS, BEING A PORTION OF A CALLED 79.61 ACRE TRACT CONVEYED TO P & H FAMILY LIMITED PARTNERSHIP NO. 1 AS TRACT A BY DEED OF RECORD IN VOLUME 1733, PAGE 755, OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS (O.P.R.H.C.T.); SAID 1.507 ACRE TRACT OF LAND BEING MORE PARTICULARLY DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

BEGINNING, at a ½ inch iron rod with "CEC" cap set at the northeast corner of the said 79.61 acre tract, being an interior "ell" corner of a called 4.25 acre tract described in Exhibit C of said deed recorded in Volume 1733, Page 755, O.P.R.H.C.T., for the **POINT OF BEGINNING** hereof;

THENCE, along the common line of said 1.507 acre tract and of said 4.25 acre tract, S00°25'57"W, a distance of 60.03 feet to a ½ inch iron rod with "CEC" cap set at the easterly common corner of said 1.507 acre tract and the remainder of said 79.61 acre tract;

THENCE, along the common line of said 1.507 acre tract and of said remainder of 79.61 acre tract, S88°43'55"W, 1,100.12 feet to a ½ inch iron rod with "CEC" cap set in the common line of said 79.61 acre tract and of a called 79.39 acre tract conveyed to P&H Family Limited Partnership No. 2 by deed of record in Volume 1733, Page 748, O.P.R.H.C.T., at the westerly common corner of said 1.507 acre tract and of the remainder of said 79.61 acre tract;

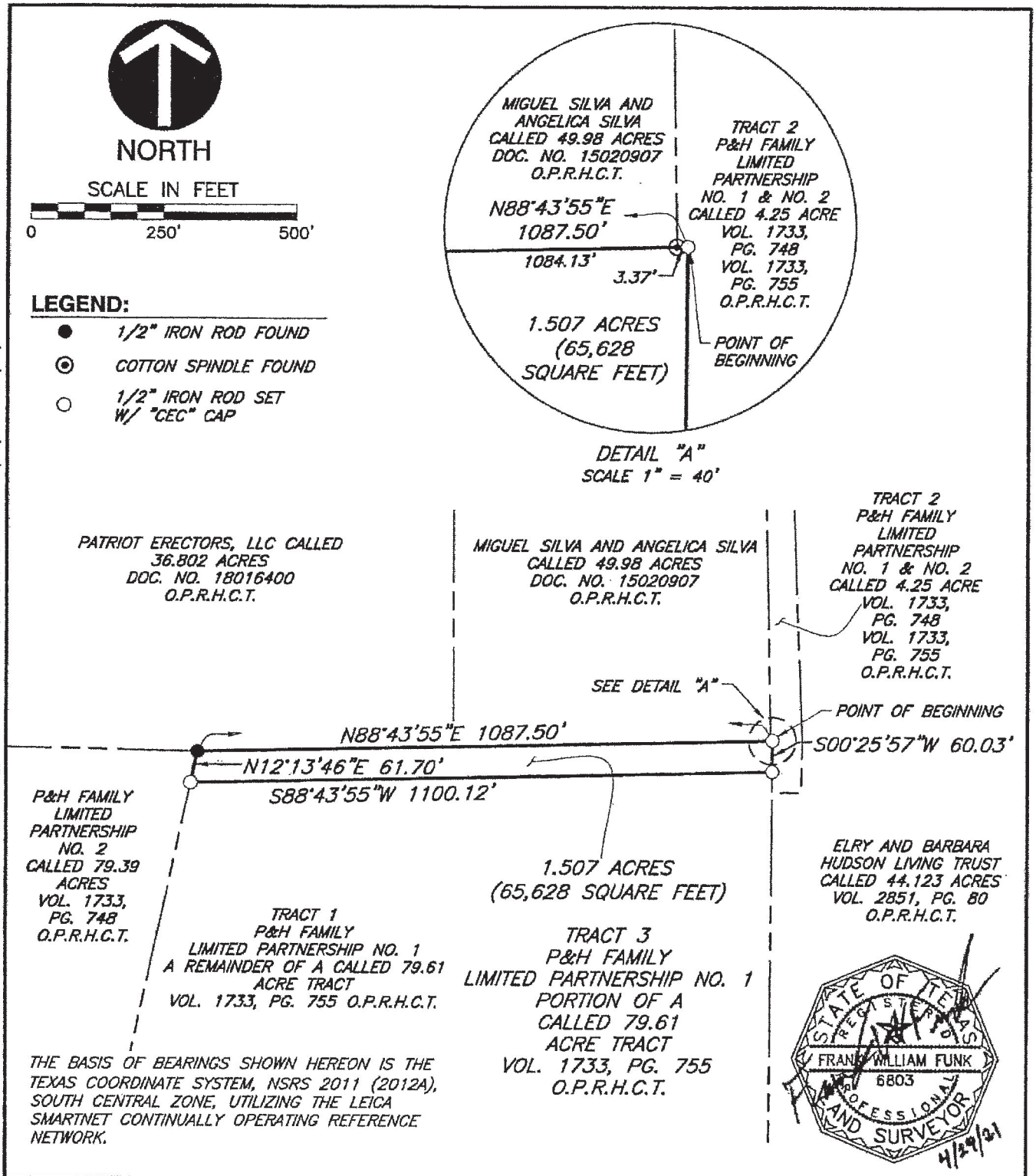
THENCE, along the common line of said 1.507 acre tract and of said 79.39 acre tract, N12°13'46"E, a distance of 61.70 feet to a ½ inch iron rod found in the southerly line of a called 36.802 acre tract conveyed to Patriot Erectors, LLC by deed of record in Document No. 18016400, O.P.R.H.C.T., at the northerly common corner of said 1.507 acre tract and of said 79.39 acre tract;

THENCE, along the common line of said 1.507 acre tract and partially of said 36.802 acre tract, and then partially of a called 49.98 acre tract conveyed to Miguel Silva and Angelica Silva by deed of record in Document No. 15020907, O.P.R.H.C.T., and then partially of said 4.25 acre tract, N88°43'55"E, passing at a distance of 1,084.13, a found cotton spindle in a fence post at the southerly common corner of said 49.98 acre tract and of said 4.25 acre tract, continuing for a total distance of 1,087.50 feet to the **POINT OF BEGINNING,** and containing 1.507 acres (65,628 square feet) of land, more or less.

THE BASIS OF BEARING OF THIS SURVEY IS TEXAS STATE PLANE COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NSRS 2011(2012A), UTILIZING THE LEICA SMARTNET CONTINUALLY OPERATING REFERENCE NETWORK.

Witness my hand and seal this 29th day of April, 2021.

Frank William Funk, R.P.L.S. 6803
Civil & Environmental Consultants, Inc.
3711 S. MoPac Expressway, Building 1, Suite 550
Austin, TX 78746
Texas Registered Surveying Firm No. 10194419



Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
Texas Registered Surveying Firm 10194419 www.cecinc.com Texas Registered Engineering Firm F-38

STEVE HARREN

CITY OF DRIPPING SPRINGS, HAYS COUNTY, TEXAS

P & H TRACT 3 EXHIBIT

DRAWN BY:	ESH	CHECKED BY:	FWF	APPROVED BY:	FWF	SHEET NO.:	1 OF 1
DATE:	APRIL, 2021	DWG SCALE:	1"=250'	PROJECT NO:	304-065		

P:\300-000\304-065\-Survey\Dwg\304-065-SV01 P AND H NORTHERN REMAINDER EXHIBIT.dwg[EXHIBIT SHEET 1 OF 1] LS:[04/29/2021 - ehopkin] - LP: 4/29/2021 6:10 PM

EXHIBIT B

Permitted Exceptions

1. Easement granted to Southwestern Bell Telephone Company, dated July 12, 1937, recorded in Volume 115, Page 86, of the Deed Records of Hays County, Texas (Tract 2).

2. Easement granted to Dripping Springs Water Supply Corporation, dated December 18, 2002, recorded in Volume 3228, Page 542, of the Official Public Records of Hays County, Texas (Tracts 1 and 3).

3. Non-exclusive ingress and egress easement set out in Special Warranty Deed recorded in Volume 1733, Page 748, Official Public Records, Hays County, Texas (Tract 3).

4. Rights and claims of cotenants in the land and to the rights of anyone claiming under them including, but not limited to, rights of partition, claims for improvements, claims for reimbursement, owelty of partition, and agreements between co-tenants (Tracts 2 and 3).

5. Easement granted to Pedernales Electric Cooperative, Inc. pursuant to Condemnation Proceedings filed May 19, 1953, under Cause No. 1648, in the County Court of Hays County, Texas and file of record in Document No. 21022398 of the Official Public Records of Hays County, Texas and as affected by Amendment recorded in Volume 1983, Page 576, of the Official Public Records of Hays County, Texas (Tract 1).

6. Easement granted to Dripping Springs Water Supply Corporation, dated December 4, 2003, recorded in Volume 3228, Page 534, of the Official Public Records of Hays County, Texas (Tract 2).

7. Affidavit to the public regarding a non-standard and/or proprietary on-site sewage facility installed on subject property, as recorded in Document No. 18037775, of the Official Public Records of Hays County, Texas. (Tract 4)

8. An approximately 60 square foot area located at the southeast corner of the Land in conflict with description of 18.250 acre tract in deed to The Overlook at Bunker Ranch, LLC recorded at Clerk's File No. 20061246, of the Official Public Records of Hays County, Texas.

THE STATE OF TEXAS
COUNTY OF HAYS

I hereby certify that this instrument was FILED on the date and the time stamped hereon by me and was duly RECORDED in the Records of Hays County, Texas.

21051171 DEED
09/17/2021 09:07:15 AM Total Fees: $110.00

Elaine H. Cárdenas, MBA, PhD,County Clerk
Hays County, Texas

Elaine H Cárdenas

HAYS COUNTY TEXAS

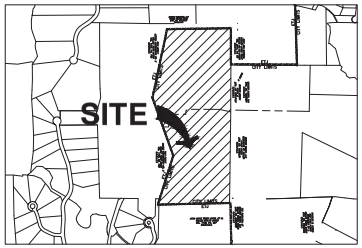
Exhibit C

SUBDIVISION CONSTRUCTION DRAWINGS

FOR

HARDY T LAND

CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX



VICINITY MAP
SCALE: 1"=1000'

OWNER/TEAM INFORMATION

CIVIL ENGINEER

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
3711 S. MOPAC EXPRESSWAY, BUILDING 1, SUITE 550
AUSTIN, TX 78746
PH: (512) 439-0400
CONTACT: BRIAN ESTES, PE

OWNER / DEVELOPER

HARDY T LAND, LLC
STEVE HARREN
317 GRACE LANE #240
AUSTIN, TEXAS 78746

LAND SURVEYOR

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
3711 S. MOPAC EXPRESSWAY, BUILDING 1, SUITE 550
AUSTIN, TX 78746
PH: (512) 439-0400
CONTACT: SYDNEY SMITH XINOS, R.P.L.S.

SUMMARY

FULL PURPOSE CITY LIMITS
ZONING: SF-2

AREAS

LOTS (73)	63.14 AC	80.93%
POND LOTS (3)	5.66 AC	7.25%
R.O.W.	9.22 AC.	11.82%
TOTAL=	78.02 AC.	

IMPERVIOUS COVER

CONCRETE = 182,836 S.F.
SIDEWALK = 65,483 S.F.
ASSUMED I.C. PER RESIDENTIAL LOT = 8,500 S.F.

IMPERVIOUS COVER TOTAL = 885,819 S.F.
IMPERVIOUS COVER TOTAL = 20.34 AC.
TOTAL AREA = 78.02 AC.

PROPOSED IMPERVIOUS COVER = 26.07%
MAX. ALLOWED IMPERVIOUS COVER = 40%

LOT COUNT

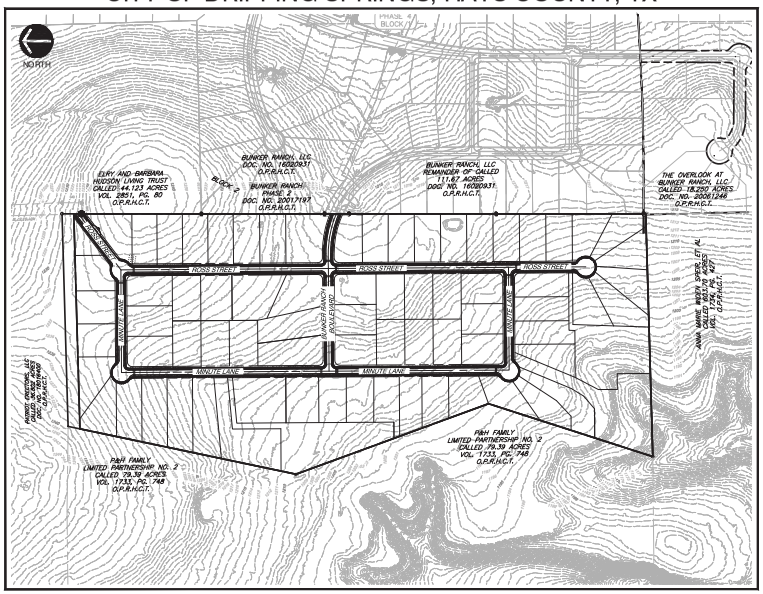
NUMBER OF LOTS = 73
AVERAGE LOT = 0.86 AC
TOTAL = 63.14 AC

BUILDING SETBACKS

FRONT = 25'
BACK = 15'
SIDE = 15'

PLAT NOTES

1. ALL RESPONSIBILITY FOR THE ACCURACY OF THESE PLANS REMAINS WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY MUST REPLY ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.
2. ASSIGNED CITY ADDRESS NUMBERS SHALL BE PERMANENTLY AFFIXED TO ALL STRUCTURES IN SUCH POSITION AS TO BE PLAINLY VISIBLE AND LEGIBLE FROM THE STREET.
3. NO PORTION OF THIS TRACT FALLS WITHIN FEMA 1% ANNUAL CHANCE FLOOD HAZARD AREA PER FEMA PANEL 48209C0085F DATED 9/2/2005.
4. WATER PROVIDER: DRIPPING SPRINGS WATER SUPPLY CORP.
5. A PORTION OF THIS PROJECT IS LOCATED WITHIN THE EDWARDS AQUIFER CONTRIBUTING ZONE.
6. THE JURISDICTIONAL AUTHORITY FOR ONSITE SEWAGE FACILITIES (OSSF) FALLS UNDER THE TEXAS COMMISSION OF ENVIRONMENTAL QUALITY. THE AUTHORIZED AGENT IS THE CITY OF DRIPPING SPRINGS.
7. THE HOA SHALL BE RESPONSIBLE FOR OPERATION AND MAINTENANCE OF STORMWATER FACILITIES.
8. DRIPPING SPRINGS WATER SUPPLY CORPORATION WILL OWN AND OPERATE THE WATER FACILITIES AS PER NOTE 4.
9. THE HOA SHALL BE THE OWNER AND OPERATOR OF ROADWAY FACILITIES
10. A WATER QUALITY BMP MAINTENANCE PLAN HAS BEEN PREPARED FOR THIS DEVELOPMENT AND IS ON FILE AT THE CITY HALL IN THE SITE DEVELOPMENT CASE # SD2022-0066.



SITE MAP
SCALE: 1"=300'

LEGAL DESCRIPTION

BEING A 78.021 ACRE TRACT OUT OF THE BENJAMIN F. HANNA SURVEY NO. 28, ABSTRACT NO. 222, SITUATED IN HAYS COUNTY, TEXAS, BEING ALL OF TRACT 1, CONVEYED TO HARDY T LAND, LLC BY SPECIAL WARRANTY DEED OF RECORD IN DOCUMENT NO. 21051171, OFFICIAL PUBLIC RECORDS OF HAYS COUNTY, TEXAS (O.P.R.H.C.T.)

NOTES:

1. OWNER WILL BE ABLE TO CONTINUE DEVELOPMENT PROCESS, SUCH AS ROADS, UTILITIES, AND ACCEPTANCE THEREOF, HOWEVER, NO BUILDING CERTIFICATE OF OCCUPANCY WILL BE ISSUED UNTIL CONNECTIVITY IS ESTABLISHED IN CONFORMANCE WITH THE 2018 INTERNATIONAL FIRE CODE, APPENDIX D, SECTION D107.1 AND SECTION D107.2.
2. CONNECTION TO THE EXISTING BUNKER RANCH BOULEVARD STUB AT BUNKER RANCH PHASE 4 MUST BE COMPLETED PRIOR TO APPROVAL OF THE FINAL PLAT FOR HARDY.
3. STREET TREES SHALL BE PLANTED IN EACH LOT PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY PER THE QUANTITY, SIZE AND LOCATION REQUIREMENTS OF SUBDIVISION ORDINANCE 28.06.051.
4. DEVELOPER WILL BUILD SIDEWALKS ADJACENT TO COMMON AREAS; HOME BUILDERS WILL BUILD SIDEWALKS ON RESIDENTIAL LOTS. DEVELOPER WILL BOND SIDEWALKS PRIOR TO CONSTRUCTION.

SUBMITTED BY : BRIAN ESTES, PE

02/13/2024

STATE OF TEXAS
BRIAN ESTES
89270
LICENSED PROFESSIONAL ENGINEER

I CERTIFY THAT THESE ENGINEERING DOCUMENTS ARE COMPLETE, ACCURATE AND ADEQUATE FOR THE INTENDED PURPOSES, INCLUDING CONSTRUCTION, BUT ARE NOT AUTHORIZED FOR CONSTRUCTION PRIOR TO FORMAL CITY APPROVAL.

APPROVED BY:

CITY ADMINISTRATOR

CITY ENGINEER

DRIPPING SPRINGS WATER SUPPLY CORPORATION

APPROVED BY:

HAYS COUNTY ESD #6

SITE PERMIT NUMBER

SHEET LIST

Sheet #	Description
01	COVER SHEET
02	GENERAL NOTES
03	PRELIMINARY PLAN
04	PRELIMINARY PLAN
05	EXISTING CONDITIONS
06	EXISTING DRAINAGE AREA MAP
07	PROPOSED DRAINAGE AREA MAP
08	ROSS STREET NORTH (0+00 – 4+50)
09	ROSS STREET NORTH (4+50 - END)
10	ROSS STREET SOUTH (0+00 – 9+50)
11	ROSS STREET SOUTH (9+50 - END)
12	MINUTE LANE NORTH (0+00 – 5+50)
13	MINUTE LANE NORTH (5+50 - END)
14	MINUTE LANE SOUTH (0+00 – 9+50)
15	MINUTE LANE SOUTH (9+50 - END)
16	BUNKER RANCH BLVD. (0+00 – END)
17	GENERAL DETAILS 2
18	GENERAL DETAILS
19	OVERALL WATER PLAN
20	WATER LINE A P&P (0+00 – 3+50)
21	WATER LINE A P&P (3+50 – 14+50)
22	WATER LINE A P&P (14+50 – 21+50)
23	WATER LINE A P&P (21+50 – END)
24	WATER LINE B P&P (0+00 – 6+00)
25	WATER LINE B P&P (6+00 – 16+00)
26	WATER LINE B P&P (16+00 – 24+00)
27	WATER LINE B P&P (24+00 – END)
28	WATER LINE C P&P
29	UTILITY DETAILS
30	OVERALL STORM PLAN
31	STORM LINES A
32	STORM LINE A1 & A2
33	STORM B
34	STORM LINES B1 & B2
35	STORM LINE C
36	STORM LINE C1-C5
37	STORM LINES D
38	STORM LINE D-2
39	STORM LINE E
40	STORM LINES E1-E2-E3
41	STORM LINE F
42	E&S CONTROL PLAN
43	DETENTION POND A
44	DETENTION POND B
45	DETENTION POND C
46	WATER QUALITY POND B
47	WATER QUALITY POND C
48	WATER QUALITY POND CALCULATIONS
49	SIGNING AND STRIPING PLAN
50	STRUCTURAL DETAILS

811 !!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
PH: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND LLC
HARDY T LAND
DRIPPING SPRINGS, HAYS COUNTY, TX

COVER SHEET

DATE:	02.13.2024
DWG SCALE:	1" =300'
PROJECT NO:	304-065
DRAWN BY:	STAFF
CHECKED BY:	MSC
APPROVED BY:	BE

DRAWING NO.: 01
SHEET 01 OF 50

P:\304-065\304-065 - CAD\Dwg\Hardy\CS\01 SHEET.dwg[HARDY CS](1/1/2022 - emmerson - LP: 6/6/2022 4:01 PM

Exhibit D

City of Dripping Springs
511 Mercer Street • PO Box 384 • Dripping Springs, TX 78620 • 512.858.4725
cityofdrippingsprings.com
Open spaces, friendly faces.

DRIPPING SPRINGS
Texas

Date: **March 7, 2024**

Name: **Luis Garcia**
Company: **CEC**
Email: **lgarcia@cecinc.com**

Dear **Luis Garcia**:

CONDITIONAL APPROVAL

This letter is to inform you that case **SUB2023-0042 HARDY CONSTRUCTION PLANS** has received a conditional approval. Each the following conditions must be addressed before the permit is approved.

1. Final approval will be withheld until completion of the secondary access.
2. Provide copy of executed drainage easement.

Should you have any questions or concerns, please feel free to reach out to the planning department.

Regards,

Tory Carpenter, AICP
Planning Director
City of Dripping Springs

Exhibit E

DRIPPING SPRINGS
Texas

City of Dripping Springs
511 Mercer Street • PO Box 384 • Dripping Springs, TX 78620 • 512.858.4725
cityofdrippingsprings.com

Open spaces, friendly faces.

Date: **November 7, 2023**

Name: **Michael Theone**
Company: **Civil & Environmental Consultants, Inc.**
Email: **mtheone@cecinc.com**

Dear **Michael Theone**:

CONDITIONAL APPROVAL

This letter is to inform you that the case **SD2022-0025 HARDY DRIVEWAY** has received a conditional approval. Each the following conditions must be addressed before the permit is approved.

1. Submit executed drainage easement document.

2. I do not see the level spreader details for the culvert discharge. Please add details or clarify location. The one detail reference 508S-13 is a standard headwall detail that will not fit the situation.

3. Confirm 100-yr flow is contained within the ROW. Provide an exhibit confirming the spread of the 100-yr is contained within the ROW.

4. Since this roadway is in the ETJ provide a signature block on the cover with approval by the County Transportation Department prior to submitting to the City for final approval and signatures.

Should you have any questions or concerns, please feel free to reach out to the planning department.

Regards,

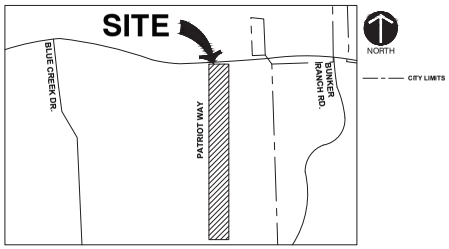
Michelle Fischer
City Administrator
City of Dripping Springs

HARDY T LAND, LLC
HARDY DRIVEWAY

CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

SITE DEVELOPMENT PLANS

SUBMITTAL DATE: 8/10/2022



VICINITY MAP
SCALE: 1"=1000'

OWNER/TEAM INFORMATION

CIVIL ENGINEER

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
3711 S. MOPAC EXPRESSWAY, BUILDING 1, SUITE 550
AUSTIN, TX 78746
PH: 512-439-0400
CONTACT: MICHAEL THEONE, PE

OWNER / DEVELOPER

HARDY T LAND, LLC
317 GRACE LANE #240
AUSTIN, TEXAS 78746

LAND SURVEYOR

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
3711 S. MOPAC EXPRESSWAY, BUILDING 1, SUITE 550
AUSTIN, TX 78746
PH: 512-439-0400
CONTACT: SYDNEY XINOS, RPLS

IMPERVIOUS COVER

IMPERVIOUS COVER TOTAL: 1.85 AC
TOTAL AREA: 3.706 AC

IMPERVIOUS COVER: 49.9%

NOTES

ALL RESPONSIBILITY FOR ACCURACY OF THESE PLANS REMAIN WITH THE ENGINEER WHO PREPARED THEM. IN REVIEWING THESE PLANS, THE CITY OF DRIPPING SPRINGS MUST RELY ON THE ADEQUACY OF THE WORK OF THE DESIGN ENGINEER.

THIS SITE LIES WITHIN THE EDWARDS AQUIFER CONTRIBUTING ZONE.

CZP EAPP ID NO. 11003502, REGULATED ENTITY NO. RN111601258

NO PORTION OF THIS SITE LIES WITHIN A FEMA FLOODPLAIN AS DEPICTED IN FEMA FIRM PANEL 48209C0085F, DATED 9/2/2005.

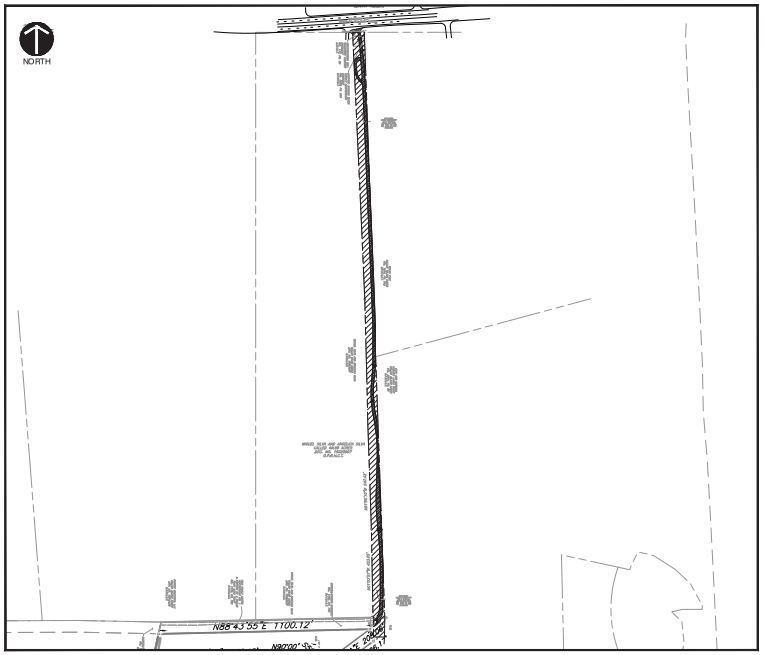
A WATER QUALITY BMP MAINTENANCE PLAN HAS BEEN PREPARED FOR THIS DEVELOPMENT AND IS ON FILE AT CITY HALL IN SITE DEVELOPMENT CASE# SD2022-0025.

THE OWNER OF THE PROPERTY - HARDY T LAND, LLC - IS RESPONSIBLE FOR THE OPERATION AND MAINTENANCE OF THE STORMWATER UTILITIES WITHIN THIS DEVELOPMENT.

THE EXISTING ROAD BASE IS TO BE UTILIZED IN THE CONSTRUCTION OF THIS ROADWAY PER THE APPROVAL OF THE GEOTECHNICAL ENGINEER.

FLOOD STATEMENT:
NO PORTION OF THE SITE IS LOCATED WITHIN THE 100-YEAR FLOODPLAIN AS DEFINED BY THE FLOOD INSURANCE RATE MAP PANEL NO. 48209C0085F FOR TRAVIS COUNTY, TEXAS, DATED SEPTEMBER 2, 2005.

WATERSHED INFORMATION:
ENTIRETY OF THE SITE LIES WITHIN EDWARDS AQUIFER CONTRIBUTING ZONE. SITE DEVELOPMENT PERMIT WILL REQUIRE A CONTRIBUTING ZONE PLAN (CZP) FROM TCEQ.



SITE MAP
SCALE: 1"=300'

LEGAL DESCRIPTION

A0222 BENJAMIN F HANNA SURVEY, ACRES 3.706

ADDRESS

2901 W HWY 290
DRIPPING SPRINGS, TX 78620

SITE DEVELOPMENT PLANS INDEX

SHEET NO.	SHEET TITLE
01	COVER SHEET
02	GENERAL NOTES
03	EXISTING CONDITIONS & DEMO PLAN
04	LAYOUT SHEET
05	SITE DETAILS
06	SITE DETAILS 2
07	EROSION PLAN SHEET
08	EROSION DETAILS
09	EXISTING DMAP1 OF 2
10	EXISTING DMAP 2 OF 2
11	PROPOSED DMAP 1 OF 2
12	PROPOSED DMAP 2 OF 2
13	TXDOT CULVERT - EXISTING DMAP
14	TXDOT CULVERT - PROPOSED DMAP
15	OVERALL GRADING AND DRAINAGE PLAN
16	TXDOT DRIVEWAY
17	UNDERGROUND DETENTION 1 OF 2
18	UNDERGROUND DETENTION 2 OF 2
19	UNDERGROUND DETENTION CALCS
20	GRADING AND DRAINAGE 1
21	GRADING AND DRAINAGE 1 CALCS
22	GRADING AND DRAINAGE 2
23	GRADING AND DRAINAGE 2 CALCS
24	GRADING AND DRAINAGE 3
25	GRADING AND DRAINAGE 3 CALCS
26	DRAINAGE DETAILS
27	STORM PLAN & PROFILES A-C
28	STORM PLAN & PROFILES D-G
29	STORM PLAN & PROFILES H-K
30	STORM PLAN & PROFILES L-M
31	RIGID PAVEMENT DESIGN
32	ROAD PLAN & PROFILE STA 0+00-11+00
33	ROAD PLAN & PROFILE STA 11+00-22+00
34	ROAD PLAN & PROFILE STA 22+00-END
35	ROAD PLAN STA 30.25 - LINE OF SIGHT
36	ROADSIDE DITCH P&P 0+00-10+00
37	ROADSIDE DITCH P&P 10+00-END
38	ROADSIDE DITCH SECTIONS
39	UNDERGROUND DETENTION 1 1 OF 2
40	UNDERGROUND DETENTION 1 2 OF 2
41	UNDERGROUND DETENTION 2 1 OF 2
42	UNDERGROUND DETENTION 2 2 OF 2

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF THE EXPANSION OF AN EXISTING 16 FOOT WIDE PRIVATE DRIVEWAY TO 26 FEET IN WIDTH SPANNING APPROXIMATELY 3,000 LINEAR FEET.

REVISIONS							
NO.	DESCRIPTION	REVISE (R) / ADD (A) SHEET NO.	PLAN SET SHEET TOTAL	NET IC CHANGE	SITE IC	% IC	APPROVED / DATE
CORRECTIONS							
NO.	DESCRIPTION	REVISE (R) / ADD (A) SHEET NO.	PLAN SET SHEET TOTAL	NET IC CHANGE	SITE IC	% IC	APPROVED / DATE

CITY OF DRIPPING SPRINGS SITE DEVELOPMENT PERMIT # SD-2022-0025

APPROVED BY:	APPROVED BY:
CITY ADMINISTRATOR	DRIPPING SPRINGS WATER SUPPLY CORPORATION
CITY ENGINEER	HAYS COUNTY ESD #6
PLANNING DIRECTOR	HAYS COUNTY TRANSPORTATION DEPARTMENT

SUBMITTED BY : MICHAEL A. THEONE

8/10/2022

I CERTIFY THAT THESE ENGINEERING DOCUMENTS ARE COMPLETE, ACCURATE AND ADEQUATE FOR THE INTENDED PURPOSES, INCLUDING CONSTRUCTION, BUT ARE NOT AUTHORIZED FOR CONSTRUCTION PRIOR TO FORMAL CITY APPROVAL.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

811 !!! CAUTION !!! IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES. !!! CAUTION !!!

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.328.0986
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

COVER SHEET

DATE:	8/10/2022	DRAWN BY:	CEC
DWG SCALE	NTS	CHECKED BY:	CB
PROJECT NO:		APPROVED BY:	324-199 MAT

DRAWING NO.: 01
SHEET 01 OF 42

GENERAL CONSTRUCTION NOTES:

1. SAW CUT AND MATCH ALL EXISTING PAVEMENT.
2. NO STREET LIGHTS OR SIGNS OF ANY KIND ARE TO BE PLACED WITHIN ANY SIDEWALKS.
3. NO BLASTING IS ALLOWED.
4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY OF DRIPPING SPRINGS STANDARD SPECIFICATIONS.
5. ANY EXISTING UTILITIES, PAVEMENT, SIDEWALKS, STRUCTURES, TREES, ETC., THAT ARE DAMAGED OR REMOVED SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.
6. THE CONTRACTOR SHALL VERIFY ALL DEPTHS AND LOCATIONS OF EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. ANY DISCREPANCIES WITH CONSTRUCTION PLANS FOUND IN THE FIELD SHALL BE BROUGHT IMMEDIATELY TO THE ATTENTION OF THE ENGINEER.
7. MANHOLE FRAMES, COVERS, VALVES, CLEANOUTS, ETC., SHALL BE RAISED TO GRADE PRIOR TO FINAL PAVEMENT CONSTRUCTION.
8. THE CONTRACTOR SHALL GIVE THE CITY OF DRIPPING SPRINGS 48 HOURS NOTICE BEFORE BEGINNING CONSTRUCTION.
9. ALL AREAS DISTURBED OR EXPOSED DURING CONSTRUCTION SHALL BE REVEGETATED IN ACCORDANCE WITH CITY SPECIFICATION AT THE CONTRACTOR'S OPTION, HOWEVER, THE TYPE OF REVEGETATION MUST EQUAL OR EXCEED THE TYPE OF VEGETATION PRESENT BEFORE CONSTRUCTION UNLESS OTHERWISE SPECIFIED BY THE PROPERTY OWNER.
10. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL CONVENE A PRE-CONSTRUCTION CONFERENCE WITH THE CITY OF DRIPPING SPRINGS, HIMSELF, THE ENGINEER, OTHER UTILITY COMPANIES, ANY AFFECTED PARTIES AND ANY OTHER ENTITY THE CITY OR THE ENGINEER MAY REQUIRE.
11. THE CONTRACTOR AND THE ENGINEER SHALL KEEP ACCURATE RECORDS OF ALL CONSTRUCTION THAT DEVIATES FROM THE PLANS. THE ENGINEER SHALL FURNISH THE CITY OF DRIPPING SPRINGS ACCURATE "RECORD" DRAWINGS FOLLOWING COMPLETION OF ALL CONSTRUCTION.
12. THE CITY OF DRIPPING SPRINGS SHALL NOT BE PETITIONED FOR ACCEPTANCE UNTIL ALL NECESSARY EASEMENT DOCUMENTS HAVE BEEN SIGNED AND RECORDED.
13. WHEN CONSTRUCTION IS BEING CARRIED OUT WITHIN EASEMENTS, THE CONTRACTOR SHALL CONFINE HIS WORK TO WITHIN THE PERMANENT AND TEMPORARY EASEMENTS. PRIOR TO ACCEPTANCE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ALL TRASH AND DEBRIS WITHIN THE PERMANENT EASEMENTS. CLEANUP SHALL BE TO THE SATISFACTION OF THE ENGINEER.
14. PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL APPLY FOR AND SECURE ALL PROPER PERMITS FROM THE APPROPRIATE AUTHORITIES.
15. DENSITY TESTING FOR TRENCH BACKFILL IS TO BE DONE IN 12" LIFTS AT ONE TEST PER 500 OR EACH LINE SEGMENT.
16. A STABILIZED CONSTRUCTION ENTRANCE IS REQUIRED AT ALL POINTS WHERE CONSTRUCTION TRAFFIC IS EXITING THE PROJECT ONTO EXISTING PAVEMENT.
17. THE ATTENTION OF THE CONTRACTOR IS DIRECTED TO THE STATE LAW (WERNONS ANNOTATED TEXAS STATUTES, ARTICLE 1436(c)) AND THE NEED FOR EFFECTIVE PRECAUTIONARY MEASURES WHEN OPERATING EQUIPMENT IN THE VICINITY OF ELECTRICAL LINES. IF THE CONTRACTOR CHOOSES TO USE EQUIPMENT WITH THE POTENTIAL OF COMING WITHIN THE DISTANCE PRESCRIBED BY STATUTE, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF THE WORK WITH THE APPROPRIATE ELECTRIC UTILITY COMPANY.
18. CONTRACTOR SHALL NOTIFY THE DRIPPING SPRINGS 811 AT LEAST 48 HOURS PRIOR TO THE INSTALLATION OF ANY DRAINAGE FACILITY WITHIN A DRAINAGE EASEMENT OR STREET ROW. THE METHOD OF PLACEMENT AND COMPACTION OF BACKFILL IN THE CITY'S ROW MUST BE APPROVED PRIOR TO THE START OF BACKFILL OPERATIONS.
19. DEPTH OF COVER FOR ALL CROSSINGS UNDER PAVEMENT, INCLUDING GAS, ELECTRIC, TELEPHONE, CABLE TV, ETC., SHALL BE A MINIMUM OF 24" BELOW SUBGRADE.
20. DEPTH OF COVER FOR WASTEWATER AND WATER LINES SHALL BE 36" UNDER NATURAL GROUND AND 42" UNDER PAVED AREAS.
21. EXTERIOR LIGHTING SHALL BE SHIELDED SUCH THAT THE LIGHT SOURCE IS NOT DIRECTLY VISIBLE FROM THE PUBLIC ROW OR ADJACENT RESIDENTIAL DISTRICTS OR USES AT THE PROPERTY LINE. UNSHIELDED "YARD" OR "POLE" LIGHTING IS NOT PROPOSED.
22. ALL SITE UTILITY LINES ARE PROPOSED TO BE LOCATED UNDERGROUND.
23. THE DEVELOPER AND SUBSEQUENT OWNERS OF THE LANDSCAPED PROPERTY, OR THE MANAGER OR AGENT OF THE OWNER SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL LANDSCAPED AREAS. SAID AREAS SHALL BE MAINTAINED SO AS TO PRESENT A HEALTHY, NEAT AND ORDERLY APPEARANCE AT ALL TIMES AND SHALL BE KEPT FREE OF REFUSE AND DEBRIS. ALL PLANTED AREAS SHALL BE PROVIDED WITH AN AUTOMATIC IRRIGATION SYSTEM AND WATERED, AS NECESSARY TO ENSURE CONTINUOUS HEALTHY GROWTH AND SUPPORT. IRRIGATION MAINTENANCE SHALL INCLUDE THE REPLACEMENT OF ALL DEAD PLANT MATERIAL IF THAT MATERIAL WAS USED TO MEET THE REQUIREMENTS OF THE LANDSCAPE ORDINANCE.
24. ALL EASEMENTS OF RECORD AS INDICATED ON THE MOST RECENT TITLE RUN FOR THIS PROPERTY ARE SHOWN ON THIS SITE PLAN.

FIRE NOTES:

1. FIRE APPARATUS ACCESS ROADS FOR TWO WAY TRAFFIC SHALL HAVE AN UNOBSTRUCTED WIDTH OF NOT LESS THAN 24 FEET (6096 MM), EXCLUSIVE OF SHOULDERS, EXCEPT FOR APPROVED SECURITY GATES, AND AN UNOBSTRUCTED VERTICAL CLEARANCE OF NOT LESS THAN 13 FEET 6 INCHES (4115 MM).
2. THE FIRE CODE OFFICIAL SHALL HAVE THE AUTHORITY TO REQUIRE AN INCREASE IN THE MINIMUM ACCESS WIDTHS WHERE THEY ARE INADEQUATE FOR FIRE OR RESCUE OPERATIONS.
3. FIRE APPARATUS ACCESS ROADS SHALL BE DESIGNED AND MAINTAINED TO SUPPORT THE IMPOSED LOADS OF 80,000 LBS.
4. THE GRADE OF THE FIRE APPARATUS ACCESS ROAD SHALL BE WITHIN THE LIMITS ESTABLISHED BY THE FIRE CODE OFFICIAL BASED ON THE FIRE DEPARTMENT'S APPARATUS.
5. THE ANGLES OF APPROACH AND DEPARTURE FOR FIRE APPARATUS ACCESS ROADS SHALL BE WITHIN THE LIMITS ESTABLISHED BY THE FIRE CODE OFFICIAL BASED ON THE FIRE DEPARTMENT'S APPARATUS.
6. WHERE REQUIRED BY THE FIRE CODE OFFICIAL, APPROVED SIGNS OR OTHER APPROVED NOTICES OR MARKINGS THAT INCLUDE THE WORDS NO STOPPING OR STANDING SHALL BE PROVIDED FOR FIRE APPARATUS ACCESS ROADS TO IDENTIFY SUCH ROADS OR PROHIBIT THE OBSTRUCTION THEREOF. THE MEANS BY WHICH FIRE LANES ARE DESIGNATED SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION AT ALL TIMES AND BE REPLACED OR REPAIRED WHEN NECESSARY TO PROVIDE ADEQUATE VISIBILITY.
7. SIGNS SHALL READ " FIRE LANE TOW AWAY ZONE " OR "FIRE ZONE TOW AWAY ZONE " AND SHALL BE 12" WIDE AND 18" HIGH. SIGNS SHALL BE PAINTED ON A WHITE BACKGROUND WITH LETTERS AND BOARDERS IN RED, USING NOT LESS THAN 2" LETTERING. SIGNS SHALL BE PERMANENTLY AFFIXED TO A STATIONARY POST AND THE BOTTOM OF THE SIGN SHALL BE SIX FEET, SIX INCHES (6'6") ABOVE FINISHED GRADE. SIGNS SHALL BE SPACED NO MORE THAN THIRTY FEET (30') APART, SIGNS MAY BE INSTALLED ON PERMANENT BUILDINGS OR WALLS OR AS APPROVED BY THE FIRE CODE OFFICIAL.
8. FIRE APPARATUS ACCESS ROADS 20 TO 26 FEET WIDE (6096 TO 7925 MM) SHALL BE POSTED ON BOTH SIDES AS A FIRE LANE.
9. FIRE APPARATUS ACCESS ROADS SHALL NOT BE OBSTRUCTED IN ANY MANNER, INCLUDING THE PARKING OF VEHICLES.
10. FIRE APPARATUS ACCESS ROADS SHALL BE CONTINUOUSLY MARKED BY PAINTED LINES OF RED TRAFFIC PAINT SIX INCHES (6") IN WIDTH TO SHOW THE BOUNDARIES OF THE LANE. THE WORDS "FIRE LANE TOW AWAY ZONE" OR "FIRE ZONE TOW AWAY ZONE" SHALL APPEAR IN FOUR INCH (4") WHITE LETTERS AT 25 FEET INTERVALS OR LESS, ON THE RED BORDER MARKINGS ALONG BOTH SIDES OF THE FIRE LANES. WHERE A CURB IS AVAILABLE, THE STRIPING SHALL BE ON THE VERTICAL FACE OF THE CURB.

STREET AND DRAINAGE NOTES:

1. ALL TESTING SHALL BE DONE BY AN INDEPENDENT LABORATORY AT THE OWNER'S EXPENSE. ANY RETESTING SHALL BE PAID FOR BY THE CONTRACTOR. A CITY INSPECTOR SHALL BE PRESENT DURING ALL TESTS. TESTING SHALL BE COORDINATED WITH THE CITY INSPECTOR AND HE SHALL BE GIVEN A MINIMUM OF 24 HOURS NOTICE PRIOR TO ANY TESTING.
2. BACKFILL BEHIND THE CURB SHALL BE COMPACTED TO OBTAIN A MINIMUM OF 95% MAXIMUM DENSITY TO WITHIN 3" OF TOP OF CURB MATERIALS USED SHALL BE PRIMARILY GRANULAR WITH NO ROCKS LARGER THAN 6". IN THE GREATEST DIMENSION. THE REMAINING 3" SHALL BE CLEAN TOPSOIL FREE FROM ALL CLODS AND SUITABLE FOR SUSTAINING PLANT LIFE.
3. STREET RIGHT-OF-WAYS SHALL BE GRADED AT A SLOPE OF ¼" PER FOOT TOWARD THE CURB UNLESS OTHERWISE INDICATED. HOWEVER, IN NO CASE SHALL THE WIDTH OF THE RIGHT-OF-WAY AT 1'-0" PER FOOT SLOPE EXCEED A WIDTH LESS THAN 10 FEET UNLESS A SPECIFIC REQUEST FOR AN ALTERNATIVE GRADING SCHEME IS MADE TO AND ACCEPTED BY THE CITY OF DRIPPING SPRINGS ENGINEERING DEPARTMENT.
4. ALL RCP SHALL BE MINIMUM OF CLASS III.

WATER NOTES:

1. ALL WATER VALVE COVERS ARE TO BE PAINTED BLUE.
2. THRUST RESTRAINTS SHALL BE IN ACCORDANCE WITH DSWSC.
3. ALL MECHANICAL RESTRAINTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.
4. FIRE HYDRANTS ON MAINS UNDER CONSTRUCTION SHALL BE SECURELY WRAPPED WITH POLY WRAP BAGS AND TAPED INTO PLACE. THE POLY WRAP SHALL BE REMOVED WHEN THE MAINS ARE ACCEPTED AND PLACED INTO SERVICE.
5. WATER LINE TESTING AND DISINFECTION SHALL BE IN ACCORDANCE WITH AWWA STANDARD AND TCEQ.
6. ALL WATER MAINS, DISTRIBUTION LINES AND SERVICE LINES SHALL BE INSTALLED IN ENCASEMENT PIPE UNDERNEATH EXISTING STREETS AND OTHER PAVED SURFACES.
7. PIPE MATERIAL FOR WATER MAINS SHALL BE PVC (AWWA C-900 CLASS 150) OR DUCTILE IRON (AWWA C-100 MIN. CLASS 150). WATER SERVICES 2" OR LESS SHALL BE POLYETHYLENE TUBING (BLACK, 200 PSI, SDR 9).
8. ALL FIRE HYDRANTS SHALL BE DUCTILE IRON PIPE (AWWA C-100 MIN. CLASS 150).
9. ALL IRON PIPE AND FITTINGS SHALL BE WRAPPED WITH MINIMUM 8-MIL POLYETHYLENE.
10. THE CONTRACTOR SHALL CONTACT THE RETAIL WATER SUPPLY COMPANY AT LEAST 48 HOURS PRIOR TO CONNECTING TO EXISTING WATER LINES.
11. THE CONTRACTOR MUST OBTAIN A BULK WATER PERMIT OR PURCHASE AND INSTALL A WATER METER FOR ALL WATER USED DURING CONSTRUCTION. A COPY OF THIS PERMIT MUST BE CARRIED AT ALL TIME BY ALL WHO USE WATER.
12. THE CONTRACTOR, AT HIS EXPENSE, SHALL PERFORM DISINFECTION OF ALL POTABLE WATER LIENS CONSTRUCTED AND SHALL PROVIDE ALL EQUIPMENT, (INCLUDING TEST GAUGE S), SUPPLIES (INCLUDING CONCENTRATED CHLORINE DISINFECTING MATERIAL), AND NECESSARY LABOR REQUIRED FOR THE STERILIZATION PROCEDURE.
13. THE TOP OF VALVE STEMS SHALL BE AT LEAST 18" AND NO MORE THAN 36" BELOW FINISHED GRADE. VALVE STEM RISERS SHALL BE WELDED ON EACH END TO THE CITY'S SATISFACTION.
14. FIRE HYDRANT LEADS TO BE DUCTILE IRON, CLASS 350 AND INSTALLED PER SPECIFICATIONS AND DETAIL.
15. PRIOR TO INSTALLATION OF FIRE HYDRANTS, THE ENGINEER WILL PROVIDE THE CONTRACTOR ONE (1) CUT FROM A HUB PIN, ESTABLISHING THE ELEVATION OF THE LINE.
16. BLUE REFLECTOR MARKERS SHALL BE LOCATED ON THE CENTERLINE OF THE PAVEMENT ACROSS FROM ALL FIRE HYDRANTS. PAVEMENT MARKERS AT INTERSECTIONS SHALL BE FOUR-SIDED.
17. DENSITY TESTING OF COMPACTED BACKFILL SHALL BE MADE AT A RATE OF ONE TEST PER TWO FOOT LIFTS PER 500 FEET OF INSTALLED PIPE.
18. THE LOCATION OF ANY EXISTING UTILITY LINES SHOWN ON THESE PLANS IS THE BEST AVAILABLE AND MAY NOT BE TOTALLY ACCURATE. ANY DAMAGE TO EXISTING UTILITY LINES, BOTH KNOWN AND UNKNOWN, SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR.
19. ALL WATER MAINS, WASTEWATER MAINS AND SERVICE LINES SHALL MEET RETAIL WATER SUPPLIER SPECIFICATIONS MINIMUM COVER REQUIREMENTS. ALL STREETS ARE TO BE CUT TO SUBGRADE PRIOR TO INSTALLATION OF WATER MAINS OR CUTS WILL BE ISSUED BY THE ENGINEER.
20. RETAIL WATER SUPPLIER TO BE GIVEN 48 HOURS NOTICE PRIOR TO ALL TESTING OF WATER AND WASTEWATER LINES. RETAIL WATER SUPPLIER INSPECTION IS REQUIRED FOR ALL TESTING OF WATER AND WASTEWATER LINES.
21. CONTRACTOR TO NOTIFY WATER UTILITY 48 HOURS PRIOR TO CONNECTING TO EXISTING UTILITIES.
22. ALL PIPE BEDDING MATERIAL SHALL CONFORM TO STANDARD SPECIFICATIONS.
23. TRACER TAPE SHALL BE INSTALLED ON ALL WATER AND WASTEWATER MAINS IN ACCORDANCE WITH CITY OF DRIPPING SPRINGS STANDARDS.

SEQUENCE OF CONSTRUCTION:

1. INSTALL STABILIZED CONSTRUCTION ENTRANCES WHERE REQUIRED.
2. INSTALL ALL TEMPORARY EROSION CONTROLS.
3. ROUGH GRADE PONDS TO 100% CAPACITY. EITHER THE PERMANENT OUTLET STRUCTURE OR A TEMPORARY OUTLET MUST BE CONSTRUCTED PRIOR TO CLEARING, EXCAVATION AND EMBANKMENT ACTIVITIES. THE PONDS AND OUTLETS SHALL BE MAINTAINED AND FUNCTIONAL AS TEMPORARY DETENTION AND SEDIMENTATION BASINS THROUGHOUT CONSTRUCTION UNTIL INSTALLATION OF THE PERMANENT PONDS IS COMPLETE.
4. CLEAR AND GRUB STRIP TOPSOIL. STOCKPILE TOPSOIL FOR LATER USE.
5. SITE GRADING.
6. ROUGH CUT ROADWAYS AND DITCHES
7. INSTALL PROPOSED UTILITIES.
8. PAVING IMPROVEMENTS AND BUILDING PAD PREPARATION.
9. FINAL GRADE DETENTION PONDS AND LANDSCAPING.
10. AFTER THE COMPLETION OF CONSTRUCTION AND PRIOR TO THE REMOVAL OF TEMPORARY EROSION CONTROLS, THE PROJECT ENGINEER MUST INSPECT THE JOB AND WRITE A CONCURRENCE LETTER TO THE CITY. FINAL INSPECTION IS SCHEDULED UPON RECEIPT OF THE LETTER.
11. REVEGETATION.
12. MAINTAIN VEGETATIVE WATERING TO ESTABLISH PERMANENT GRASSES.
13. REMOVAL AND DISPOSE OF TEMPORARY EROSION CONTROLS WHEN RESTORATION HAS BEEN ACCEPTED.

SILT FENCE NOTES:

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF ONE FOOT.
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CAN NOT BE TRENCHED (E.G. PAVEMENT), WEIGHT FABRIC FLAP WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.
3. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL. SILT FENCE SHOULD BE ATTACHED TO EACH STEEL SUPPORT POSTS OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST.
4. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY.
5. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.
7. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6 INCHES. THE SILT SHALL BE DISPOSED OF IN AN APPROVED SITE AND IN SUCH A MANNER AS TO NOT CONTRIBUTE TO ADDITIONAL SILTATION.

EROSION CONTROL NOTES:

1. THE CONTRACTOR SHALL INSTALL EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTIVE FENCING PRIOR TO ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR EXCAVATION).
2. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD ON-SITE WITH THE CONTRACTOR, DESIGN ENGINEER, PERMIT APPLICANT AND ENVIRONMENTAL INSPECTOR AFTER INSTALLATION OF THE EROSION/SEDIMENTATION CONTROLS AND TREE/NATURAL AREA PROTECTION MEASURES AND PRIOR TO BEGINNING ANY SITE PREPARATION WORK. THE CONTRACTOR SHALL NOTIFY THE CITY OF DRIPPING SPRINGS, AT LEAST THREE (3) DAYS PRIOR TO THIS MEETING DATE.
3. ANY MAJOR VARIATION IN MATERIALS OR LOCATIONS OF CONTROLS OR FENCES FROM THOSE SHOWN ON THE APPROVED PLANS WILL REQUIRE A REVISION AND MUST BE APPROVED BY THE REVIEWING ENGINEER, ENVIRONMENTAL SPECIALIST OR CITY ARBORIST AS APPROPRIATE. MAJOR REVISIONS MUST BE APPROVED BY THE CITY OF DRIPPING SPRINGS. MINOR CHANGES TO BE MADE AS FIELD REVISIONS MAY BE APPROVED BY THE ENGINEER OR CONTRACTOR, BUT MAY BE REQUIRED BY THE ENVIRONMENTAL INSPECTOR DURING THE COURSE OF CONSTRUCTION TO CORRECT SPECIFIC DEFICIENCIES.
4. THE CONTRACTOR IS REQUIRED TO INSPECT THE CONTROLS AND FENCES AT WEEKLY INTERVALS AND AFTER SIGNIFICANT RAINFALL EVENTS TO INSURE THAT THEY ARE FUNCTIONING PROPERLY. THE PERSON(S) RESPONSIBLE FOR MAINTENANCE OF CONTROLS AND FENCES SHALL IMMEDIATELY MAKE ANY NECESSARY REPAIRS TO DAMAGED AREAS. SILT ACCUMULATION AT CONTROLS SHALL BE REMOVED WHEN THE DEPTH REACHES SIX (6) INCHES.
5. PRIOR TO FINAL ACCEPTANCE BY THE CITY, HAULROADS AND WATERWAY CROSSINGS CONSTRUCTED FOR CONSTRUCTION PURPOSES SHALL BE REMOVED. ACCUMULATED SEDIMENT REMOVED FROM THE WATERWAY AND THE AREA RESTORED TO THE ORIGINAL GRADE AND REVEGETATED. ALL LAND CLEARING DEBRIS SHALL BE DISPOSED OF IN A APPROVED SPOIL DISPOSAL SITES.
6. ALL WORK MUST STOP IF A VOID IN THE ROCK SUBSTRATE IS DISCOVERED WHICH IS ONE SQUARE FOOT OR LARGER IN AREA. FLOWS ARE FROM WITHIN THE SINKHOLE AND NOT CONSISTENTLY RECEIVES WATER DURING ANY RAIN EVENT. AT THIS TIME IT IS THE RESPONSIBILITY OF THE PROJECT MANAGER TO IMMEDIATELY CONTACT A CITY OF DRIPPING SPRINGS ENVIRONMENTAL INSPECTOR FOR FURTHER INVESTIGATION.

TEMPORARY VEGETATIVE STABILIZATION:

1. FROM SEPTEMBER 15 TO MARCH 1, SEEDING IS CONSIDERED TO BE APPLIED ONCE (WHEAT AT 0.5 POUNDS PER 1000 S.F, OATS AT 0.5 POUNDS PER 1000 SF, CEREAL RYEGRAIN AT 0.5 POUNDS PER 1000 S.F) WITH A TOTAL RATE OF 1.5 POUNDS PER 1000 SF. COOL SEASON COVER CROPS ARE NOT PERMANENT EROSION CONTROL.
2. FROM MARCH 1 TO SEPTEMBER 14, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF 1 POUNDS PER 1000 SF.
   A. FERTILIZER SHALL BE WATER SOLUBLE WITH AN ANALYSIS OF 15-15-15 TO BE APPLIED ONCE AT PLANTING AND ONCE DURING THE PERIOD OF ESTABLISHMENT AT A RATE OF 1/2 POUND PER 1000 SF.
   B. HYDROMULCH SHALL COMPLY WITH TABLE1, BELOW.
   C. TEMPORARY EROSION CONTROL SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1 ½ INCHES HIGH WITH 95% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 16 SQUARE FEET EXIST.

PERMANENT VEGETATIVE STABILIZATION:

1. FROM SEPTEMBER 15 TO MARCH 1, SEEDING IS CONSIDERED TO BE TEMPORARY STABILIZATION ONLY. IF COOL SEASON COVER CROPS EXIST WHERE PERMANENT VEGETATIVE STABILIZATION IS DESIRED, THE GRASSES SHALL BE MOWED TO A HEIGHT OF LESS THAN ONE-HALF (1/2) INCH AND THE AREA SHALL BE RE-SEEDED IN ACCORDANCE WITH 2. BELOW.
2. FROM MARCH 2 TO SEPTEMBER 14, SEEDING SHALL BE WITH HULLED BERMUDA AT A RATE OF 1 POUND PER 1000 SF WITH A PURITY OF 95% AND 85% GERMINATION. BERMUDA GRASS IS A WARM SEASON GRASS AND IS CONSIDERED PERMANENT EROSION CONTROL.
   A. FERTILIZER SHALL BE A WATER SOLUBLE WITH AN ANALYSIS OF 15-15-15 TO BE APPLIED ONCE AT PLANTING AND ONCE DURING THE PERIOD OF ESTABLISHMENT AT A RATE OF 1/2 POUND PER 1000 SF.
   B. HYDROMULCH
   C. THE PLANTED AREA SHALL BE IRRIGATED OR SPRINKLED IN A MANNER THAT WILL NOT ERODE THE TOPSOIL BUT WILL SUFFICIENTLY SOAK THE SOIL TO A DEPTH OF SIX INCHES. THE IRRIGATION SHALL OCCUR AT DAILY INTERVALS (MINIMUM) DURING THE FIRST TWO MONTHS. RAINFALL OCCURRENCES OF ½ INCH OR MORE SHALL POSTPONE THE WATERING SCHEDULE FOR ONE WEEK.
   D. PERMANENT EROSION CONTROL SHALL BE ACCEPTABLE WHEN THE GRASS HAS GROWN AT LEAST 1 ½ INCHES HIGH WITH 95% COVERAGE, PROVIDED NO BARE SPOTS LARGER THAN 16 SQUARE FEET EXIST.

TREE & NATURAL AREA PROTECTION NOTES:

1. ALL TREES AND NATURAL AREAS SHOWN ON PLAN TO BE PRESERVED SHALL BE PROTECTED DURING CONSTRUCTION WITH TEMPORARY FENCING.
2. PROTECTIVE FENCING SHALL BE ERECTED ACCORDING TO STANDARDS FOR TREE PROTECTION PER THIS SHEET.
   PROTECTIVE FENCES SHALL BE INSTALLED PRIOR TO THE START OF ANY SITE PREPARATION WORK (CLEARING, GRUBBING OR GRADING), AND SHALL BE MAINTAINED THROUGHOUT ALL PHASES OF THE CONSTRUCTION PROJECT.
4. EROSION AND SEDIMENTATION CONTROL BARRIERS SHALL BE INSTALLED OR MAINTAINED IN A MANNER WHICH DOES NOT RESULT IN SOIL BUILDUP WITHIN THE TREE DRIPLINES.
5. PROTECTIVE FENCES SHALL SURROUND THE TREES OR GROUP OF TREES, AND WILL BE LOCATED AT THE OUTERMOST LIMIT OF BRANCHES (DRIP LINE), FOR NATURAL AREAS, PROTECTIVE FENCES SHALL FOLLOW THE LIMIT OF CONSTRUCTION LINE, IN ORDER TO PREVENT THE FOLLOWING:
   A. SOIL COMPACTION IN THE ROOT ZONE AREA RESULTING FROM VEHICULAR TRAFFIC OR STORAGE OF EQUIPMENT OR MATERIALS.
   B. ROOT ZONE DISTURBANCE DUE TO GRADE CHANGES (GREATER THAN 6 INCHES CUT OR FILL), OR TRENCHING NOT REVIEWED AND AUTHORIZED BY THE CITY ARBORIST;
   C. WOUNDS TO EXPOSED ROOTS, TRUNK OR LIMBS BY MECHANICAL EQUIPMENT.
   D. OTHER ACTIVITIES DETRIMENTAL TO TREES SUCH AS CHEMICAL STORAGE, CEMENT TRUCK CLEANING, AND FIRES.
6. EXCEPTIONS TO INSTALLING FENCES AT TREE DRIP LINES MAY BE PERMITTED IN THE FOLLOWING CASES:
   A. WHERE THERE IS TO BE AN APPROVED GRADE CHANGE, IMPERMEABLE PAVING SURFACE, TREE WELL, OR OTHER SUCH SITE DEVELOPMENT, ERECT THE FENCE APPROXIMATELY 2 TO 4 FEET BEYOND THE AREA DISTURBED.
   B. WHERE PERMEABLE PAVING IS TO BE INSTALLED WITHIN A TREES DRIP LINE, ERECT THE FENCE AT THE OUTER LIMITS OF THE PERMEABLE PAVING AREA (PRIOR TO SITE GRADING SO THAT THIS AREA IS GRADED SEPARATELY PRIOR TO PAVING INSTALLATION TO MINIMIZED ROOT DAMAGE);
   C. WHERE TREES ARE CLOSE TO PROPOSED BUILDINGS, ERECT THE FENCE TO ALLOW 6 TO 10 FEET OF WORK SPACE BETWEEN THE FENCE AND THE BUILDING;
   D. WHERE THERE ARE SEVERE SPACE CONSTRAINTS DUE TO TRACT SIZE, OR OTHER SPECIAL REQUIREMENTS, CONTACT THE CITY ARBORIST TO DISCUSS ALTERNATIVES.

SPECIAL NOTE: FOR THE PROTECTION OF NATURAL AREAS, NO EXCEPTIONS TO INSTALLING FENCES AT THE LIMIT OF CONSTRUCTION LINE WILL BE PERMITTED.

7. WHERE ANY OF THE ABOVE EXCEPTIONS RESULT IN A FENCE BEING CLOSER THAN 4 FEET TO A TREE TRUNK, PROTECT THE TRUNK WITH STRAPPED-ON PLANKING TO A HEIGHT OF 8 FT. (OR TO THE LIMITS OF LOWER BRANCHING) IN ADDITION TO THE REDUCED FENCING PROVIDED.
8. TREES APPROVED FOR REMOVAL SHALL BE REMOVED IN A MANNER WHICH DOES NOT IMPACT TREES TO BE PRESERVED.
9. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED FLUSH WITH THE SOIL BACKFILL ROOT AREAS WITH GOOD QUALITY TOP SOIL AS SOON AS POSSIBLE. IF EXPOSED ROOT AREAS ARE NOT BACKFILLED WITHIN 2 DAYS, THEY SHALL BE COVERED WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE AND MINIMIZES WATER LOSS DUE TO EVAPORATION.
10. ANY TRENCHING REQUIRED FOR THE INSTALLATION OF LANDSCAPE IRRIGATION SHALL BE PLACED AS FAR FROM EXISTING TREE TRUNKS AS POSSIBLE.
11. NO LANDSCAPE TYPE SOIL BRIDGING/GRADATION THAN 6 INCHES SHALL BE PERMITTED WITHIN THE DRIP LINE OF TREES. NO SOIL IS PERMITTED ON THE ROOT FLARE OF ANY TREE.
12. PRUNING TO PROVIDE CLEARANCE FOR SITE FEATURES, VEHICULAR TRAFFIC AND EQUIPMENT SHALL TAKE PLACE BEFORE DAMAGE OCCURS (RIPPING OF BRANCHES, ETC.).
13. ALL PRUNING AND PRUNING SHALL BE DONE ACCORDING TO RECOGNIZED, APPROVED STANDARDS OF THE INDUSTRY (REFERENCE THE NATIONAL ARBORIST ASSOCIATION PRUNING STANDARDS FOR SHADE TREES AVAILABLE ON REQUEST FROM THE CITY ARBORIST).
14. DEVIATIONS FROM THESE NOTES MAY OCCUR DUE TO FIELD CONDITIONS. VIOLATIONS IF THERE IS SUBSTANTIAL NON-COMPLIANCE OR IF A TREE SUSTAINS DAMAGE AS A RESULT.

ACCESSIBILITY NOTES:

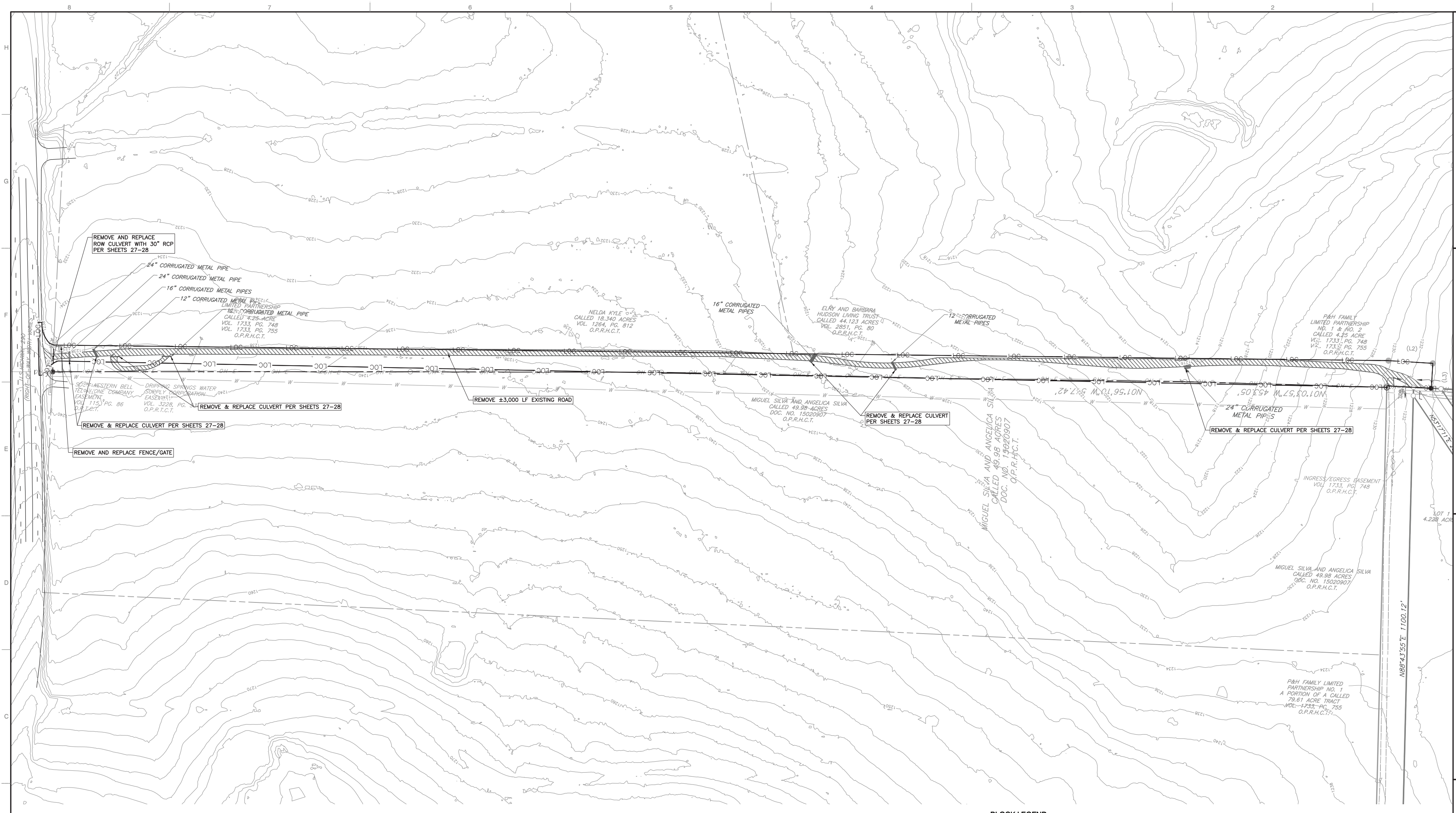
1. SLOPES ON ACCESSIBLE ROUTES MAY NOT EXCEED 1:20 UNLESS DESIGNED AS A RAMP. [TAS 4.3.7]
2. THE MAXIMUM SLOPE OF A RAMP IN NEW CONSTRUCTION IS 1:12. THE MAXIMUM RISE FOR ANY RAMP RUN IS 30 IN. [TAS 4.8.2]
3. ACCESSIBLE ROUTES MUST HAVE A CROSS-SLOPE NO GREATER THAN 1:50. [TAS 4.3.7]
4. GROUND SURFACES ALONG ACCESSIBLE ROUTES MUST BE STABLE, FIRM AND SLIP RESISTANT. [TAS 4.5.1]

TRENCH SAFETY NOTES:

1. IN ACCORDANCE WITH THE LAWS OF THE STATE OF TEXAS AND THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, ALL TRENCHES OVER 5 FEET IN DEPTH IN BITHER HARD AND COMPACT OR SOFT AND UNSTABLE SOIL SHALL BE SLOPED, SHIED, BRACED OR OTHERWISE SUPPORTED. FURTHERMORE, ALL TRENCHES LESS THAN 5 FEET IN DEPTH SHALL ALSO BE EFFECTIVELY PROTECTED WHENEVER GROUND MOVEMENT MAY BE EXPECTED. TRENCH SAFETY SYSTEMS TO BE UTILIZED FOR THIS PROJECT ARE DESCRIBED IN ITEM 9095 "TRENCH SAFETY SYSTEMS" OF THE CITY OF AUSTIN STANDARD SPECIFICATIONS.
2. IN ACCORDANCE WITH THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, WHEN EMPLOYEES ARE REQUIRED TO BE IN TRENCHES 4 FEET DEEP OR MORE, ADEQUATE MEANS OF EXIT, SUCH AS A LADDER OR STEPS MUST BE PROVIDED AND LOCATED SO AS TO REQUIRE NO MORE THAN 25 FEET OF LATERAL TRAVEL.

TCEQ WATER DISTRIBUTION SYSTEM GENERAL CONSTRUCTION NOTES: REVISED FEBRUARY 2019

1. THIS WATER DISTRIBUTION SYSTEM MUST BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS 30 TEXAS ADMINISTRATIVE CODE (TAC) CHAPTER 290. SUBCHAPTER D. WHEN CONFLICTS ARE NOTED WITH LOCAL STANDARDS, THE MORE STRINGENT REQUIREMENT SHALL BE APPLIED. AT A MINIMUM, DISTRIBUTION SYSTEMS MUST ENSURE THAT ALL WATERWORKS MEET TCEQ'S "RULES AND REGULATIONS FOR PUBLIC WATER

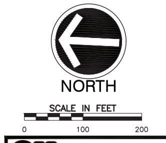


LINETYPE LEGEND

EXISTING		EXISTING	
	RIGHT-OF-WAY	G	GAS LINE
	LOT BOUNDARY	OU	OVERHEAD UTILITY
	EASEMENT	UG	UNDERGROUND UTILITY
×	FENCE: BARBED	SAN	SANITARY SEWER LINE
//	FENCE: WOOD (PICKET)	W	WATER LINE
□	FENCE: WOOD (PRIVACY)	F	FIRE LINE
○	FENCE: CHAIN LINK		ROAD CENTERLINE
|	FENCE: IRON		CURB & GUTTER
385	MAJOR CONTOUR		STRIPING
	MINOR CONTOUR	FIRE	FIRE LANE STRIPING
E	ELECTRIC LINE	○○○○○	H.C. ACCESSIBLE ROUTE
OE	OVERHEAD ELECTRIC WIRE		LIMITS OF CONSTRUCTION
UE	UNDERGROUND ELECTRIC LINE		RAIL ROAD
T	TELEPHONE		FLOODWAY
C	COMMUNICATIONS LINE		CWQZ
TV	CABLE TELEVISION	ST	STORM SEWER
FO	FIBER OPTIC LINE		DRAINAGE CHANNEL

BLOCK LEGEND

EXISTING		EXISTING	
·	BENCHMARK		(MONITORING) WELL
⊗	CUT IN CONCRETE	◎	UTILITY RISER
△	CONTROL POINT	HB	HOSE BIB
◎	IRON PIPE	S	SANITARY M.H.
●	IRON ROD		CLEANOUT
○	IRON ROD W/ CAP	D	DRAINAGE M.H.
▣	MONUMENT TYPE 1		DOWN SPOUT
⊙	MONUMENT TYPE 2		AREA INLET
▲	NAIL		CURB INLET
S	PIPE BREAK		HEADWALL
]	PIPE CAP		SAFETY END TREATMENT
〉	PIPE FLOW	⇨	DRAINAGE FLOW
◁	REDUCER	E	ELEC. M.H.
A	AIR RELEASE VALVE		ELEC./TELE. POLE
B	BLOW-OFF VALVE	←	GUY WIRE
PI	POST INDICATOR VALVE		LIGHT FIXTURE
⊗	MISCELLANEOUS VALVE		TRAFFIC SIGNAL
⊘	UTILITY VALVE		PEDESTRIAN SIGNAL
W	UTILITY METER	☒	UTILITY (PULL)BOX
⊠	BACKFLOW PREVENTER	X	UTILITY RISER
W	FLUSH CONNECTION	X	UTILITY SERVICE
	FIRE HYDRANT		



MICHAEL A. THEONE
142972

!!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

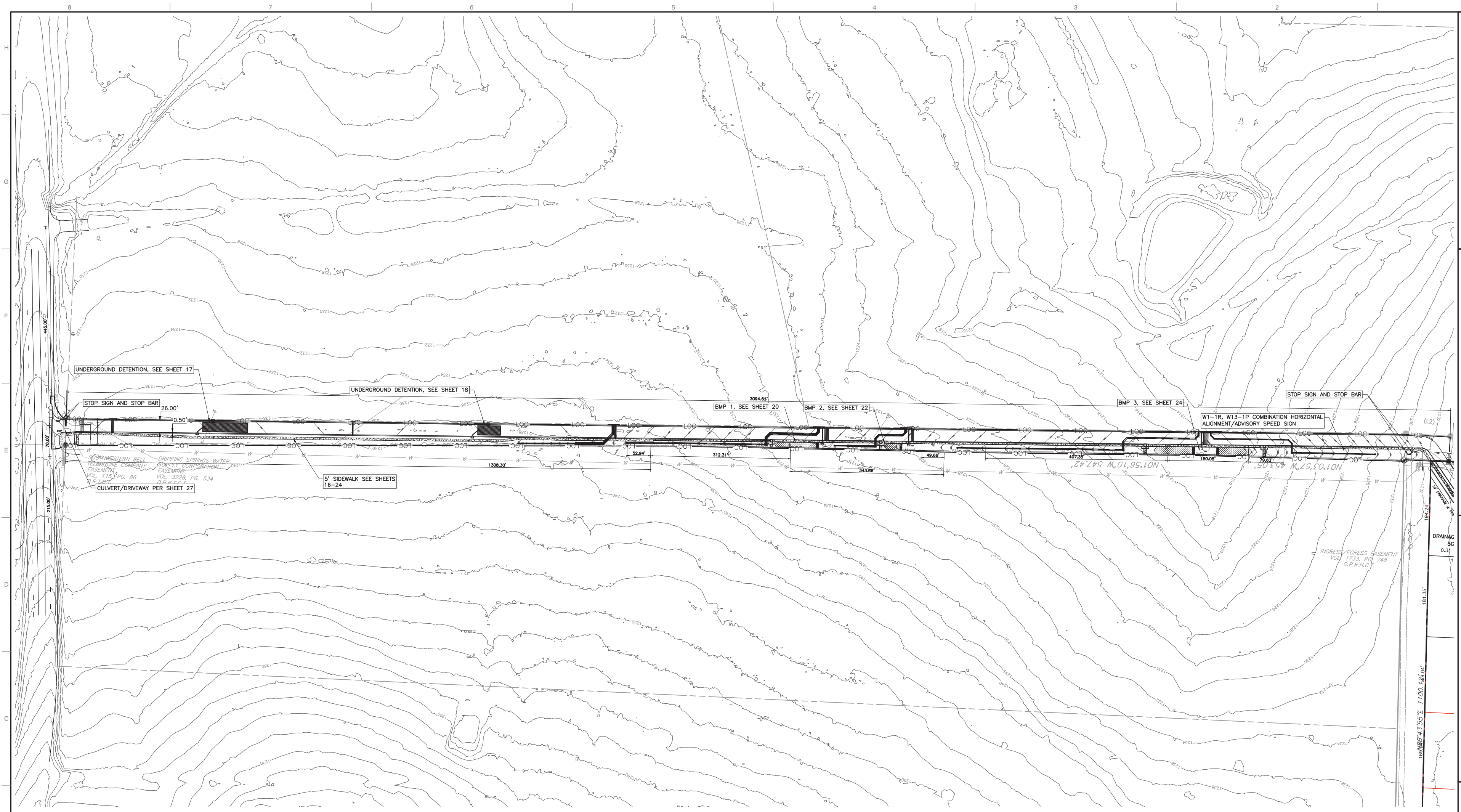
EXISTING CONDITIONS & DEMO PLAN

DATE:	1/10/2024	DRAWN BY:	CEC
DWG SCALE:	1" = 100'	CHECKED BY:	CB
PROJECT NO:			324-199
APPROVED BY:			MT

DRAWING NO.:
03
SHEET 03 OF 42

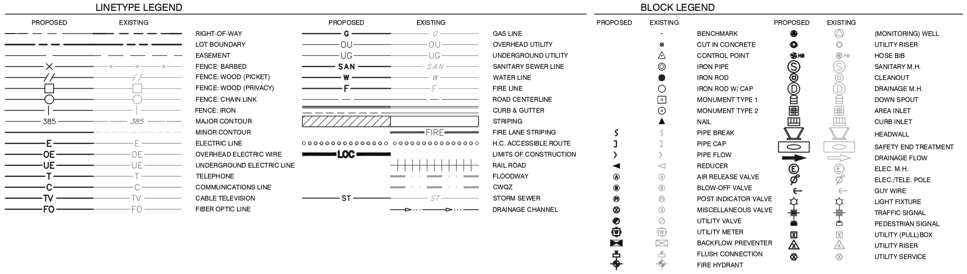
SD-2022-0025

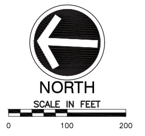
P:\320-000\324-199\-CADD\Dwg\CV01\324199-CV01-C100-EXISTING.dwg{EXISTING CONDITIONS} LS:(2/21/2023 - otovar) - LP: 1/10/2024 10:26 AM



SITE DATA TABLE

ZONING	ETJ
LAND USE DESIGNATION	PRIVATE DRIVEWAY
PROPOSED LAND USE	PRIVATE DRIVEWAY
TOTAL SITE AREA (AC)	3.71
EXISTING IMPERVIOUS COVER AREA (AC)	1.14
EXISTING IMPERVIOUS COVER PERCENT	30.7%
PROPOSED ONSITE IMPERVIOUS COVER AREA (AC)	1.85
PROPOSED ONSITE IMPERVIOUS COVER PERCENT	49.9%





MICHAEL A. THEONE
142972

811

!!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

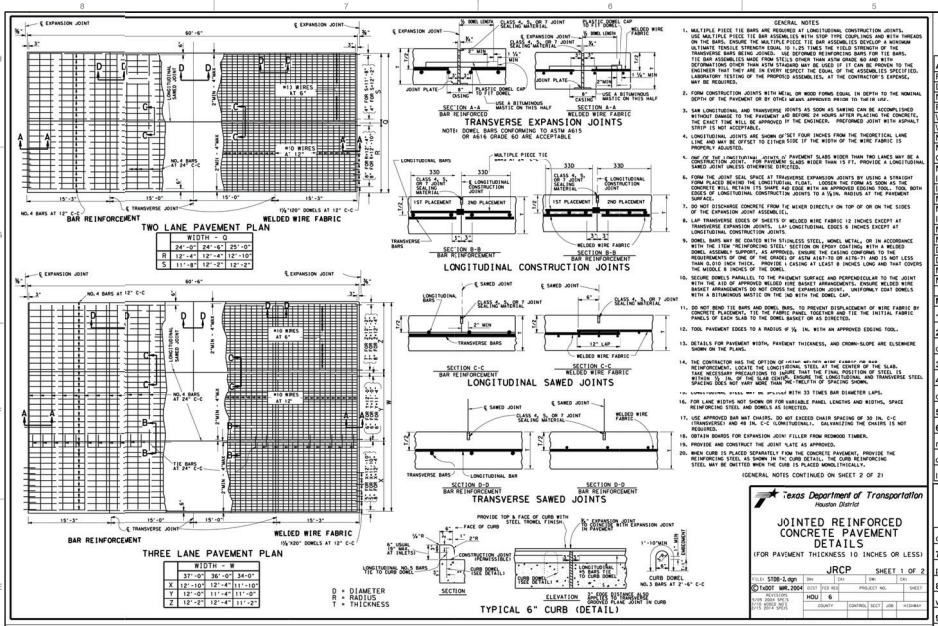
LAYOUT SHEET

DATE:	8/10/2022	DRAWN BY:	CEC
DWG SCALE:	1" = 100'	CHECKED BY:	CB
PROJECT NO:			324-199
APPROVED BY:			MT

DRAWING NO.: 04
SHEET 04 OF 42

SD-2022-0025

P:\320-000\324-199\-CADD\Dwg\CV01\324199-CV01-C200-LAYOUT.dwg{LAYOUT SHEET} LS:(11/27/2023 - cbrowder) - LP: 1/10/2024 10:26 AM



GENERAL NOTES

1. MULTIPLE PIECE TIE BARS ARE REQUIRED AT LONGITUDINAL CONSTRUCTION JOINTS. USE MULTIPLE PIECE TIE BAR ASSEMBLIES WITH STOP TYPE COUPLINGS AND WITH THREADS ON THE BARS. ENSURE THE MULTIPLE PIECE TIE BAR ASSEMBLIES DEVELOP A MINIMUM OF 125% OF THE YIELD STRENGTH OF THE BARS. DO NOT WELD THE COUPLINGS TO THE TRANSVERSE BARS BEING JOINED. USE DEFORMED REINFORCING BARS FOR TIE BARS. TIE BAR ASSEMBLIES MADE FROM STEELS OTHER THAN ASTM GRADE 60 AND WITH DEFORMATIONS OTHER THAN ASTM STANDARD MAY BE USED IF IT CAN BE PROVEN TO THE ENGINEER THAT THEY ARE IN EVERY RESPECT THE EQUAL OF THE ASSEMBLIES SPECIFIED. SUBMIT SHOP DRAWING OF THE PROPOSED ASSEMBLIES. AT THE CONTRACTOR'S EXPENSE, MAY BE REQUIRED.
2. FORM CONSTRUCTION JOINTS WITH METAL OR WOOD FORMS EQUAL IN DEPTH TO THE NOMINAL DEPTH OF THE PAVEMENT OR BY OTHER MEANS APPROVED PRIOR TO THEIR USE.
3. SAW LONGITUDINAL AND TRANSVERSE JOINTS AS SOON AS SAWING CAN BE ACCOMPLISHED WITHOUT DAMAGE TO THE PAVEMENT AND BEFORE 24 HOURS AFTER PLACING THE CONCRETE, THE EXACT TIME WILL BE APPROVED BY THE ENGINEER. PREFORMED JOINT WITH ASPHALT STRIP IS NOT ACCEPTABLE.
4. LONGITUDINAL JOINTS ARE SHOWN OFSET FOUR INCHES FROM THE THEORETICAL LANE LINE AND MAY BE OFFSET TO EITHER SIDE OF THE WIDTH OF THE WIRE FABRIC IS PROPERLY ADJUSTED.
5. ONE OR TWO LONGITUDINAL JOINTS OF PAVEMENT SLABS WIDER THAN TWO LANES MAY BE A SAWED JOINT UNLESS OTHERWISE DIRECTED. PAVEMENT SLABS WIDER THAN 15 FT. PROVIDE A LONGITUDINAL
6. FORM THE JOINT SEAL SPACE AT TRANSVERSE EXPANSION JOINTS BY USING A STRAIGHT FORM PLACED BEHIND THE LONGITUDINAL FLOAT. LOOSEN THE FORM AS SOON AS THE CONCRETE HAS SET SUFFICIENTLY TO HOLD ITS SHAPE. FINISH AND ROUND THE EDGES OF LONGITUDINAL CONSTRUCTION JOINTS TO A 1/4 IN. RADIUS AT THE PAVEMENT SURFACE.
7. DO NOT DISCHARGE CONCRETE FROM THE MIXER DIRECTLY ON TOP OF OR ON THE SIDES OF THE EXPANSION JOINT ASSEMBLIES.
8. LAP TRANSVERSE EDGES OF SHEETS OF WELDED WIRE FABRIC 12 INCHES EXCEPT AT TRANSVERSE EXPANSION JOINTS. LAY LONGITUDINAL EDGES 6 INCHES EXCEPT AT LONGITUDINAL CONSTRUCTION JOINTS.
9. DOWEL BARS MAY BE COATED WITH STUNLESS STEEL, MONEL METAL, OR IN ACCORDANCE WITH THE ITEM "REINFORCING STEEL" SECTION ON EPOXY COATING WITH A WELDED DOWEL ASSEMBLY SUPPORT, AS APPROVED. ENSURE THE CASING CONFORMS TO THE DIMENSIONS SHOWN AND IS WATERTIGHT. ENSURE THE CASING IS NOT LESS THAN 0.010 INCH THICK. PROVIDE CASING AT LEAST 8 INCHES LONG AND THAT COVERS THE MIDDLE 8 INCHES OF THE DOWEL.
10. SECURE DOWELS PARALLEL TO THE PAVEMENT SURFACE AND PERPENDICULAR TO THE JOINT WITH THE AID OF APPROVED WELDED WIRE BASKET ARRANGEMENTS. ENSURE WELDED WIRE BASKET ARRANGEMENTS DO NOT CROSS THE EXPANSION JOINT. UNIFORMLY COAT DOWELS WITH A BITUMINOUS MASTIC ON THE SIDE WITH THE DOWEL CAP.
11. DO NOT BEND TIE BARS AND DOWEL BARS, TO PREVENT DISPLACEMENT OF WIRE FABRIC BY MORE THAN 1 INCH. DO NOT BEND WIRE FABRIC. REMOVE THE INITIAL FABRIC PANELS OF EACH SLAB TO THE DOWEL BASKET OR AS DIRECTED.
12. TOOL PAVEMENT EDGES TO A RADIUS OF 1/2 IN. WITH AN APPROVED EDGING TOOL.
13. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS, AND CROWN-SLOPE ARE ELSEWHERE SHOWN ON THE PLANS.
14. THE CONTRACTOR HAS THE OPTION OF USING WELDED WIRE FABRIC AS BAR REINFORCEMENT. LOCATE THE LONGITUDINAL STEEL AT THE CENTER OF THE SLAB. TAKE NECESSARY PRECAUTIONS TO ENSURE THAT THE FINAL POSITION OF STEEL IS WITHIN 2 IN. OF THE SLAB CENTER. ENSURE THE LONGITUDINAL AND TRANSVERSE STEEL SPACING DOES NOT VARY MORE THAN PRESCRIBED OF SPACING SHOWN.
15. LONGITUDINAL STEEL MAY BE SPLICED WITH 33 TIMES BAR DIAMETER LAPS.
16. FOR LANE WIDTHS NOT SHOWN OR FOR VARIABLE PANEL LENGTHS AND SKEW ANGLES, SPACE REINFORCING STEEL AND DOWELS AS DIRECTED.
17. USE APPROVED BAR MAT CHAIRS, DO NOT EXCEED CHAIR SPACING OF 30 IN. C-C (TRANSVERSE) AND 48 IN. C-C (LONGITUDINAL). GALVANIZING THE CHAIRS IS NOT REQUIRED.
18. OBTAIN BOARDS FOR EXPANSION JOINT FILLER FROM REDWOOD TIMBER.
19. PROVIDE AND CONSTRUCT THE JOINT SLOTS AS APPROVED.
20. WHEN CURB IS PLACED SEPARATELY FROM THE CONCRETE PAVEMENT, PROVIDE THE REINFORCING STEEL AS SHOWN IN THE CURB DETAIL. THE CURB REINFORCING STEEL MAY BE OMITTED WHEN THE CURB IS PLACED MONOLITHICALLY.

(GENERAL NOTES CONTINUED ON SHEET 2 OF 2)

Texas Department of Transportation
Houston District

JOINTED REINFORCED CONCRETE PAVEMENT DETAILS
(FOR PAVEMENT THICKNESS 10 INCHES OR LESS)

JRCP SHEET 1 OF 2

FILE: STD8-1.dgn	DN:	CK:	DW:	CK:
©TxDOT MAR.2004	DIST	COUNTY	PROJECT NO.	SHEET
REVISIONS	HOU	6		
5-03 ADDED BAR SIZES	COUNTY	CONTROL	SECT	JOB	HIGHWAY

TABLE 7.3
SUMMARY OF HAYS COUNTY ROAD STANDARDS*

Average Daily Traffic (one-way trips)*	Not more than 100	101-1000	1001-2500	2501-5000	5001-15000	More than 15000
Functional Classification	County Lane	Local Street	Minor Collector	Major Collector	Minor Arterial	Major Arterial
Design Speed	25 mph	25 mph	35 mph	45 mph	55mph	
Number of Lanes	1	2	2	2	4	***All elements***
ROW Width	50'	60'	60'	70'	100'	***including***
Width of Traveled way	18'	20'	22'	24'	48'	***geometric***
Width of Shoulders	2'	4'	5'	5'	8'	***layout and***
Minimum Centerline Radius	260'	300'	375'	675'	975'	***cross-section***
Minimum Tangent Length between Reverse Curves or Compound Curves	50'	100'	150'	300'	500'	***shall be approved***
Minimum Radius for Edge of Pavement at Intersections	25'	25'	25'	25'	25'	***by the***
Intersection Street Angle	80-100	80-100	80-100	80-100	80-100	***Road Director***
Maximum Grade:	11%	11%	10%	8%	8%	***on a case-by-case***
Minimum Street Centerline Offect at Adjacent Intersections	125'	125'	125'	125'	125'	***basis.***
Minimum Stopping Sight Distance	175'	175'	250'	350'	550'	
Minimum Intersection Sight Distance	250'	250'	350'	450'	550'	
Ditch Foreslope Grade	4:01	4:01	5:01	5:01	6:01	
Ditch Backslope Grade	3:01	3:01	4:01	4:01	4:01	
Minimum Cul-de-sac ROW Radius	65'	70'	70'	70'	70'	
Minimum Cul-de-sac Pavement Radius	35'	45'	45'	45'		
Notes:						

*) Any deviation from these standards must be the subject of an approved variance.

2) Lots that are restricted by plat note to one single-family residence shall be presumed to generate 10 one-way trips per day. Average daily traffic for all other lots shall be determined on a case-by-case basis by the Road Director.

3) Occasional short runs between intersections may exceed the amounts shown, but maximum grades through intersections may not exceed the amounts shown.

4) The entire side ditch shall be contained entirely within the road right-of-way or a dedicated drainage easement. Guardrails shall be designed in accordance with current TXDOT standards.

5) No cul-de-sac shall have a cross slope that exceeds 6 percent.

6) Revegetation of disturbed areas within new road rights of way is required.

required whereever ditch depth exceeds 8'-0" from edge of shoulder to bottom of ditch on Country Lanes and Local streets, 6'-0" from edge of shoulder to bottom of ditch on Minor Collectors, and 4'-0" from edge of shoulder to bottom of ditch on Major Collectors and Minor Arterials.

Individual driveway entrances, if not shown on the approved constructions plans, must be approved by the Road Director. Maximum spacing between commerical driveways or curb cuts is 150ft. Safety-end treatment required on all driveways. (Minimum 6:1 slope)

7) All design standards may be modified on a case-by-case basis as each project merits depending upon topography and other pertinent features. This is to include possible wider ROWs when designed backslopes will not fit within standard ROW.

8) Utility construction and design, if intended to be underground, shall comply with USDOT utility guide. The design and installation of utilities needs to be coordinated with the Hays County Road Dept.

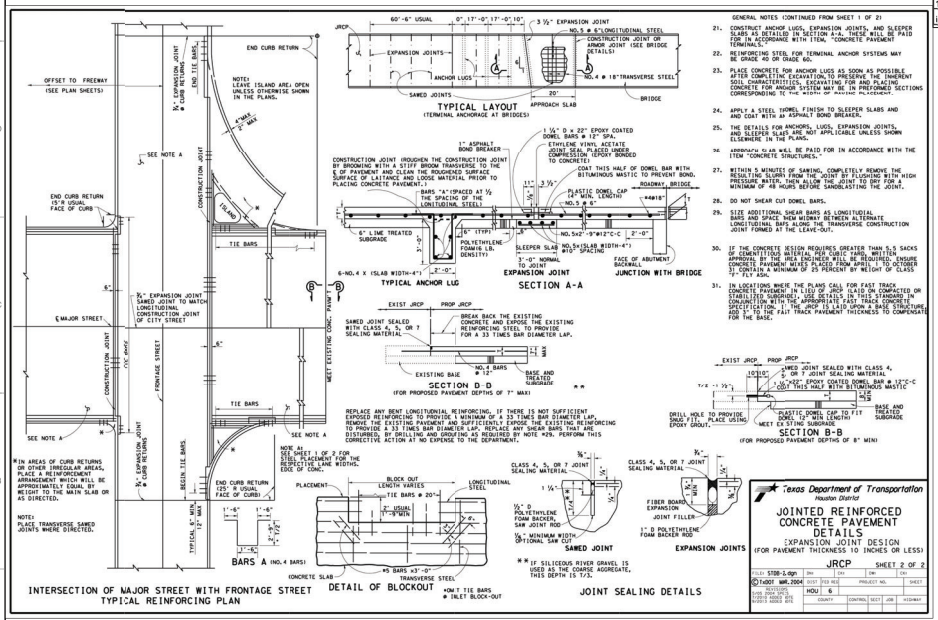
9) No road and drainage constructior may begin until a set of construction and drainage plans have been approved by the County Road Department.

10) Seventy-Two (72) hours before construction is to begin a preconstruction meeting is required to be held. Contact the County Road Department for scheduling . Information.

TABLE 7.3
SUMMARY OF HAYS COUNTY ROAD STANDARDS*

NOTES:

1. ALL IMPROVEMENTS SHALL BE MADE IN ACCORDANCE WITH THE RELEASED SITE PLAN. ANY ADDITIONAL IMPROVEMENTS WILL REQUIRE SITE PLAN AMENDMENT AND APPROVAL OF THE DEVELOPMENT SERVICES DEPARTMENT.
2. APPROVAL OF THIS SITE PLAN DOES NOT INCLUDE BUILDING AND FIRE CODE APPROVAL NOR BUILDING PERMIT APPROVAL.
3. STRIPING – FIRE APPARATUS ACCESS ROADS SHALL BE CONTINUOUSLY MARKED BY PAINTED LINES OF RED TRAFFIC PAINT SIX INCHES (6") IN WIDTH TO SHOW THE BOUNDARIES OF THE LANE. THE WORDS "FIRE LANE - NO PARKING" SHALL APPEAR IN FOUR INCH (4") WHITE LETTERS AT 25 FEET INTERVALS ON THE RED BORDER MARKINGS ALONG BOTH SIDES OF THE FIRE LANES.
4. SIGNS SHALL READ 'FIRE LANE- NO PARKING' AND SHALL BE 12"WIDE AND 18" HIGH. SIGNS SHALL BE PAINTED ON A WHITE BACKGROUND WITH LETTERS AND BORDERS IN RED, USING NOT LESS THAN 2" LETTERING. SIGNS SHALL BE PERMANENTLY AFFIXED TO A STATIONARY POST AND THE BOTTOM OF THE SIGN SHALL BE SIX FEET, SIX INCHES (6'6") ABOVE FINISHED GRADE. SIGNS SHALL BE SPACED NOT MORE THAN FIFTY FEET (50') APART ALONG BOTH SIDES OF THE FIRE LANE.



GENERAL NOTES (CONTINUED FROM SHEET 1 OF 2)

21. CONSTRUCT ANCHOR LUGS, EXPANSION JOINTS, AND SLEEPER SLABS AS DETAILED IN SECTION A-A. THESE WILL BE PAID FOR IN ACCORDANCE WITH ITEM, "CONCRETE PAVEMENT TERMINALS."
22. REINFORCING STEEL FOR TERMINAL ANCHOR SYSTEMS MAY BE GRADE 40 OR GRADE 60.
23. PLACE CONCRETE FOR ANCHOR LUGS AS SOON AS POSSIBLE AFTER COMPLETING EXCAVATION, TO PRESERVE THE INHERENT SOIL CHARACTERISTICS. EXCAVATING FOR AND PLACING CONCRETE FOR ANCHOR SYSTEM MAY BE IN PREFORMED SECTIONS CORRESPONDING TO THE WIDTH OF PAVING PLACED.
24. APPLY A STEEL BROOM FINISH TO SLEEPER SLABS AND AND COAT WITH AN ASPHALT BOND BREAKER.
25. THE DETAILS FOR ANCHORS, LUGS, EXPANSION JOINTS, AND SLEEPER SLABS ARE NOT APPLICABLE UNLESS SHOWN ELSEWHERE IN THE PLANS.
26. APPROACH SLAB WILL BE PAID FOR IN ACCORDANCE WITH THE ITEM "CONCRETE STRUCTURES."
27. WITHIN 5 MINUTES OF SAWING, COMPLETELY REMOVE THE RESULTING SLURRY FROM THE JOINT BY FLUSHING WITH HIGH PRESSURE WATER, THEN ALLOW THE JOINT TO DRY FOR A MINIMUM OF 48 HOURS BEFORE SANDBLASTING THE JOINT.
28. DO NOT SHEAR CUT DOWEL BARS.
29. SIZE ADDITIONAL SHEAR BARS AS LONGITUDIAL BARS AND SPACE THEM MIDWAY BETWEEN ALTERNATE LONGITUDINAL BARS ALONG THE TRANSVERSE CONSTRUCTION JOINT FORMED AT THE LEAVE-OUT.
30. IF THE CONCRETE MIXTURE REQUIRES GREATER THAN 5.5 SACKS OF CEMENTITIOUS MATERIAL PER CUBIC YARD, WRITTEN APPROVAL BY THE IRES ENGINEER WILL BE REQUIRED. INSURE CONCRETE PAVEMENT MIXES PLACED FROM APRIL 1 TO OCTOBER 31 CONTAIN A MINIMUM OF 25 PERCENT BY WEIGHT OF CLASS C FLY ASH.
31. IN LOCATIONS WHERE THE PLANS CALL FOR FAST TRACK CONCRETE PAVEMENT IN LIEU OF GRADE (LAID ON CRUSHED OR CRUSHED GRAVEL BASE COURSE), USE JRCP (LAID ON SUBGRADE) IN CONJUNCTION WITH THE APPROPRIATE FAST TRACK CONCRETE SPECIFICATION. 1. THE JRCP IS LAID UPON A BASE STRUCTURE, ADD 1" TO THE FAST TRACK PAVEMENT THICKNESS TO COMPENSATE FOR THE BASE.

Texas Department of Transportation
Houston District

JOINTED REINFORCED CONCRETE PAVEMENT DETAILS
EXPANSION JOINT DESIGN
(FOR PAVEMENT THICKNESS 10 INCHES OR LESS)

JRCP SHEET 2 OF 2

FILE: STD8-1.dgn	DN:	CK:	DW:	CK:
©TxDOT MAR.2004	DIST	COUNTY	PROJECT NO.	SHEET
REVISIONS	HOU	6		
5-03 ADDED BAR SIZES	COUNTY	CONTROL	SECT	JOB	HIGHWAY

CEP
Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cepinc.com

REVISION RECORD

NO.	DATE	DESCRIPTION

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

SITE DETAILS

DATE:	1/10/2024
DRAWN BY:	CEC
DWG SCALE:	NTS
CHECKED BY:	CB
PROJECT NO.	324-199
APPROVED BY:	MT

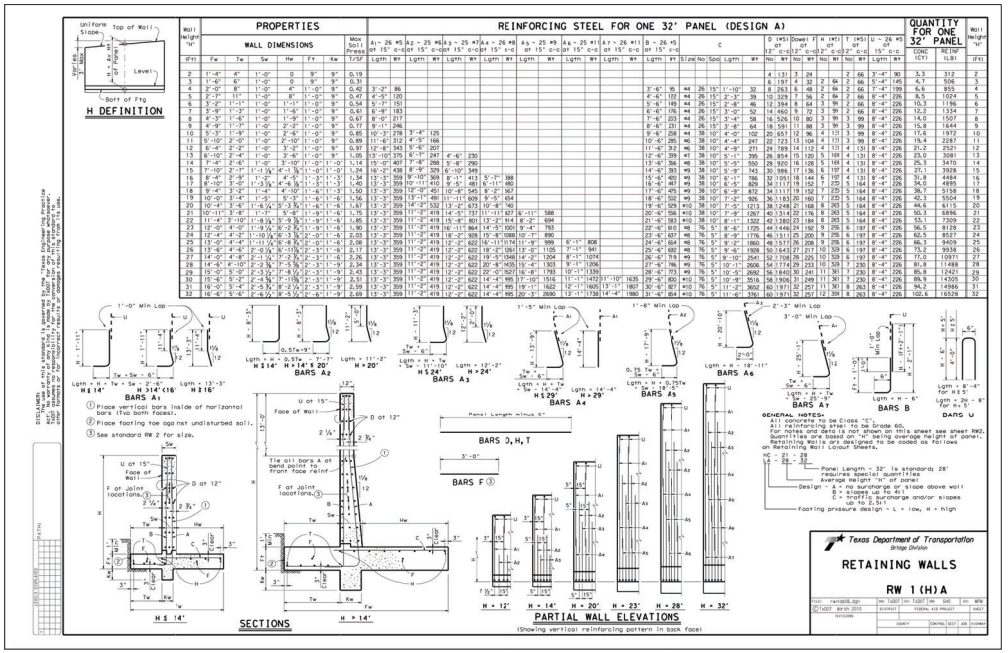
STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

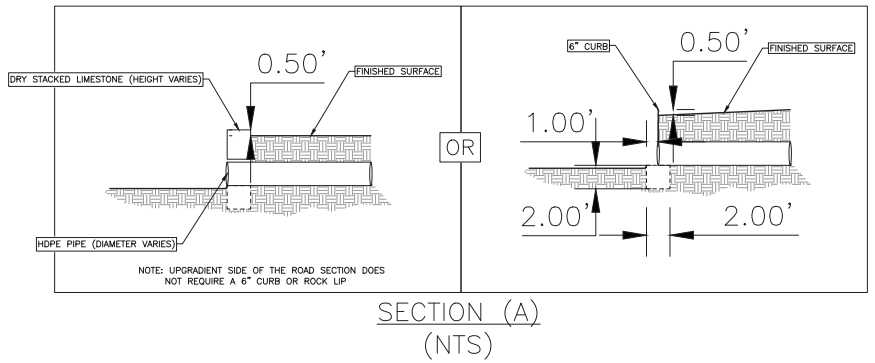
811 !!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

DRAWING NO.: 05
SHEET 05 OF 42

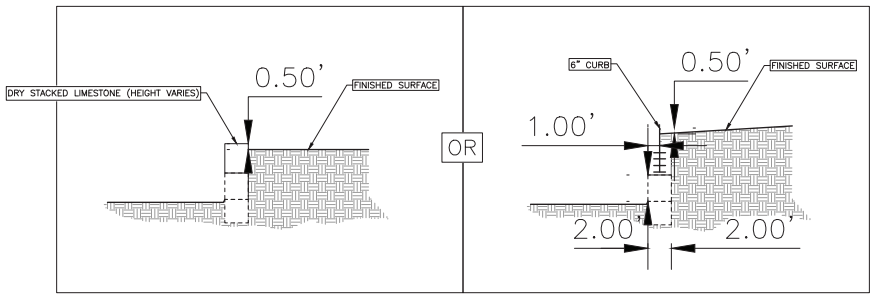
SD-2022-0025

P:\324-199\24-199\24-0101-CIVIL\DWG\324199-CIVIL-SITE DETAILS.dwg(SITE DETAILS) 1/10/2024 - cbrooks - LPT: 1/10/2024 10:58 AM

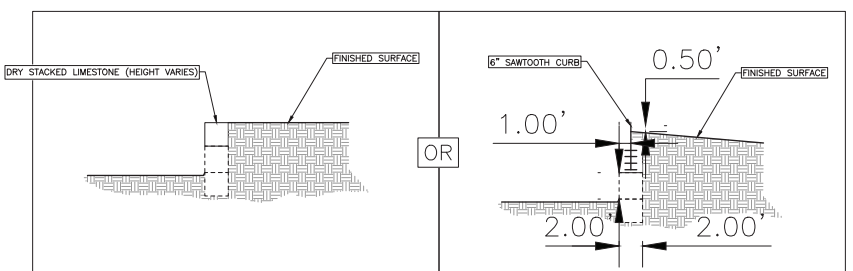




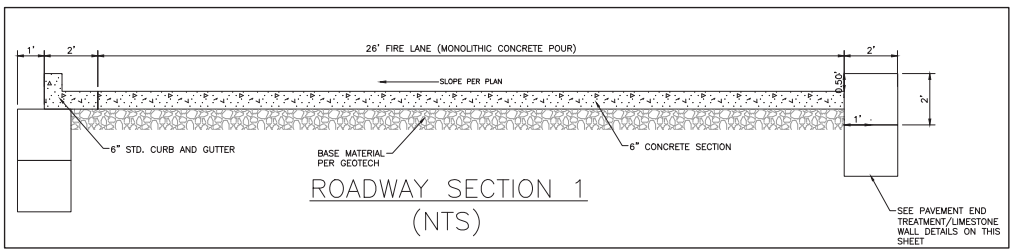
SECTION (A)
(NTS)



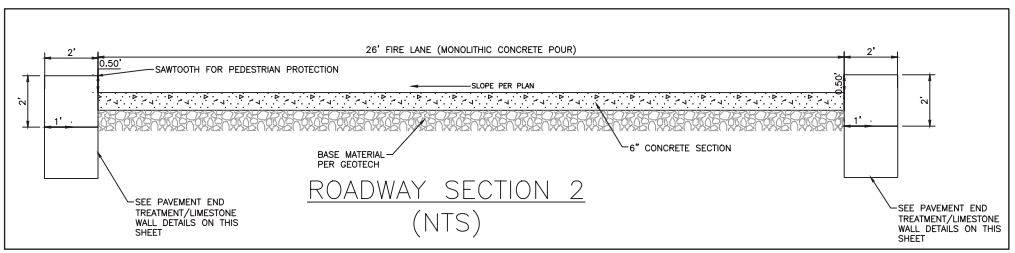
SECTION (B)
(NTS)



SECTION (C)
(NTS)



ROADWAY SECTION 1
(NTS)



ROADWAY SECTION 2
(NTS)

LIMESTONE WALL DETAILS

NOTE

1. LIMESTONE BLOCKS TO BE GROUTED WITH NON-SHRINK GROUT.
2. TIE-BACKS WILL BE REQUIRED IF STACKED GREATER THAN THREE BLOCKS.
3. BEDDING MATERIAL WILL BE SAME AS IN TRENCHES.
4. NON-SHRINK GROUT FACING WITH TROWEL FINISH.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

811 — !!! CAUTION !!! IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES. !!! CAUTION !!!

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0996
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

SITE DETAILS 2

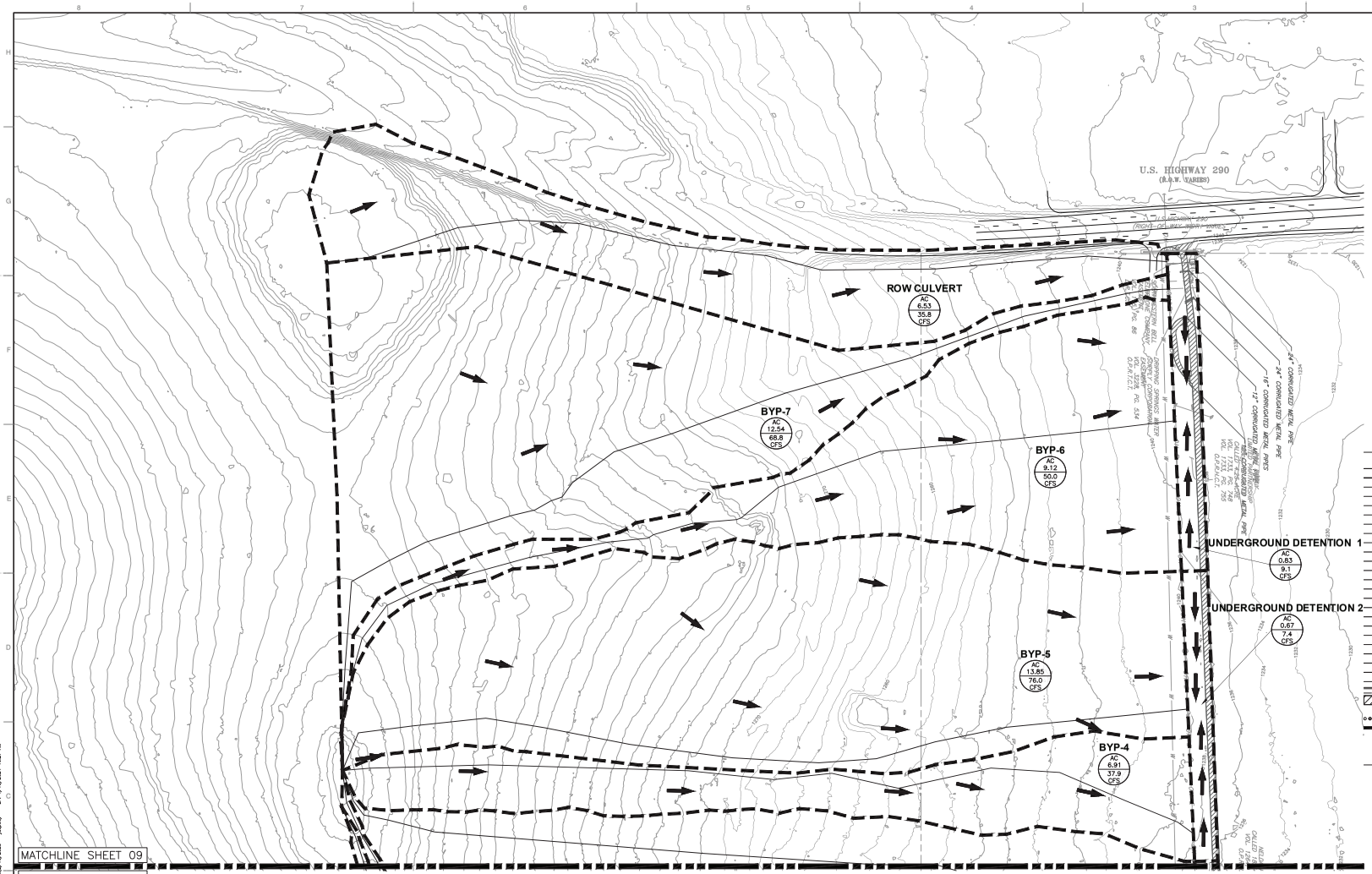
DATE:	1/10/2024
DWG SCALE:	NTS
PROJECT NO:	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 06
SHEET 06 OF 42

SD-2022-0025

EROSION PLAN SHEET
DRAWING NO. 07
SHEET 07 OF 42
DATE: 6/10/2022
DRAWN BY: CEC
DWG SCALE: 1" = 100'
CHECKED BY: CB
PROJECT NO.: 324-199
APPROVED BY: MT
HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX
CEH & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
PH: 512.439.0400 · FAX: 512.328.0096
WWW.CEHTX.COM
REVISION RECORD
NO | DATE | DESCRIPTION
SD-2022-0025
811 TEXAS ONE-CALL SYSTEM
811 CAUTION !!!
!!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL UTILITY LOCATIONS WITH TEXAS ONE-CALL SYSTEM PRIOR TO CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
NORTH
SCALE IN FEET
0 100 200
MICHAEL A. TWEIN
143972
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
BENCHMARK
CONCRETE
CONTROL POINT
IRON PIPE
IRON ROD
IRON ROW CAP
MONUMENT TYPE 1
MONUMENT TYPE 2
NAIL
PIPE BREAK
PIPE CAP
PIPE FLOW
REDUCER
AIR RELEASE VALVE
BLOW-OFF VALVE
BACKFLOW PREVENTER
MISCELLANEOUS VALVE
UTILITY VALVE
UTILITY METER
BACKFLOW PREVENTER
BLOW-OFF VALVE
FIRE HYDRANT
MONITORING WELL
OVERHEAD WIRE
HOSE BIB
SANITARY M.H.
CLEANOUT
DRAINAGE M.H.
DRAINAGE INLET
AREA INLET
CURB INLET
HEADWALL
SAFETY END TREATMENT
SAN.SEWER FLOW
ELEC. MH
ELEC. / TELE. POLE
GUY WIRE
LIGHT FIXTURE
TRAFFIC SIGNAL
PEDESTRIAN SIGNAL
UTILITY PULLBOX
UTILITY RISER
UTILITY SERVICE
LINETYPE LEGEND
PROPOSED | EXISTING
RIGHT-OF-WAY
CURB & GUTTER
EASEMENT
FENCE BARBED
FENCE WOOD (PICKET)
FENCE WOOD (PRIVACY)
FENCE CHAIN
FENCE IRON
MAJOR CONTOUR
MINOR CONTOUR
ELECTRIC LINE
OVERHEAD ELECTRIC WIRE
UNDERGROUND ELECTRIC LINE
TELEPHONE
COMMUNICATIONS LINE
CABLE TV
FIBER OPTIC LINE
GAS LINE
OVERHEAD UTILITY
UNDERGROUND UTILITY
SANITARY SEWER LINE
WATER LINE
FIRE LINE
STORM WATER LINE
CURB & GUTTER
STRIPING
FIRE LANE STRIPING
HANDICAP ACCESS ROUTE
LIMITS OF CONSTRUCTION
RAIL ROAD
FLOODWAY
CWDZ
STORM SEWER
DRAINAGE CHANNEL
BLOCK LEGEND
PROPOSED | EXISTING
TEMPORARY ROCK BERM ON DOWNHILL SIDE OF CULVERT
STABILIZED CONSTRUCTION ENTRANCE
MATERIALS STORAGE
CONCRETE WASHOUT
CURB INLET PROTECTION (TYP.)
1,040' LF SILT FENCE
1,700' LF SILT FENCE
1,816' LF SILT FENCE
1,275' LF SILT FENCE
1,032' LF SILT FENCE TO END OF PROPERTY BOUNDARY
1,240' LF SILT FENCE
PAH FAMILY LIMITED PARTNERSHIP A PORTION OF A CALLED 4.45 ACRES VOL. 1733, PG. 748 O.P.R.H.C.T.
MIGUEL SILVA AND ANGELICA SILVA CALLED 49.98 ACRES DOC. NO. 19020907 O.P.R.H.C.T.
BY HIS TURRIN HUDSON TO MIGUEL CALLED 44.121 ACRES VOL. 1264, PG. 415 O.P.R.H.C.T.
NELDA KYLE CALLED 4.45 ACRES VOL. 1264, PG. 415 O.P.R.H.C.T.
PAH FAMILY LIMITED PARTNERSHIP A PORTION OF A CALLED 4.45 ACRES VOL. 1733, PG. 748 O.P.R.H.C.T.
N68°43'35"E 1100.17'
N01°56'10"W 547.42'
S01°56'10"E 1147.51'
MIGUEL SILVA AND ANGELICA SILVA CALLED 49.98 ACRES DOC. NO. 19020907 O.P.R.H.C.T.
MONTE DEL SOL WATER, LLC
21.00'
640.00'
P:\320-000\324-199\CAD\dwg\DWG\324199-CVD1-C800-EROSION.dwg[EROSION PLAN SHEET] 1/12/22/2022 - (unsaved) - LP 1/10/2024 10:27 AM

FIBRE ROLL / FILTER SOCK INLET PROTECTION
1 OF 1
CURB INLET
GRATE INLET
FIBRE ROLL
ROADWAY
CURB
GUTTER
STAKE
NOTES:
1. FIBRE ROLL SHALL BE INSTALLED AT THE TIME OF CURB AND GUTTER CONSTRUCTION.
2. FIBRE ROLL SHALL BE PLACED AT THE BACK OF CURB AND GUTTER.
3. FIBRE ROLL SHALL BE PLACED AT THE BACK OF CURB AND GUTTER.
4. FIBRE ROLL SHALL BE PLACED AT THE BACK OF CURB AND GUTTER.



BLOCK LEGEND

PROPOSED	EXISTING	
	•	BENCHMARK
	●	CUT IN CONCRETE
	△	CONTROL POINT
	◆	IRON PIPE
	■	IRON ROD
	○	IRON ROD W/ CAP
	⊡	MONUMENT TYPE 1
	⊙	MONUMENT TYPE 2
	▲	NAIL
S	S	PIPE BREAK
]	]	PIPE CAP
>	>	PIPE FLOW
	◁	REDUCER
	⊛	AIR RELEASE VALVE
	⊛	BLOW-OFF VALVE
	⊛	POST INDICATOR VALVE
	⊛	MISCELLANEOUS VALVE
	⊘	UTILITY VALVE
	⊕	UTILITY METER
	⊠	BACKFLOW PREVENTER
	⊹	FLUSH CONNECTION
	⊕	FIRE HYDRANT
	◉	(MONITORING) WELL
	○	UTILITY RISER
	⊕	HOSE BIB
	Ⓢ	SANITARY M.H.
	Ⓒ	CLEANOUT
	Ⓓ	DRAINAGE M.H.
	▥	DOWN SPOUT
	▤	AREA INLET
	▥	CURB INLET
	▼	HEADWALL
	▭	SAFETY END TREATMENT
	⇨	DRAINAGE FLOW
	Ⓔ	ELEC. M.H.
	Ⓔ	ELEC./TELE. POLE
	←	GUY WIRE
	☼	LIGHT FIXTURE
	▪	TRAFFIC SIGNAL
	■	PEDESTRIAN SIGNAL
	▥	UTILITY (P.U.) BOX
	△	UTILITY RISER
	⊗	UTILITY SERVICE

LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
□	□	FENCE: WOOD (PRIVACY)
○	○	FENCE: CHAIN LINK
I	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	FIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
FIRE		FIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		OWQZ
ST	ST	STORM SEWER
		MATCHLINE
		DRAINAGE AREA BOUNDARY
		TIME OF CONCENTRATION LINE

BYP-1
AC
X.XX
X.X
CFS

DRAINAGE AREA LABEL

Time of Concentration (TR-55 method) - Existing Site Conditions

Subbasin		BYP-1	EX-1	BYP-2	EX-2	BYP-3	EX-3	ROW CULVERT	BYP-4	BYP-5	BYP-6	BYP-7	UNDERGROUND DETENTIO	UNDERGROUND DETENTIO
Area	sf	502668	21528	405720	95813	1441935	64811	284447	300918	603137	397267	546242	36870	29104
	ac	11.54	0.49	9.31	2.20	33.10	1.49	6.53	6.91	13.85	9.12	12.54	0.85	0.67
	sq mi	0.018034	0.000772	0.014554	0.003437	0.051722	0.002324	0.010203	0.010795	0.021641	0.014249	0.019597	0.001329	0.001047
Impervious	Ia	0%	35%	0%	35%	0%	35%	0%	0%	0%	0%	0%	0%	32%
Pervious	Ia	80	80	80	80	80	80	80	80	80	80	80	80	80
Composite	Ia	80	86	80	80	80	80	80	80	80	80	80	80	86
Sheet Flow														
Slope	avin	0.0400	0.0200	0.0300	0.0220	0.0400	0.0200	0.0300	0.0420	0.0420	0.0200	0.0220	0.0000	0.0000
Length	ft	100	100	100	100	100	100	100	100	100	100	100	100	100
Roughness	n	0.24	0.011	0.24	0.011	0.24	0.011	0.24	0.24	0.24	0.24	0.24	0.011	0.011
Time	hr	0.15	0.02	0.18	0.02	0.15	0.02	0.18	0.16	0.16	0.19	0.20	0.04	0.04
Shallow Concentrated														
Slope	avin	0.0430	0.0200	0.0430	0.0220	0.0430	0.0200	0.0430	0.0430	0.0430	0.0300	0.0220	0.0000	0.0000
Length	ft	1781	475	1914	0	1781	475	1617	1617	1725	1904	2050	511	487
Paved?	p/u	p		p	p	p		p	u	u	p	p	p	p
Time	hr	0.15	0.03	0.16	0.01	0.15	0.03	0.13	0.14	0.14	0.15	0.24	0.13	0.12
Summary														
Travel Time	hr	0.30	0.06	0.34	0.03	0.30	0.06	0.30	0.29	0.30	0.34	0.44	0.17	0.16
Tc	min	17.92	3.92	20.25	1.91	17.92	3.92	17.81	17.32	17.93	22.72	26.41	10.36	9.58
Lag Time	min	10.75	3.06	12.15	1.80	10.75	3.06	10.68	10.51	10.77	13.63	15.85	6.23	5.75
Existing Run-off Values														
2 Year	cfs	15.00	1.58	13.00	0.74	43.00	4.58	8.58	9.00	18.00	11.80	16.30	2.60	2.19
10 Year	cfs	26.80	2.80	24.80	1.28	76.90	8.30	15.28	16.00	32.20	21.20	29.10	4.60	3.70
25 Year	cfs	38.30	3.78	35.50	1.70	109.90	11.18	21.75	22.90	46.00	30.30	41.60	6.60	4.94
100 Year	cfs	63.30	5.75	58.60	2.58	181.60	16.98	35.80	37.90	76.00	50.00	68.80	9.10	7.44

Point of Analysis Flow Summary Table

Storm Event	Existing	Proposed
02-YR	11	11
10-YR	20.1	20.1
25-YR	26.7	26.5
100-YR	40.7	39.9

NOTE: POINT OF ANALYSIS FLOW SUMMARY TABLE DESCRIBES ONLY THE ON-SITE FLOWS FOR EACH STORM EVENT. ALL BYPASS FLOWS REMAIN AS SHOWN WITHIN THE DRAINAGE AREA MAPS AND DO NOT CHANGE BETWEEN PROPOSED AND EXISTING CONDITIONS.

NORTH
SCALE IN FEET
0 100 200

811 ||| CAUTION ||| ||| CAUTION |||
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0996
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

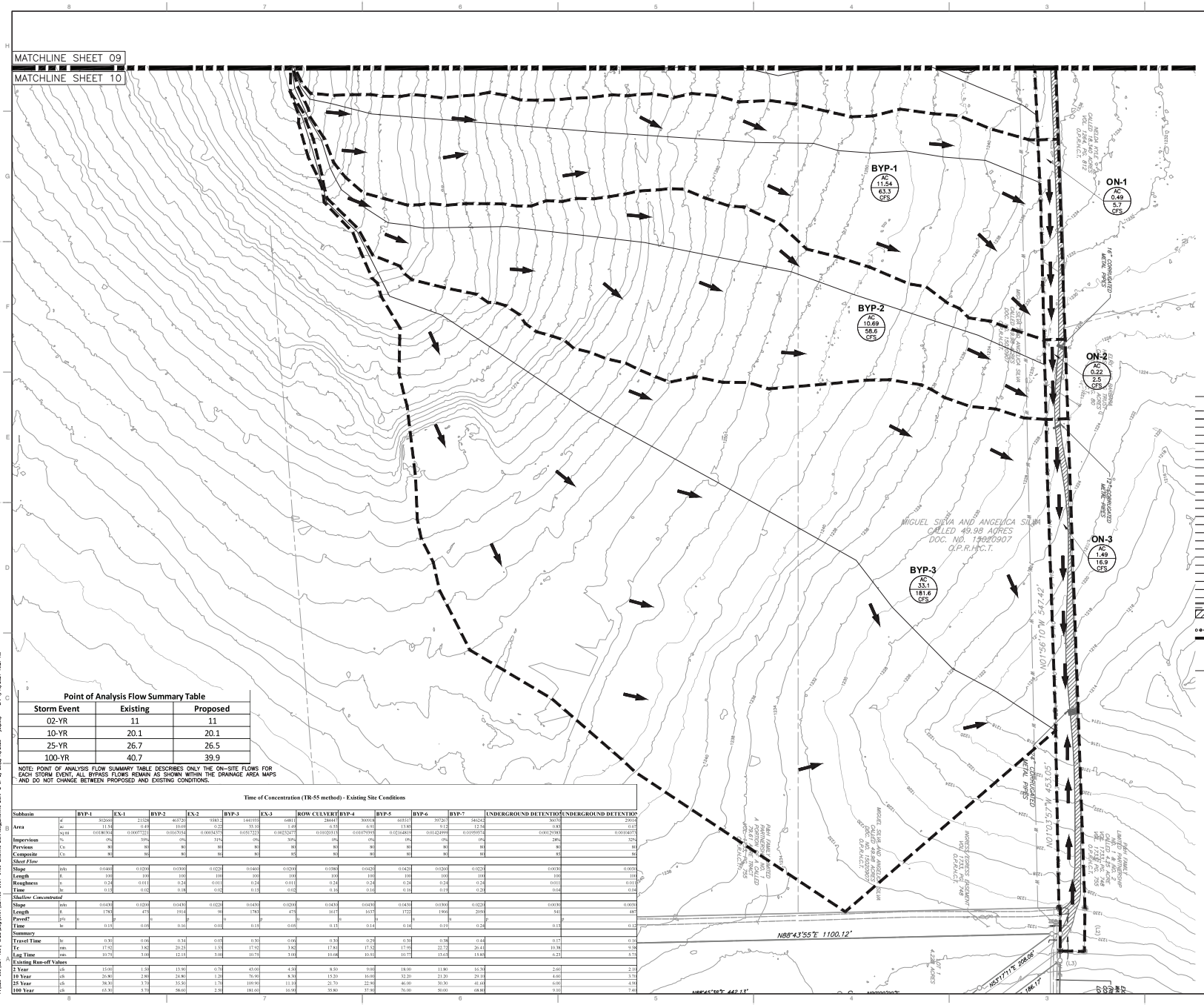
EXISTING DMAP1 OF 2

DATE:	1/10/2024
DWG SCALE:	1" = 100'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 09
SHEET 09 OF 42

SD-2022-0025

P:\324-0001\324-1991-2400\dwg\CD01\324199-CD01-2400-EXISTING DMAP.dwg 1 of 1 1/10/2024 10:37 AM - Howard - LP



BLOCK LEGEND

PROPOSED	EXISTING	
	•	BENCHMARK
	●	CUT IN CONCRETE
	△	CONTROL POINT
	◆	IRON PIPE
	■	IRON ROD
	○	IRON ROD W/ CAP
	⊡	MONUMENT TYPE 1
	⊙	MONUMENT TYPE 2
	▲	NAIL
S	S	PIPE BREAK
]	]	PIPE CAP
>	>	PIPE FLOW
	◁	REDUCER
	⊛	AIR RELEASE VALVE
	⊛	BLOW-OFF VALVE
	⊛	POST INDICATOR VALVE
	⊛	MISCELLANEOUS VALVE
	⊛	UTILITY VALVE
	⊛	UTILITY METER
	⊠	BACKFLOW PREVENTER
	⊹	FLUSH CONNECTION
	⊹	FIRE HYDRANT
	◎	(MONITORING) WELL
	○	UTILITY RISER
	⊛	HOSE BIB
	Ⓢ	SANITARY M.H.
	Ⓒ	CLEANOUT
	Ⓓ	DRAINAGE M.H.
	▥	DOWN SPOUT
	▥	AREA INLET
	▥	CURB INLET
	▽	HEADWALL
	▭	SAFETY END TREATMENT
	⇨	DRAINAGE FLOW
	Ⓔ	ELEC. M.H.
	⊘	ELEC./TELE. POLE
	←	GUY WIRE
	☼	LIGHT FIXTURE
	▲	TRAFFIC SIGNAL
	■	PEDESTRIAN SIGNAL
	▣	UTILITY (PULL) BOX
	△	UTILITY RISER
	⊗	UTILITY SERVICE

LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
□	□	FENCE: WOOD (PRIVACY)
○	○	FENCE: CHAIN LINK
I	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	FIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
	FIRE	FIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		OWOZ
ST	ST	STORM SEWER

MATCHLINE

DRAINAGE AREA BOUNDARY

TIME OF CONCENTRATION LINE

BYP-1
AC
X.XX
X.X
CFS

DRAINAGE AREA LABEL

Point of Analysis Flow Summary Table

Storm Event	Existing	Proposed
02-YR	11	11
10-YR	20.1	20.1
25-YR	26.7	26.5
100-YR	40.7	39.9

NOTE: POINT OF ANALYSIS FLOW SUMMARY TABLE DESCRIBES ONLY THE ON-SITE FLOWS FOR EACH STORM EVENT, ALL BYPASS FLOWS REMAIN AS SHOWN WITHIN THE DRAINAGE AREA MAPS AND DO NOT CHANGE BETWEEN PROPOSED AND EXISTING CONDITIONS.

Time of Concentration (TR-55 method) - Existing Site Conditions

Subbasin		BYP-1	EX-1	BYP-2	EX-2	BYP-3	EX-3	ROW CULVERT	BYP-4	BYP-5	BYP-6	BYP-7	UNDERGROUND DETENTION	UNDERGROUND DETENTION
	sf	502668	21528	465720	9383	1441935	6881	28441	300918	603511	397267	546268	8658	2961
Area	ac	11.54	0.49	10.69	0.22	33.10	1.49	0.53	6.91	13.85	9.12	12.54	0.83	0.07
	sq mi	0.01803004	0.00077221	0.01670354	0.00034375	0.05172231	0.00232477	0.00082813	0.01079395	0.02164819	0.01424999	0.01959374	0.00129381	0.00010472
Impervious	%	0%	35%	0%	31%	0%	30%	0%	0%	0%	0%	0%	28%	32%
Pervious	Cn	80	80	80	80	80	80	80	80	80	80	80	80	80
Composite	Cn	80	86	80	86	80	80	80	80	80	80	80	85	86
Sheet Flow														
Slope	in/ft	0.0400	0.0200	0.0300	0.0220	0.0400	0.0200	0.0300	0.0400	0.0420	0.0200	0.0220	0.0030	0.0030
Length	ft	100	100	100	100	100	100	100	100	100	100	100	100	100
Roughness	n	0.24	0.011	0.24	0.011	0.24	0.011	0.24	0.24	0.24	0.24	0.24	0.011	0.011
Time	hr	0.15	0.02	0.18	0.02	0.13	0.02	0.16	0.16	0.16	0.19	0.20	0.04	0.04
Shallow Concentrated														
Slope	in/ft	0.0400	0.0200	0.0400	0.0220	0.0400	0.0200	0.0400	0.0400	0.0400	0.0300	0.0220	0.0030	0.0030
Length	ft	1782	475	1910	90	1782	475	1617	1617	1617	1722	1904	541	487
Paved?	y/n	n	n	n	n	n	n	n	n	n	n	n	y	y
Time	hr	0.15	0.05	0.16	0.01	0.13	0.05	0.13	0.14	0.14	0.19	0.24	0.13	0.12
Summary														
Travel Time	hr	0.30	0.06	0.34	0.03	0.26	0.06	0.30	0.29	0.30	0.38	0.44	0.17	0.16
Tc	min	17.92	3.82	20.25	1.53	17.92	3.82	17.83	17.32	17.95	22.72	26.43	10.38	9.58
Lag Time	min	10.75	3.06	12.15	3.06	10.75	3.06	10.68	10.31	10.77	13.63	15.85	6.23	5.75
Existing Run-off Values														
2 Year	cfs	15.00	1.50	13.90	0.70	43.00	4.50	8.50	9.00	18.00	11.80	16.30	2.60	2.10
10 Year	cfs	20.80	2.80	24.80	1.25	76.90	8.50	15.20	16.00	32.20	21.20	29.10	4.60	3.75
25 Year	cfs	38.30	3.70	35.50	1.70	109.90	11.10	21.70	22.90	46.00	30.30	41.60	6.00	4.90
100 Year	cfs	65.30	5.70	58.60	2.50	181.60	16.90	35.80	37.90	76.00	50.00	68.80	9.10	7.40

811 !!! CAUTION !!! IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES. !!! CAUTION !!!

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0996
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

EXISTING DMAP 2 OF 2

DATE: 1/10/2024 · DRAWN BY: CEC
DWG SCALE: 1" = 100' · CHECKED BY: CB
PROJECT NO. 324-199
APPROVED BY: MT

DRAWING NO.: **10**
SHEET 10 OF 42

SD-2022-0025

P:\320-001\324-199\~2420\dwg\[C01\324199-C01-2420-EXISTING DMAP.dwg]EXISTING DMAP 2 OF 2] 1/10/2024 10:37 AM - Howard - LP

Time of Concentration (TR-55 method) - Proposed Site Conditions

Subbasin		BYP-1	BYP-2	BYP-3	BYP-4	BYP-5	BYP-6	BYP-7	ROW CULVERT	UNDERGROUND DETENTION 1	UNDERGROUND DETENTION 2
Sheet	sf	300	300	300	300	300	300	300	300	300	300
Area	ac	21.54	4.72	3.53	4.62	19.65	9.93	12.34	6.53	0.83	5.32
	sq mi	0.0337	0.0074	0.0055	0.0072	0.0307	0.0155	0.0193	0.0102	0.0013	0.0083
Impervious	%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cropcode	n/a	0	0	0	0	0	0	0	0	0	0
Manning's	n	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
Slope	ft/ft	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pwidth	ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paradims	ft	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Depth	in	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sheet Calculated											
Slope	ft/ft	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424
Length	ft	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0	300.0
Pwidth	ft	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Depth	in	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shallconc											
Slope	ft/ft	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424
Length	ft	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437	1,437
Velocity	ft/s	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Channel											
Slope	ft/ft	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424	0.0424
Length	ft	6,197	1,437	1,437	1,437	6,197	3,437	4,197	2,437	437	2,437
Velocity	ft/s	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Travel Time	hr	0.32	0.08	0.08	0.08	0.32	0.18	0.22	0.13	0.02	0.13
Total Time	min	19.5	4.8	4.8	4.8	19.5	10.8	13.2	7.8	1.4	7.8
Lag Time	min	11.7	2.9	2.9	2.9	11.7	6.5	7.9	4.7	0.8	4.7
Peak Runoff Values											
2 Year	cfs	37.6	7.9	5.4	6.9	33.5	16.6	21.0	9.8	1.4	8.9
10 Year	cfs	58.2	12.2	8.4	10.7	51.9	25.7	32.5	15.2	2.2	13.8
25 Year	cfs	76.5	16.0	11.0	14.0	68.2	33.8	42.7	19.9	2.9	18.1
100 Year	cfs	111.3	23.3	16.0	20.4	99.2	49.2	62.1	29.0	4.2	26.4

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
PH: 512.439.0400 · FAX: 512.328.0096
WWW.CEICTC.COM

NO	DATE	REVISION RECORD DESCRIPTION

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

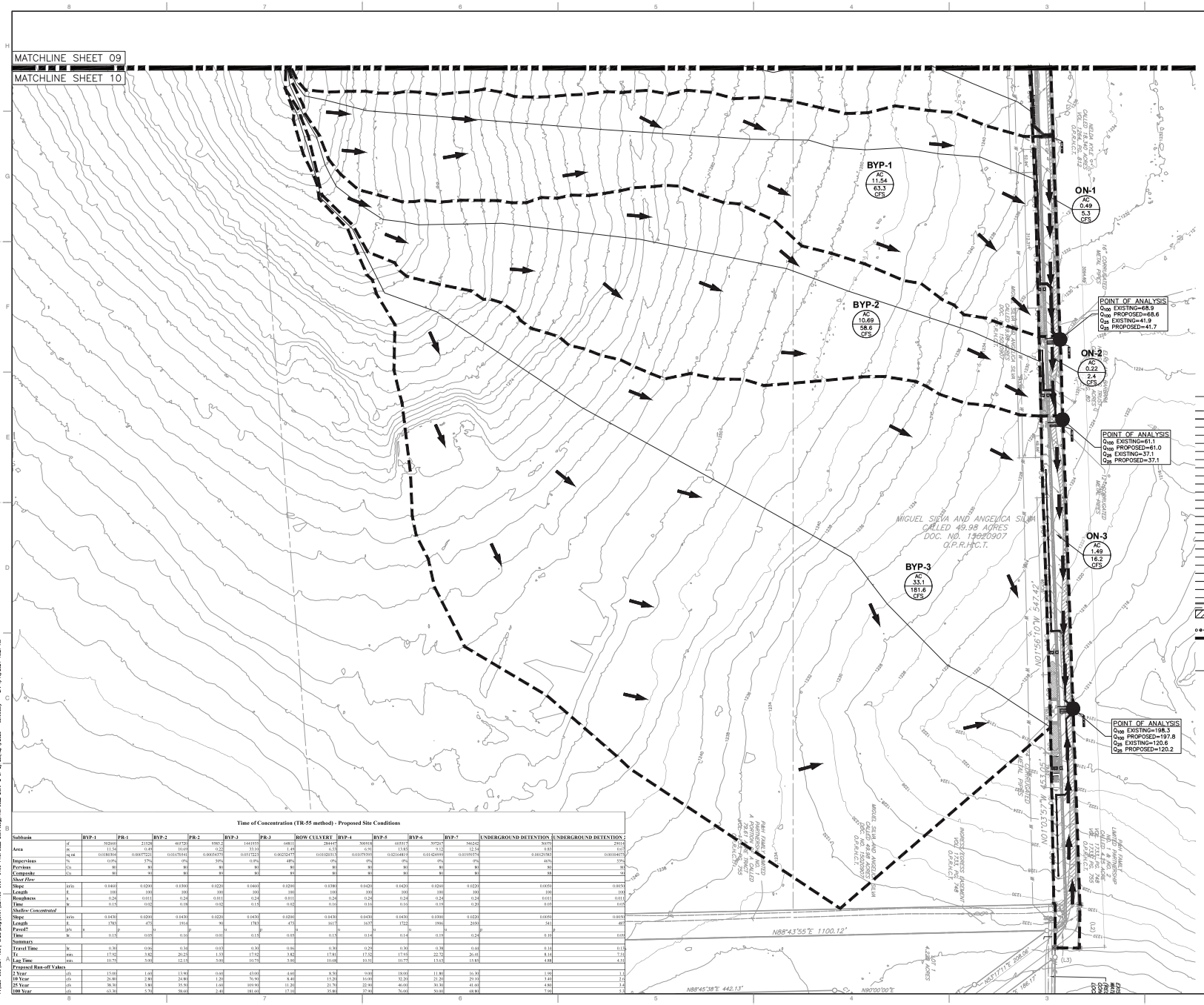
PROPOSED DMAP 1 OF 2

DATE:	1/10/2024
DRAWN BY:	CEC
DWG SCALE:	1"= 100'
CHECKED BY:	CB
PROJECT NO.:	324-199
APPROVED BY:	MT

DRAWING NO. 11 OF 42
SHEET 11 OF 42

SD-2022-0025

P:\320-000\324-199\CIVIL\324199-CHD1DWG\324199-CHD1-PROPOSED DMAP 1 OF 2.DWG (PROPOSED DMAP 1 OF 2) 1/10/2024 10:23 AM



Time of Concentration (TR-55 method) - Proposed Site Conditions

Subbasin		BYP-1	PR-1	BYP-2	PR-2	BYP-3	PR-3	ROW CULVERT	BYP-4	BYP-5	BYP-6	BYP-7	UNDERGROUND DETENTION	UNDERGROUND DETENTION
Area	sf	502601	21526	465720	9585.2	1441955	64811	284447	509418	693517	597267	560242	36059	29014
	ac	11.54	0.49	10.69	0.22	33.10	1.49	6.53	11.70	15.92	13.71	12.86	0.83	0.67
	sq mi	0.0180394	0.0007722	0.0167054	0.0003439	0.0517223	0.0023254	0.0102033	0.0182813	0.0248869	0.0214249	0.0200974	0.0012938	0.0010407
Impervious	%	0.0%	57%	0%	59%	0.0%	48%	0%	0%	0%	0%	0%	46%	53%
Pervious	Cn	80	80	80	80	80	80	80	80	80	80	80	80	80
Composite	Cn	80	80	80	89	80	80	80	80	80	80	80	88	90
Sheet Flow														
Slope	in/in	0.0400	0.0200	0.0300	0.0220	0.0400	0.0200	0.0300	0.0420	0.0420	0.0260	0.0220	0.0050	0.0050
Length	ft	100	100	100	100	100	100	100	100	100	100	100	100	100
Roughness	n	0.24	0.011	0.24	0.011	0.24	0.011	0.24	0.24	0.24	0.24	0.24	0.011	0.011
Time	hr	0.15	0.02	0.16	0.02	0.15	0.02	0.16	0.16	0.16	0.19	0.20	0.03	0.03
Shallow Concentrated														
Slope	in/in	0.0430	0.0200	0.0430	0.0220	0.0430	0.0200	0.0430	0.0430	0.0430	0.0300	0.0220	0.0050	0.0050
Length	ft	1765	475	1916	90	1783	475	3617	6457	1722	1906	2050	541	407
Paved?	y/n	n	n	n	n	n	n	n	n	n	n	n	n	n
Time	hr	0.15	0.05	0.16	0.01	0.15	0.05	0.15	0.16	0.14	0.19	0.24	0.10	0.09
Summary														
Travel Time	hr	0.30	0.06	0.30	0.03	0.30	0.06	0.30	0.29	0.30	0.38	0.44	0.14	0.13
Tc	min.	17.92	3.82	20.25	1.83	17.92	3.82	17.81	17.52	17.93	22.72	26.41	8.34	7.51
Lag Time	min.	10.75	3.00	12.15	3.00	10.75	3.90	10.68	10.51	10.75	13.63	15.85	4.88	4.51
Proposed Run-off Values														
2 Year	cfs	15.00	1.60	13.90	0.60	43.00	4.60	8.50	9.00	18.00	11.80	10.30	1.90	1.1
10 Year	cfs	26.80	2.80	24.80	1.20	76.90	8.40	15.20	16.00	32.20	21.20	29.10	3.40	2.6
25 Year	cfs	38.30	3.80	35.50	1.60	109.90	11.20	21.70	22.90	46.00	30.30	41.60	4.80	3.4
100 Year	cfs	63.30	5.70	58.60	2.40	181.60	17.10	35.90	37.90	76.00	50.00	68.80	7.90	5.3

REVISION RECORD		
NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0996
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

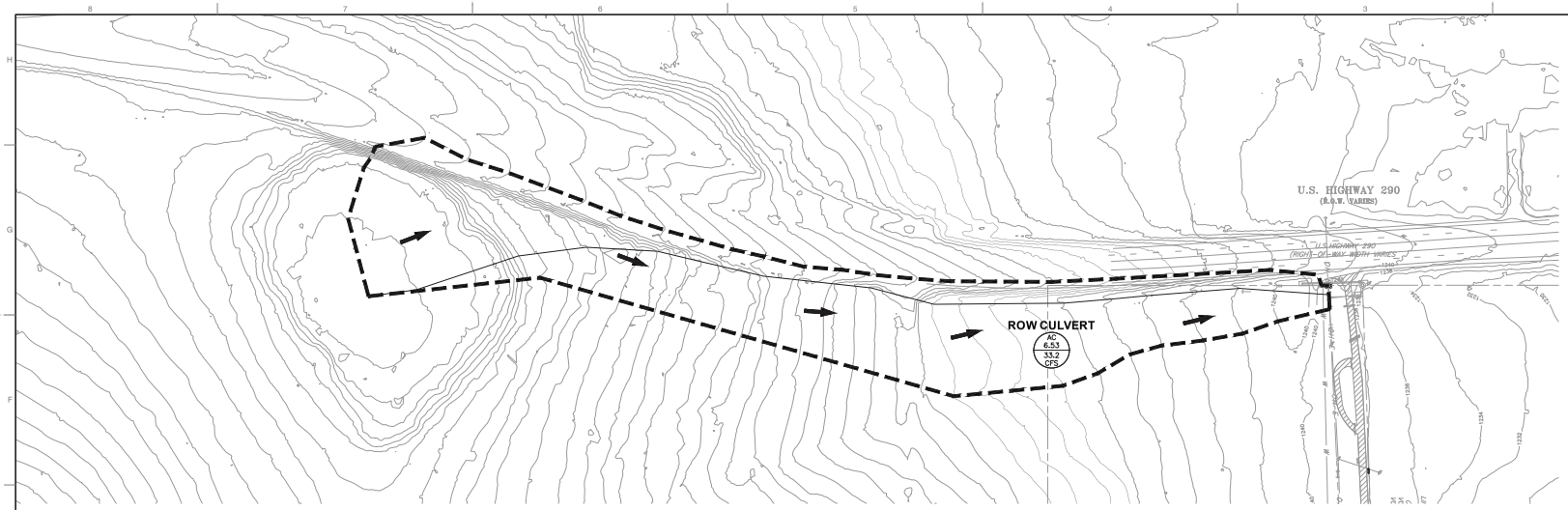
PROPOSED DMAP 2 OF 2

DRAWN BY:	CEC
CHECKED BY:	CB
PROJECT NO.	324-199
APPROVED BY:	MT
DATE:	1/10/2024
DWG SCALE:	1" = 100'

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

DRAWING NO.: 12
SHEET 12 OF 42

SD-2022-0025



ROW CULVERT

Runoff Calculations (Eq 2-1)

Event	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A (ac)	6.53	6.53	6.53	6.53	6.53	6.53
C	0.21	0.23	0.25	0.29	0.32	0.36
Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
I (in/hr)	6.14	7.80	9.18	11.11	12.61	14.12
Q (cfs)	8.4	11.7	15.0	21.0	26.3	33.2

"C" Value Calculations (Table 2-1)

Area (ac)	% of Area		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
0.00	0%	Pasture	0.33	0.36	0.38	0.42	0.45	0.49
6.53	100%	Grass	0.21	0.23	0.25	0.29	0.32	0.36
0.00	0%	Forest/Wood	0.31	0.34	0.36	0.40	0.43	0.47
0.00	0%	Concrete	0.75	0.80	0.83	0.88	0.92	0.97
6.53	100%							

NOTES:
1. ALL DRAINAGE CALCULATIONS HAVE BEEN DETERMINED VIA THE RATIONAL METHOD
2. DRAINAGE FOR THIS DEVELOPMENT HAS BEEN DESIGNED SUCH THAT THERE WILL BE NO ADVERSE IMPACTS ON THE CAPACITY, FUNCTION OR INTEGRITY OF TEXAS DEPARTMENT OF TRANSPORTATION RIGHT OF WAY DRAINAGE FACILITIES.
3. TXDOT ATLAS 14 RAINFALL DATA FOR ZONE-1 OF HAYS COUNTY HAS BEEN UTILIZED FOR ANALYSIS.

Rational Method Runoff Equation (Eq. 2-1)

$Q_p = CiA$

Q_p peak runoff (cfs)
C runoff coefficient
i intensity of rainfall (in/hr) - Eq 2-8
A area (acres)

Rainfall Intensity Equation (Eq. 2-8)

$i=a/(t+b)^c$

i intensity of rainfall (in/hr)
t storm duration (min)
a, b, c storm frequency coefficients

I-D-F Curve Coefficients			
Freq.	a	b	c
2	64.5986	12.9935	0.8144
5	78.5582	12.7853	0.8024
10	92.0534	13.166	0.7949
25	112.6923	13.9657	0.7872
50	130.8565	14.8519	0.7829
100	152.128	16.1074	0.7795

BLOCK LEGEND

PROPOSED	EXISTING	
	•	BENCHMARK
	●	CUT IN CONCRETE
	△	CONTROL POINT
	◆	IRON PIPE
	■	IRON ROD
	○	IRON ROD W/ CAP
	⊡	MONUMENT TYPE 1
	⊙	MONUMENT TYPE 2
	▲	NAIL
S	S	PIPE BREAK
]	]	PIPE CAP
>	>	PIPE FLOW
	◁	REDUCER
	⊛	AIR RELEASE VALVE
	⊛	BLOW OFF VALVE
	⊛	POST INDICATOR VALVE
	⊛	MISCELLANEOUS VALVE
	⊘	UTILITY VALVE
	⊕	UTILITY METER
	⊠	BACKFLOW PREVENTER
	⊹	FLUSH CONNECTION
	⊕	FIRE HYDRANT
	◎	(MONITORING) WELL
	○	UTILITY RISER
	⊕	HOSE BIB
	Ⓢ	SANITARY M.H.
	Ⓒ	CLEANOUT
	Ⓓ	DRAINAGE M.H.
	▥	DOWN SPOUT
	▦	AREA INLET
	▤	CURB INLET
		HEADWALL
		SAFETY END TREATMENT
		DRAINAGE FLOW
	Ⓔ	ELEC. M.H.
	⊘	ELEC./TELE. POLE
	⊢	GUY WIRE
	☼	LIGHT FIXTURE
	✱	TRAFFIC SIGNAL
	■	PEDESTRIAN SIGNAL
	▣	UTILITY (PULLBOX
	△	UTILITY RISER
	⊗	UTILITY SERVICE

LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
□	□	FENCE: WOOD (PRIVACY)
○	○	FENCE: CHAIN LINK
I	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	FIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
	FIRE	FIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		OWOZ
ST	ST	STORM SEWER
		DRAINAGE AREA BOUNDARY
		TIME OF CONCENTRATION LINE

A-1
AC
X.XX
X.X
CFS
DRAINAGE AREA LABEL

NORTH
SCALE IN FEET
0 100 200

811 ||| CAUTION ||| ||| CAUTION |||
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.328.0986
www.cecinc.com

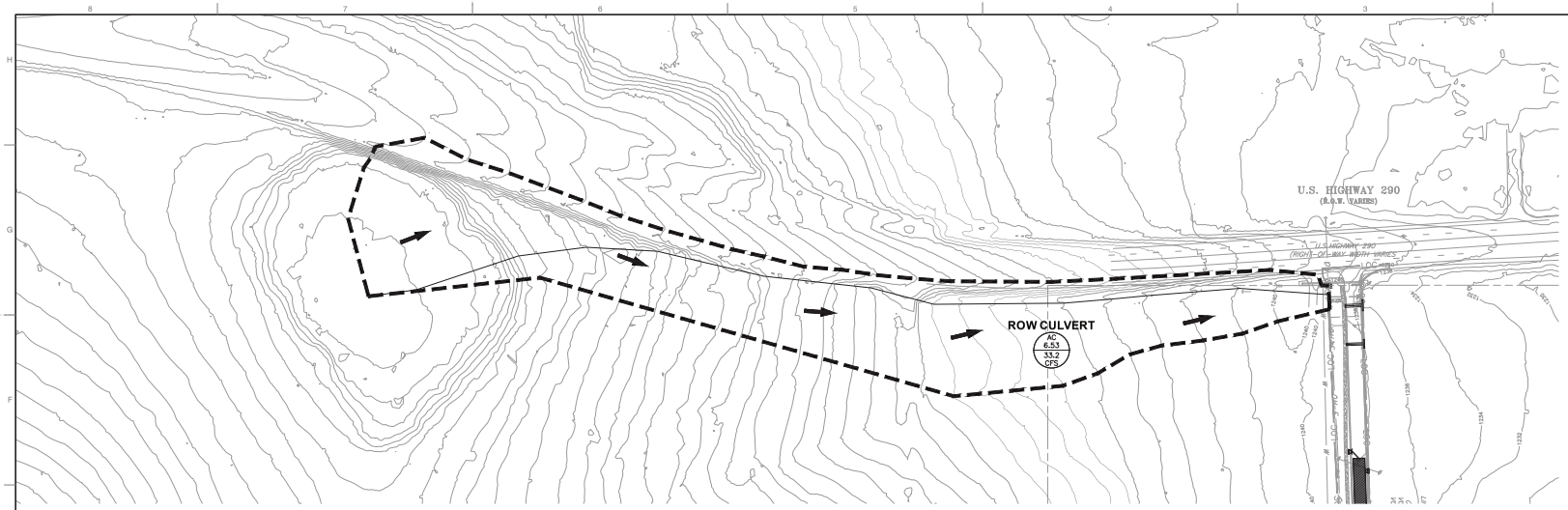
HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

TXDOT CULVERT - EXISTING DMAP

DATE:	1/10/2024
DWG SCALE:	1"=20'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 13
SHEET 13 OF 42

SD-2022-0025



ROW CULVERT

Runoff Calculations (Eq 2-1)

Event	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
A (ac)	6.53	6.53	6.53	6.53	6.53	6.53
C	0.21	0.23	0.25	0.29	0.32	0.36
Tc (min)	5.0	5.0	5.0	5.0	5.0	5.0
I (in/hr)	6.14	7.80	9.18	11.11	12.61	14.12
Q (cfs)	8.4	11.7	15.0	21.0	26.3	33.2

"C" Value Calculations (Table 2-1)

Area (ac)	% of Area		2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
0.00	0%	Pasture	0.33	0.36	0.38	0.42	0.45	0.49
6.53	100%	Grass	0.21	0.23	0.25	0.29	0.32	0.36
0.00	0%	Forest/Wood	0.31	0.34	0.36	0.40	0.43	0.47
0.00	0%	Concrete	0.75	0.80	0.83	0.88	0.92	0.97
6.53	100%							

NOTES:
1. ALL DRAINAGE CALCULATIONS HAVE BEEN DETERMINED VIA THE RATIONAL METHOD
2. DRAINAGE FOR THIS DEVELOPMENT HAS BEEN DESIGNED SUCH THAT THERE WILL BE NO ADVERSE IMPACTS ON THE CAPACITY, FUNCTION OR INTEGRITY OF TEXAS DEPARTMENT OF TRANSPORTATION RIGHT OF WAY DRAINAGE FACILITIES.
3. TXDOT ATLAS 14 RAINFALL DATA FOR ZONE-1 OF HAYS COUNTY HAS BEEN UTILIZED FOR ANALYSIS.

Rational Method Runoff Equation (Eq. 2-1)

$Q_p = CiA$

Q_p peak runoff (cfs)
C runoff coefficient
i intensity of rainfall (in/hr) - Eq 2-8
A area (acres)

Rainfall Intensity Equation (Eq. 2-8)

$i=a/(t+b)^c$

i intensity of rainfall (in/hr)
t storm duration (min)
a, b, c storm frequency coefficients

I-D-F Curve Coefficients			
Freq.	a	b	c
2	64.5986	12.9935	0.8144
5	78.5582	12.7853	0.8024
10	92.0534	13.166	0.7949
25	112.6923	13.9657	0.7872
50	130.8565	14.8519	0.7829
100	152.128	16.1074	0.7795

BLOCK LEGEND

PROPOSED	EXISTING	
	•	BENCHMARK
	●	CUT IN CONCRETE
	△	CONTROL POINT
	◆	IRON PIPE
	■	IRON ROD
	○	IRON ROD W/ CAP
	⊡	MONUMENT TYPE 1
	⊙	MONUMENT TYPE 2
	▲	NAIL
S	S	PIPE BREAK
]	]	PIPE CAP
>	>	PIPE FLOW
	◁	REDUCER
	⊛	AIR RELEASE VALVE
	⊛	BLOW OFF VALVE
	⊛	POST INDICATOR VALVE
	⊛	MISCELLANEOUS VALVE
	⊘	UTILITY VALVE
	⊕	UTILITY METER
	⊠	BACKFLOW PREVENTER
	⊥	FLUSH CONNECTION
	⊕	FIRE HYDRANT
	◎	(MONITORING) WELL
	○	UTILITY RISER
	⊕	HOSE BIB
	Ⓢ	SANITARY M.H.
	Ⓒ	CLEANOUT
	Ⓓ	DRAINAGE M.H.
	▥	DOWN SPOUT
	▦	AREA INLET
	▤	CURB INLET
		HEADWALL
		SAFETY END TREATMENT
		DRAINAGE FLOW
	Ⓔ	ELEC. M.H.
	⊘	ELEC./TELE. POLE
	⊢	GUY WIRE
	☼	LIGHT FIXTURE
	✱	TRAFFIC SIGNAL
	■	PEDESTRIAN SIGNAL
	▣	UTILITY (PULLBOX
	△	UTILITY RISER
	⊗	UTILITY SERVICE

LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
□	□	FENCE: WOOD (PRIVACY)
○	○	FENCE: CHAIN LINK
I	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	FIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
	FIRE	FIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		OWQZ
ST	ST	STORM SEWER
		DRAINAGE AREA BOUNDARY
		TIME OF CONCENTRATION LINE

A-1
AC
X.XX
X.X
CFS
DRAINAGE AREA LABEL

NORTH
SCALE IN FEET
0 100 200

811 ||| CAUTION ||| ||| CAUTION |||
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

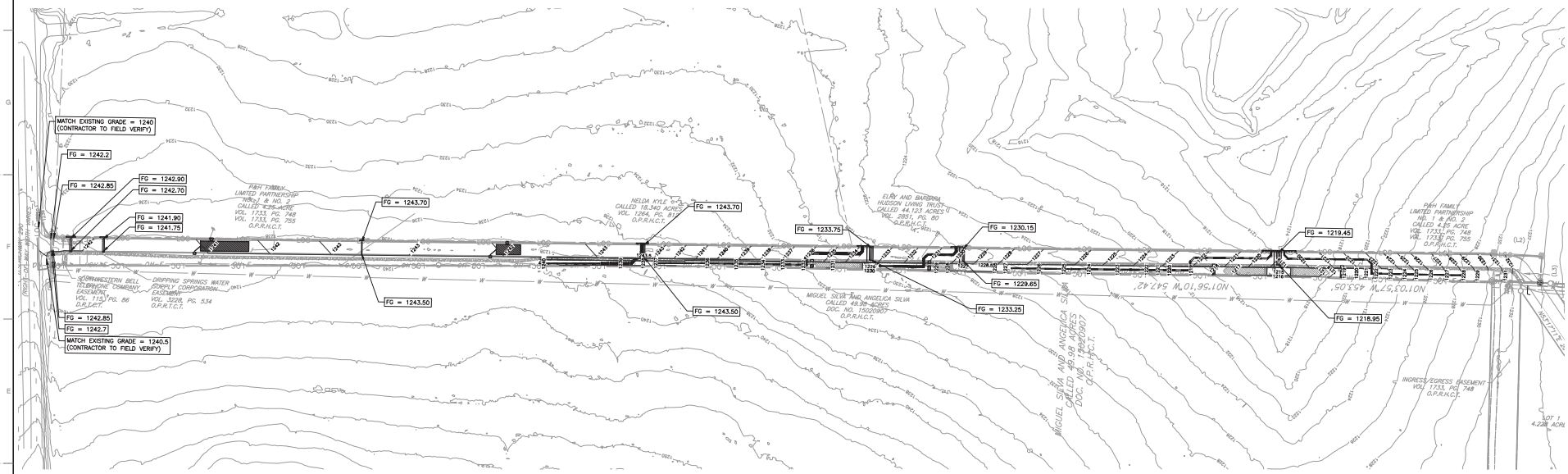
HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

TXDOT CULVERT - PROPOSED DMAP

DATE:	1/10/2024
DWG SCALE:	1"=20'
PROJECT NO.	324-199
APPROVED BY:	MT
DRAWN BY:	CEC
CHECKED BY:	CB

DRAWING NO.: 14
SHEET 14 OF 42

SD-2022-0025



NOTES

1. DRAINAGE FOR THIS DEVELOPMENT DOES NOT DRAIN TO TXDOT ROW, DOES NOT CAUSE TXDOT DRAINAGE TO BE BLOCKED, AND HAS BEEN DESIGNED SUCH THAT THERE WILL BE NO ADVERSE IMPACTS ON THE CAPACITY, FUNCTION OR INTEGRITY OF TEXAS DEPARTMENT OF TRANSPORTATION RIGHT OF WAY DRAINAGE FACILITIES.

LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
□	□	FENCE: WOOD (PRIVACY)
○	○	FENCE: CHAIN LINK
I	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE

PROPOSED	EXISTING	
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	RIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
FIRE		RIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		CWQZ
ST	ST	STORM SEWER
		DRAINAGE CHANNEL

BLOCK LEGEND

PROPOSED	EXISTING		PROPOSED	EXISTING	
	•	BENCHMARK		Ⓜ	(MONITORING) WELL
	●	CUT IN CONCRETE		⊙	UTILITY RISER
	△	CONTROL POINT		⊕	HOSE BIB
	Ⓢ	IRON PIPE		Ⓢ	SANITARY M.H.
	⬢	IRON ROD		Ⓒ	CLEANOUT
	○	IRON ROD W/ CAP		Ⓓ	DRAINAGE M.H.
	⊡	MONUMENT TYPE 1		⊟	DOWN SPOUT
	⊙	MONUMENT TYPE 2		▤	AREA INLET
	▲	NAIL		▥	CURB INLET
S	S	PIPE BREAK			HEADWALL
]	]	PIPE CAP			SAFETY END TREATMENT
>	>	PIPE FLOW			DRAINAGE FLOW
	◁	REDUCER			
		AIR RELEASE VALVE		Ⓔ	ELEC. M.H.
		BLOW-OFF VALVE			ELEC. /TELE. POLE
		POST INDICATOR VALVE			GUY WIRE
		MISCELLANEOUS VALVE			LIGHT FIXTURE
		UTILITY VALVE			TRAFFIC SIGNAL
		UTILITY METER			PEDESTRIAN SIGNAL
		BACKFLOW PREVENTER			UTILITY (PULL)BOX
		FLUSH CONNECTION			UTILITY RISER
		FIRE HYDRANT			UTILITY SERVICE

NORTH

SCALE IN FEET
0 100 200

811 !!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

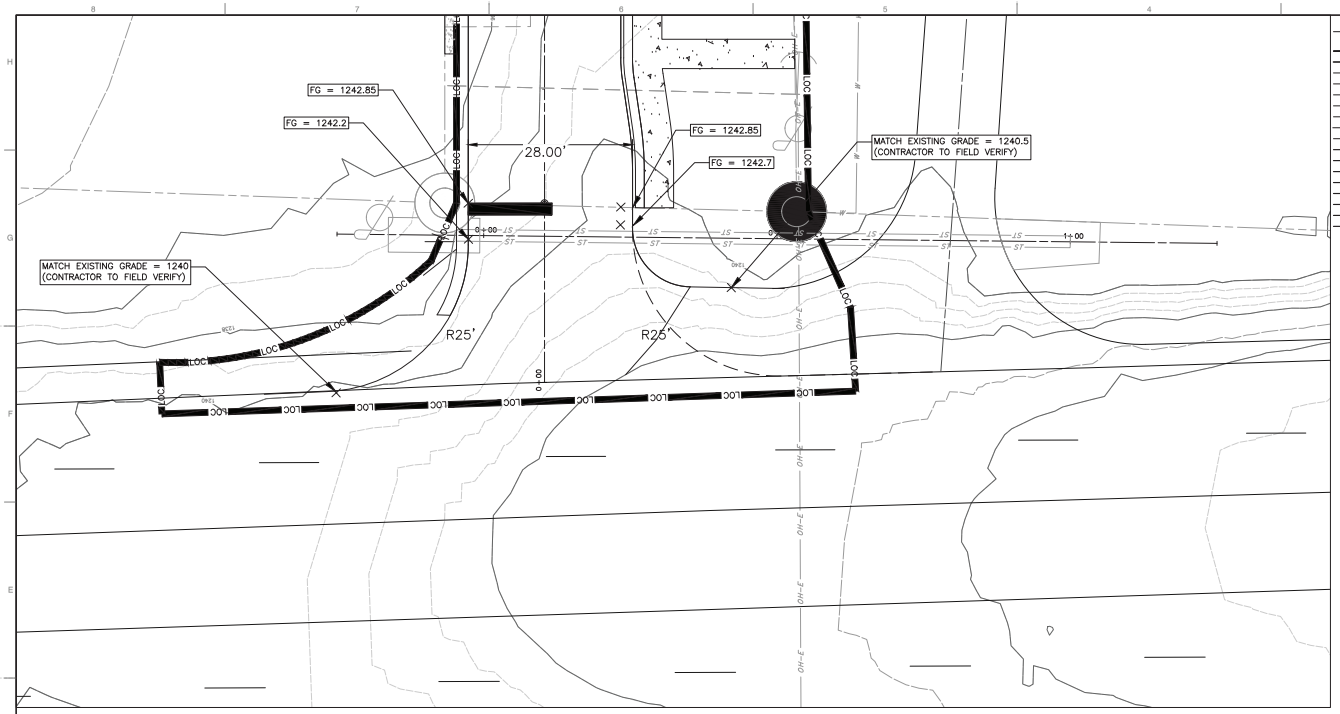
OVERALL GRADING AND DRAINAGE PLAN

DATE:	1/10/2024
DWG SCALE:	1" = 100'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 15
SHEET 15 OF 42

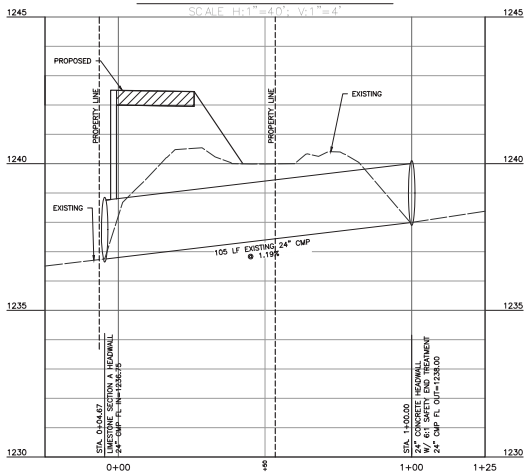
SD-2022-0025

P:\324-199\1-CAD\Civil\Exhibits\GRADING AND DRAINAGE PLAN 1/10/2024 - chrisw - LP 1/10/2024 10:38 AM



STORM LINE IN R.O.W. PROFILE

SCALE H1"=40', V1"=4'



LINETYPE LEGEND

PROPOSED	EXISTING		PROPOSED	EXISTING	
		RIGHT-OF-WAY	G	G	GAS LINE
		LOT BOUNDARY	OU	OU	OVERHEAD UTILITY
		EASEMENT	UG	UG	UNDERGROUND UTILITY
X	X	FENCE: BARBED	SAN	SAN	SANITARY SEWER LINE
		FENCE: WOOD (PICKET)	W	W	WATER LINE
		FENCE: WOOD (PRIVACY)	F	F	FIRE LINE
		FENCE: CHAIN LINK			ROAD CENTERLINE
		FENCE: IRON			CURB & GUTTER
385	385	MAJOR CONTOUR			STRIPING
		MINOR CONTOUR	FIRE		FIRE LANE STRIPING
E	E	ELECTRIC LINE			H.C. ACCESSIBLE ROUTE
OE	OE	OVERHEAD ELECTRIC WIRE	LOC		LIMITS OF CONSTRUCTION
UE	UE	UNDERGROUND ELECTRIC LINE			RAILROAD
T	T	TELEPHONE			FLOODWAY
C	C	COMMUNICATIONS LINE			CWQZ
TV	TV	CABLE TELEVISION	ST	ST	STORM SEWER
FO	FO	FIBER OPTIC LINE			DRAINAGE CHANNEL

BLOCK LEGEND

PROPOSED	EXISTING		PROPOSED	EXISTING	
	•	BENCHMARK			(MONITORING) WELL
		CUT IN CONCRETE			UTILITY RISER
		CONTROL POINT			HOSE BIB
		IRON PIPE			SANITARY M.H.
		IRON ROD			CLEANOUT
		IRON ROD W/ CAP			DRAINAGE M.H.
		MONUMENT TYPE 1			DOWN SPOUT
		MONUMENT TYPE 2			AREA INLET
		NAIL			CURB INLET
S	S	PIPE BREAK			HEADWALL
]	]	PIPE CAP			SAFETY END TREATMENT
›	›	PIPE FLOW			DRAINAGE FLOW
		REDUCER			ELEC. M.H.
		AIR RELEASE VALVE			ELEC./TELE. POLE
		BLOW-OFF VALVE			GUY WIRE
		POST INDICATOR VALVE			LIGHT FIXTURE
		MISCELLANEOUS VALVE			TRAFFIC SIGNAL
		UTILITY VALVE			PEDESTRIAN SIGNAL
		UTILITY METER			UTILITY (PULL)BOX
		BACKFLOW PREVENTER			UTILITY RISER
		FLUSH CONNECTION			UTILITY SERVICE
		FIRE HYDRANT			

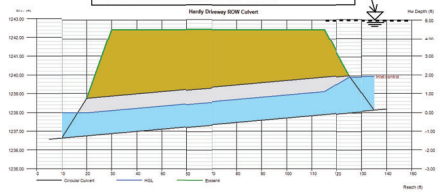
Culvert Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. — Monday, Jul 17 2023

Hardy Driveway ROW Culvert

Invert Elev Dn (ft)	= 1236.75	**Calculations**	
Pipe Length (ft)	= 105.00	Qmin (cfs)	= 11.70
Slope (%)	= 1.19	Qmax (cfs)	= 33.20
Invert Elev Up (ft)	= 1238.00	Tailwater Elev (ft)	= 0.00
Rise (in)	= 24.0		
Shape	= Circular	**Highlighted**	
Span (in)	= 24.0	Qtotal (cfs)	= 11.70
No. Barrels	= 1	Qpipe (cfs)	= 11.70
n-Value	= 0.024	Qovertop (cfs)	= 0.00
Culvert Type	= Circular Corrugate Metal Pipe	Veloc Dn (ft/s)	= 5.79
Culvert Entrance	= Mitered to slope (C)	Veloc Up (ft/s)	= 5.79
Coeff. K,M,c,Y,k	= 0.021, 1.33, 0.0463, 0.75, 0.7	HGL Dn (ft)	= 1237.98
		HGL Up (ft)	= 1239.23
Embankment		Hw Elev (ft)	= 1239.92
Top Elevation (ft)	= 1242.50	Hw/D (ft)	= 0.96
Top Width (ft)	= 85.00	Flow Regime	= Inlet Control
Crest Width (ft)	= 30.00		

MAX ALLOWABLE HEADWATER ELEVATION = 1242.9
(EDGE OF PAVEMENT/TOP OF WALL AT UPSTREAM INLET)
5-YR HEADWATER ELEVATION = 1239.6
100-YR HEADWATER ELEVATION = 1242.8



Hardy Driveway Hydraflow Results

Storm Event	Q Total (cfs)	Q Pipe (cfs)	Q Over (cfs)	Velocity Dn (ft/s)	Velocity Up (ft/s)	Depth Dn (in)	Depth Up (in)	HGL Dn (ft)	HGL Up (ft)	HGL Hw (ft)	HGL Hw/D
2-yr	8.4	8.4	0.0	5.1	5.1	12.4	12.4	1237.78	1239.03	1239.56	0.78
5-yr	11.7	11.7	0.0	5.8	5.8	14.7	14.7	1237.98	1239.23	1239.92	0.96
10-yr	15.0	15.0	0.0	6.4	4.8	16.7	24.0	1238.15	1240.35	1240.95	1.48
25-yr	21.0	21.0	0.0	7.6	6.7	19.7	24.0	1238.39	1241.68	1242.86	2.43
50-yr	26.4	20.5	5.9	7.5	6.5	19.5	24.0	1238.37	1241.55	1242.67	2.33
100-yr	33.2	20.8	12.5	7.6	6.6	19.6	24.0	1238.38	1241.62	1242.77	2.39

NORTH
SCALE IN FEET
0 10 20

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

811 — !!! CAUTION !!! IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES. !!! CAUTION !!!

REVISION RECORD

NO.	DATE	DESCRIPTION

CEP Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0996
www.cepinc.com

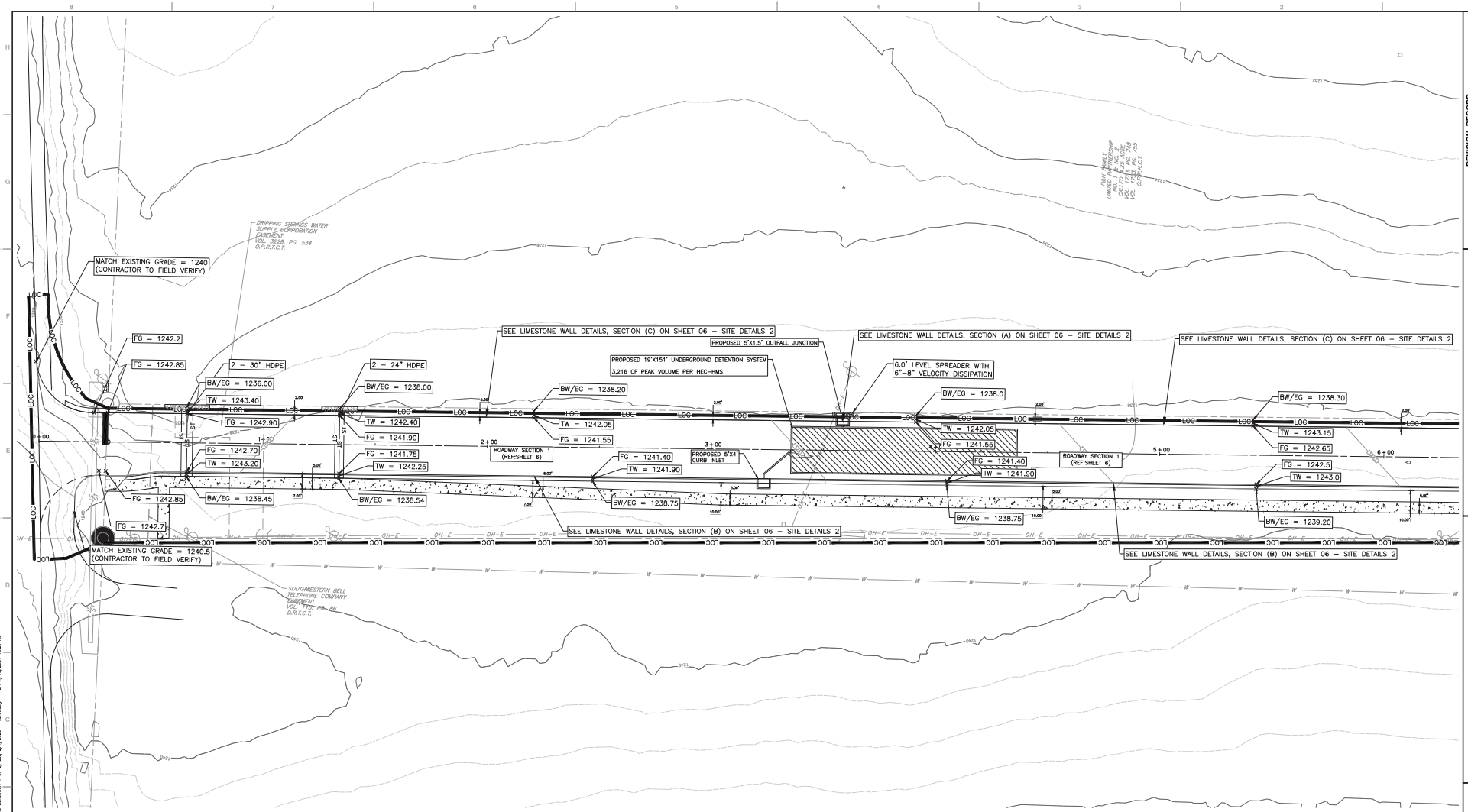
HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

TXDOT DRIVEWAY

DATE:	1/10/2024
DWG SCALE:	1"=20'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 16
SHEET 16 OF 42

SD-2022-0025



LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
□	□	FENCE: WOOD (PRIVACY)
○	○	FENCE: CHAIN LINK
I	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE

PROPOSED	EXISTING	
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	FIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
	FIRE	FIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		CWQZ
ST	ST	STORM SEWER
		DRAINAGE CHANNEL

BLOCK LEGEND

PROPOSED	EXISTING		PROPOSED	EXISTING	
	•	BENCHMARK		Ⓜ	(MONITORING) WELL
	●	CUT IN CONCRETE		⊙	UTILITY RISER
	△	CONTROL POINT		⊕	HOSE BIB
	Ⓘ	IRON PIPE		Ⓢ	SANITARY M.H.
	⬢	IRON ROD		Ⓒ	CLEANOUT
	○	IRON ROD W/ CAP		Ⓓ	DRAINAGE M.H.
	⊡	MONUMENT TYPE 1		⊓	DOWN SPOUT
	⊙	MONUMENT TYPE 2		▤	AREA INLET
	▲	NAIL		▥	CURB INLET
S	S	PIPE BREAK		▽	HEADWALL
]	]	PIPE CAP		⬭	SAFETY END TREATMENT
›	›	PIPE FLOW		⇒	DRAINAGE FLOW
◁	◁	REDUCER		Ⓔ	ELEC. M.H.
⊛	⊛	AIR RELEASE VALVE		Ⓔ	ELEC. /TELE. POLE
⊛	⊛	BLOW-OFF VALVE		←	GUY WIRE
⊛	⊛	POST INDICATOR VALVE		☼	LIGHT FIXTURE
⊛	⊛	MISCELLANEOUS VALVE		▲	TRAFFIC SIGNAL
⊛	⊘	UTILITY VALVE		▲	PEDESTRIAN SIGNAL
⊕	⊕	UTILITY METER		▣	UTILITY (PULL)BOX
⊠	⊠	BACKFLOW PREVENTER		△	UTILITY RISER
⊕	⊕	FLUSH CONNECTION		⊛	UTILITY SERVICE
⊕	⊕	FIRE HYDRANT			

NORTH

SCALE IN FEET
0 20 40

811

!!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

UNDERGROUND DETENTION 1 OF 2

DATE:	1/10/2024
DWG SCALE:	1" = 20'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 17

SHEET 17 OF 42

SD-2022-0025

SEE LIMESTONE WALL DETAILS, SECTION (A) ON SHEET 06 – SITE DETAILS 2
SEE LIMESTONE WALL DETAILS, SECTION (C) ON SHEET 06 – SITE DETAILS 2
SEE LIMESTONE WALL DETAILS, SECTION (B) ON SHEET 06 – SITE DETAILS 2
PROPOSED 5'X1.5' OUTFALL JUNCTION
PROPOSED 20'X70' UNDERGROUND DETENTION SYSTEM
2,202 CF PEAK VOLUME PER HEC–HMS
2.5' LEVEL SPREADER WITH 6'–8' VELOCITY DISSIPATION
PROPOSED 5'X4' CURB INLET
ROADWAY SECTION 1 (REFSHEET 6)
1 – 18" HDPE
BW/EG = 1238.20
TW = 1244.20
FG = 1243.70
TW = 1244.0
BW/EG = 1238.54
BW/EG = 1237.30
TW = 1243.20
FG = 1242.70
TW = 1243.0
BW/EG = 1238.9
FG = 1242.50
BW/EG = 1239.3
TW = 1243.20
FG = 1242.70
TW = 1243.0
FG = 1242.50
BW/EG = 1238.20
TW = 1243.20
FG = 1242.70
TW = 1243.0
FG = 1242.50
0+00
2+50
4+68
8+00
9+00
10+00
12+00
NORTH
SCALE IN FEET
0
20
40
LINETYPE LEGEND
PROPOSED
EXISTING
RIGHT-OF-WAY
LOT LINE/LOT LINE
EASEMENT
FENCE, BARBED
FENCE, WOOD (PICKET)
FENCE, WOOD (PRIVACY)
FENCE, CHAIN LINK
FENCE, IRON
MAJOR CONTOUR
MINOR CONTOUR
ELECTRIC LINE
OVERHEAD ELECTRIC WIRE
UNDERGROUND ELECTRIC LINE
TELEPHONE
COMMUNICATIONS LINE
CABLE TELEVISION
FIBER OPTIC LINE
BLOCK LEGEND
PROPOSED
EXISTING
GAS LINE
OVERHEAD UTILITY
UNDERGROUND UTILITY
SANITARY SEWER LINE
WATER LINE
FIRE LINE
IRRIGATION LINE
CURB & GUTTER
STRIPING
FIRE LANE STRIPING
HANDICAP SYMBOL
LIMITS OF CONSTRUCTION
RAILROAD
FLOODWAY
CWOZ
STORM SEWER
DRAINAGE CHANNEL
BENCHMARK
CONCRETE
CONTROL POINT
IRON PIPE
IRON ROD
IRON ROD W/ CAP
MONUMENT TYPE 1
MONUMENT TYPE 2
NAIL
PIPE BREAK
PIPE END
PIPE FLOW
REDUCER
AIR RELEASE VALVE
BLOW-OFF VALVE
FIRE DEPARTMENT
MISCELLANEOUS VALVE
UTILITY VALVE
UTILITY METER
BACKFLOW PREVENTER
FIRE PROTECTION
FIRE HYDRANT
MONITORING WELL
UTILITY RISER
HOSE BIB
SANITARY M.H.
CLEANOUT
DRAINAGE M.H.
DRAINAGE INLET
AREA INLET
CURB INLET
HEADWALL
SAFETY END TREATMENT
SAN. VALVE MANHOLE
ELEC. MANHOLE
ELEC. / TELE. POLE
GUY WIRE
LIGHT FIXTURE
TRAFFIC SIGNAL
PEDESTRIAN SIGNAL
UTILITY PULLBOX
UTILITY RISER
UTILITY SERVICE
811
III. CAUTION III.
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY, AND TO CONTACT BEFORE BEGINNING ANY WORK, THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
MICHAEL A. TREON
142972
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
REVISION RECORD
NO
DATE
DESCRIPTION
CIVIL & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
PH: 512.439.0400 · FAX: 512.329.0098
WWW.CIECIVIL.COM
HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX
UNDERGROUND DETENTION 2 OF 2
DATE: 1/10/2024
DRAWN BY: CEC
PROJECT NO.: 324-199
DWG SCALE: 1"=20'
CHECKED BY: CB
APPROVED BY: MT
DRAWING NO.: 18
SHEET 18 OF 42
SD-2022-0025
P:\324-199\324-199-CAD\dwg\324-199-CVD1-C200-UNDERGROUND DETENTION 2 OF 2.dwg(12/1/2023 - drewm) - LP: 1/10/2024 10:28 AM

UNDERGROUND DETENTION 1 - Detention Pond Values from HEC-HMS Hydrologic Modeling Software				
Storm Event	Q-Ex (cfs)	Q-Pr (cfs)	PR-Routed (cfs)	WS Elevation (ft)
2-yr	2.1	2.4	1.9	1238.5
10-yr	4.0	4.4	3.4	1238.9
25-yr	5.4	5.9	4.8	1239.2
100-yr	8.4	9.0	7.9	1239.6

HARDY DRIVEWAY Detention Pond Stage Values - UNDERGROUND DETENTION 1					
Stage	Area (sf)	Area (ac)	Volume (cf)	Cum. Volume (cf)	Ac-ft
1238.00	2000	0.045914	0 cf	0 cf	0.0000
1238.50	2000	0.045914	1,000	1,000	0.0230
1239.00	2000	0.045914	1,000	2,000	0.0459
1239.50	2000	0.045914	1,000	3,000	0.0689

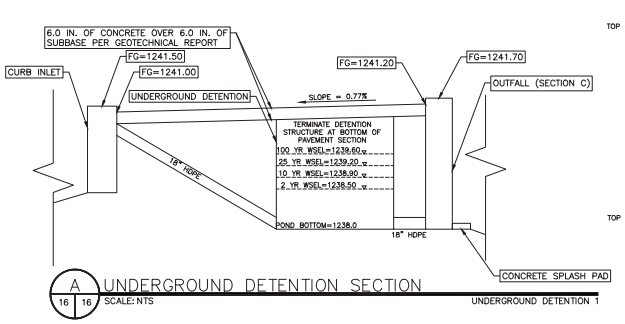
UNDERGROUND DETENTION 1 Outflow Velocity (Weir) [v=Q/A]			
Storm Event	*Q-Routed (cfs) [Q]	Area of Weir (ft^2) [A]	Weir Velocity (fps) [v]
2-yr	1.9	0.15	12.67
10-yr	3.4	0.2	22.67
25-yr	4.8	0.3	16.00
100-yr	7.9	0.9	8.78

UNDERGROUND DETENTION 1 Outflow Velocity (Orifice) [v=C_d(2gH)^(1/2)]			
Storm Event	Discharge	Head (ft) [H]	Orifice Velocity (fps)
2-yr	0.6	0.1	1.7
10-yr	0.6	0.5	3.5
25-yr	0.6	0.8	4.4
100-yr	0.6	1.2	5.3

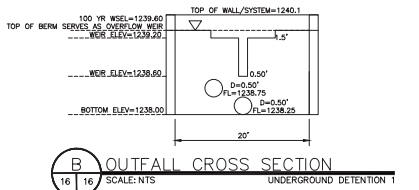
UNDERGROUND DETENTION 2 - Detention Pond Values from HEC-HMS Hydrologic Modeling Software				
Storm Event	Q-Ex (cfs)	Q-Pr (cfs)	PR-Routed (cfs)	WS Elevation (ft)
2-yr	1.7	2.0	1.7	1239.3
10-yr	3.3	3.7	3.3	1239.7
25-yr	4.5	4.9	4.4	1240.0
100-yr	6.9	7.4	6.8	1240.5

HARDY DRIVEWAY Detention Pond Stage Values - UNDERGROUND DETENTION 2					
Stage	Area (sf)	Area (ac)	Volume (cf)	Cum. Volume (cf)	Ac-ft
1238.50	1000	0.022957	0 cf	0 cf	0.0000
1239.00	1000	0.022957	500	500	0.0115
1239.50	1000	0.022957	500	1,000	0.0230
1240.00	1000	0.022957	500	1,500	0.0344

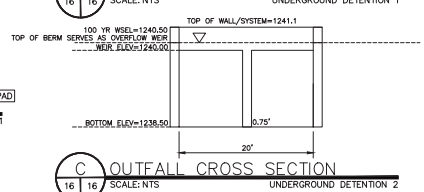
UNDERGROUND DETENTION 2 Outflow Velocity (Weir) [v=Q/A]			
Storm Event	*Q-Routed (cfs) [Q]	Area of Weir (ft^2) [A]	Weir Velocity (fps) [v]
2-yr	1.7	0.6	2.83
10-yr	3.3	0.9	3.67
25-yr	4.4	1.1	3.91
100-yr	6.8	1.5	4.53



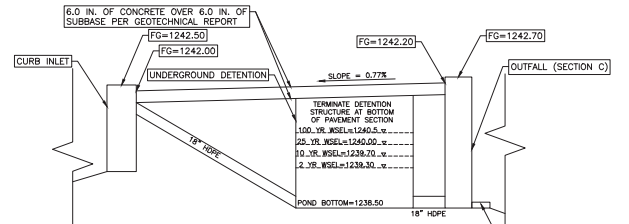
A UNDERGROUND DETENTION SECTION
16 16 SCALE: NTS UNDERGROUND DETENTION 1



B OUTFALL CROSS SECTION
16 16 SCALE: NTS UNDERGROUND DETENTION 1



C OUTFALL CROSS SECTION
16 16 SCALE: NTS UNDERGROUND DETENTION 2



D UNDERGROUND DETENTION SECTION
16 16 SCALE: NTS UNDERGROUND DETENTION 2

Time of Concentration (TR-55 method) - Proposed Site Conditions

Subbasin		BYP-1	PR-1	BYP-2	PR-2	BYP-3	PR-3	ROW CULVERT	BYP-4	BYP-5	BYP-6	BYP-7	UNDERGROUND DETENTION	UNDERGROUND DETENTION 2
Area	sf	502660	21528	465720	9583.2	1441935	64811	284447	309918	603517	397267	546242	36070	29014
	ac	11.54	0.49	10.69	0.22	33.10	1.49	6.53	6.91	13.85	9.12	12.54	0.83	0.67
	sq mi	0.0180304	0.00077221	0.0167054	0.00034375	0.0517232	0.00232477	0.01020313	0.01075595	0.02164819	0.01424999	0.01959374	0.00129383	0.00104077
Impervious	%	0.0%	57%	0%	50%	0.0%	48%	0%	0%	0%	0%	0%	46%	53%
Pervious	Cn	80	80	80	80	80	80	80	80	80	80	80	80	80
Composite	Cn	80	90	80	89	80	89	80	80	80	80	80	88	90
Sheet Flow														
Slope	in/in	0.0460	0.0200	0.0300	0.0220	0.0460	0.0200	0.0300	0.0420	0.0420	0.0260	0.0220	0.0050	0.0050
Length	ft	100	100	100	100	100	100	100	100	100	100	100	100	100
Roughness	n	0.24	0.011	0.24	0.011	0.24	0.011	0.24	0.24	0.24	0.24	0.24	0.011	0.011
Time	hr	0.15	0.02	0.18	0.02	0.15	0.02	0.16	0.16	0.16	0.19	0.20	0.03	0.03
Shallow Concentrated														
Slope	in/in	0.0430	0.0200	0.0430	0.0220	0.0430	0.0200	0.0430	0.0430	0.0430	0.0300	0.0220	0.0050	0.0050
Length	ft	1783	475	1914	90	1783	475	1617	1637	1722	1906	2050	541	487
Paved?	y/n	n	n	n	n	n	n	n	n	n	n	n	n	n
Time	hr	0.15	0.05	0.16	0.01	0.15	0.05	0.13	0.14	0.14	0.19	0.24	0.10	0.09
Summary														
Travel Time	hr	0.30	0.06	0.34	0.03	0.30	0.06	0.30	0.29	0.30	0.38	0.44	0.16	0.12
Tc	min	17.92	3.82	20.25	1.53	17.92	3.82	17.81	17.52	17.95	22.72	26.41	8.14	7.51
Lag Time	min	10.75	3.00	12.15	3.00	10.75	3.00	10.68	10.51	10.77	13.63	15.85	4.88	4.51
Proposed Run-off Values														
2 Year	cfs	15.00	1.60	13.90	0.60	43.00	4.60	8.50	26.90	18.00	11.80	16.30	1.90	1.1
10 Year	cfs	26.80	2.80	24.80	1.20	76.90	8.40	15.20	48.20	32.20	21.20	29.10	3.40	2.4
25 Year	cfs	38.30	3.80	35.50	1.60	109.90	11.20	21.70	68.90	46.00	30.30	41.60	4.80	3.4
100 Year	cfs	63.30	5.70	58.60	2.40	181.60	17.10	35.80	113.90	76.00	50.00	68.80	7.90	5.3

Time of Concentration (TR-55 method) - Existing Site Conditions

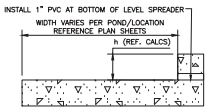
Subbasin		BYP-1	EX-1	BYP-2	EX-2	BYP-3	EX-3	ROW CULVERT	BYP-4	BYP-5	BYP-6	BYP-7	UNDERGROUND DETENTION	UNDERGROUND DETENTION 2
Area	sf	502660	21528	465720	9583.2	1441935	64811	284447	309918	603517	397267	546242	36070	29014
	ac	11.54	0.49	10.69	0.22	33.10	1.49	6.53	6.91	13.85	9.12	12.54	0.83	0.67
	sq mi	0.0180304	0.00077221	0.0167054	0.00034375	0.0517232	0.00232477	0.01020313	0.01075595	0.02164819	0.01424999	0.01959374	0.00129383	0.00104077
Impervious	%	0%	35%	0%	31%	0%	30%	0%	0%	0%	0%	0%	28%	32%
Pervious	Cn	80	80	80	80	80	80	80	80	80	80	80	80	80
Composite	Cn	80	86	80	86	80	85	80	80	80	80	80	85	86
Sheet Flow														
Slope	in/in	0.0460	0.0200	0.0300	0.0220	0.0460	0.0200	0.0300	0.0420	0.0420	0.0260	0.0220	0.0050	0.0050
Length	ft	100	100	100	100	100	100	100	100	100	100	100	100	100
Roughness	n	0.24	0.011	0.24	0.011	0.24	0.011	0.24	0.24	0.24	0.24	0.24	0.011	0.011
Time	hr	0.15	0.02	0.18	0.02	0.15	0.02	0.16	0.16	0.16	0.19	0.20	0.04	0.04
Shallow Concentrated														
Slope	in/in	0.0430	0.0200	0.0430	0.0220	0.0430	0.0200	0.0430	0.0430	0.0430	0.0300	0.0220	0.0050	0.0050
Length	ft	1783	475	1914	90	1783	475	1617	1637	1722	1906	2050	541	487
Paved?	y/n	n	n	n	n	n	n	n	n	n	n	n	n	n
Time	hr	0.15	0.05	0.16	0.01	0.15	0.05	0.13	0.14	0.14	0.19	0.24	0.13	0.12
Summary														
Travel Time	hr	0.30	0.06	0.34	0.03	0.30	0.06	0.30	0.29	0.30	0.38	0.44	0.17	0.16
Tc	min	17.92	3.82	20.25	1.53	17.92	3.82	17.81	17.52	17.95	22.72	26.41	10.38	9.58
Lag Time	min	10.75	3.00	12.15	3.00	10.75	3.00	10.68	10.51	10.77	13.63	15.85	6.23	5.75
Existing Run-off Values														
2 Year	cfs	15.00	1.40	13.90	0.60	43.00	4.10	8.50	9.00	18.00	11.80	16.30	1.70	1.70
10 Year	cfs	26.80	2.70	24.80	1.20	76.90	7.90	15.20	16.00	32.20	21.20	29.10	3.30	3.30
25 Year	cfs	38.30	3.60	35.50	1.60	109.90	10.70	21.70	22.90	46.00	30.30	41.60	4.40	4.40
100 Year	cfs	63.30	5.60	58.60	2.50	181.60	16.70	35.80	37.90	76.00	50.00	68.80	6.80	6.80

Underground Detention 1 Outflow Velocity (Level Spreader) [v=Q/A]					
Storm Event	*Q-Routed (cfs) [Q]	Length of Level Spreader (ft) [L]	Height of Level Spreader (ft) [h]	Area of Level Spreader (ft^2) [A=L*h]	Level Spreader Velocity (fps) [v]
2-yr	1.9	6.0	0.25	1.5	1.3
10-yr	3.4	6.0	0.25	1.5	2.3
25-yr	4.8	6.0	0.25	1.5	3.2
100-yr	7.9	6.0	0.25	1.5	5.3

SPLITTER BOX WEIR LENGTH CALC.

weir equation: $q = 3.33\ (b - 0.2\ h)\ h^{3/2}$

Q (100-yr storm) =	58.20 cfs
max Q over weir	58.75 cfs
b = length of weir	50.00 ft.
h = head abv. Weir	0.50 ft.



TYPICAL LEVEL SPREADER DETAIL

Underground Detention 2 Outflow Velocity (Level Spreader) [v=Q/A]					
Storm Event	*Q-Routed (cfs) [Q]	Length of Level Spreader (ft) [L]	Height of Level Spreader (ft) [h]	Area of Level Spreader (ft^2) [A=L*h]	Level Spreader Velocity (fps) [v]
2-yr	1.7	2.5	0.50	1.25	1.4
10-yr	3.3	2.5	0.50	1.25	2.6
25-yr	4.4	2.5	0.50	1.25	3.5
100-yr	6.8	2.5	0.50	1.25	5.4

SPLITTER BOX WEIR LENGTH CALC.

weir equation: $q = 3.33\ (b - 0.2\ h)\ h^{3/2}$

Q (100-yr storm) =	82.90 cfs
max Q over weir	86.06 cfs
b = length of weir	12.00 ft.
h = head abv. Weir	1.70 ft.

811 !!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

UNDERGROUND DETENTION CALCS

DATE:	1/10/2024
DWG SCALE:	NTS
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 19
SHEET 19 OF 42

SD-2022-0025

GRADING AND DRAINAGE 1
HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX
CEDE & Environmental Consultants, Inc.
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.CEDRC.COM
REVISION RECORD
NO | DATE | DESCRIPTION
DRAWING NO. 20 SHEET 20 OF 42
SD-2022-0025
DATE: 1/10/2024 | DRAWN BY: CEC
PROJECT NO.: 324-199
DWG SCALE: 1"=20' | CHECKED BY: CB
APPROVED BY: MT
LINETYPE LEGEND
BLOCK LEGEND
NORTH
SCALE IN FEET
811
3094.64'
5294'
3437'
7407'
343'
BEGIN WALL
PEDESTRIAN HANDRAIL
EXTENDED DETENTION, SEE SHEET 20
EXTENDED DETENTION STAGE 1: LOW-FLOW CHANNEL OPENING
EXTENDED DETENTION STAGE 2 AND DETENTION POND
SPLITTER BOX, SEE RETAINING WALL DETAIL ON SHEET 26
25.0' LEVEL SPREADER WITH 6"-8" VELOCITY DISSIPATION SEE DETAIL ON SHEET 21
PERFORATED PVC UNDERDRAIN
ROADWAY SECTION 2 (REF-SHEET 6)
SEE LIMESTONE WALL DETAILS, SECTION (A) ON SHEET 06 – SITE DETAILS 2
SEE LIMESTONE WALL DETAILS, SECTION (C) ON SHEET 06 – SITE DETAILS 2
4 – 24" HDPE
2 – 18" HDPE
BW/FL = 1228.70
TW = 1234.25
FG = 1233.75
TW = 1233.25
FG = 1233.25
TW = 1233.15
BW/FL = 1228.90
TW = 1231.00
BW/FG = 1232.30
BW/FG = 1231.70
BW/FG = 1234.40
TW = 1240.50
FG = 1240.00
TW = 1239.90
FG = 1239.50
TW = 1237.50
FG = 1237.00
TW = 1236.90
FG = 1236.50
BW/FG = 1235.30
BW/FL = 1236.25
TW = 1244.20
FG = 1243.70
TW = 1244.00
FG = 1243.50
TW = 1231.00
BW/FL = 1228.90
NO VOL Eq. = 1224.00
100-YR WSEL = 1231.4
1 IS CAUTION !!!
THE CONTRACTORS RESPONSIBILITY TO VERIFY, LOCATE AND PROTECT ALL UTILITIES (BOTH SHOWN AND NOT SHOWN) PRIOR TO CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
MICHAEL A. TREVIÑO
142972
LICENSED PROFESSIONAL ENGINEER
1/10/2024
P:\320-000\324-199\-CAD\Dwg\320-324199-C201-GRADING AND DRAINAGE 1.dgn 1/10/2024 10:29 AM

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Hardy Driveway
Date Prepared: 7/13/2022

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 — Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Hays	
Total project area included in plan * =	3.71	acres
Predevelopment impervious area within the limits of the plan * =	1.14	acres
Total post-development impervious area within the limits of the plan* =	1.850	acres
Total post-development impervious cover fraction * =	0.50	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	837	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 4

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 1

Total drainage basin/outfall area =	0.51	acres
Predevelopment impervious area within drainage basin/outfall area =	0.18	acres
Post-development impervious area within drainage basin/outfall area =	0.290	acres
Post-development impervious fraction within drainage basin/outfall area =	0.57	
$L_{M\ THIS\ BASIN}$ =	99	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention
Removal efficiency = 75 percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_C x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	0.51	acres
A_I =	0.290	acres
A_P =	0.22	acres
L_R =	251	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 251 lbs.

F = 1.00

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	4.00	inches
Post Development Runoff Coefficient =	0.40	
On-site Water Quality Volume =	2952	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site Impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	590	
Total Capture Volume (required water quality volume(s) x 1.20) =	3543	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

8. Extended Detention Basin System Designed as Required in RG-348 — Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = 3543 cubic feet

EXTENDED DETENTION CALCULATIONS FOR DEVELOPMENT PERMIT

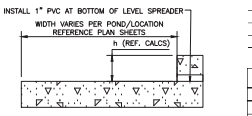
DRAINAGE AREA DATA:
Drainage Area to Control (DA) 0.51 ac.
Drainage Area Impervious Cover 0.93% %

WATER QUALITY CONTROL CALCULAIIONS (PER TCEQ RG-348):	REQUIRED	PROVIDED
Water Quality Volume (REQ WQV = 1.2*WQV PER TCEQ)	148 cf	150.5 cf
100-year Peak Flow Rate to Control (QIOO)	5.5 cfs	
Forbay Area (Af)		10.0 sf
Depth of forebay (D)	Min 2 ft Max 5 ft	2.0 ft
Forebay Water Quality Volume (WQVponded=Af*D)		20.0 cf
Stage 2 Water Quality Volume		130.5 cf
Water Quality Elevation (WQE)		1229.5 ft msl.
Extended Detention Drawdown Time	Min 48 hr	48 hr
Underdrain Oriface Size (Diameter)		0.1 in
Underdrain Oriface Size (Area)		0.0137 sq-in

Oriface Calculation:
Q = V / T
WQV 148.0 cf
Time = 48 Hr x 60 Min x 60 Sec = 172800 Sec
Q 0.000856 cfs
Assumption: Average Head Will Occour .5 Feet Below WQE
WQE 1229 ft msl.
Oriface E 1224.989 ft msl.
H average 3.511 ft
Q = 0.6 * A * (2 * 32.2 * (H))^0.5
A 9.49E-05 sqft
D 0.010994 ft
D 0.131929 in

Pond 1 - Detention Pond Values from HEC-HMS Hydrologic Modeling Software

Storm Event	Q-Ex (cfs)	Q-Pr (cfs)	PR-Routed (cfs)	WS Elevation (ft)
2-yr	1.4	1.6	1.1	1230.8
10-yr	2.7	2.8	2.6	1231.1
25-yr	3.6	3.8	3.4	1231.2
100-yr	5.6	5.7	5.3	1231.4



TYPICAL LEVEL SPREADER DETAIL

Pond 1 Outflow Velocity (Weir) [v=Q/A]

Storm Event	*Q-Routed (cfs) [Q]	Area of Weir (ft^2) [A]	Weir Velocity (fps) [v]
2-yr	1.1	2.1	0.523809524
10-yr	2.6	4.9	0.53
25-yr	3.4	6.0	0.57
100-yr	5.3	7.5	0.71

Pond 1 Outflow Velocity (Orifice) [$v=C_d(2gH)^{(1/2)}$]

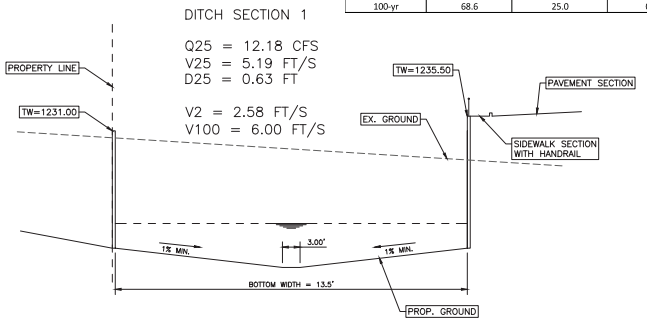
Storm Event	Discharge	Head (ft) [H]	Orifice Velocity (fps)
2-yr	0.6	1.2	5.2
10-yr	0.6	1.3	5.6
25-yr	0.6	1.5	5.8
100-yr	0.6	1.7	6.2

HARDY DRIVEWAY Detention Pond Stage Values - BMP 1

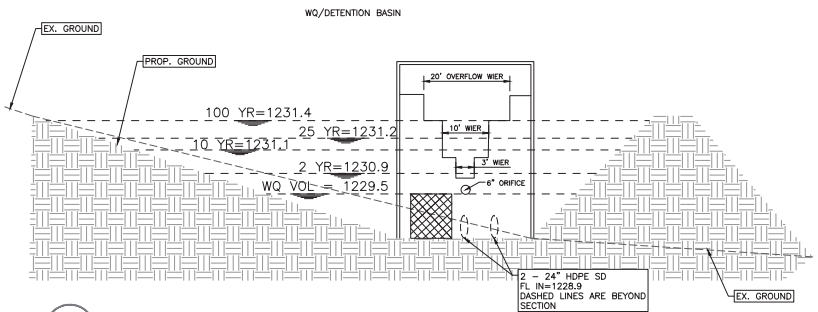
Stage	Area (sf)	Area (ac)	Volume (cf)	Cum. Volume (cf)	Ac-ft
1229.75	0	0.000000	0 cf	0 cf	0.0000
1230.00	353	0.008104	44	44	0.0010
1231.00	1,559	0.035790	956	1,000	0.0230
1232.00	2,253	0.051722	1,906	2,906	0.0667
1233.00	2,732	0.062718	2,493	5,399	0.1239
1234.00	3,180	0.073003	2,956	8,355	0.1918

Pond 1 Outflow Velocity (Level Spreader) [v=Q/A]

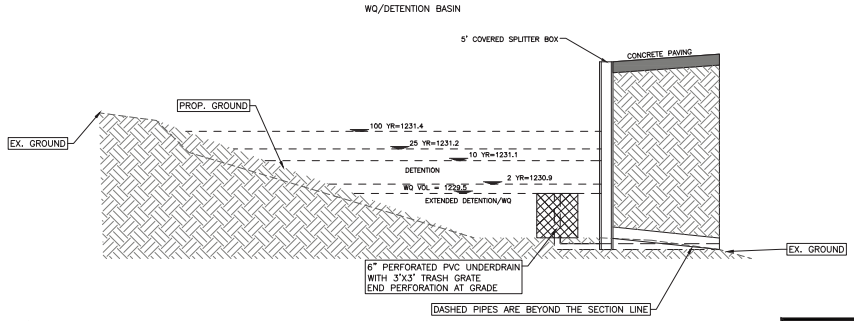
Storm Event	*Q-Routed (cfs) [Q]	Length of Level Spreader (ft) [L]	Height of Level Spreader (ft) [h]	Area of Level Spreader (ft^2) [A=L*h]	Level Spreader Velocity (fps) [v]
2-yr	16.1	25.0	0.50	12.5	1.3
10-yr	29.4	25.0	0.50	12.5	2.4
25-yr	41.7	25.0	0.50	12.5	3.3
100-yr	68.6	25.0	0.50	12.5	5.5



1 / 19 19 POND CROSS SECTION C
SCALE: NTS
BMP 1



1 / 19 19 POND CROSS SECTION B
SCALE: NTS
BMP 1



1 / 19 19 POND CROSS SECTION A
SCALE: NTS
BMP 1

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

811 !!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 300 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

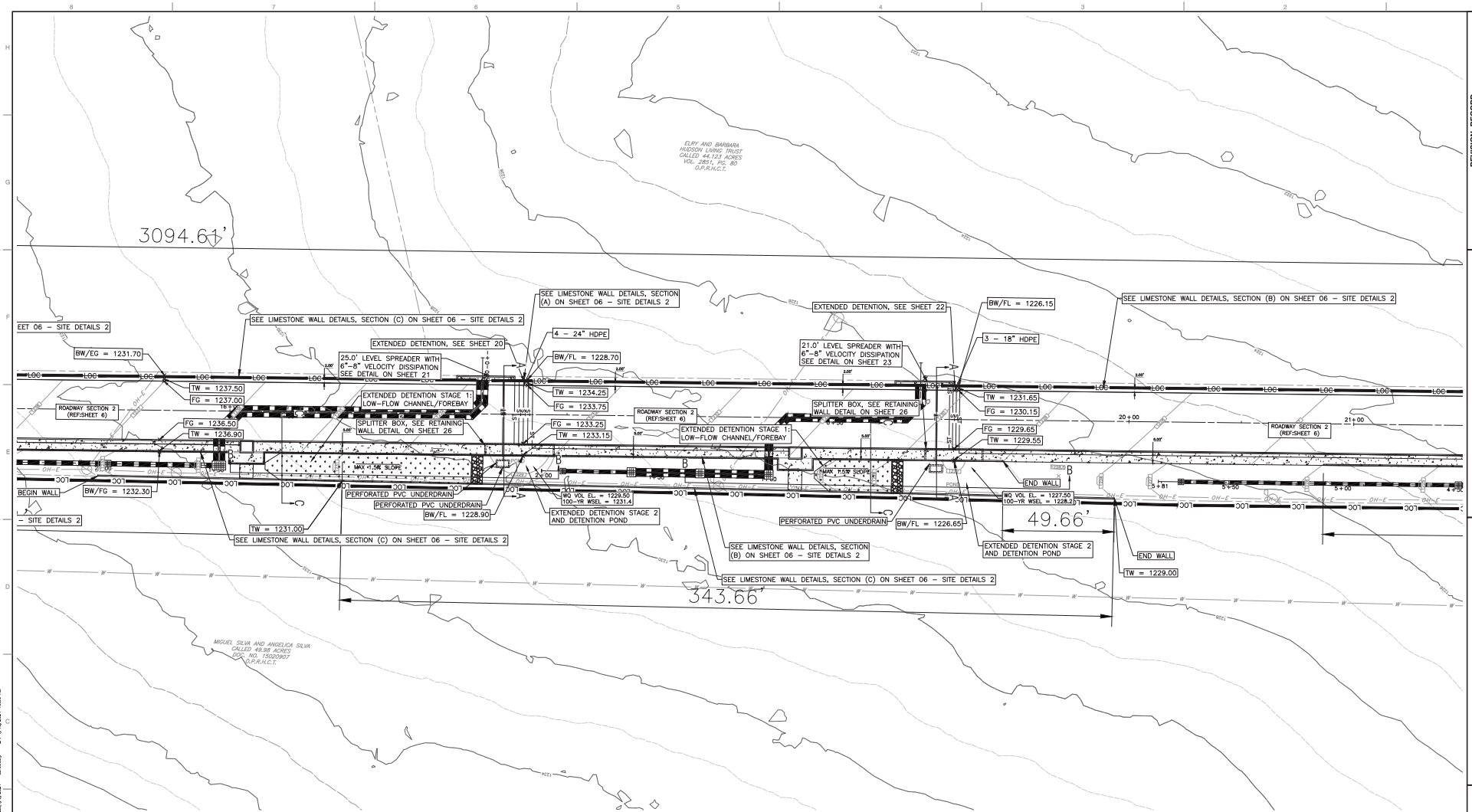
GRADING AND DRAINAGE 1 CALCS

DATE:	1/10/2024
DWG SCALE:	NTS
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 21
SHEET 21 OF 42

SD-2022-0025

P:\324-0001\324-1991-2401\dwg\civil\324-1991-C101-C105-SWPPP&POND&WQ AND DRAINAGE 1 CALCS.dwg 1/10/2024 10:59 AM - LPI



LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
□	□	FENCE: WOOD (PRIVACY)
○	○	FENCE: CHAIN LINK
	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE

PROPOSED	EXISTING	
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	FIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
FIRE		FIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		CWQZ
ST	ST	STORM SEWER
		DRAINAGE CHANNEL

BLOCK LEGEND

PROPOSED	EXISTING	
	•	BENCHMARK
	●	CUT IN CONCRETE
	△	CONTROL POINT
	⊙	IRON PIPE
	●	IRON ROD
	○	IRON ROD W/ CAP
	□	MONUMENT TYPE 1
	⊙	MONUMENT TYPE 2
	▲	NAIL
S	S	PIPE BREAK
]	]	PIPE CAP
>	>	PIPE FLOW
◁	◁	REDUCER
⊗	⊗	AIR RELEASE VALVE
⊗	⊗	BLOW-OFF VALVE
⊗	⊗	POST INDICATOR VALVE
⊗	⊗	MISCELLANEOUS VALVE
⊗	⊘	UTILITY VALVE
⊞	⊞	UTILITY METER
⋈	⋈	BACKFLOW PREVENTER
⊕	⊕	FLUSH CONNECTION
⊕	⊕	FIRE HYDRANT

PROPOSED	EXISTING	
	(M)	(MONITORING) WELL
	⊙	UTILITY RISER
	⊙	HOSE BIB
	S	SANITARY M.H.
	⊙	CLEANOUT
	D	DRAINAGE M.H.
	⊟	DOWN SPOUT
	▤	AREA INLET
	▤	CURB INLET
		HEADWALL
		SAFETY END TREATMENT
		DRAINAGE FLOW
	E	ELEC. M.H.
		ELEC. /TELE. POLE
	←	GUY WIRE
	☼	LIGHT FIXTURE
	⊟	TRAFFIC SIGNAL
	⊟	PEDESTRIAN SIGNAL
	⊠	UTILITY (PULL)BOX
	△	UTILITY RISER
	⊗	UTILITY SERVICE

NORTH
SCALE IN FEET
0 20 40

811 !!! CAUTION !!! IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES. !!! CAUTION !!!

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

GRADING AND DRAINAGE 2

DATE:	1/10/2024
DWG SCALE:	1" = 20'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 22
SHEET 22 OF 42

SD-2022-0025

P:\324-0001\324-1991-2400\dwg\civil\324199-C201-C205-SWPPP&GRADING AND DRAINAGE 2.dwg 1/10/2024 10:30 AM - steveanz - LY: 1/10/2024 10:30 AM

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Hardy Driveway
Date Prepared: 7/13/2022

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Hays	
Total project area included in plan * =	3.71	acres
Predevelopment impervious area within the limits of the plan * =	1.14	acres
Total post-development impervious area within the limits of the plan* =	1.850	acres
Total post-development impervious cover fraction * =	0.50	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	637	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area = 4

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. = 2

Total drainage basin/outfall area =	0.22	acres
Predevelopment impervious area within drainage basin/outfall area =	0.07	acres
Post-development impervious area within drainage basin/outfall area =	0.110	acres
Post-development impervious fraction within drainage basin/outfall area =	0.50	
$L_{M\ THIS\ BASIN}$ =	36	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP = Extended Detention
Removal efficiency = 75 percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_I x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	0.22	acres
A_I =	0.110	acres
A_P =	0.11	acres
L_R =	96	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ = 96 lbs.

F = 1.00

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 Pages 3-34 to 3-36

Rainfall Depth =	4.00	inches
Post Development Runoff Coefficient =	0.36	
On-site Water Quality Volume =	1142	cubic feet

Calculations from RG-348 Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	228	
Total Capture Volume (required water quality volume(s) x 1.20) =	1370	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

8. Extended Detention Basin System Designed as Required in RG-348 Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin = 1370 cubic feet

EXTENDED DETENTION CALCULATIONS FOR DEVELOPMENT PERMIT

DRAINAGE AREA DATA:

Drainage Area to Control (DA)	0.22 ac.
Drainage Area Impervious Cover	50.00% %

WATER QUALITY CONTROL CALCULAIIONS (PER TCEQ RG-348):	REQUIRED	PROVIDED
Water Quality Volume (REQ WQV = 1.2*WQV PER TCEQ)	1,370 cf	1,435.5 cf
100-year Peak Flow Rate to Control (QIOO)	2.2 cfs	
Forbay Area (Af)		577.0 sf
Depth of forebay (D)	Min 2 ft Max 5 ft	2.0 ft
Forebay Water Quality Volume (WQVponded=Af*D)		1,154.0 cf
Stage 2 Water Quality Volume		281.5 cf
Water Quality Elevation (WQE)		1227.5 ft msl.
Extended Detention Drawdown Time	Min 48 hr	48 hr
Underdrain Oriface Size (Diameter)		0.4 in
Underdrain Oriface Size (Area)		0.1261 sq-in

Oriface Calculation:

Q = V / T

WQV 1,370.0 cf

Time = 48 Hr x 60 Min x 60 Sec = 172800 Sec

Q 0.007928 cfs

Assumption: Average Head Will Occour .5 Feet Below WQE

WQE 1227.75 ft msl.

Oriface E 1223.717 ft msl.

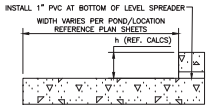
H average 3.533 ft

Q = 0.6 * A * (2 * 32.2 * (H))^0.5

A 0.000876 sqft

D 0.033397 ft

D 0.400767 in



TYPICAL LEVEL SPREADER DETAIL

Pond 2 - Detention Pond Values from HEC-HMS Hydrologic Modeling Software

Storm Event	Q-Ex (cfs)	Q-Pr (cfs)	PR-Routed (cfs)	WS Elevation (ft)
2-yr	0.6	0.7	0.6	1228.0
10-yr	1.2	1.2	1.2	1228.1
25-yr	1.6	1.7	1.6	1228.1
100-yr	2.5	2.5	2.4	1228.2

Pond 2 Outflow Velocity (Weir) [v=Q/A]

Storm Event	*Q-Routed (cfs) [Q]	Area of Weir (ft^2) [A]	Weir Velocity (fps) [v]
2-yr	0.6	0.5	1.2
10-yr	1.2	0.7	1.78
25-yr	1.6	0.7	2.37
100-yr	2.4	1.2	1.96

Pond 2 Outflow Velocity (Orifice) [v=C_d(2gH)^(1/2)]

Storm Event	Discharge	Head (ft) [H]	Orifice Velocity (fps)
2-yr	0.6	0.3	2.4
10-yr	0.6	0.3	2.8
25-yr	0.6	0.3	2.8
100-yr	0.6	0.5	3.2

HARDY DRIVEWAY Detention Pond Stage Values - BMP 2

Stage	Area (sf)	Area (ac)	Volume (cf)	Cum. Volume (cf)	Ac-ft
1227.75	0	0.000000	0 cf	0 cf	0.0000
1228.00	1,381	0.031703	173	173	0.0040
1229.00	1,609	0.036938	1,495	1,668	0.0383
1230.00	2,155	0.049472	1,882	3,550	0.0815
1231.00	2,443	0.056084	2,299	5,849	0.1343

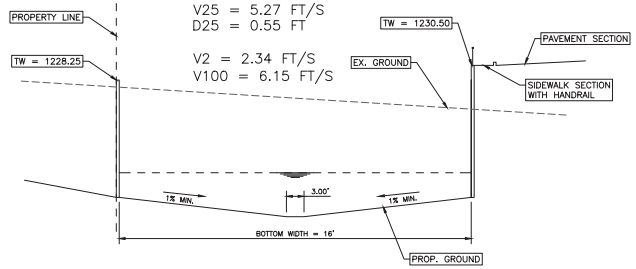
Pond 2 Outflow Velocity (Level Spreader) [v=Q/A]

Storm Event	*Q-Routed (cfs) [Q]	Length of Level Spreader (ft) [L]	Height of Level Spreader (ft) [h]	Area of Level Spreader (ft^2) [A=L*h]	Level Spreader Velocity (fps) [v]
2-yr	14.5	21.0	0.50	10.5	1.4
10-yr	26.0	21.0	0.50	10.5	2.5
25-yr	37.1	21.0	0.50	10.5	3.5
100-yr	61.0	21.0	0.50	10.5	5.8

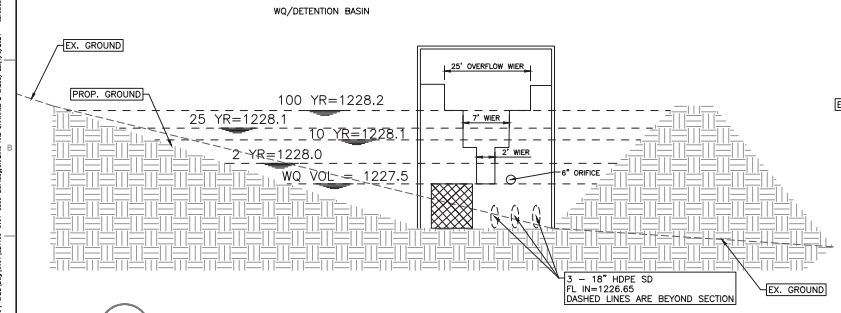
DITCH SECTION 2

Q25 = 13.64 CFS
V25 = 5.27 FT/S
D25 = 0.55 FT

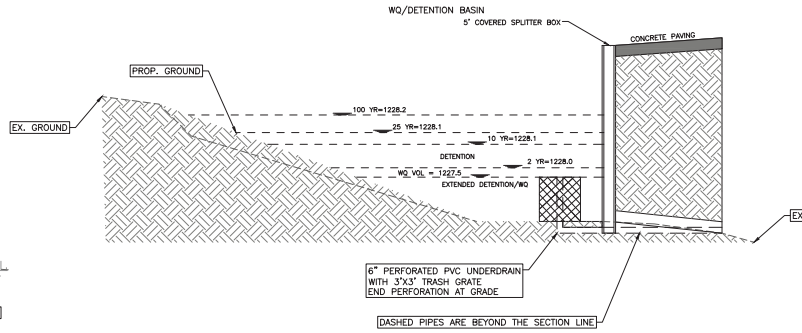
V2 = 2.34 FT/S
V100 = 6.15 FT/S



2 / 21 / 21 POND CROSS SECTION C
SCALE: NTS
BMP 2



2 / 21 / 21 POND CROSS SECTION B
SCALE: NTS
BMP 2



2 / 21 / 21 POND CROSS SECTION A
SCALE: NTS
BMP 2

NORTH
SCALE IN FEET
0 10 20

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

811 III CAUTION III III CAUTION III
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

REVISION RECORD

NO.	DESCRIPTION	DATE

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

GRADING AND DRAINAGE 2 CALCS

DATE:	1/10/2024
DWG SCALE:	1" = 10'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 23
SHEET 23 OF 42

SD-2022-0025

P:\324-0001\324-1991-2400\dwg\civil\324-1991-C400-BMP-Map(GRADING AND DRAINAGE 2 CALCS).dwg(1/10/2024 - dtheone) - LP: 1/10/2024 10:58 AM

GRADING AND DRAINAGE 3
DRAWING NO. 24
SHEET 24 OF 42
DATE: 1/10/2024
DRAWN BY: CEC
DWG SCALE: 1"=40'
CHECKED BY: CB
PROJECT NO.: 324-199
APPROVED BY: MT
HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX
CIVIL & Environmental Consultants, Inc.
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
PH: 512.439.0400 · FAX: 512.328.0096
WWW.CEICINC.COM
REVISION RECORD
NO DATE DESCRIPTION
811 III CAUTION III
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL UTILITY LOCATIONS BOTH HORIZONTALLY AND VERTICALLY PRIOR TO CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
NORTH
SCALE IN FEET
0 40 80
LINETYPE LEGEND
BLOCK LEGEND
SD-2022-0025

Texas Commission on Environmental Quality

TSS Removal Calculations 04-20-2009

Project Name: Hardy Driveway
Date Prepared: 7/13/2022

Additional information is provided for cells with a red triangle in the upper right corner. Place the cursor over the cell.
Text shown in blue indicate location of instructions in the Technical Guidance Manual - RG-348.
Characters shown in red are data entry fields.
Characters shown in black (Bold) are calculated fields. Changes to these fields will remove the equations used in the spreadsheet.

1. The Required Load Reduction for the total project: Calculations from RG-348 — Pages 3-27 to 3-30

Page 3-29 Equation 3.3: $L_M = 27.2(A_N \times P)$

where:
$L_{M\ TOTAL\ PROJECT}$ = Required TSS removal resulting from the proposed development = 80% of increased load
A_N = Net increase in impervious area for the project
P = Average annual precipitation, inches

Site Data: Determine Required Load Removal Based on the Entire Project

County =	Hays	
Total project area included in plan * =	3.71	acres
Predevelopment impervious area within the limits of the plan * =	1.14	acres
Total post-development impervious area within the limits of the plan* =	1.890	acres
Total post-development impervious cover fraction * =	0.50	
P =	33	inches
$L_{M\ TOTAL\ PROJECT}$ =	637	lbs.

* The values entered in these fields should be for the total project area.

Number of drainage basins / outfalls areas leaving the plan area =	4	

2. Drainage Basin Parameters (This information should be provided for each basin):

Drainage Basin/Outfall Area No. =	3	
Total drainage basin/outfall area =	1.49	acres
Predevelopment impervious area within drainage basin/outfall area =	0.44	acres
Post-development impervious area within drainage basin/outfall area =	0.720	acres
Post-development impervious fraction within drainage basin/outfall area =	0.48	
$L_{M\ THIS\ BASIN}$ =	251	lbs.

3. Indicate the proposed BMP Code for this basin.

Proposed BMP =	Extended Detention	
Removal efficiency =	75	percent

4. Calculate Maximum TSS Load Removed (L_R) for this Drainage Basin by the selected BMP Type.

RG-348 Page 3-33 Equation 3.7: L_R = (BMP efficiency) x P x (A_C x 34.6 + A_P x 0.54)

where:
A_C = Total On-Site drainage area in the BMP catchment area
A_I = Impervious area proposed in the BMP catchment area
A_P = Pervious area remaining in the BMP catchment area
L_R = TSS Load removed from this catchment area by the proposed BMP

A_C =	1.49	acres
A_I =	0.720	acres
A_P =	0.77	acres
L_R =	627	lbs

5. Calculate Fraction of Annual Runoff to Treat the drainage basin / outfall area

Desired $L_{M\ THIS\ BASIN}$ =	290	lbs.
F =	0.46	

6. Calculate Capture Volume required by the BMP Type for this drainage basin / outfall area. Calculations from RG-348 — Pages 3-34 to 3-36

Rainfall Depth =	0.37	inches
Post Development Runoff Coefficient =	0.35	
On-site Water Quality Volume =	697	cubic feet

Calculations from RG-348 — Pages 3-36 to 3-37

Off-site area draining to BMP =	0.00	acres
Off-site impervious cover draining to BMP =	0.00	acres
Impervious fraction of off-site area =	0	
Off-site Runoff Coefficient =	0.00	
Off-site Water Quality Volume =	0	cubic feet
Storage for Sediment =	139	
Total Capture Volume (required water quality volume(s) x 1.20) =	837	cubic feet

The following sections are used to calculate the required water quality volume(s) for the selected BMP.
The values for BMP Types not selected in cell C45 will show NA.

8. Extended Detention Basin System Designed as Required in RG-348 — Pages 3-46 to 3-51

Required Water Quality Volume for extended detention basin =	837	cubic feet

EXTENDED DETENTION CALCULATIONS FOR DEVELOPMENT PERMIT

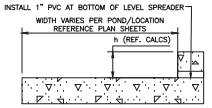
DRAINAGE AREA DATA:
Drainage Area to Control (DA) 1.49 ac.
Drainage Area Impervious Cover 48.00% %

WATER QUALITY CONTROL CALCULAIIONS (PER TCEQ RG-348):	REQUIRED	PROVIDED
Water Quality Volume (REQ WQV = 1.2*WQV PER TCEQ)	837 cf	904.0 cf
100-year Peak Flow Rate to Control (QIOO)	14.8 cfs	
Forbay Area (Af)		400.0 sf
Depth of forebay (D)	Min 2 ft Max 5 ft	2.0 ft
Forebay Water Quality Volume (WQVponded=Af*D)		800.0 cf
Stage 2 Water Quality Volume		104.0 cf
Water Quality Elevation (WQE)		1215 ft msl.
Extended Detention Drawdown Time	Min 48 hr	48 hr
Underdrain Orifice Size (Diameter)		0.3 in
Underdrain Orifice Size (Area)		0.0771 sq-in

Oriface Calculation:
Q = V / T
WQV 837.0 cf
Time = 48 Hr x 60 Min x 60 Sec = 172800 Sec
Q 0.004844 cfs
Assumption: Average Head Will Occour .5 Feet Below WQE
WQE 1215.75 ft msl.
Oriface E 1211.724 ft msl.
H average 3.526 ft
Q = 0.6 * A * (2 * 32.2 * (H))^0.5
A 0.000536 sqft
D 0.026117 ft
D 0.313408 in

Pond 3 - Detention Pond Values from HEC-HMS Hydrologic Modeling Software

Storm Event	Q-Ex (cfs)	Q-Pr (cfs)	PR-Routed (cfs)	WS Elevation (ft)
2-yr	4.5	4.4	4.4	1216.7
10-yr	8.3	7.9	7.9	1217.1
25-yr	11.1	10.6	10.6	1217.2
100-yr	16.9	16.5	16.5	1217.4



TYPICAL LEVEL SPREADER DETAIL

Pond 3 Outflow Velocity (Weir) [v=Q/A]

Storm Event	*Q-Routed (cfs) [Q]	Area of Weir (ft^2) [A]	Weir Velocity (fps) [v]
2-yr	4.4	1.9	2.315789474
10-yr	7.9	4.9	1.61
25-yr	10.6	6.0	1.77
100-yr	16.5	7.5	2.20

Pond 3 Outflow Velocity (Orifice) [v=C_d(2gH)^(1/2)]

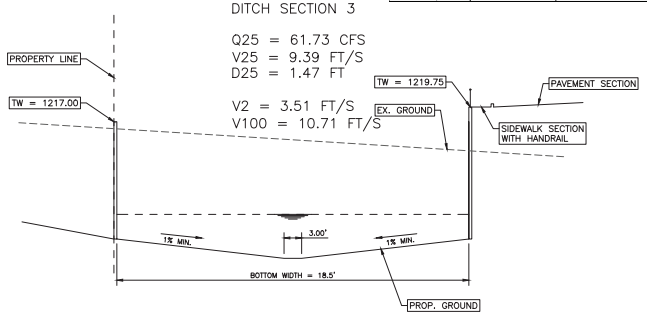
Storm Event	Discharge	Head (ft) [H]	Orifice Velocity (fps)
2-yr	0.6	1.0	4.7
10-yr	0.6	1.3	5.6
25-yr	0.6	1.5	5.8
100-yr	0.6	1.7	6.2

HARDY DRIVEWAY Detention Pond Stage Values - BMP 3

Stage	Area (sf)	Area (ac)	Volume (cf)	Cum. Volume (cf)	Ac-ft
1215.75	0	0.000000	0 cf	0 cf	0.0000
1216.00	850	0.019513	106	106	0.0024
1217.00	3,000	0.068871	1,925	2,031	0.0466
1218.00	4,467	0.102548	3,734	5,765	0.1323
1219.00	5,735	0.131657	5,101	10,866	0.2494
1220.00	6,597	0.151446	6,166	17,032	0.3910

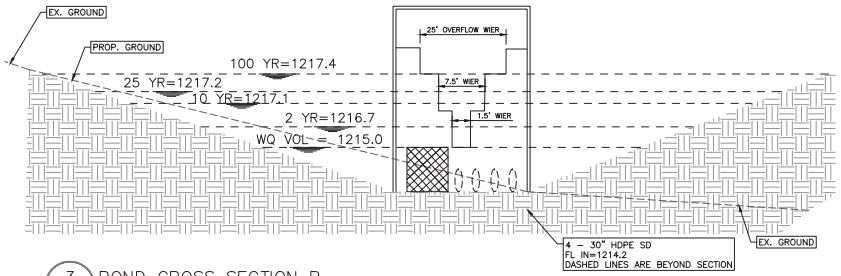
Pond 3 Outflow Velocity (Level Spreader) [v=Q/A]

Storm Event	*Q-Routed (cfs) [Q]	Length of Level Spreader (ft) [L]	Height of Level Spreader (ft) [h]	Area of Level Spreader (ft^2) [A=L*h]	Level Spreader Velocity (fps) [v]
2-yr	47.0	70.0	0.50	35	1.3
10-yr	84.4	70.0	0.50	35	2.4
25-yr	120.2	70.0	0.50	35	3.4
100-yr	197.8	70.0	0.50	35	5.7



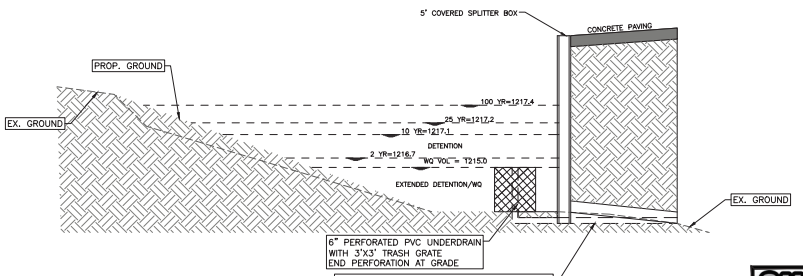
3 / 23 23 POND CROSS SECTION C
SCALE: NTS
BMP 3

WQ/DETENTION BASIN



3 / 23 23 POND CROSS SECTION B
SCALE: NTS
BMP 3

WQ/DETENTION BASIN



3 / 23 23 POND CROSS SECTION A
SCALE: NTS
BMP 3

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

811 !!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

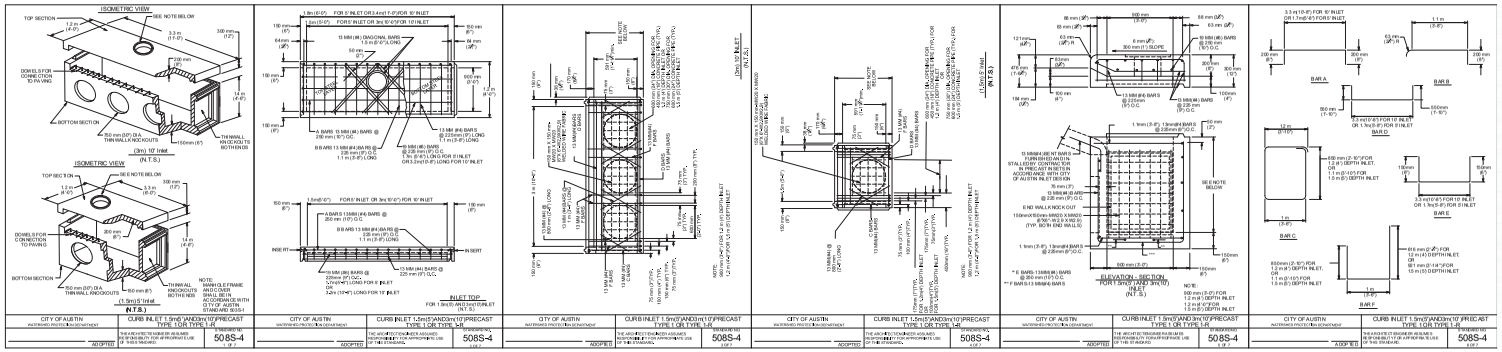
HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

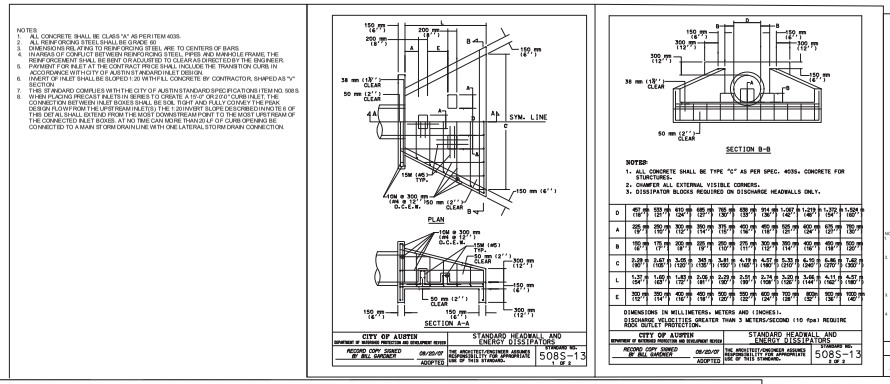
GRADING AND DRAINAGE 3 CALCS

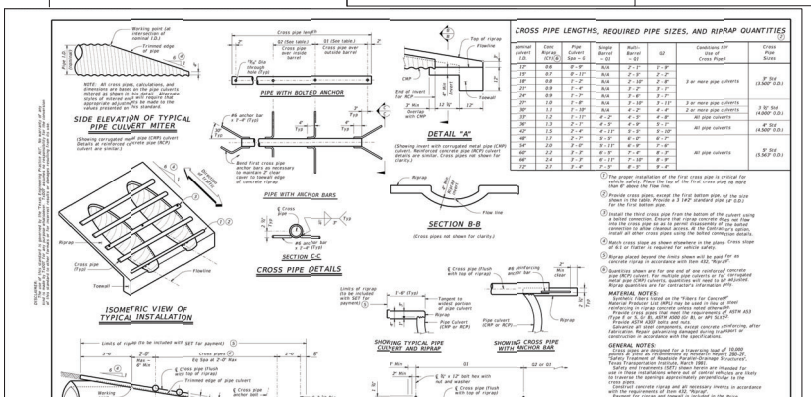
DATE:	1/10/2024
DWG SCALE:	NTS
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

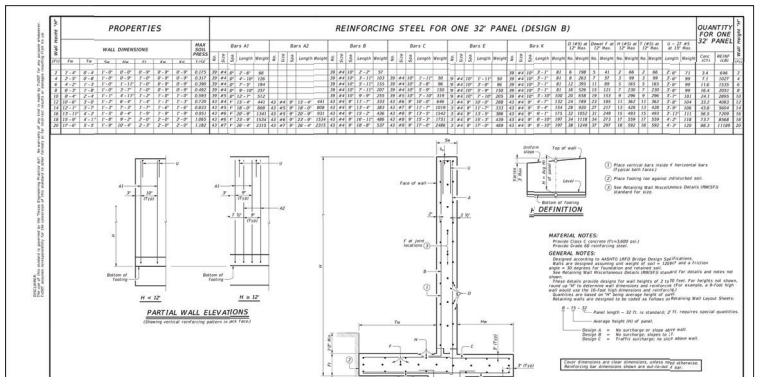
DRAWING NO.: 25
SHEET 25 OF 42

SD-2022-0025









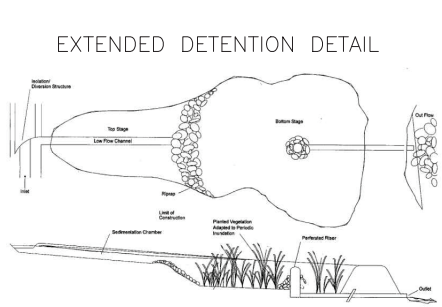
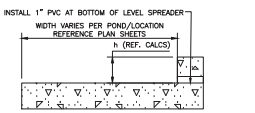


Figure 3-17 Schematic of a two stage Extended Detention Basin (LCRA, 1998)



TYPICAL LEVEL SPREADER DETAIL

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0996
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

DRAINAGE DETAILS

DATE:	1/10/2024
DRAWN BY:	CEC
DWG SCALE:	NTS
CHECKED BY:	CB
PROJECT NO.	324-199
APPROVED BY:	MT

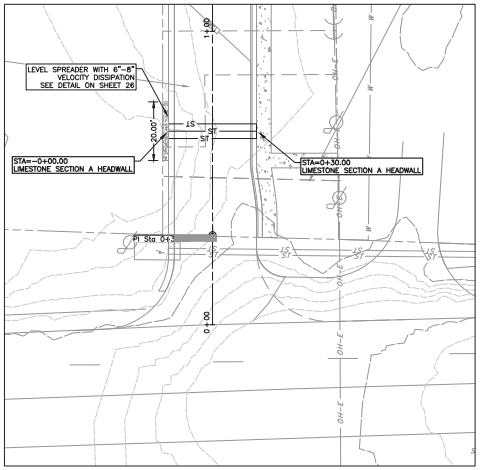
STATE OF TEXAS · MICHAEL A. THEONE · 142972 · LICENSED · PROFESSIONAL ENGINEER

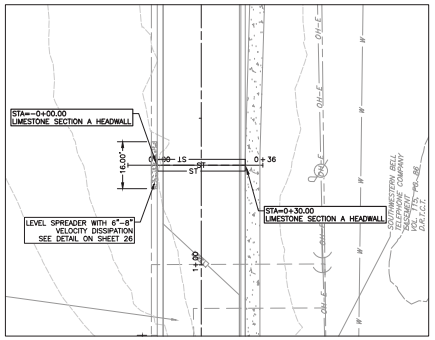
DRAWING NO.: 26
SHEET 26 OF 42

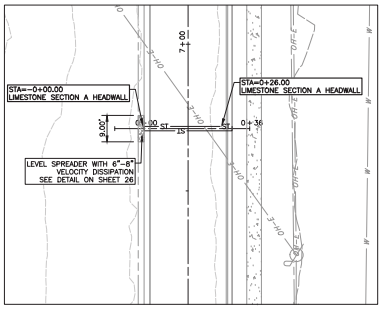
811 ||| CAUTION ||| ||| CAUTION ||| IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

SD-2022-0025

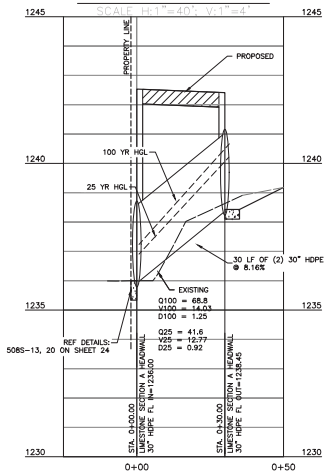
P:\320-0001\324-199\-2400\dwg\[320132419-C401-C405-DRAINAGE DETAILS.dwg]DRAINAGE DETAILS 1/5/2024 - 10:20 AM - cmeaney - LT: 1/10/2024 - 10:20 AM



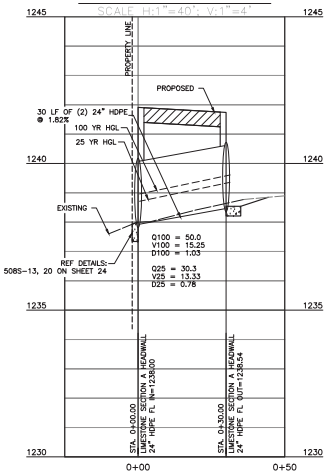




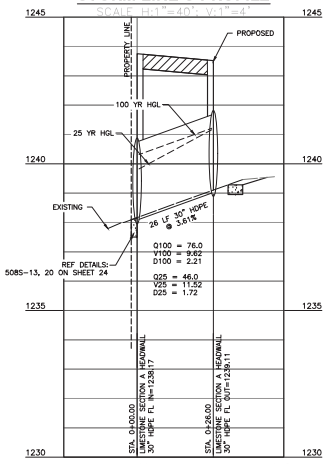
STORM LINE A PROFILE



STORM LINE B PROFILE



STORM LINE C PROFILE



NOTES

1. SEE SHEET 06 FOR LIMESTONE SECTION/WALL DETAILS.
2. SIDEWALK CULVERTS WILL BE REQUIRED AT ANY LOCATION WHERE THE PROPOSED SIDEWALK CROSSES A CHANNELIZED FLOW PATH.

NORTH
SCALE IN FEET
0 20 40

!!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

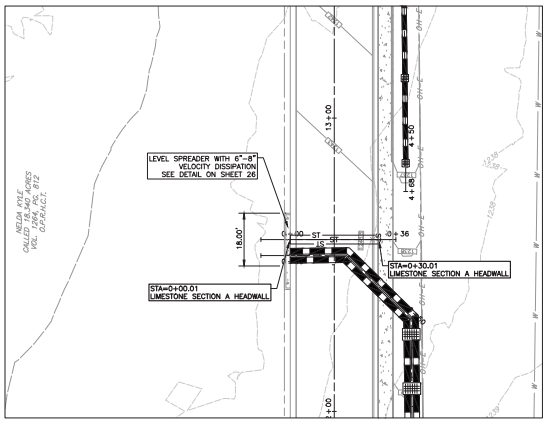
HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

STORM PLAN & PROFILES A-C

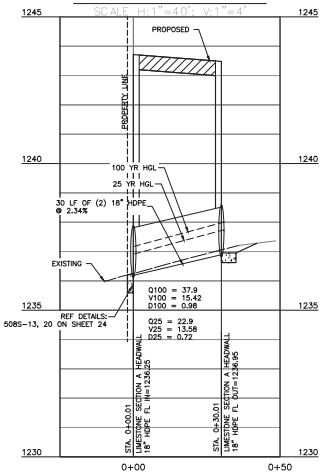
DATE:	1/10/2024
DWG SCALE:	1"=20'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

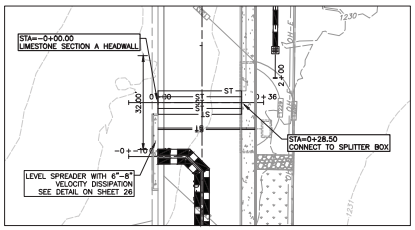
DRAWING NO.: 27
SHEET 27 OF 42

SD-2022-0025

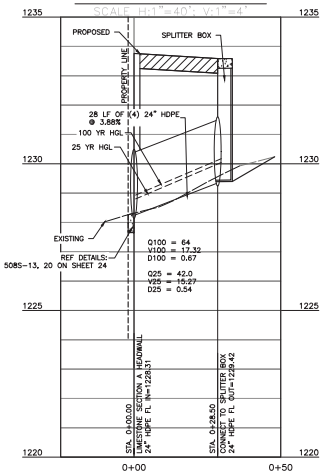


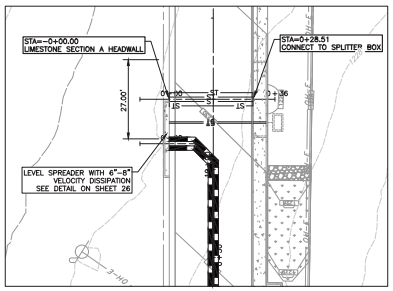
STORM LINE D PROFILE



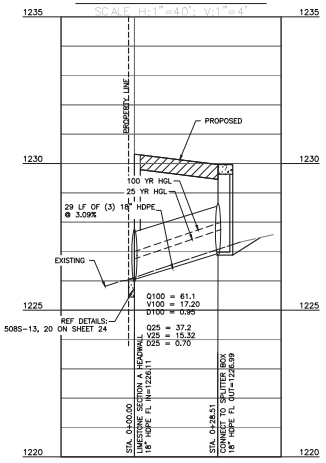


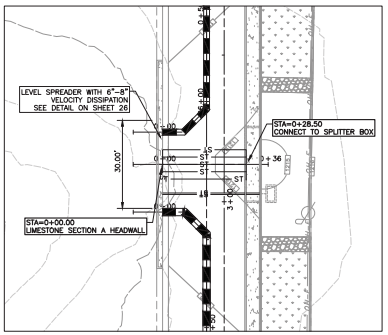
STORM LINE E PROFILE



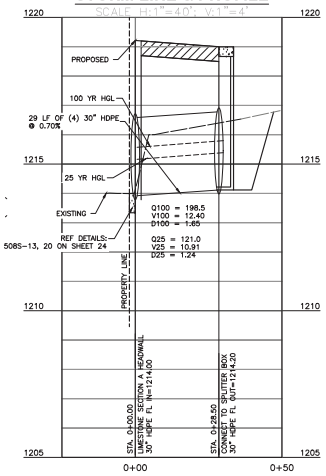


STORM LINE F PROFILE





STORM LINE G PROFILE



NOTES

1. SEE SHEET 06 FOR LIMESTONE SECTION/WALL DETAILS.
2. SIDEWALK CULVERTS WILL BE REQUIRED AT ANY LOCATION WHERE THE PROPOSED SIDEWALK CROSSES A CHANNELIZED FLOW PATH.

NORTH
SCALE IN FEET
0 20 40

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED PROFESSIONAL ENGINEER

811 !!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0996
www.cecinc.com

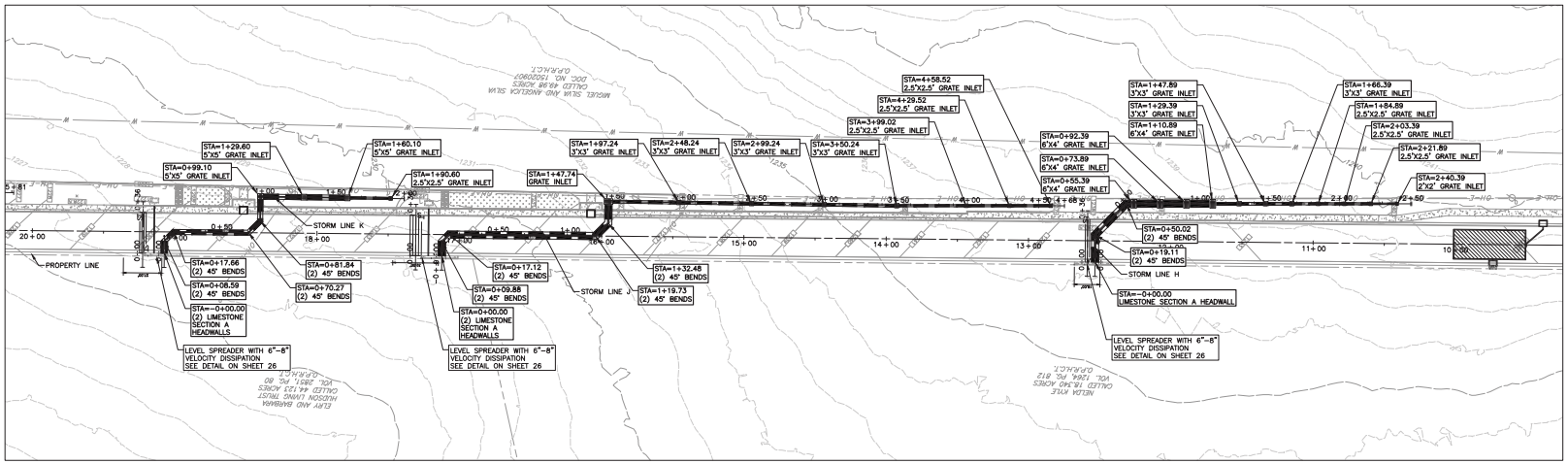
HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

STORM PLAN & PROFILES D-G

DATE:	1/10/2024
DWG SCALE:	1"=20'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

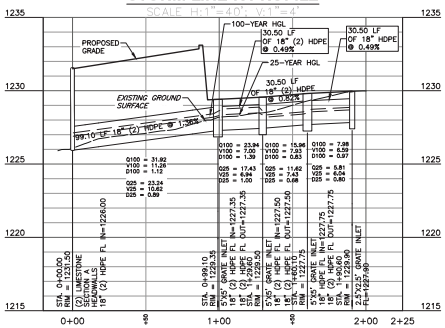
DRAWING NO.: 28
SHEET 28 OF 42

SD-2022-0025



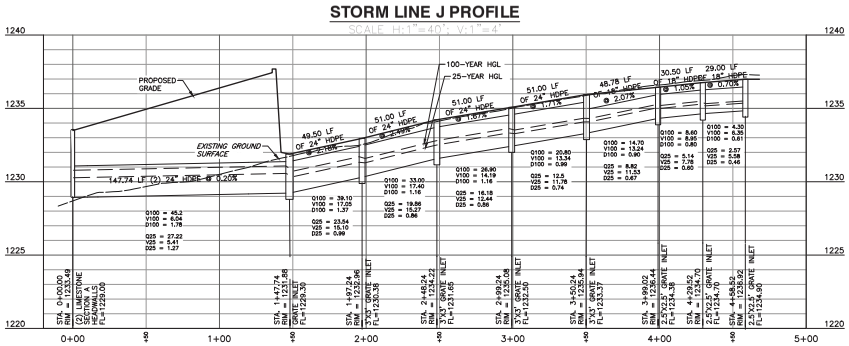
STORM LINE K PROFILE

SCALE H:1"=40'; V:1"=4'



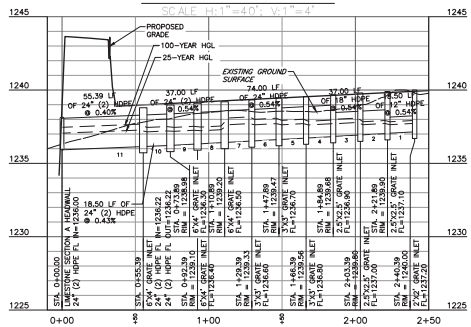
STORM LINE J PROFILE

SCALE H:1"=40'; V:1"=4'



STORM LINE H PROFILE

SCALE H:1"=40'; V:1"=4'



NOTES

1. SEE SHEET 06 FOR LIMESTONE SECTION/WALL DETAILS.
2. SIDEWALK CULVERTS WILL BE REQUIRED AT ANY LOCATION WHERE THE PROPOSED SIDEWALK CROSSES A CHANNELIZED FLOW PATH.

NORTH
SCALE IN FEET
0 40 80

811 ||| CAUTION ||| ||| CAUTION |||
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED PROFESSIONAL ENGINEER

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0996
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

STORM PLAN & PROFILES H-K

DATE:	1/10/2024
DWG SCALE:	1" = 40'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 29
SHEET 29 OF 42

SD-2022-0025

P:\324-0001\324-1991-DRIVE\Engineering\Civil\324-1991-Civil-Hardy-STORM Plan & PROFILES H-K.dgn 1/10/2024 10:57 AM - dmeade - LP: 1/10/2024

NOTES

1. SEE SHEET 06 FOR LIMESTONE SECTION/WALL DETAILS.
2. SIDEWALK CULVERTS WILL BE REQUIRED AT ANY LOCATION WHERE THE PROPOSED SIDEWALK CROSSES A CHANNELIZED FLOW PATH.

811 III. CAUTION III.
THE CONTRACTORS RESPONSIBILITY TO VERIFY, DIG TESS CONSTRUCTION NOTIFICATION SYSTEM PRIOR TO CONSTRUCTION AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

MICHAEL A. TWEDE
142972
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

STORM PLAN & PROFILES L-M

DATE:	1/10/2024
DRAWN BY:	CEC
DWG SCALE:	1" = 40'
CHECKED BY:	CB
PROJECT NO.:	324-199
APPROVED BY:	MT

DRAWING NO. 30 SHEET 30 OF 42

SD-2022-0025

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

CEA & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
PH: 512.439.0400 · FAX: 512.329.0098
WWW.CEAINC.COM

REVISION RECORD		
NO	DATE	DESCRIPTION

P:\324-199\324-199-CAD\dwg\DWG\324-199-CAD-SDdwg\STORM PLAN & PROFILES L-M 1/10/2024 10:31 AM - cmowery - LM 1/10/2024 10:31 AM

Rigid Pavements

Based on the Hays County criteria stated above, a design ADT of 750 and 500, and a design ESAL value of 34,000 and 25,000 was selected for design. We performed our analyses using current AASHTO pavement thickness design procedures and ACI 325.12R-02 guidance. Based on these procedures, and Hays County, City of Dripping Springs and City of Austin criteria, together with known subgrade conditions, the following Jointed Reinforced Concrete Pavement thickness is recommended:

Local Roadway	**34,000 ESALs**	**6.0 in. concrete over 6.0 in. subbase**
Local Roadway	**25,000 ESALs**	**6.0 in. concrete over 6.0 in. subbase**

The 6.0-inch thickness for the Local Roadway Category is set based on reinforcing steel cover requirements and recommended depth of control joints. In addition, the following recommendations to guide pavement detailing and material selection are provided.

1. Over-excavate and remove any surficial CH clay soils and then scarify and moisture-condition the existing subgrade (limestone derivative material) to a depth of 6 inches and compact to 95% of the maximum dry density as determined using Test Method TEX-113-E at a moisture content within 2% of optimum.
2. Provide at least 6 inches of compacted subbase material beneath the concrete pavement. A site-generated subbase material mined on-site is acceptable provided it conforms with the criteria for select fill presented on page 7 of this report.
3. The subbase material should be compacted to 95% of the maximum dry density determined by TxDOT Test Method TEX-113-E at a moisture content within 2% of optimum. The compacted subbase should extend 2 ft beyond the edges of the pavement structure (including curbs).
4. The concrete pavement should be reinforced with #4 longitudinal bars spaced at 16-inch centers, and transverse bars spaced at 24-inch centers. As an alternate, #10 welded wire fabric (WWF) may be used with 6-inch spacing between longitudinal wires and 12-inch spacing between transverse wires. All reinforcements should be chained to be secure at slab mid-height. Please refer to TxDOT JCRP Detail Sheet 1 of 2 attached in Appendix 1, for other details (Note: TxDOT longitudinal bar spacing is different.)
5. The concrete mix should be designed to satisfy a 28-day design strength of 4,500 psi with a flexural strength of 650 psi (third point loading). To promote aggregate interlock and efficient load transfer, we recommend crushed limestone aggregate. Contractor should submit concrete mix designs at least 2 weeks before paving commencement.
6. For slipform paving operations, we recommend a maximum concrete slump of 1 to 1.5 inches. For concrete placed by hand or with a vibratory or roller screed, we recommend a maximum slump of 4 inches.
7. We recommend a concrete air content of 3 to 5%.
8. Transverse control joints should be placed on minimum 15 ft centers. Joints should penetrate at least ¼ of the pavement thickness and should be cut within the time allocations prescribed by ACI criteria (ACI 302.1.R, Reference 19). For early-entry saw cutting, the time of cutting is usually in the range of 2 to 6 hrs. We recommend that the successful bidding contractor address this issue in his Quality Control Plan submitted for approval by the engineer. It is important to make the saw cuts early to avoid premature crack formation but not too early to avoid possible spalling and raveling damage to the concrete.
9. Full depth expansion joints should be constructed at 180 ft spacing.
10. Longitudinal joints will also be required along the centerline of the pavement. The longitudinal joints should be cut at the same time as the transverse joints using the same procedure.
11. All saw cut joints should be approximately ¼ inch wide and will need to be routed. See details on the attached TxDOT JCRP Detail Sheets – Appendix A. All joints will need to be sealed with appropriate joint sealer satisfying requirements of ACI 325.12R-4.7. Proposed joint sealer product information shall be submitted to the engineer for approval. The use of backer material and silicone sealer is recommended. Routine maintenance of joints and joint filler over the life of the pavement will be required and could include re-sealing on a 5 to 10-year frequency.
12. It is recommended that the successful bidding contractor provide a detailed Quality Control Plan document outlining specific joint locations (including cul de sacs), method of construction of joints, proposed backer material and joint filler material and periodic maintenance recommendations.
13. Appropriate curing compounds should be used to properly cure the concrete pavement. Proposed curing compounds and application procedures should be submitted for review to the engineer.
14. In lieu of ribbon curbs, it may be possible to thicken the edges of the pavement to support wheel loads and mitigate possible edge cracking if vehicles run off the pavement edge. Guidance is given by the National Ready Mix Concrete Association (NRMCA). NRMCA suggests thickening the edges by 50% of the pavement thickness over a transition extending 4 ft from the pavement edge.
15. Pavement construction should follow the concrete paving specifications provided in Appendix B. In addition, pavement construction should be in general conformance with City of Austin Standard Specifications Item 360.

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

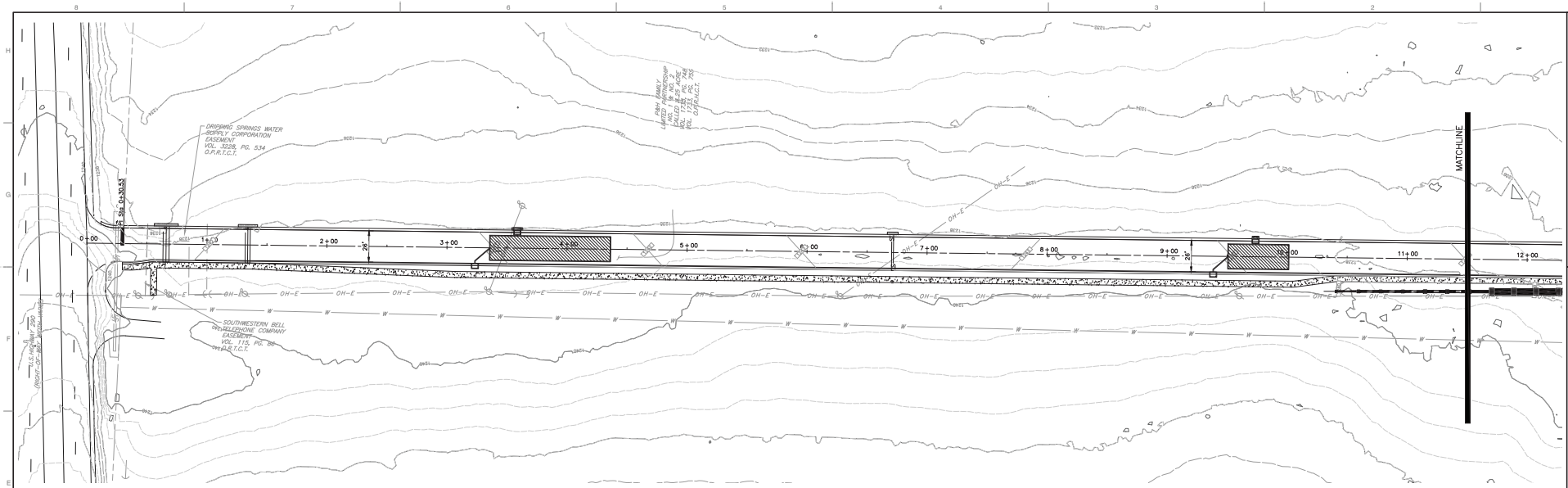
811 !!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

RIGID PAVEMENT DESIGN

DATE:	1/10/2024	DRAWN BY:	CEC
DWG SCALE:	NTS	CHECKED BY:	CB
PROJECT NO:			324-199
APPROVED BY:			MT

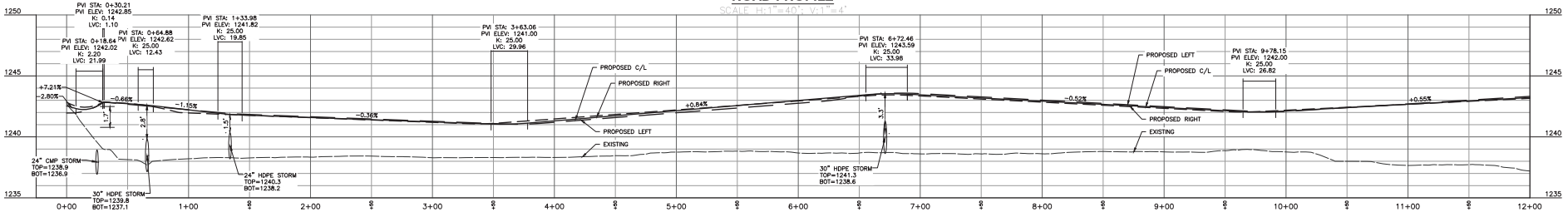
DRAWING NO.: 31
SHEET 31 OF 42

SD-2022-0025



ROAD PROFILE

SCALE H:1"=40', V:1"=4'



LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
□	□	FENCE: WOOD (PRIVACY)
○	○	FENCE: CHAIN LINK
I	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	RISER OPTIC LINE
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	RIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
	FIRE	RIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		CWQZ
ST	ST	STORM SEWER
		DRAINAGE CHANNEL

BLOCK LEGEND

PROPOSED	EXISTING		PROPOSED	EXISTING	
		BENCHMARK			(MONITORING) WELL
		CUT IN CONCRETE			UTILITY RISER
		CONTROL POINT			HOSE BIB
		IRON PIPE			SANITARY M.H.
		IRON ROD			CLEANOUT
		IRON ROD W/ CAP			DRAINAGE M.H.
		MONUMENT TYPE 1			DOWN SPOUT
		MONUMENT TYPE 2			AREA INLET
		NAIL			CURB INLET
S	S	PIPE BREAK			HEADWALL
]	]	PIPE CAP			SAFETY END TREATMENT
>	>	PIPE FLOW			DRAINAGE FLOW
		REDUCER			ELEC. M.H.
		AIR RELEASE VALVE			ELEC. /TELE. POLE
		BLOW-OFF VALVE			GUY WIRE
		POST INDICATOR VALVE			LIGHT FIXTURE
		MISCELLANEOUS VALVE			TRAFFIC SIGNAL
		UTILITY VALVE			PEDESTRIAN SIGNAL
		UTILITY METER			UTILITY (PULL)BOX
		BACKFLOW PREVENTER			UTILITY RISER
		FLUSH CONNECTION			UTILITY SERVICE
		FIRE HYDRANT			

NORTH

SCALE IN FEET

0 40 80

811

!!! CAUTION !!! IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

NO.	DATE	REVISION RECORD DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0996
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

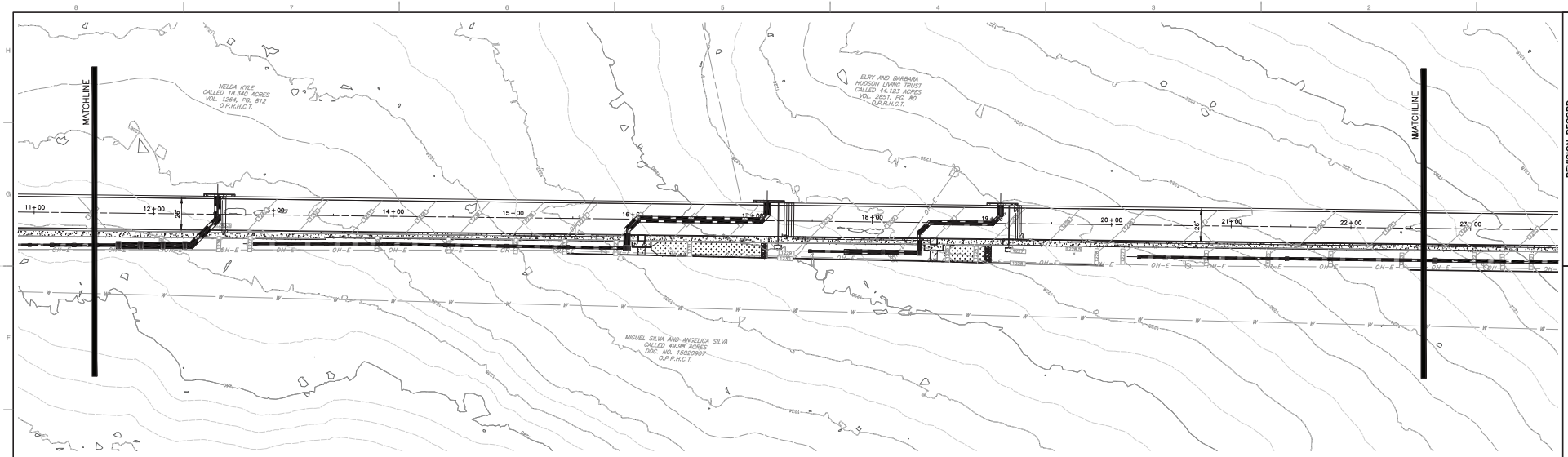
ROAD PLAN & PROFILE STA 0+00-11+00

DATE:	1/10/2024
DWG SCALE:	1" = 40'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 32

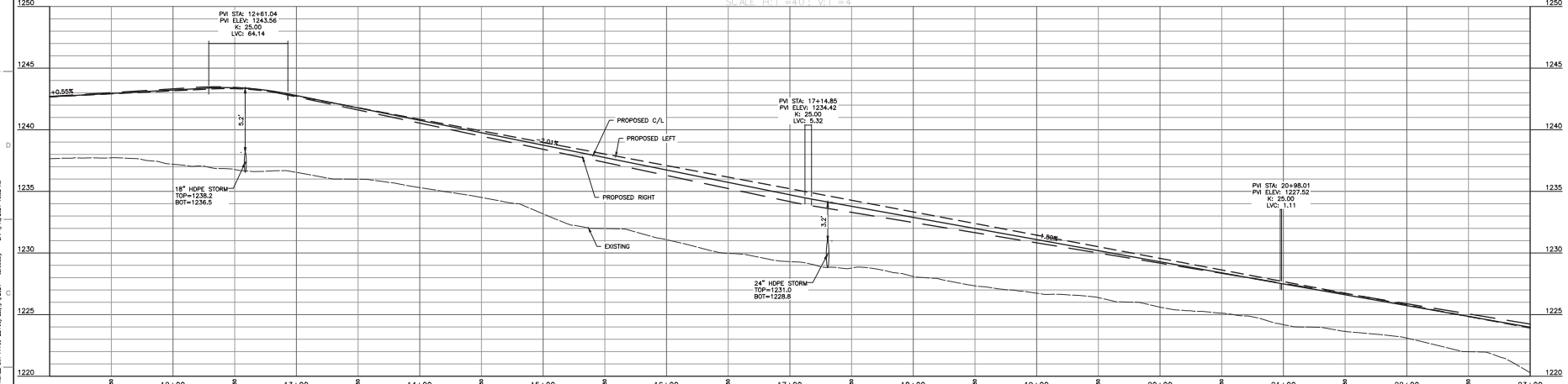
SHEET 32 OF 42

SD-2022-0025



ROAD PROFILE

SCALE H:1"=40'; V:1"=4'



LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
		FENCE: WOOD (PRIVACY)
		FENCE: CHAIN LINK
	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE

PROPOSED	EXISTING	
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	RIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
	FIRE	RIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		CWQZ
ST	ST	STORM SEWER
		DRAINAGE CHANNEL

BLOCK LEGEND

PROPOSED	EXISTING	
		BENCHMARK
		CUT IN CONCRETE
		CONTROL POINT
		IRON PIPE
		IRON ROD
		IRON ROD W/ CAP
		MONUMENT TYPE 1
		MONUMENT TYPE 2
		NAIL
S	S	PIPE BREAK
]	]	PIPE CAP
>	>	PIPE FLOW
		REDUCER
		AIR RELEASE VALVE
		BLOW-OFF VALVE
		POST INDICATOR VALVE
		MISCELLANEOUS VALVE
		UTILITY VALVE
		UTILITY METER
		BACKFLOW PREVENTER
		FLUSH CONNECTION
		FIRE HYDRANT

PROPOSED	EXISTING	
		(MONITORING) WELL
		UTILITY RISER
		HOSE BIB
		SANITARY M.H.
		CLEANOUT
		DRAINAGE M.H.
		DOWN SPOUT
		AREA INLET
		CURB INLET
		HEADWALL
		SAFETY END TREATMENT
		DRAINAGE FLOW
		ELEC. M.H.
		ELEC./TELE. POLE
		GUY WIRE
		LIGHT FIXTURE
		TRAFFIC SIGNAL
		PEDESTRIAN SIGNAL
		UTILITY (PULL)BOX
		UTILITY RISER
		UTILITY SERVICE

NORTH

SCALE IN FEET

0 40 80

811

!!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-28
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0996
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

ROAD PLAN & PROFILE STA 11+00-22+00

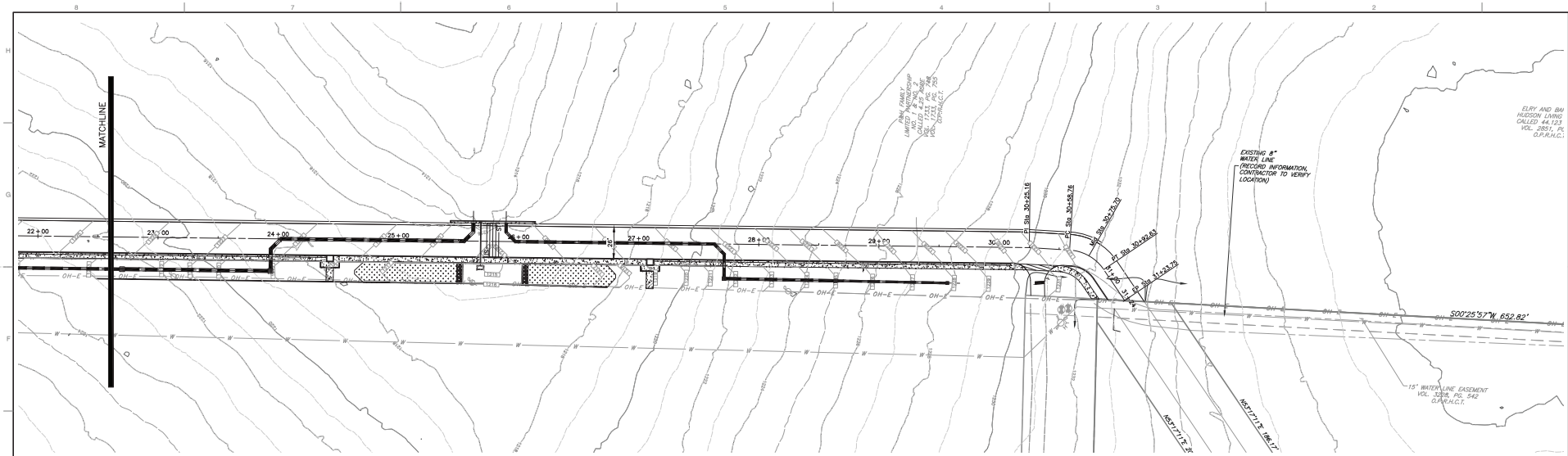
DATE:	1/10/2024
DWG SCALE:	1" = 40'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 33

SHEET 33 OF 42

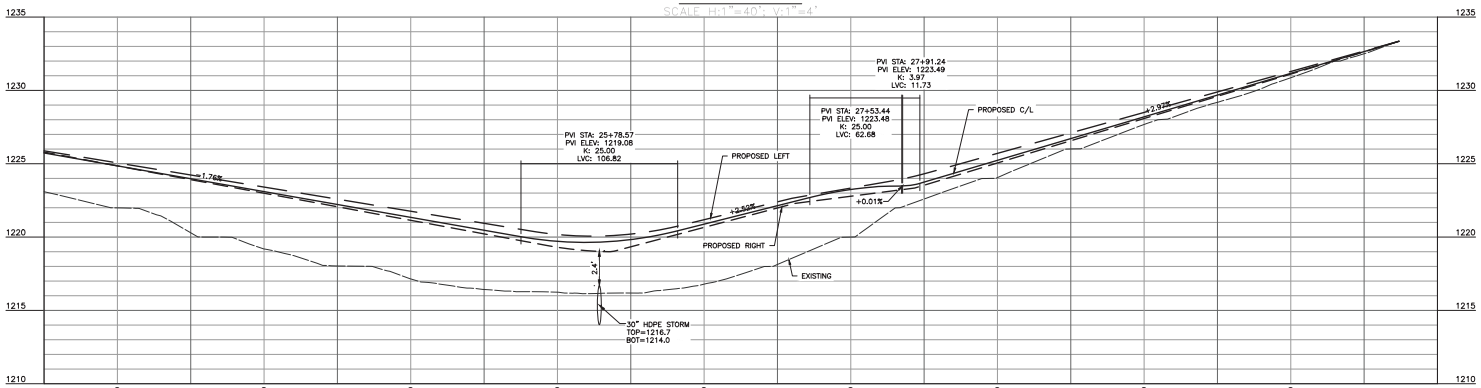
SD-2022-0025

P:\324-199\1-24-199\1-24(01)\dwg\(001)324-199-CV01-ROAD PLAN & PROFILE.dwg ROAD PLAN & PROFILE STA 11+00-22+00 (ST) 1/9/2024 - dmeeks - LPI 1/10/2024 10:52 AM



ROAD PROFILE

SCALE: H:1"=40' ; V:1"=4'



LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
□	□	FENCE: WOOD (PRIVACY)
○	○	FENCE: CHAIN LINK
I	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE

PROPOSED	EXISTING	
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	FIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
FIRE		FIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		CWQZ
ST	ST	STORM SEWER
		DRAINAGE CHANNEL

BLOCK LEGEND

PROPOSED	EXISTING	
	•	BENCHMARK
	•	CUT IN CONCRETE
	△	CONTROL POINT
	⊙	IRON PIPE
	⬢	IRON ROD
	○	IRON ROD W/ CAP
	⊡	MONUMENT TYPE 1
	⊙	MONUMENT TYPE 2
	▲	NAIL
S	S	PIPE BREAK
]	]	PIPE CAP
>	>	PIPE FLOW
	◁	REDUCER
⊛	⊛	AIR RELEASE VALVE
⊛	⊛	BLOW-OFF VALVE
⊛	⊛	POST INDICATOR VALVE
⊛	⊛	MISCELLANEOUS VALVE
⊛	⊘	UTILITY VALVE
⊕	⊕	UTILITY METER
▣	⊠	BACKFLOW PREVENTER
⊥	⊥	FLUSH CONNECTION
⊛	⊛	FIRE HYDRANT

PROPOSED	EXISTING	
	ⓜ	(MONITORING) WELL
	⊙	UTILITY RISER
	⊙	HOSE BIB
	Ⓢ	SANITARY M.H.
	⊙	CLEANOUT
	Ⓓ	DRAINAGE M.H.
	⊟	DOWN SPOUT
	▦	AREA INLET
	▤	CURB INLET
		HEADWALL
	⬭	SAFETY END TREATMENT
	⊃	DRAINAGE FLOW
Ⓔ	Ⓔ	ELEC. M.H.
⊘	⊘	ELEC./TELE. POLE
←	←	GUY WIRE
☼	☼	LIGHT FIXTURE
⊞	⊞	TRAFFIC SIGNAL
⊞	⊞	PEDESTRIAN SIGNAL
⊠	⊠	UTILITY (PULL)BOX
△	△	UTILITY RISER
⊛	⊛	UTILITY SERVICE

NORTH

SCALE IN FEET

0 40 80

811 ||| CAUTION ||| ||| CAUTION |||
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

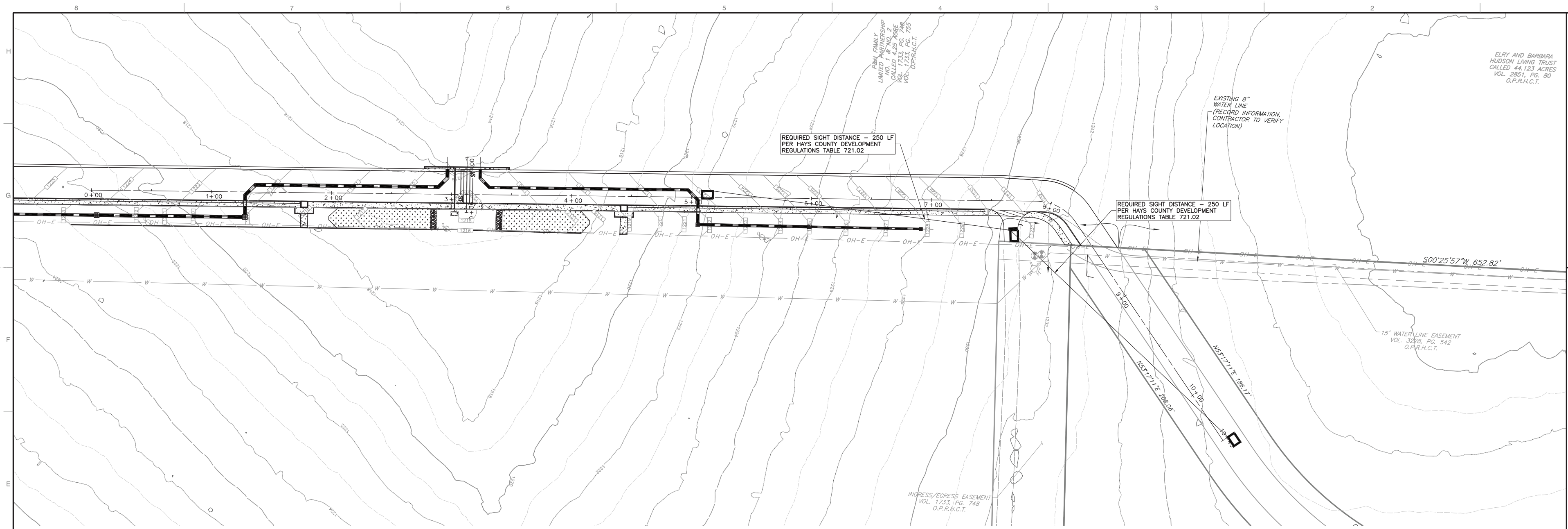
ROAD PLAN & PROFILE STA 22+00-END

DATE:	1/10/2024
DWG SCALE:	1" = 40'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 34

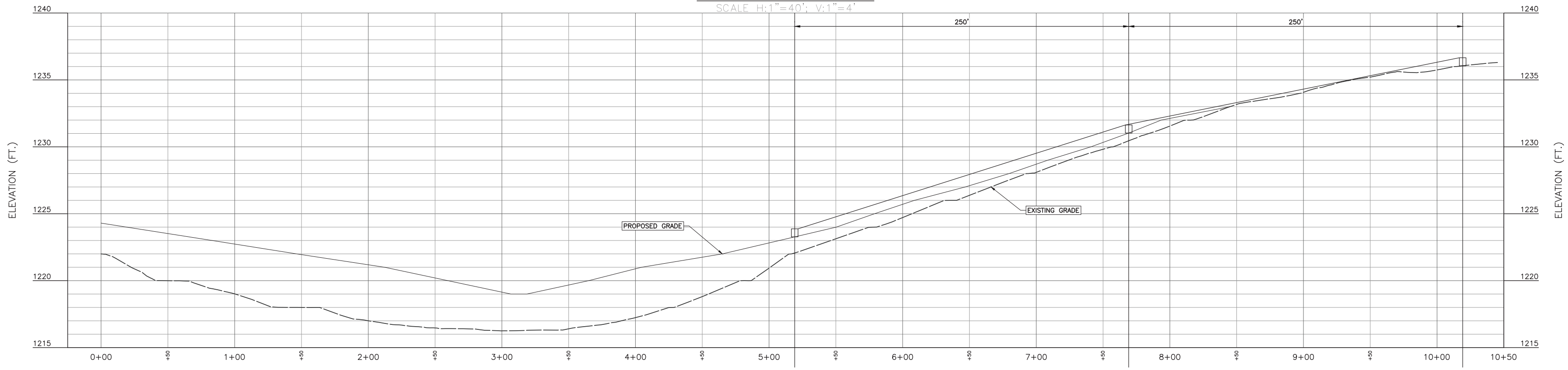
SHEET 34 OF 42

SD-2022-0025



LINE OF SIGHT PROFILE

SCALE H:1"=40'; V:1"=4'



LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
		FENCE: BARBED
		FENCE: WOOD (PICKET)
		FENCE: WOOD (PRIVACY)
		FENCE: CHAIN LINK
		FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE

PROPOSED	EXISTING	
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	FIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
	FIRE	FIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		CWQZ
ST	ST	STORM SEWER
		DRAINAGE CHANNEL

BLOCK LEGEND

PROPOSED	EXISTING	
	·	BENCHMARK
	⊗	CUT IN CONCRETE
	△	CONTROL POINT
	◎	IRON PIPE
	●	IRON ROD
	○	IRON ROD W/ CAP
	⊡	MONUMENT TYPE 1
	⊙	MONUMENT TYPE 2
	▲	NAIL
S	S	PIPE BREAK
]	]	PIPE CAP
›	›	PIPE FLOW
◀	◁	REDUCER
Ⓐ	Ⓐ	AIR RELEASE VALVE
Ⓑ	Ⓑ	BLOW-OFF VALVE
Ⓟ	Ⓟ	POST INDICATOR VALVE
⊗	⊗	MISCELLANEOUS VALVE
	⊘	UTILITY VALVE
W	W	UTILITY METER
⋈	⊠	BACKFLOW PREVENTER
		FLUSH CONNECTION
		FIRE HYDRANT

PROPOSED	EXISTING	
		(MONITORING) WELL
	◎	UTILITY RISER
HB	HB	HOSE BIB
Ⓢ	Ⓢ	SANITARY M.H.
		CLEANOUT
Ⓓ	Ⓓ	DRAINAGE M.H.
		DOWN SPOUT
		AREA INLET
		CURB INLET
		HEADWALL
		SAFETY END TREATMENT
➡	⇨	DRAINAGE FLOW
Ⓔ	Ⓔ	ELEC. M.H.
		ELEC./TELE. POLE
←	←	GUY WIRE
☼	☼	LIGHT FIXTURE
		TRAFFIC SIGNAL
		PEDESTRIAN SIGNAL
☒	☒	UTILITY (PULL) BOX
		UTILITY RISER
⊗	⊗	UTILITY SERVICE

NORTH

SCALE IN FEET

0 40 80

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED PROFESSIONAL ENGINEER

!!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

REVISION RECORD

NO	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

ROAD PLAN STA 30.25 - LINE OF SIGHT

DATE:	1/10/2024	DRAWN BY:	CEC
DWG SCALE:	1" = 40'	CHECKED BY:	CB
PROJECT NO:	324-199		
APPROVED BY:			MT

DRAWING NO.: 35
SHEET 35 OF 42

SD-2022-0025

P:\320-000\324-199\-CADD\Dwg\CV01\324199-CV01-C600-LINE OF SIGHT.dwg(ROAD PLAN STA 30.25 - LINE OF SIGHT) LS:(1/4/2024 - cbrowder) - LP: 1/10/2024 10:33 AM

LINETYPE LEGEND

	PROPOSED	EXISTING
RIGHT-OF-WAY		
LOT LINE/ MONUMENT		
EASEMENT		
FENCE: BARBED		
FENCE: WOOD (PICKET)		
FENCE: WOOD (PRIVACY)		
FENCE: CHAIN LINK		
FENCE: IRON		
MAJOR CONTOUR	385	385
MINOR CONTOUR		
ELECTRIC LINE	E	E
OVERHEAD ELECTRIC WIRE	OE	OE
UNDERGROUND ELECTRIC LINE	UE	UE
TELEPHONE	T	T
COMMUNICATIONS LINE	C	C
CABLE TELEVISION	CTV	CTV
FIBER OPTIC LINE	FO	FO
GAS LINE	G	G
OVERHEAD UTILITY	OU	OU
UNDERGROUND UTILITY	UG	UG
SANITARY SEWER LINE	SAN	SAN
WATER LINE	W	W
FIRE LINE	F	F
STORM SEWER LINE		
CURB & GUTTER		
STRIPING		
FIRE LANE STRIPING		FIRE
HAZ-MAT ACCESS ROUTE		
LIMITS OF CONSTRUCTION	LOC	
RAIL ROAD		
FLOODWAY		
CWDZ		
STORM SEWERS	ST	ST
DRAINAGE CHANNEL		

BLOCK LEGEND

	PROPOSED	EXISTING
BENCHMARK		
CONCRETE MONUMENT		
CONTROL POINT		
IRON PIPE		
IRON ROD		
IRON ROD W/ CAP		
MONUMENT TYPE 1		
MONUMENT TYPE 2		
NAIL		
PIPE BREAK		
PIPE END		
PIPE FLOW		
REDUCER		
AIR RELEASE VALVE		
BLOW-OFF VALVE		
CHECK VALVE		
MISCELLANEOUS VALVE		
UTILITY VALVE		
UTILITY METER		
BACKFLOW PREVENTER		
BLOW-OFF/HYDRANT		
FIRE HYDRANT		
MONITORING WELL		
UTILITY RISER		
HOSE BIB		
SANITARY M.H.		
CLEANOUT		
DRAINAGE M.H.		
DRAINAGE INLET		
AREA INLET		
CURB INLET		
HEADWALL		
SAFETY END TREATMENT		
SAN. SEWER FLOW		
ELEC. MANHOLE		
ELEC. / TELE. POLE		
GUY WIRE		
LIGHT FIXTURE		
TRAFFIC SIGNAL		
PEDESTRIAN SIGNAL		
UTILITY PULLBOX		
UTILITY RISER		
UTILITY SERVICE		

NORTH
SCALE IN FEET
0 40 80

811 III. CAUTION III.
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL UTILITIES WITHIN THE PROJECT LIMITS AND TO CONTACT UTILITY COMPANIES PRIOR TO CONSTRUCTION. NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

MICHAEL A. TREVIÑO
142972
LICENSED PROFESSIONAL ENGINEER
1/10/2024

ROADSIDE DITCH P&P 0+00-10+00

DATE:	1/10/2024
DRAWN BY:	CEC
DWG SCALE:	1" = 40'
CHECKED BY:	CB
PROJECT NO.:	324-199
APPROVED BY:	MT

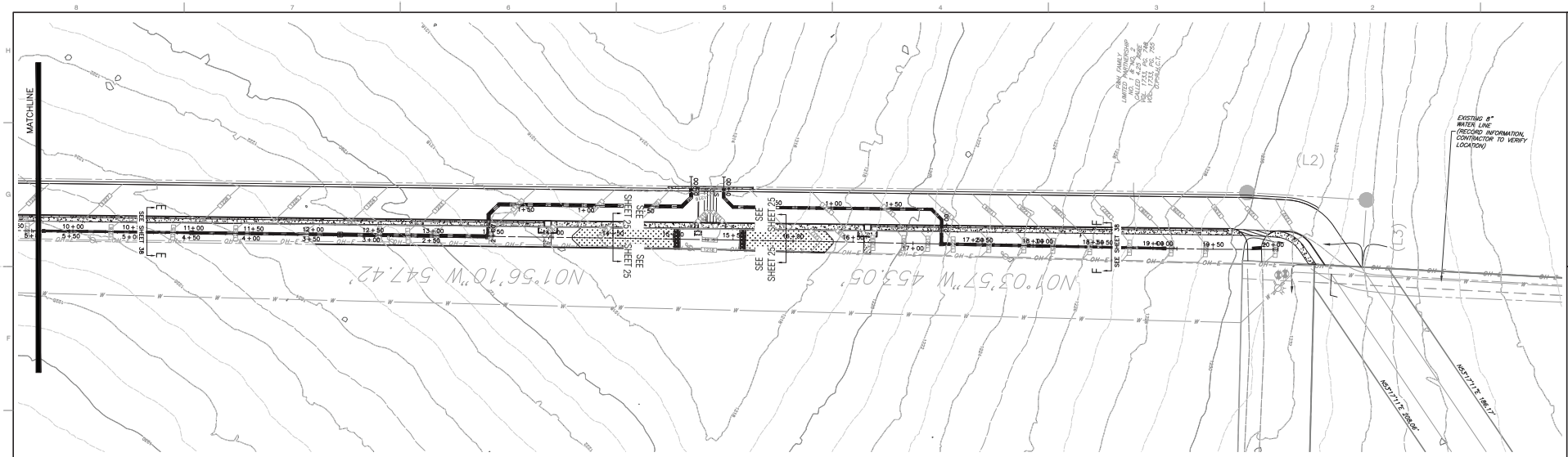
DRAWING NO. 36
SHEET 36 OF 42

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
PH: 512.439.0400 · FAX: 512.328.0096
WWW.CEICTC.COM

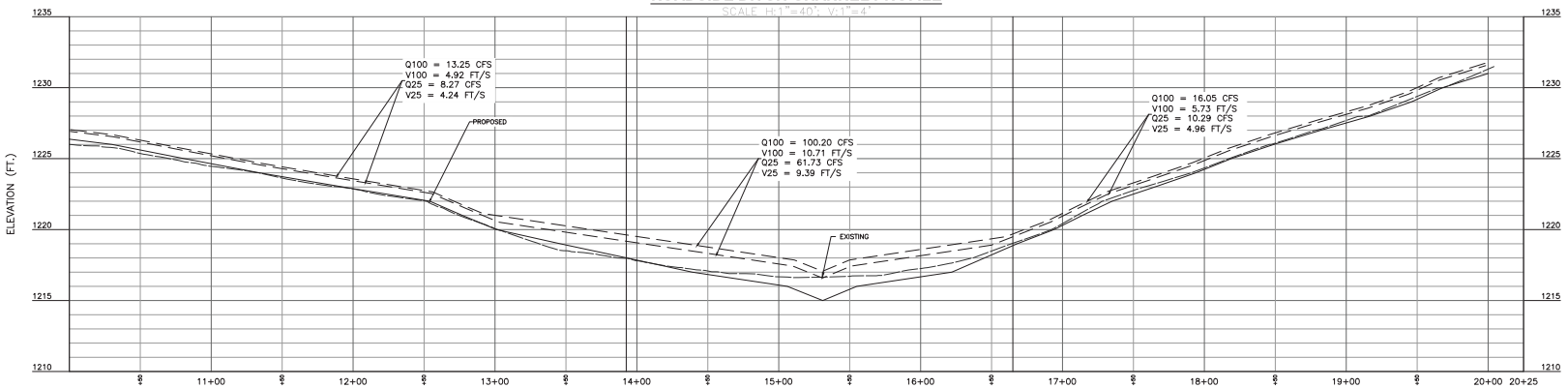
REVISION RECORD		
NO	DATE	DESCRIPTION

SD-2022-0025



ROADSIDE DITCH CHANNEL PROFILE

SCALE: H:1"=40'; V:1"=4'



LINETYPE LEGEND

PROPOSED	EXISTING	
		RIGHT-OF-WAY
		LOT BOUNDARY
		EASEMENT
X	X	FENCE: BARBED
//	//	FENCE: WOOD (PICKET)
□	□	FENCE: WOOD (PRIVACY)
○	○	FENCE: CHAIN LINK
I	I	FENCE: IRON
385	385	MAJOR CONTOUR
		MINOR CONTOUR
E	E	ELECTRIC LINE
OE	OE	OVERHEAD ELECTRIC WIRE
UE	UE	UNDERGROUND ELECTRIC LINE
T	T	TELEPHONE
C	C	COMMUNICATIONS LINE
TV	TV	CABLE TELEVISION
FO	FO	FIBER OPTIC LINE

PROPOSED	EXISTING	
G	G	GAS LINE
OU	OU	OVERHEAD UTILITY
UG	UG	UNDERGROUND UTILITY
SAN	SAN	SANITARY SEWER LINE
W	W	WATER LINE
F	F	FIRE LINE
		ROAD CENTERLINE
		CURB & GUTTER
		STRIPING
FIRE		FIRE LANE STRIPING
		H.C. ACCESSIBLE ROUTE
LOC		LIMITS OF CONSTRUCTION
		RAIL ROAD
		FLOODWAY
		CWQZ
ST	ST	STORM SEWER
		DRAINAGE CHANNEL

BLOCK LEGEND

PROPOSED	EXISTING	
	•	BENCHMARK
	•	CUT IN CONCRETE
	△	CONTROL POINT
	◎	IRON PIPE
	⬢	IRON ROD
	⊙	IRON ROD W/ CAP
	⊡	MONUMENT TYPE 1
	⊙	MONUMENT TYPE 2
	▲	NAIL
S	S	PIPE BREAK
]	]	PIPE CAP
>	>	PIPE FLOW
◁	◁	REDUCER
⊛	⊛	AIR RELEASE VALVE
⊛	⊛	BLOW-OFF VALVE
⊛	⊛	POST INDICATOR VALVE
⊛	⊛	MISCELLANEOUS VALVE
⊛	⊘	UTILITY VALVE
⊕	⊕	UTILITY METER
⋈	⋈	BACKFLOW PREVENTER
⊥	⊥	FLUSH CONNECTION
⊕	⊕	FIRE HYDRANT

PROPOSED	EXISTING	
	(M)	(MONITORING) WELL
	⊙	UTILITY RISER
	⊙	HOSE BIB
	Ⓢ	SANITARY M.H.
	Ⓒ	CLEANOUT
	Ⓓ	DRAINAGE M.H.
	D	DOWN SPOUT
	▤	AREA INLET
	▤	CURB INLET
		HEADWALL
		SAFETY END TREATMENT
		DRAINAGE FLOW
	Ⓔ	ELEC. M.H.
	Ⓔ	ELEC. /TELE. POLE
	←	GUY WIRE
	☼	LIGHT FIXTURE
	▲	TRAFFIC SIGNAL
	▲	PEDESTRIAN SIGNAL
	▣	UTILITY (PULL)BOX
	△	UTILITY RISER
	Ⓤ	UTILITY SERVICE

NORTH

SCALE IN FEET

0 40 80

811 !!! CAUTION !!! !!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING UTILITIES VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION, and NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

STATE OF TEXAS
MICHAEL A. THEONE
142972
LICENSED
PROFESSIONAL ENGINEER

REVISION RECORD

NO.	DATE	DESCRIPTION

Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.459.0400 · Fax: 512.329.0096
www.cecinc.com

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

ROADSIDE DITCH P&P 10+00-END

DATE:	1/10/2024
DWG SCALE:	1" = 40'
PROJECT NO.	324-199
DRAWN BY:	CEC
CHECKED BY:	CB
APPROVED BY:	MT

DRAWING NO.: 37

SHEET 37 OF 42

SD-2022-0025

811
!!! CAUTION !!!
IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND EXISTING UTILITY LOCATIONS PRIOR TO CONSTRUCTION. DO NOT SCALE PLANS. NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
!!! CAUTION !!!

STATE OF TEXAS
MICHAEL A. TWEDIE
142972
LICENSED PROFESSIONAL ENGINEER

ROADSIDE DITCH SECTIONS

DATE:	1/10/2024
DRAWN BY:	CEC
DWG SCALE:	1" = 40'
CHECKED BY:	CB
PROJECT NO.:	324-199
APPROVED BY:	MT

DRAWING NO. 38
SHEET 38 OF 42

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

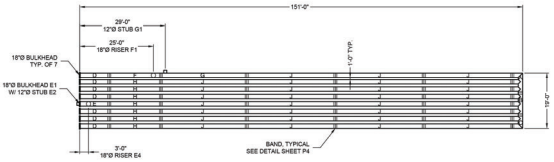
Civil & Environmental Consultants, Inc.
Texas Registered Engineering Firm F-38
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
PH: 512.439.0400 · FAX: 512.329.0096
WWW.CBDTC.COM

REVISION RECORD

NO	DATE	DESCRIPTION

SD-2022-0025

NORTH ARROW PROVIDED FOR REFERENCE ONLY. REFER TO ENGINEERED SITE PLANS FOR EXACT LOCATION AND ORIENTATION



STUB INFORMATION		
PIECE	STUB INVERT	SYSTEM INVERT
12"Ø STUB E2	1,238.00	1,238.00
12"Ø STUB G1	1,238.00	1,238.00

RISER INFORMATION		
PIECE	RIM ELEV.	SYSTEM INVERT
18"Ø RISER E3	1,241.12	1,238.00
18"Ø RISER F1	1,241.06	1,238.00

THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (5) PAGES INCLUDING THE FOLLOWING:

- **PIPE STORAGE = 2,147 CF**
- **MAINLINE PIPE GAGE = 16**
- **WALL TYPE = SOLID W/ XFILTRATION JOINTS**
- **DIAMETER = 18"**
- **FINISH = ALT2**
- **CORRUGATION = 2 2/3x1/2**

CUSTOMER _____ DATE _____

ASSEMBLY

SCALE: 1" = 30'
STRUCTURAL BACKFILL STORAGE: 1,069 CF
TOTAL STORAGE PROVIDED: 3,216 CF
LOADING: H20
PIPE INV. = 1238'±

ASSUMES 12" OF PERIMETER STONE WITH 40% VOIDS. ASSUMES NO STONE ABOVE OR BELOW PIPE.

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD (EOR) PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE AS REQUIRED, BY CONTRACTOR.
- QUANTITY OF PIPESHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUT,ET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL ACCESS CASTNGS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND ARE NOT SUPPLIED BY CONTECH.

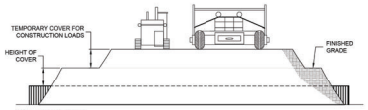
MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-64-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

18"Ø XFILTRATION RETENTION SYSTEM - 723797-010
BUNKER RANCH LLC - HARDY DRIVEWAY
DRIPPING SPRINGS, TX
SITE DESIGNATION: UDS 1

PROJECT No:	SEQ. No:	DATE:
723797	010	10/26/23
DESIGNED: JGB	DRAWN: JGB	
CHECKED: LJK	APPROVED: LJK	
SHEET NO: P1 OF 5		



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS kips			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM

NOT TO SCALE

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 ITEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMNIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

ANTI-FLOTATION PROVISIONS DUE TO HIGH GROUNDWATER OR OTHER FLOTATION CONCERNS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.

MATERIAL SPECIFICATION

NOT TO SCALE

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-64-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

18"Ø XFILTRATION RETENTION SYSTEM - 723797-010
BUNKER RANCH LLC - HARDY DRIVEWAY
DRIPPING SPRINGS, TX
SITE DESIGNATION: UDS 1

PROJECT No:	SEQ. No:	DATE:
723797	010	10/26/23
DESIGNED: JGB	DRAWN: JGB	
CHECKED: LJK	APPROVED: LJK	
SHEET NO: P2 OF 5		

811 !!! CAUTION !!! IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL EXISTING UTILITIES, VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES !!! CAUTION !!!

SD-2022-0025

SHEET 39 OF 42

DRAWING NO. 39

UNDERGROUND DETENTION 1 1 OF 2

DATE:	8/10/2022	DRAWN BY:	CEC
DWG SCALE:	NTS	CHECKED BY:	CB
PROJECT NO:			324-199
APPROVED BY:			MAT

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

CEC
Texas Registered Engineering Firm F-38
Civil & Environmental Consultants, Inc.
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.328.0096
www.cecinc.com

REVISION RECORD

NO	DATE	DESCRIPTION

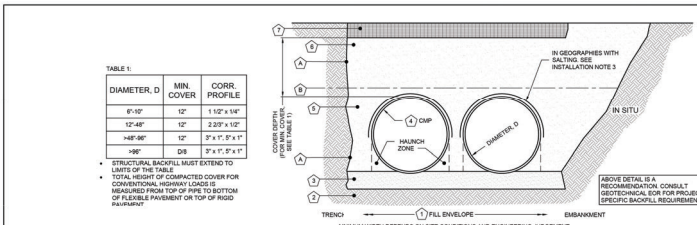


TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT

INSTALLATION NOTES

1 WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.

2 OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.

3 IF SALTING AGENTS FOR SNOW AND ICE REMOVAL ARE USED ON OR NEAR THE PROJECT, A GEOMEMBRANE BARRIER IS RECOMMENDED OVER THE UPPER HALF OF THE PIPE. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM A CHANGE IN THE SURROUNDING ENVIRONMENT OVER A PERIOD OF TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL INFORMATION.

TABLE 2:

XFILTRATION™ JOINT STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.5D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2 -** PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5	BACKFILL	FREE-DRAINING, ANGULAR, WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTIONWITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THATTHERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. **"IN AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.WHEN STONE BEDDING IS USED. IF NO STONE BEDDING IS USED, THEN SIDE GEOTEXTILE IS REQUIRD.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.
- APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MDOT 6AA, 6I, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL
NOT TO SCALE

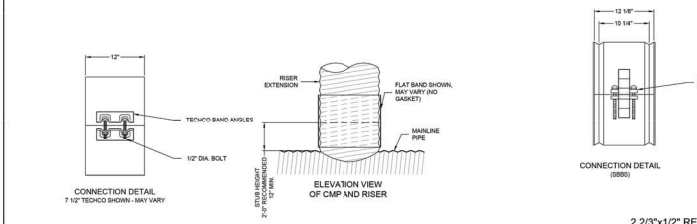
MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ConechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

18"Ø XFILTRATION RETENTION SYSTEM - 723797-010
BUNKER RANCH LLC - HARDY DRIVEWAY
DRIPPING SPRINGS, TX
SITE DESIGNATION: UDS 1

PROJECT No:	SEQ. No:	DATE:
723797	010	10/26/23
DESIGNED: JGB	DRAWN: JGB	
CHECKED: LJK	APPROVED: LJK	
SHEET NO: P3	OF 5	



PLAIN END CMP RISER PIPE

GENERAL NOTES:

1. **DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.**
2. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.1.4.
3. BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.
4. IF RISER HAS A HEIGHT OF COVER OF 10' OR MORE, USE A SLIP JOINT.
5. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   - 12" THRU 48" 1 PIECE
   - 54" 2-PIECES
6. ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.
7. MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.
8. DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

12" RISER BAND DETAIL
NOT TO SCALE

2 2/3"x1/2" RE-RCLLED END HEL-COR PIPE

GENERAL NOTES:

1. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
2. BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION. CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.
3. BANDS ARE SHAPED TO MATCH THE PIPE-ARCH WHEN APPLICABLE.
4. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   - 12" THRU 48" 1-PIECE
   - 54" THRU 96" 2-PIECES
   - 102" THRU 144" 3-PIECES
5. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
6. ALL CMP IS REROLLED TO HAVE ANNULAR END CORRUGATIONS OF 2 2/3"x1/2"
7. DIMENSIONS ARE SUBJECT TO MANUFACTURINGTOLERANCES.
8. ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

H-12 HUGGER BAND DETAIL
NOT TO SCALE

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ConechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

18"Ø XFILTRATION RETENTION SYSTEM - 723797-010
BUNKER RANCH LLC - HARDY DRIVEWAY
DRIPPING SPRINGS, TX
SITE DESIGNATION: UDS 1

PROJECT No:	SEQ. No:	DATE:
723797	010	10/26/23
DESIGNED: JGB	DRAWN: JGB	
CHECKED: LJK	APPROVED: LJK	
SHEET NO: P4	OF 5	

811 !!! CAUTION !!! CONTRACTOR IS RESPONSIBLE FOR ACCURATELY LOCATING ALL EXISTING UTILITIES, VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES !!! CAUTION !!!

SD-2022-0025

SHEET 40 OF 42 DRAWING NO.

UNDERGROUND DETENTION 1 2 OF 2

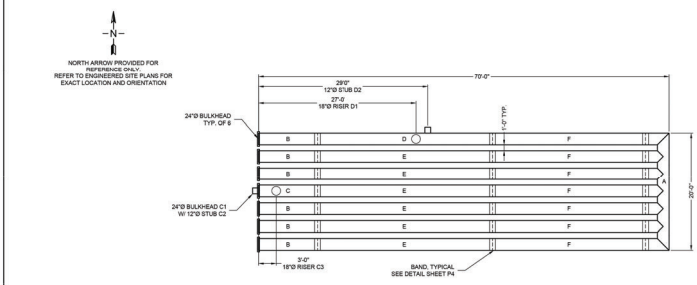
DATE:	8/10/2022	DRAWN BY:	CEC
DWG SCALE:	NTS	CHECKED BY:	CB
PROJECT NO:	324-199		
APPROVED BY:	MAT		

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

Texas Registered Engineering Firm F-38
Civil & Environmental Consultants, Inc.
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.328.0096
www.cecinc.com

REVISION RECORD

NO	DATE	DESCRIPTION



STUB INFORMATION		
PIECE	STUB INVERT	SYSTEM INVERT
12"Ø STUB C2	1,238.50	1,238.50
12"Ø STUB D2	1,238.50	1,238.50

RISER INFORMATION		
PIECE	RIM ELEV.	SYSTEM INVERT
18"Ø RISER C3	1,242.15	1,238.50
18"Ø RISER D1	1,242.08	1,238.50

THE UNDERSIGNED HEREBY APPROVES THE ATTACHED (5) PAGES INCLUDING THE FOLLOWING:

- **PIPE STORAGE = 1,558 CF**
- **MAINLINE PIPE GAGE = 16**
- **WALL TYPE = SOLID W/ XFILTRATION JOINTS**
- **DIAMETER = 24"**
- **FINISH = ALT2**
- **CORRUGATION = 2 2/3x1/2**

CUSTOMER _____ DATE _____

ASSEMBLY

SCALE: 1" = 10'

STRUCTURAL BACKFILL STORAGE: 644 CF
TOTAL STORAGE PROVIDED: 2,202 CF
LOADING: H20
PIPE INV.= 1238.50'±

ASSUMES 12" OF STONE PERIMETER WITH 40% VOIDS.
ASSUMES NO STONE ABOVE OR BELOW PIPE.

NOTES

- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE.
- ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD (EOR) PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE AS REQUIRED, BY CONTRACTOR.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR IRRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL ACCESS CASTINGS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND ARE NOT SUPPLIED BY CONTECH.

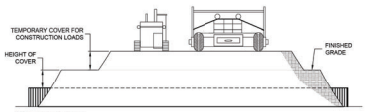
MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ConechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

24"Ø XFILTRATION RETENTION SYSTEM - 723797-020
BUNKER RANCH LLC - HARDY DRIVEWAY
DRIPPING SPRINGS, TX
SITE DESIGNATION: UDS 2

PROJECT No:	SEQ. No:	DATE:
723797	020	10/26/2023
DESIGNED: CJG	DRAWN: CJG	
CHECKED: LJK	APPROVED: LJK	
SHEET NO: P1 OF 5		



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS kips			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM
NOT TO SCALE

SPECIFICATION FOR CORRUGATED STEEL PIPE-ALUMINIZED TYPE 2 ITEEL

SCOPE

THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE CORRUGATED STEEL PIPE (CSP) DETAILED IN THE PROJECT PLANS.

MATERIAL

THE ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M274 OR ASTM A929.

PIPE

THE CSP SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M36 OR ASTM A760. THE PIPE SIZES, GAGES AND CORRUGATIONS SHALL BE AS SHOWN ON THE PROJECT PLANS.

ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.

HANDLING AND ASSEMBLY

SHALL BE IN ACCORDANCE WITH RECOMMENDATIONS OF THE NATIONAL CORRUGATED STEEL PIPE ASSOCIATION (NCSPA)

INSTALLATION

SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM A798 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

ANTI-FLOTATION PROVISIONS DUE TO HIGH GROUNDWATER OR OTHER FLOTATION CONCERNS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.

MATERIAL SPECIFICATION
NOT TO SCALE

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ConechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

24"Ø XFILTRATION RETENTION SYSTEM - 723797-020
BUNKER RANCH LLC - HARDY DRIVEWAY
DRIPPING SPRINGS, TX
SITE DESIGNATION: UDS 2

PROJECT No:	SEQ. No:	DATE:
723797	020	10/26/2023
DESIGNED: CJG	DRAWN: CJG	
CHECKED: LJK	APPROVED: LJK	
SHEET NO: P2 OF 5		

811 III CAUTION III IT IS THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY ALL EXISTING UTILITIES, VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION AND TO NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES III CAUTION III

SD-2022-0025

SHEET 41 OF 42 | DRAWING(S) 41

UNDERGROUND DETENTION 2 1 OF 2

DATE:	8/10/2022	DRAWN BY:	CEC
DWG SCALE:	NTS	CHECKED BY:	CB
PROJECT NO:	324-199		
APPROVED BY:	MAT		

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

CEC
Texas Registered Engineering Firm F-38
Civil & Environmental Consultants, Inc.
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.328.0096
www.cecinc.com

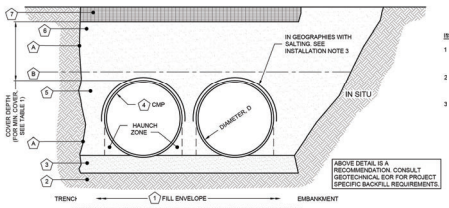
REVISION RECORD

NO	DATE	DESCRIPTION

TABLE 1:

DIAMETER, D	MIN. COVER	CORR. PROFILE
6"-10"	12"	1 1/2" x 1/4"
12"-48"	12"	2 2/3" x 1/2"
>48"-96"	12"	3" x 1", 5" x 1"
>96"	D/8	3" x 1", 5" x 1"

- STRUCTURAL BACKFILL MUST EXTEND TO LIMITS OF THE TABLE
- TOTAL HEIGHT OF COMPACTED COVER FOR CONVENTIONAL HIGHWAY LOADS IS MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TOP OF RIGID PAVEMENT



MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT

INSTALLATION NOTES

1 WHEN PLACING THE FIRST LIFTS OF BACKFILL IT IS IMPORTANT TO MAKE SURE THAT THE BACKFILL IS PROPERLY COMPACTED UNDER AND AROUND THE PIPE HAUNCHES.

2 OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS, AS APPROVED BY SITE ENGINEER.

3 IF SALTING AGENTS FOR SNOW AND ICE REMOVAL ARE USED ON OR NEAR THE PROJECT, A GEOMEMBRANE BARRIER IS RECOMMENDED OVER THE UPPER HALF OF THE PIPE. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM A CHANGE IN THE SURROUNDING ENVIRONMENT OVER A PERIOD OF TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL INFORMATION.

TABLE 2:

XFILTRATION™ JOINT STANDARD BACKFILL SPECIFICATIONS

	MATERIAL LOCATION	MATERIAL SPECIFICATION	DESCRIPTION	
1	FILL ENVELOPE WIDTH	PER ENGINEER OF RECORD	MINIMUM TRENCH WIDTH MUST ALLOW ROOM FOR PROPER COMPACTION OF HAUNCH MATERIALS UNDER THE PIPE. THE SUGGESTED MINIMUM TRENCH WIDTH, OR EOR RECOMMENDATION: PIPE ≤ 12": D + 16" PIPE > 12": 1.5D + 12"	MINIMUM EMBANKMENT WIDTH (IN FEET) FOR INITIAL FILL ENVELOPE: PIPE < 24": 3.5D PIPE 24" - 144": D + 4'0" PIPE > 144": D + 10'0"
2	FOUNDATION	**AASHTO 26.5.2 -** PER ENGINEER OF RECORD	PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND FOUNDATION BROUGHT BACK TO GRADE WITH A FILL MATERIAL APPROVED BY THE ENGINEER OF RECORD.	
3	BEDDING	**AASHTO M 43: 3, 357, 4, 467, 5, 56, 57**	ENGINEER OF RECORD TO DETERMINE IF BEDDING IS REQUIRED. PIPE MAY BE PLACED ON THE TRENCH BOTTOM OF A RELATIVELY LOOSE, NATIVE SUITABLE WELL GRADED GRANULAR MATERIAL THAT IS ROUGHLY SHAPED TO FIT THE BOTTOM OF THE PIPE, 2" MIN DEPTH. THE BEDDING MATERIAL MAY BE SUITABLE OPEN GRADED GRANULAR BEDDING CONFORMING TO AASHTO SOIL CLASSIFICATIONS A1, A2, OR A3 WITH MAXIMUM PARTICLE SIZE OF 3" PER AASHTO 26.3.8.1	
4	CORRUGATED METAL PIPE			
5	BACKFILL	FREE-DRAINING, ANGULAR, WASHED-STONE PER **AASHTO M 43: 3, 357, 4, 467, 5, 56, 57** OR APPROVED EQUAL *	HAUNCH ZONE MATERIAL SHALL BE HAND SHOVELED OR SHOVEL SLICED INTO PLACE TO ALLOW FOR PROPER COMPACTIONWITHOUT SOFT SPOTS. BACKFILL SHALL BE PLACED IN 8" +/- LOOSE LIFTS AND COMPACTED TO 90% STANDARD PROCTOR PER AASHTO T 99. BACKFILL SHALL BE PLACED SUCH THATTHERE IS NO MORE THAN A TWO LIFT (16") DIFFERENTIAL BETWEEN ANY OF THE PIPES AT ANY TIME DURING THE BACKFILL PROCESS. THE BACKFILL SHOULD BE ADVANCED ALONG THE LENGTH OF THE SYSTEM TO AVOID DIFFERENTIAL LOADING. WHERE CONVENTIONAL COMPACTION TESTING IS NOT PRACTICAL, THE MATERIAL SHALL BE MECHANICALLY COMPACTED UNTIL NO FURTHER YIELDING OF MATERIAL IS OBSERVED UNDER THE COMPACTOR. **"IN AREAS WITH HIGH WATER TABLE FLUCTUATIONS THAT INTERACT WITH THE PIPE ZONE, CONSIDER INSTALLING A GEOTEXTILE SEPARATION LAYER TO PREVENT SOIL MIGRATION.	
6	COVER MATERIAL	UP TO MIN. COVER - **AASHTO M 145: A-1, A-2, A3** ABOVE MIN. COVER - PER ENGINEER OF RECORD	COVER MATERIAL MAY INCLUDE NON-BITUMINOUS, GRANULAR ROADBASE MATERIAL WITHIN MIN COVER LIMITS	
7	RIGID OR FLEXIBLE PAVEMENT (IF APPLICABLE)	PER ENGINEER OF RECORD	FLEXIBLE PAVEMENT SHOULD NOT BE COUNTED AS PART OF THE FILL HEIGHT OVER THE CMP. FINAL BACKFILL MATERIAL SELECTION AND COMPACTION REQUIREMENTS SHALL FOLLOW THE PROJECT PLANS AND SPECIFICATIONS PER THE ENGINEER OF RECORD.	
A	SIDE GEOTEXTILE	NONE	GEOTEXTILE LAYER IS RECOMMENDED ON SIDES OF EXCAVATION TO PREVENT SOIL MIGRATION.WHEN STONE BEDDING IS USED. IF NO STONE BEDDING IS USED, THEN SIDE GEOTEXTILE IS REQUIRED.	
B	GEOTEXTILE BETWEEN LAYERS	NONE	IF SOIL TYPES DIFFER AT ANY POINT ABOVE PIPE INVERT, A GEOTEXTILE LAYER IS RECOMMENDED TO BE PLACED BETWEEN THE LAYERS TO PREVENT SOIL MIGRATION.	

NOTES:
- FOR MULTIPLE BARREL INSTALLATIONS, THE RECOMMENDED STANDARD SPACING BETWEEN PARALLEL PIPE RUNS SHALL BE THE PIPE DIAMETER /2 BUT NO LESS THAN 12" FOR DIAMETERS <72". FOR 72" AND LARGER DIAMETERS, THE MINIMUM SPACING IS 36". CONTACT YOUR CONTECH REPRESENTATIVE FOR NONSTANDARD SPACING.
- APPROVED REGIONAL EQUIVALENTS FOR SECTION 5 INCLUDE CA-7, MDOT 6AA, 6I, OR 5G, PROVIDED THEY MEET THE PARTICLE SIZES INDICATED.

MANUFACTURER RECOMMENDED BACKFILL
NOT TO SCALE

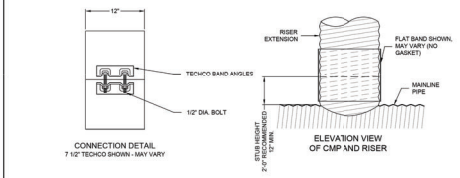
MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ConechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

24"Ø XFILTRATION RETENTION SYSTEM - 723797-020
BUNKER RANCH LLC - HARDY DRIVEWAY
DRIPPING SPRINGS, TX
SITE DESIGNATION: UDS 2

PROJECT No:	SEQ. No:	DATE:
723797	020	10/26/2023
DESIGNED: CJG	DRAWN: CJG	
CHECKED: LJK	APPROVED: LJK	
SHEET NO: P3 OF 5		

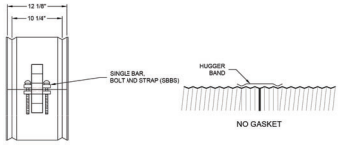


PLAIN END CMP RISER PIPE

GENERAL NOTES:

1. **DELIVERED BAND STYLE AND FASTENER TYPE MAY VARY BY FABRICATION PLANT.**
2. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.1.4.
3. BAND MATERIAL AND GAGE TO BE SAME AS RISER MATERIAL.
4. IF RISER HAS A HEIGHT OF COVER OF 10' OR MORE, USE A SLIP JOINT.
5. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   - 12" THRU 48" 1 PIECE
   - 54" 2-PIECES
6. ALL RISER JOINT COMPONENTS WILL BE FIELD ASSEMBLED.
7. MANHOLE RISERS IN APPLICATIONS WHERE TRAFFIC LOADS ARE IMPOSED REQUIRE SPECIAL DESIGN CONSIDERATIONS.
8. DIMENSIONS SUBJECT TO MANUFACTURING TOLERANCES.

12" RISER BAND DETAIL
NOT TO SCALE



2 2/3"x1/2" RE-RCLLED END HEL-COR PIPE

GENERAL NOTES:

1. JOINT IS TO BE ASSEMBLED PER AASHTO BRIDGE CONSTRUCTION SPECIFICATION SEC 26.4.2.4.
2. BAND MATERIALS AND/OR COATING CAN VARY BY LOCATION. CONTACT YOUR CONTECH REPRESENTATIVE FOR AVAILABILITY.
3. BANDS ARE SHAPED TO MATCH THE PIPE-ARCH WHEN APPLICABLE.
4. BANDS ARE NORMALLY FURNISHED AS FOLLOWS:
   - 12" THRU 48" 1-PIECE
   - 54" THRU 96" 2-PIECES
   - 102" THRU 144" 3-PIECES
5. BAND FASTENERS ARE ATTACHED WITH SPOT WELDS, RIVETS OR HAND WELDS.
6. ALL CMP IS REROLLED TO HAVE ANNULAR END CORRUGATIONS OF 2 2/3"x1/2"
7. DIMENSIONS ARE SUBJECT TO MANUFACTURINGTOLERANCES.
8. ORDER SHALL DESIGNATE GASKET OPTION, IF REQUIRED (SEE DETAILS ABOVE).

H-12 HUGGER BAND DETAIL
NOT TO SCALE

MARK	DATE	REVISION DESCRIPTION	BY

CONTECH ENGINEERED SOLUTIONS LLC
www.ConechES.com
9100 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CONTECH CMP DETENTION SYSTEMS
CONTECH PROPOSAL DRAWING

24"Ø XFILTRATION RETENTION SYSTEM - 723797-020
BUNKER RANCH LLC - HARDY DRIVEWAY
DRIPPING SPRINGS, TX
SITE DESIGNATION: UDS 2

PROJECT No:	SEQ. No:	DATE:
723797	020	10/26/2023
DESIGNED: CJG	DRAWN: CJG	
CHECKED: LJK	APPROVED: LJK	
SHEET NO: P4 OF 5		

811 !! CAUTION !!! CONTRACTOR IS RESPONSIBLE FOR ACCURACY AND PROTECTION OF ALL EXISTING UTILITIES, VERTICALLY AND HORIZONTALLY PRIOR TO CONSTRUCTION. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES !!! CAUTION !!!

SD-2022-0025

SHEET 42 OF 42 | DRAWING NO. 42

UNDERGROUND DETENTION 2 2 OF 2

DATE:	8/10/2022	DRAWN BY:	CEC
DWG SCALE:	NTS	CHECKED BY:	CB
PROJECT NO:	324-199		
APPROVED BY:	MAT		

HARDY T LAND, LLC
SITE DEVELOPMENT PLANS
HARDY DRIVEWAY
CITY OF DRIPPING SPRINGS, HAYS COUNTY, TX

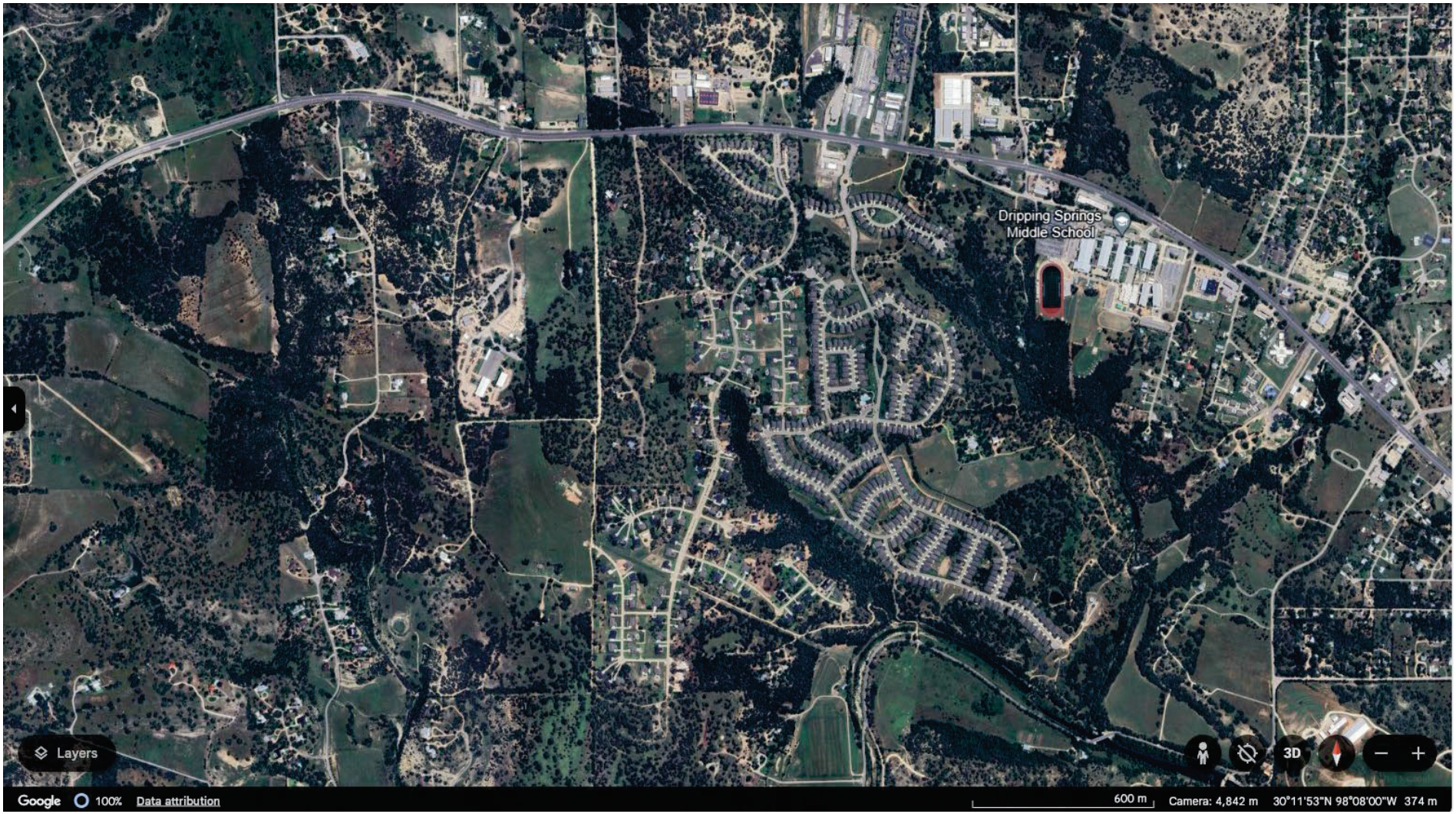
CEC
Texas Registered Engineering Firm F-38
Civil & Environmental Consultants, Inc.
1221 South MoPac Expressway · Suite 350 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.328.0096
www.cecinc.com

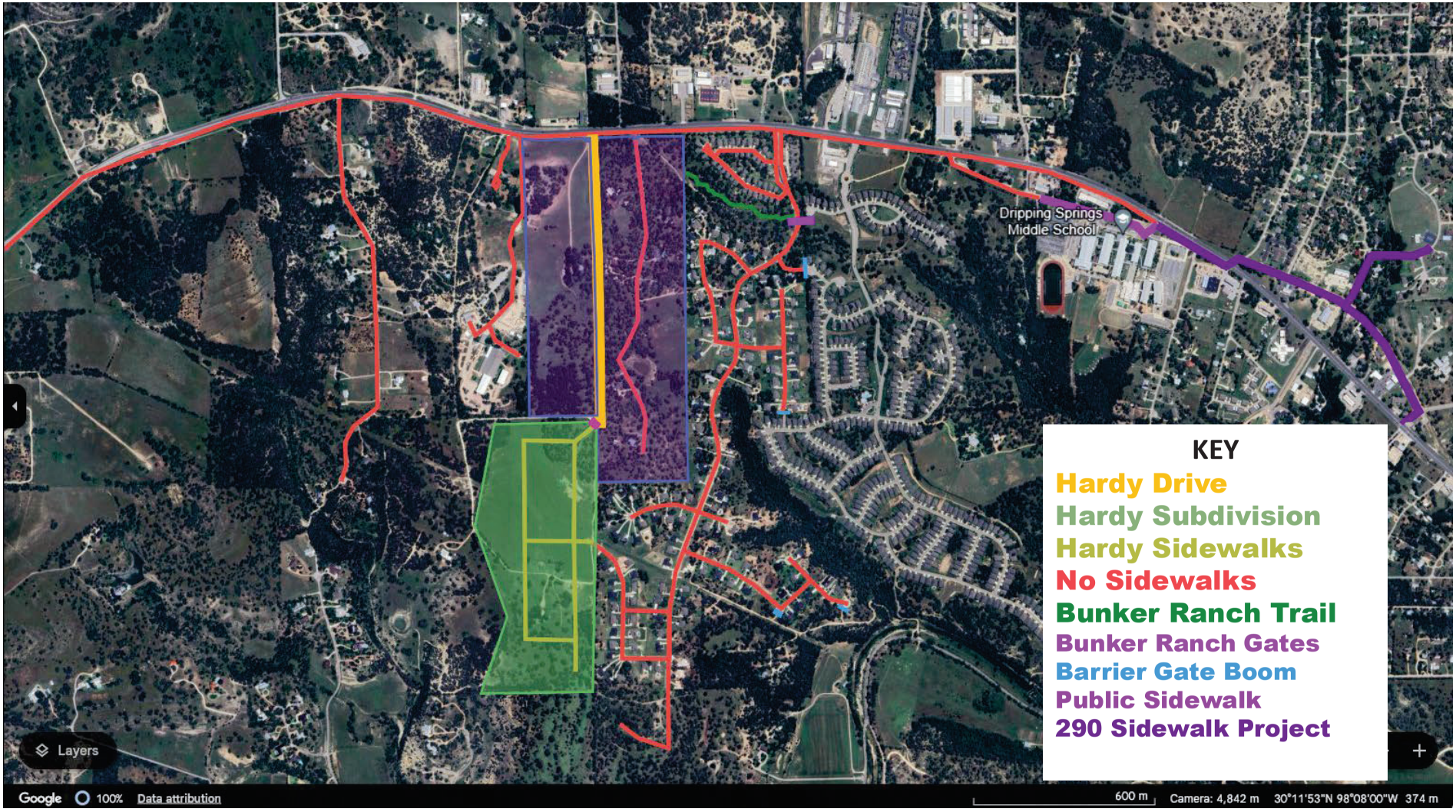
REVISION RECORD

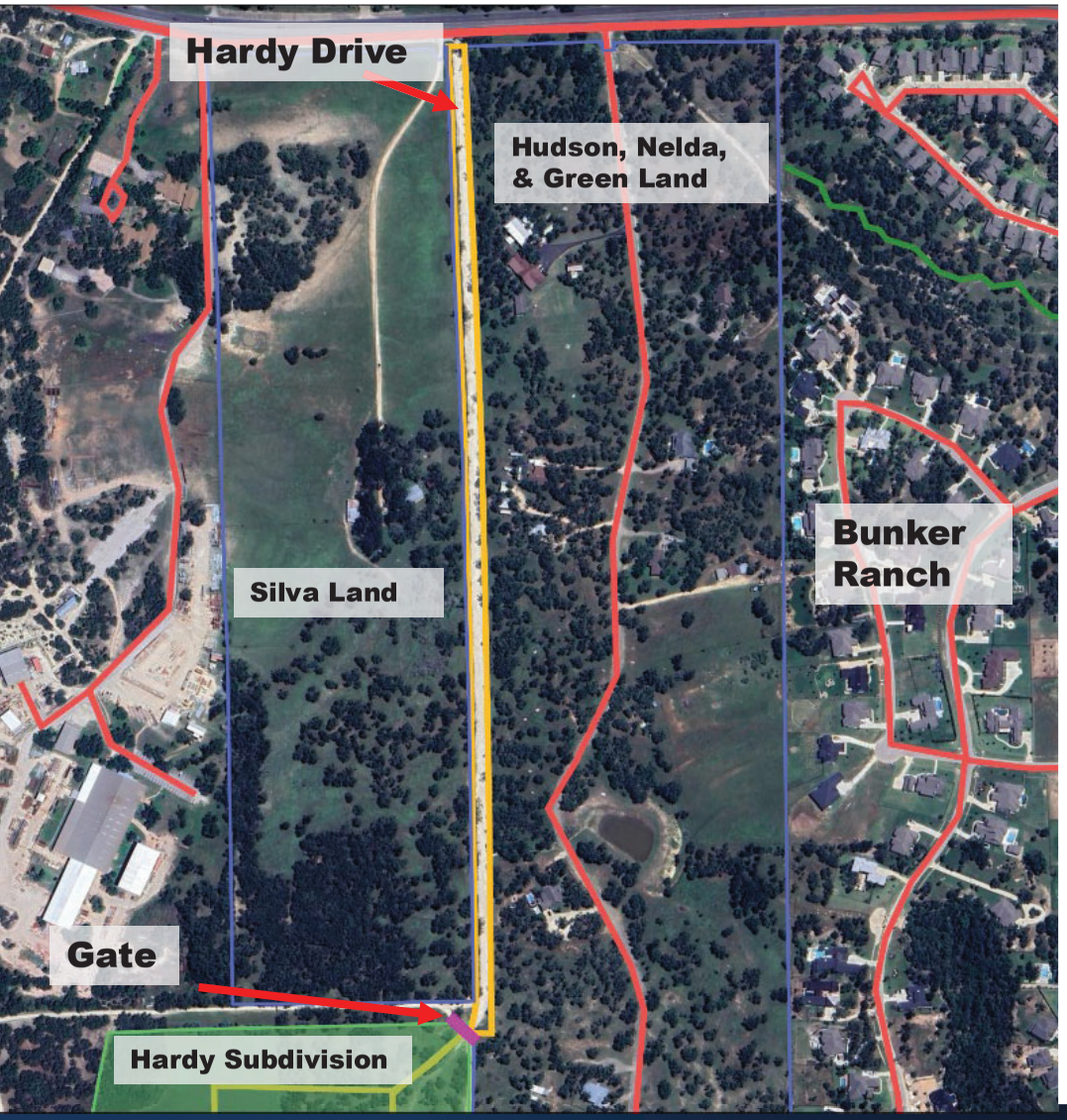
NO	DATE	DESCRIPTION

Exhibit F

Overview


Dripping Springs
Middle School
Layers
3D
Google
100%
Data attribution
600 m
Camera: 4,842 m
30°11'53"N 98°08'00"W 374 m


Dripping Springs
Middle School
KEY
Hardy Drive
Hardy Subdivision
Hardy Sidewalks
No Sidewalks
Bunker Ranch Trail
Bunker Ranch Gates
Barrier Gate Boom
Public Sidewalk
290 Sidewalk Project
Layers
Google
100%
Data attribution
600 m
Camera: 4,842 m
30°11'53"N 98°08'00"W 374 m

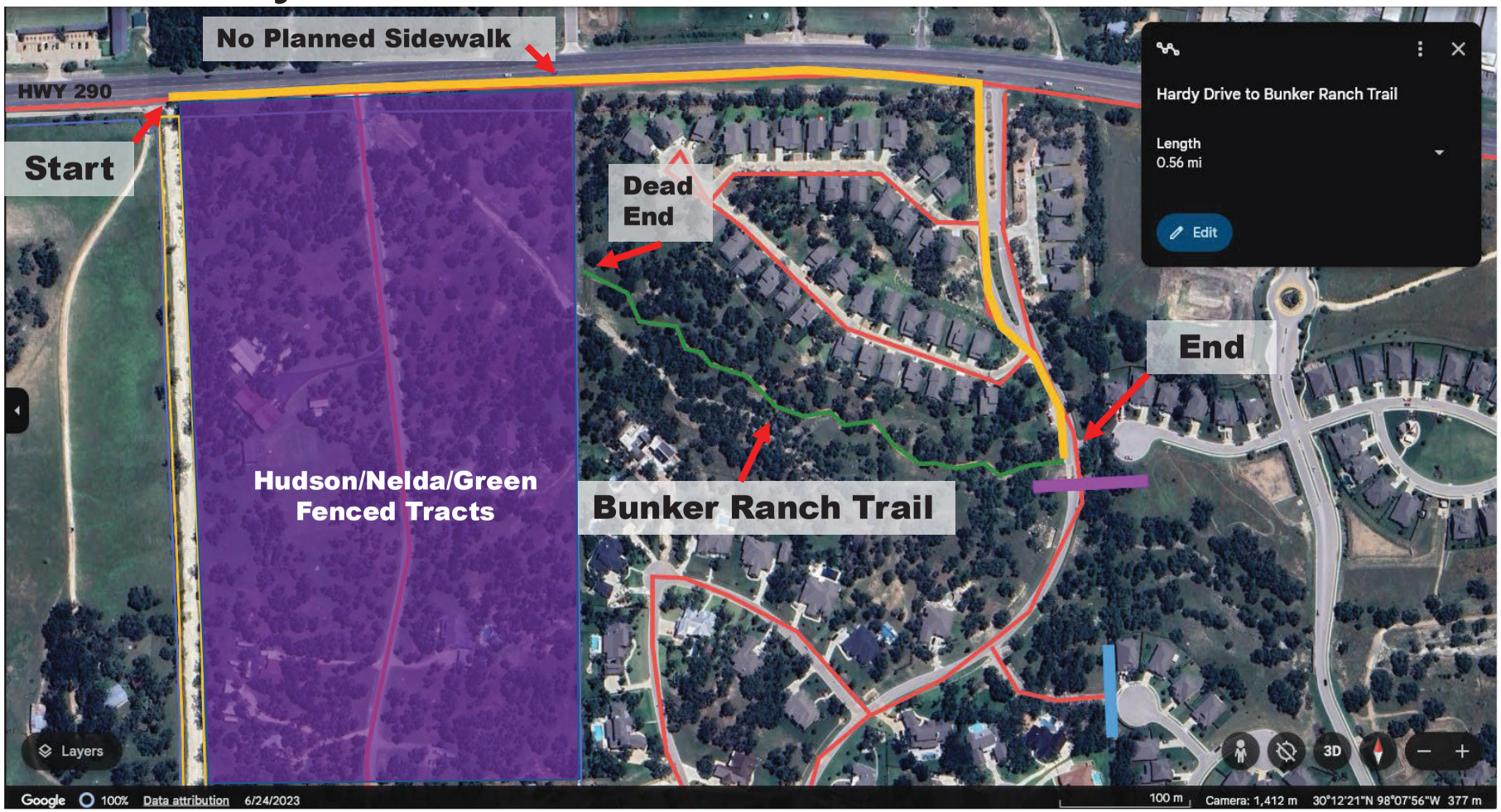


Hardy Drive

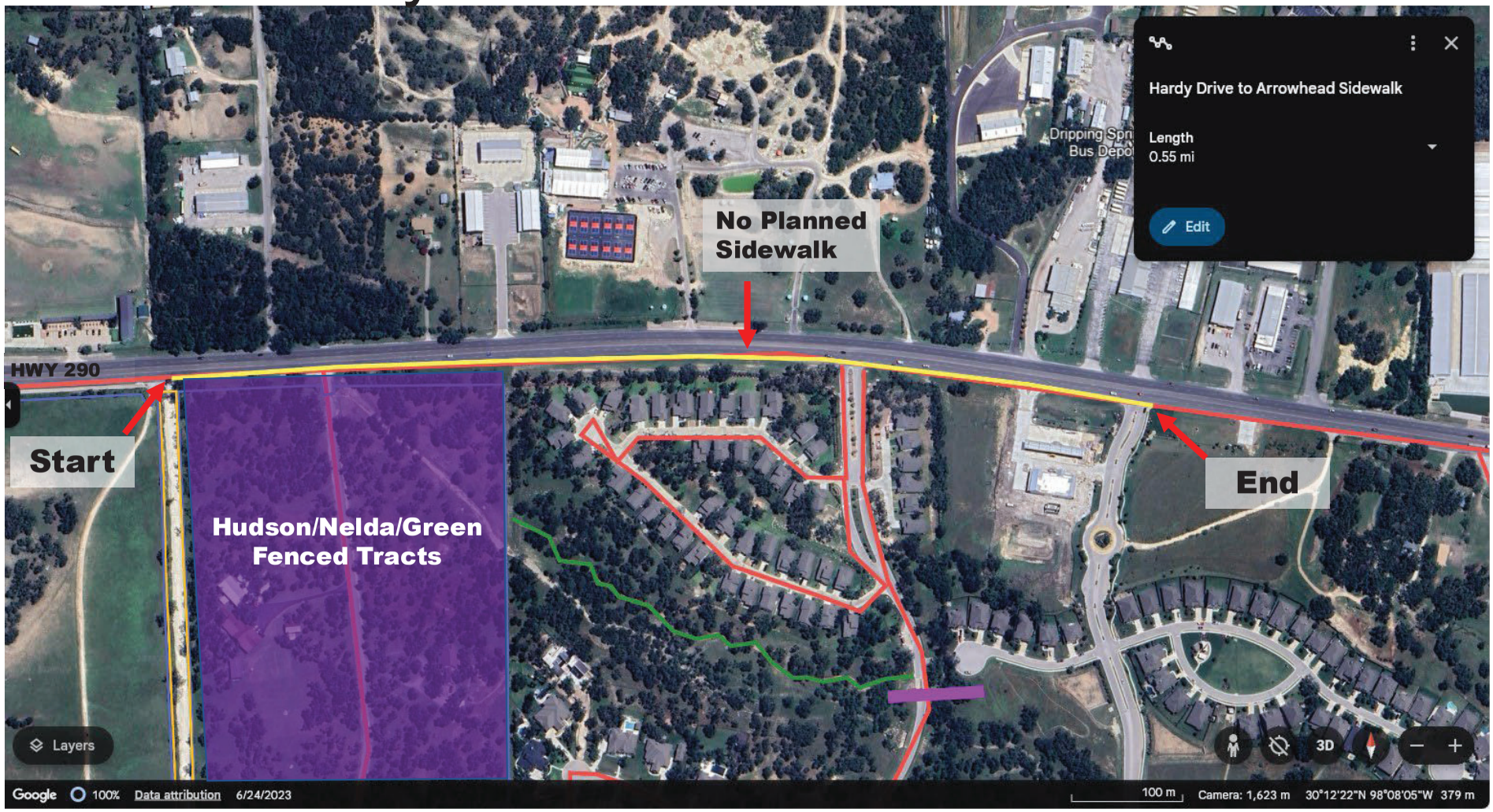
Neighboring Land

- Private
- Fenced
- Rural
- Large Parcels
- No Planned Development/Sale
- No Planned Multifamily Development
- No Planned Commercial Development
- No Connectivity

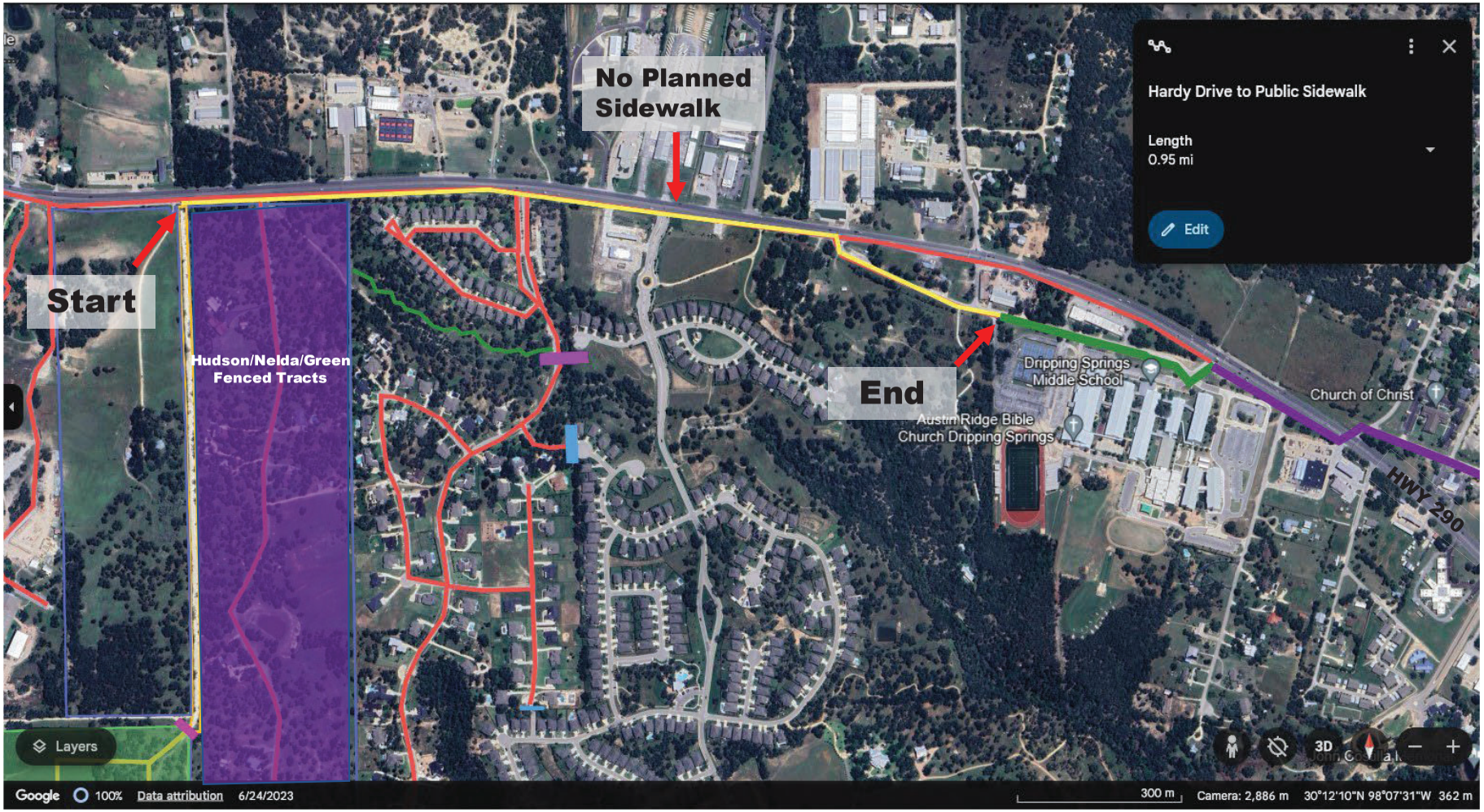
Proximity to Bunker Ranch Trail: Half of a Mile



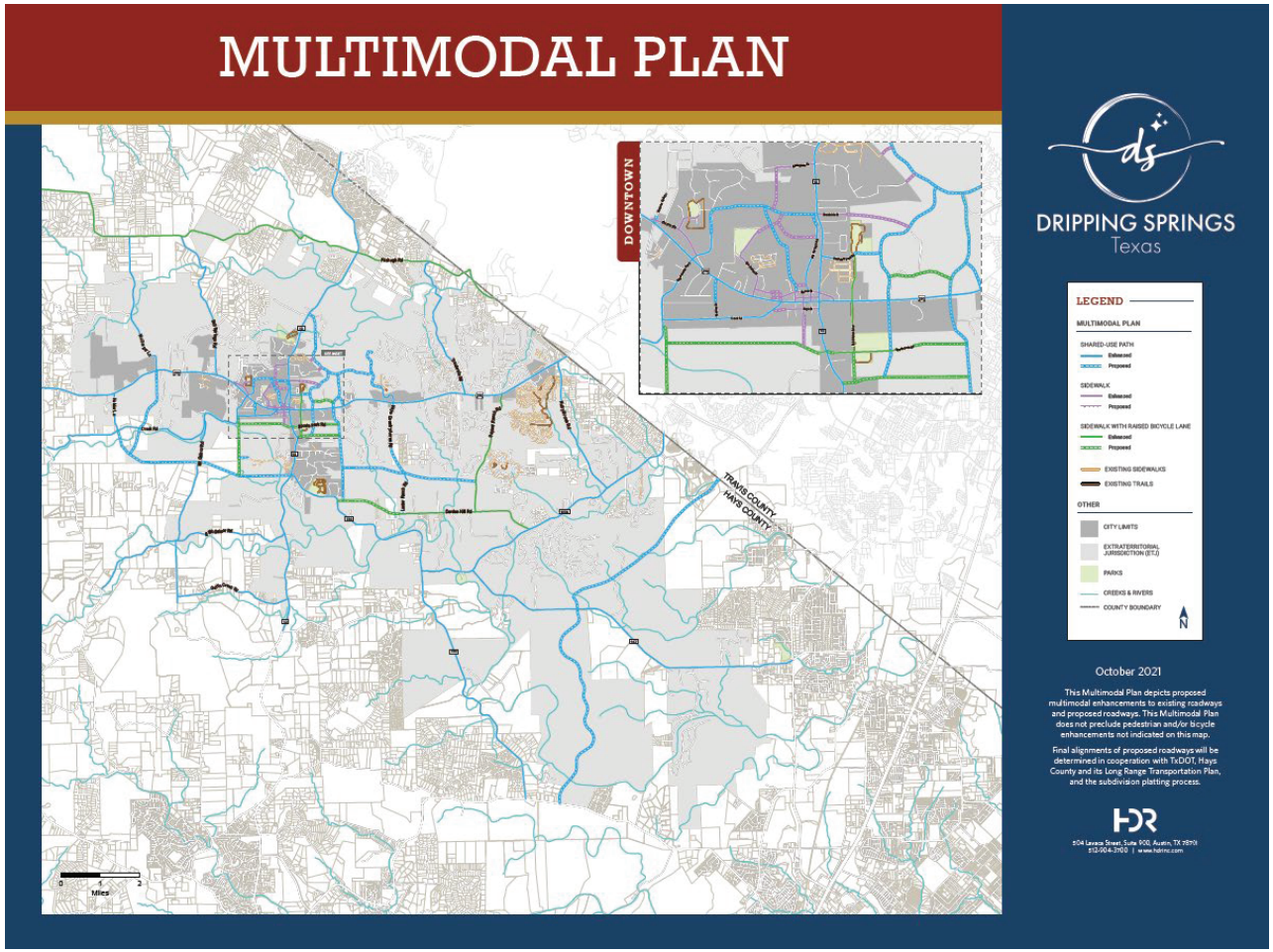
Proximity to Arrowhead: Half of a Mile



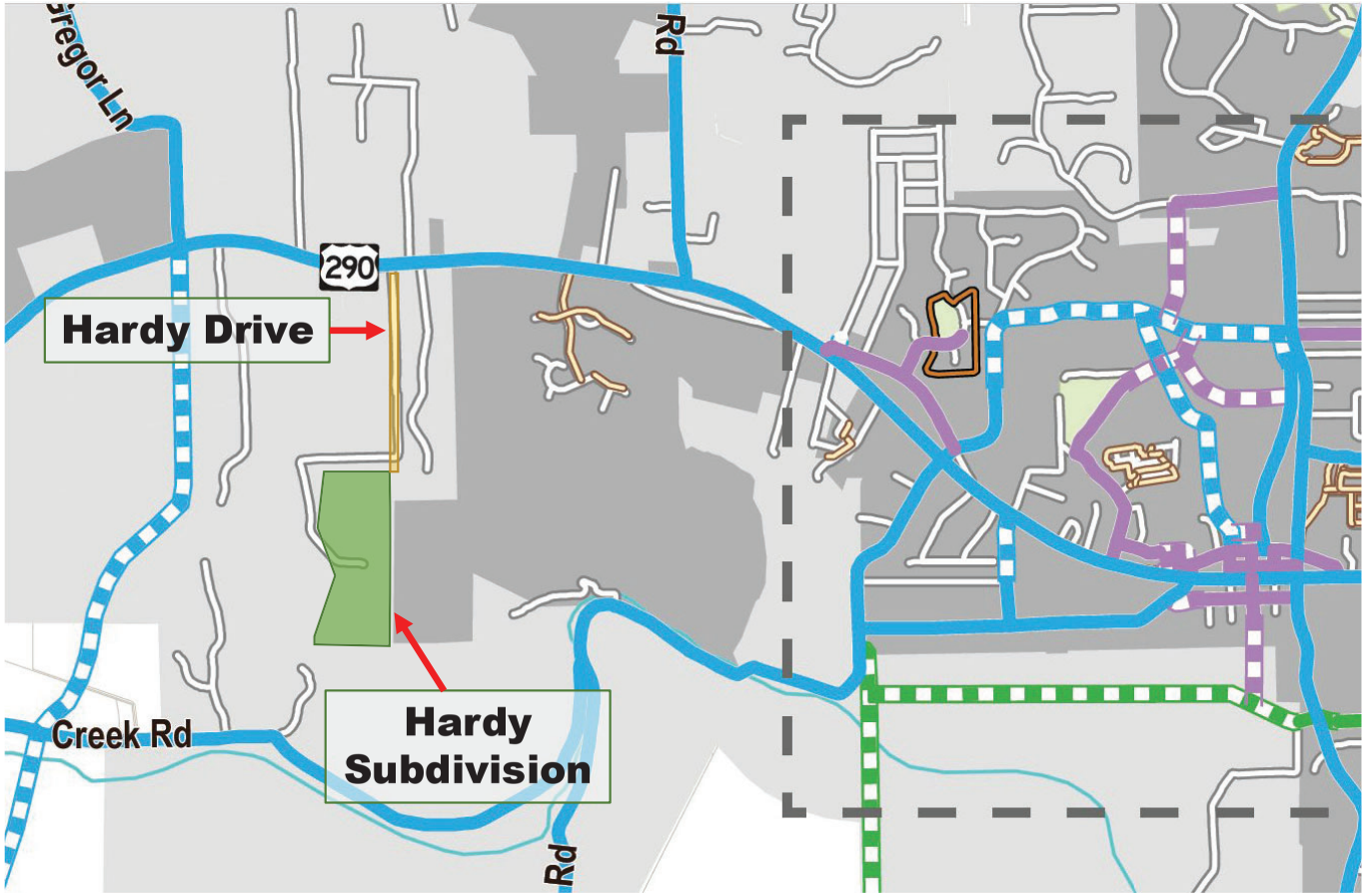
Proximity to Closest Public Sidewalk
- Walnut Springs - ~1 Mile



City's Future Sidewalk Plans



City's Future Sidewalk Plans Cont.



SIDEWALK

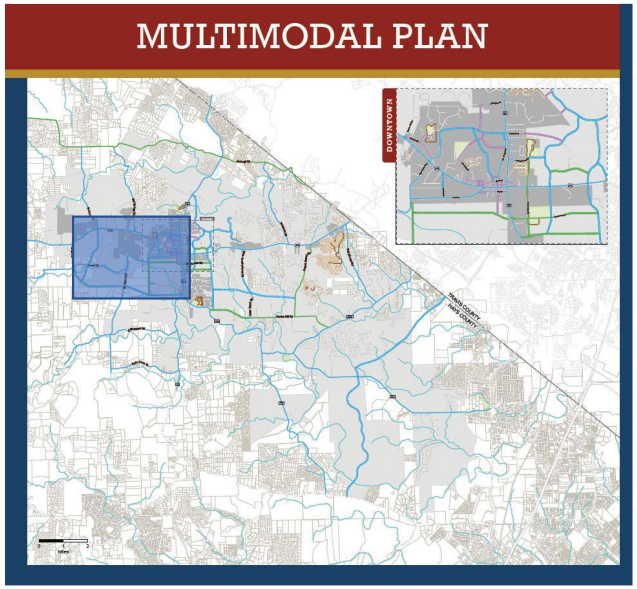
Enhanced

Proposed

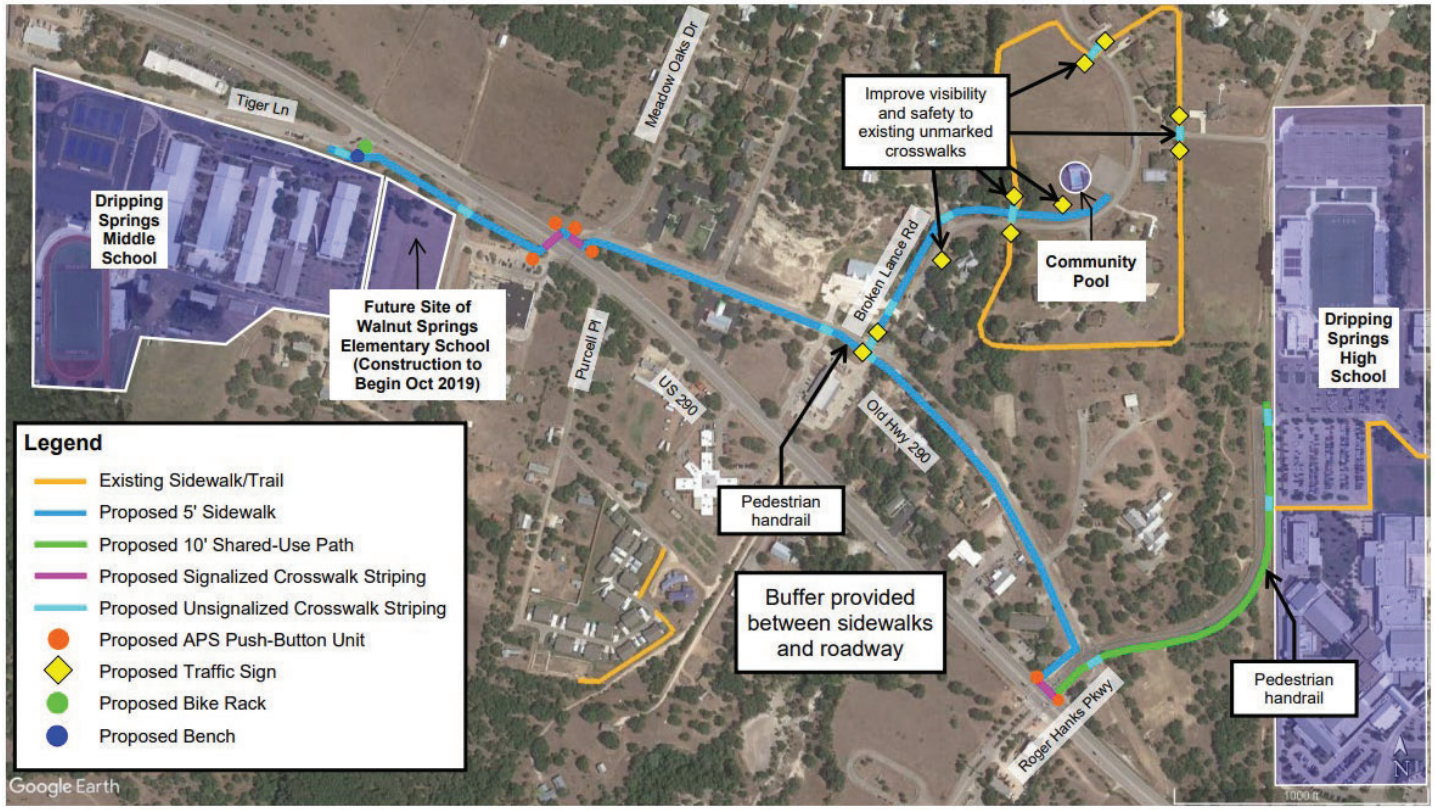
SIDEWALK WITH RAISED BICYCLE LANE

Enhanced

Proposed

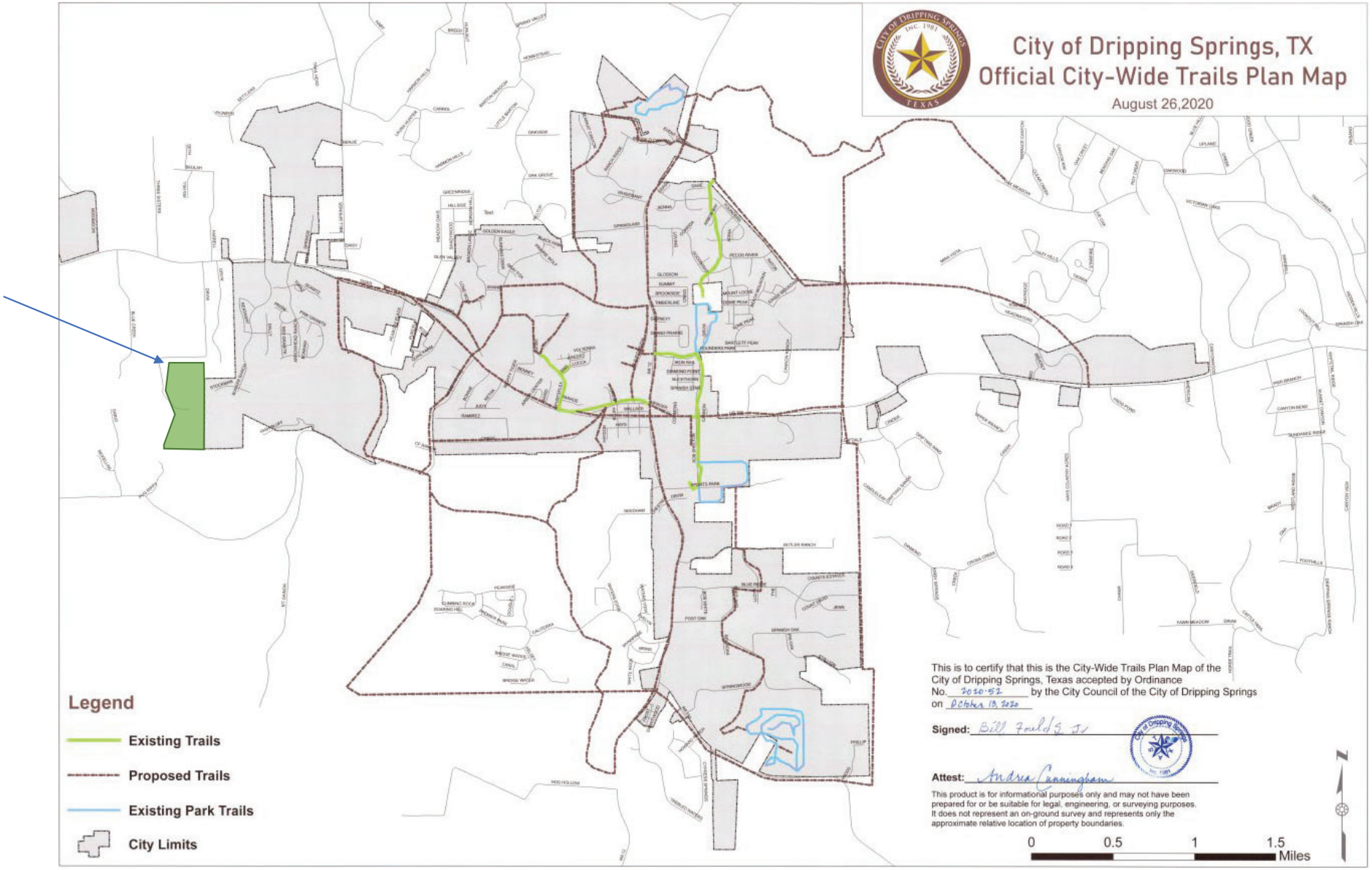


City of Dripping Springs
DSMS to DSHS SRTS Shared-Use Path/Sidewalk Project
Project Layout Map

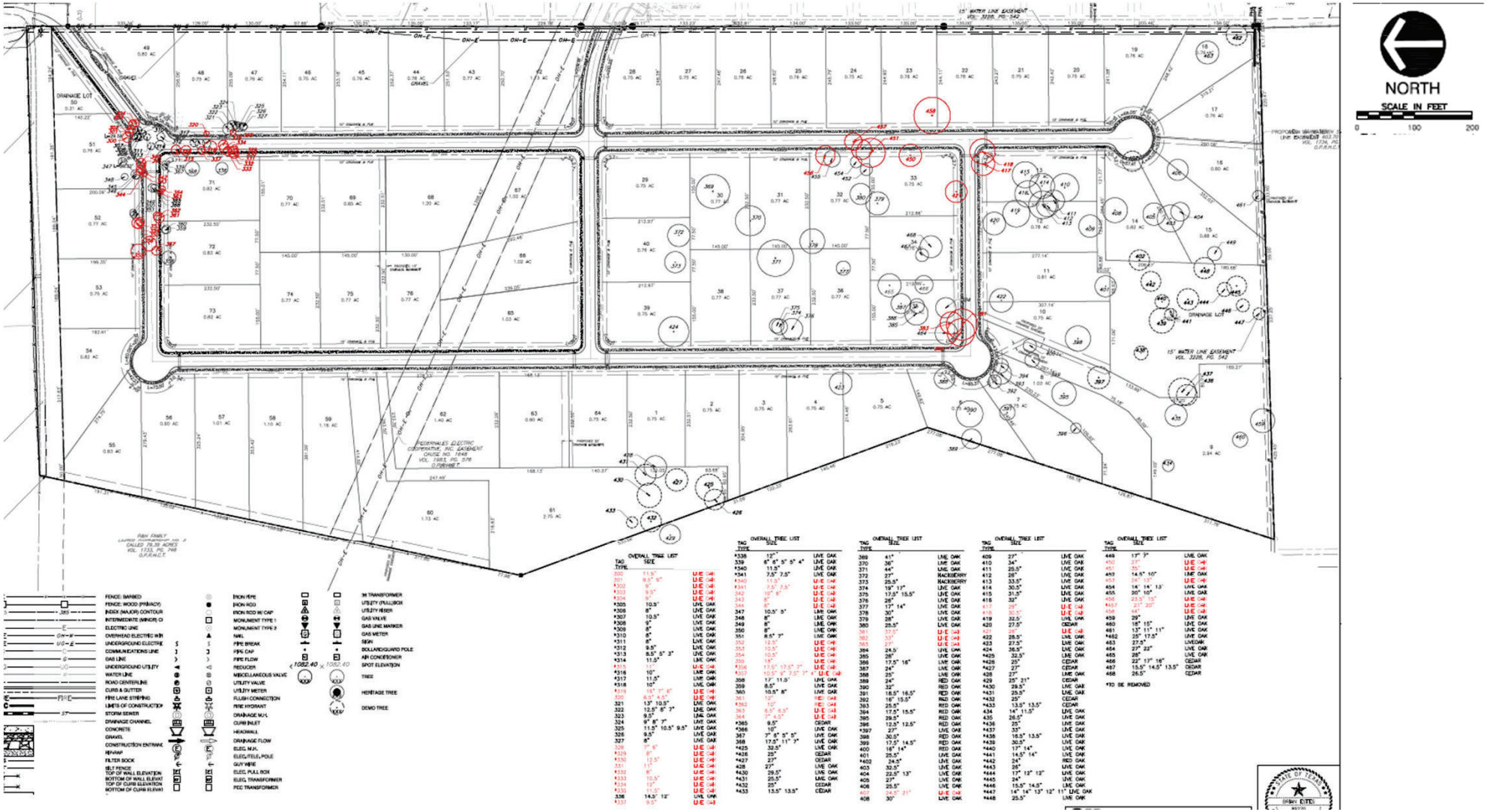


Dripping Spr Middle School SRTS SUP/Sidewalk Project along US Hwy 290 from DSpr High School to DSpr Middle School Project # 0_AUS_Dripping Springs03_SRTS-TA_Dripping Springs MS SUP & Sidewalk

Cite: https://www.cityofdrippingsprings.com/sites/g/files/vyhlif6956/f/uploads/project_location_middle_school_sup_and_sidewalks.pdf


City of Dripping Springs, TX
Official City-Wide Trails Plan Map
August 26,2020
Legend
Existing Trails
Proposed Trails
Existing Park Trails
City Limits
This is to certify that this is the City-Wide Trails Plan Map of the City of Dripping Springs, Texas accepted by Ordinance No. 2020-52 by the City Council of the City of Dripping Springs on October 13, 2020
Signed: Bill Foulds Jr.
Attest: Andrea Cunningham
This product is for informational purposes only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-ground survey and represents only the approximate relative location of property boundaries.
0
0.5
1
1.5
Miles

Protected Tree Removal



Protected Tree Removal – Hardy Drive

Protected Tree Removal – Hardy Drive Cont.

Protected Tree Removal – Hardy Drive Cont.

Protected Tree Removal – Hardy Drive Cont.

Protected Tree Removal – Hardy Drive Cont.

Protected Tree Removal – Hardy Drive Cont.

Supplemental Slides

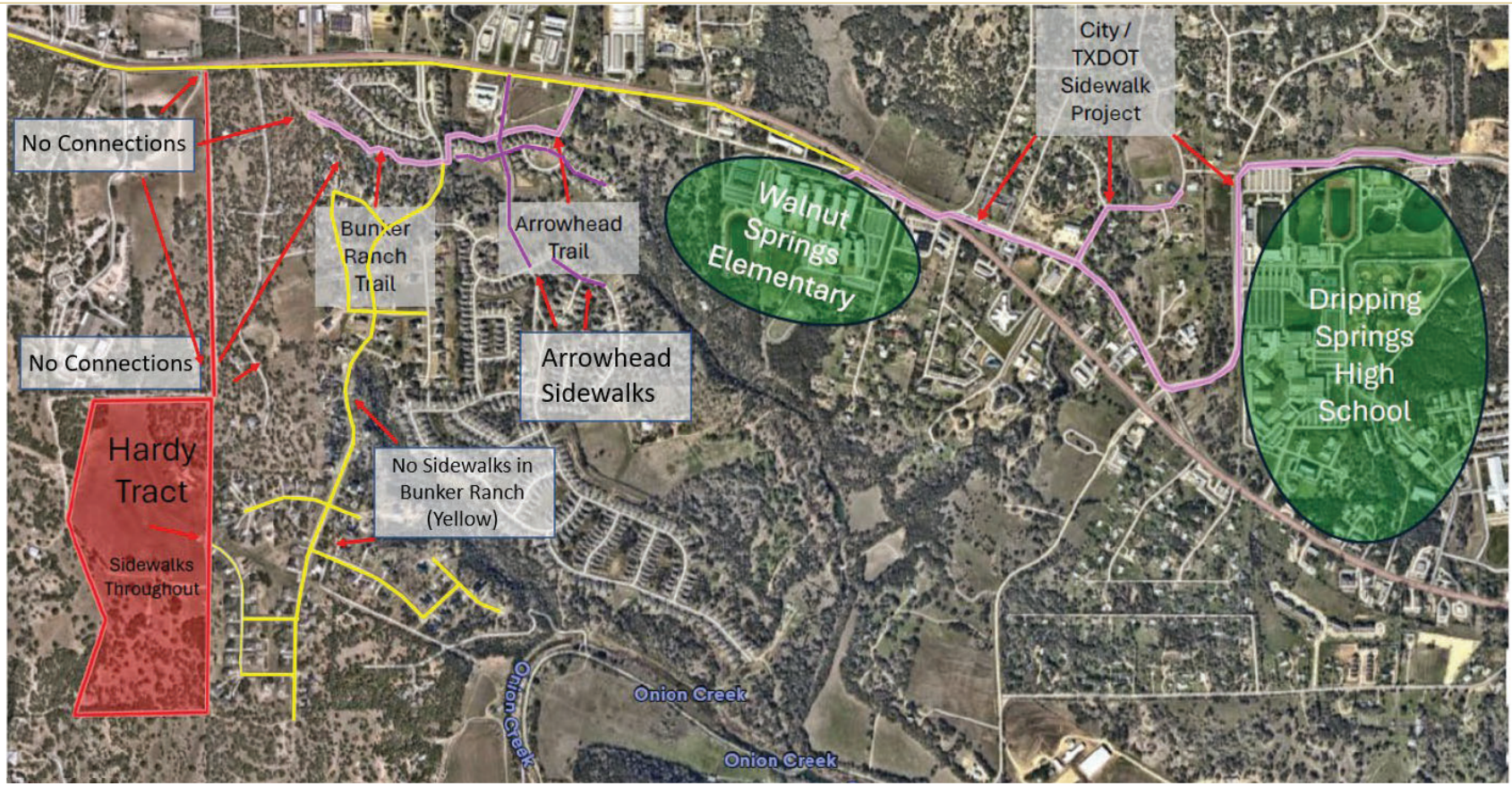


Exhibit G

JUNE 9, 2021

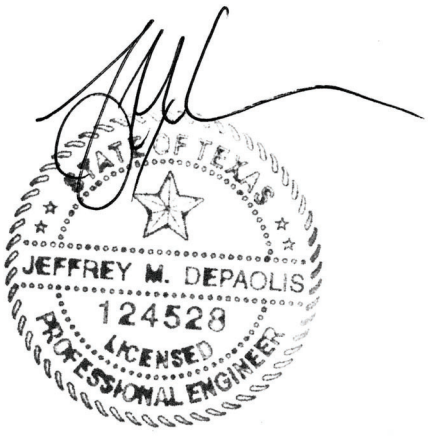
REVISED TRAFFIC IMPACT ANALYSIS FOR THE PROPOSED BUNKER RANCH SUBDIVISION EXPANSION

US 290 and
Bunker Ranch Boulevard

City of Dripping Springs
Hays County, Texas

Prepared for:

The Overlook at Bunker Ranch, LLC
Mr. Steve Harren
317 Grace Lane #240
Austin, Texas 78746
(512) 644-6800



Prepared by:

Civil & Environmental Consultants, Inc.
Mr. Jeffrey M. DePaolis, P.E., PTOE
333 Baldwin Road
Pittsburgh, Pennsylvania 15205
(412) 429-2324

TABLE OF CONTENTS

EXECUTIVE SUMMARY v

PROJECT DESCRIPTION/DATA COLLECTION/EXISTING ROADWAY DESCRIPTION 1

- PROJECT DESCRIPTION 1
- DATA COLLECTION 2
- EXISTING CONDITIONS 3

EXISTING 2021 CONDITION CAPACITY ANALYSIS 4

FORECASTED 2025 NO-BUILD (BASE) TRAFFIC VOLUMES 5

FORECASTED 2025 NO-BUILD (BASE) CONDITION CAPACITY CALCULATIONS 8

SITE TRAFFIC GENERATION AND DISTRIBUTION 9

- VEHICULAR TRIP GENERATION 9
- SITE TRAFFIC DISTRIBUTION 10

FORECASTED 2025 BUILD (WITH DEVELOPMENT) TRAFFIC VOLUMES 10

FORECASTED 2025 BUILD (WITH DEVELOPMENT) CONDITION CAPACITY CALCULATIONS 10

ADDITIONAL ANALYSES 11

- SIGNAL WARRANT EVALUATION 11
- QUEUING ANALYSIS 12
- STOPPING SIGHT DISTANCE 12

CONCLUSIONS/RECOMMENDATIONS 13

LIST OF TABLES

TABLE 1 – SUMMARY OF CAPACITY ANALYSIS RESULTS – AM PEAK HOUR

TABLE 2 – SUMMARY OF CAPACITY ANALYSIS RESULTS – PM PEAK HOUR

TABLE 3 – APPROVED BUNKER RANCH SUBDIVISION TRIP GENERATION SUMMARY

TABLE 4 – PROPOSED BUNKER RANCH SUBDIVISION TRIP GENERATION SUMMARY

TABLE 5 – PROPOSED BUNKER RANCH SUBDIVISION APPROVED PLUS EXPANSION TRIP GENERATION SUMMARY

TABLE 6 – ARROWHEAD RANCH DEVELOPMENT TRIP GENERATION SUMMARY

LIST OF FIGURES

FIGURE 1 – SITE LOCATION

FIGURE 2 – SITE PLAN

FIGURE 3 – STUDY INTERSECTION

FIGURE 4 – EXISTING 2021 PEAK HOUR TRAFFIC VOLUMES

FIGURE 5 – EXISTING 2021 PEAK HOUR LEVELS OF SERVICE

FIGURE 6 – FORECASTED 2025 BACKGROUND PEAK HOUR TRAFFIC VOLUMES

FIGURE 7 – ANTICIPATED BUNKER RANCH SUBDIVISION PRIMARY TRIP ARRIVAL/DEPARTURE DISTRIBUTION

FIGURE 8 – ANTICIPATED BUNKER RANCH APPROVED BACKGROUND PRIMARY SITE GENERATED PEAK HOUR TRIPS

FIGURE 9 – ANTICIPATED ARROWHEAD RANCH RESIDENTIAL PRIMARY TRIP ARRIVAL/DEPARTURE DISTRIBUTION

FIGURE 10 – ANTICIPATED ARROWHEAD RANCH COMMERCIAL PRIMARY TRIP ARRIVAL/DEPARTURE DISTRIBUTION

FIGURE 11 – ANTICIPATED ARROWHEAD RANCH COMMERCIAL PASS-BY TRIP ARRIVAL/DEPARTURE DISTRIBUTION

FIGURE 12 – ANTICIPATED ARROWHEAD RANCH APPROVED BACKGROUND RESIDENTIAL SITE GENERATED PEAK HOUR TRIPS

FIGURE 13 – ANTICIPATED ARROWHEAD RANCH PLANNED LIQUOR STORE PRIMARY SITE GENERATED PEAK HOUR TRIPS

FIGURE 14- ANTICIPATED ARROWHEAD RANCH PLANNED GAS STATION PRIMARY SITE GENERATED PEAK HOUR TRIPS

FIGURE 15 – ANTICIPATED ARROWHEAD RANCH PLANNED GAS STATION PASS-BY SITE GENERATED PEAK HOUR TRIPS

FIGURE 16 – ANTICIPATED ARROWHEAD RANCH TOTAL BACKGROUND SITE GENERATED PEAK HOUR TRIPS

FIGURE 17 – FORECASTED 2025 NO-BUILD (BASE) PEAK HOUR TRAFFIC VOLUMES

FIGURE 18 – FORECASTED 2025 NO-BUILD (BASE) LEVELS OF SERVICE

FIGURE 19 – FORECASTED 2025 NO-BUILD (BASE) MITIGATED LEVELS OF SERVICE

FIGURE 20 – ANTICIPATED PROPOSED BUNKER RANCH PRIMARY SITE GENERATED PEAK HOUR TRIPS

FIGURE 21 – FORECASTED 2025 BUILD (WITH DEVELOPMENT) PEAK HOUR TRAFFIC VOLUMES

FIGURE 22 - FORECASTED 2025 BUILD (WITH DEVELOPMENT) PEAK HOUR LEVELS OF SERVICE

FIGURE 23 – FORECASTED 2025 BUILD (WITH DEVELOPMENT) MITIGATED PEAK HOUR LEVELS OF SERVICE

LIST OF APPENDICES

APPENDIX A – TRAFFIC IMPACT ANALYSIS SCOPE OF STUDY

APPENDIX B – BACKGROUND TRAFFIC GROWTH RATE CALCULATIONS

APPENDIX C – TURNING MOVEMENT COUNT SUMMARIES

APPENDIX D - COVID-19 TRAFFIC VOLUME FACTOR EVALUATION

APPENDIX E – INTERSECTION APPROACH PHOTOGRAPHS

APPENDIX F – LEVEL OF SERVICE DEFINITIONS

APPENDIX G – EXISTING 2021 CAPACITY CALCULATIONS

APPENDIX H – BUNKER RANCH TRIP GENERATION CALCULATIONS

APPENDIX I – ARROWHEAD RANCH CONCEPTUAL SITE PLAN

APPENDIX J – ARROWHEAD RANCH BACKGROUND DEVELOPMENT TRIP GENERATION CALCULATIONS

APPENDIX K – FORECASTED 2025 NO-BUILD (BASE) CAPACITY CALCULATIONS

APPENDIX L – TRAFFIC SIGNAL WARRANT EVALUATION

APPENDIX M – FORECASTED 2025 NO-BUILD (BASE) MITIGATED CAPACITY CALCULATIONS

APPENDIX N – FORECASTED 2025 BUILD (WITH DEVELOPMENT) CAPACITY CALCULATIONS

APPENDIX O – FORECASTED 2025 BUILD (WITH DEVELOPMENT) MITIGATED CAPACITY CALCULATIONS

APPENDIX P – EXISTING 2021 QUEUING ANALYSIS

APPENDIX Q – FORECASTED 2025 NO-BUILD (BASE) QUEUING ANALYSIS

APPENDIX R – FORECASTED 2025 NO-BUILD (BASE) MITIGATED QUEUEING ANALYSIS

APPENDIX S – FORECASTED 2025 BUILD (WITH DEVELOPMENT) QUEUEING ANALYSIS

APPENDIX T – FORECASTED 2025 BUILD (WITH DEVELOPMENT) MITIGATED QUEUEING ANALYSIS

REVISED TRAFFIC IMPACT ANALYSIS
FOR THE PROPOSED
BUNKER RANCH SUBDIVISION EXPANSION
City of Dripping Springs, Hays County, Texas

EXECUTIVE SUMMARY

General Overview of the Development

- The Bunker Ranch subdivision is located south of US 290, at its intersection with Bunker Ranch Boulevard, in the City of Dripping Springs, Hays County, Texas.
- The Bunker Ranch subdivision was previously approved to include 160 single family units and 42 condominium units. At the time of the data collection for this project, 58 single family units and six (6) condominium units have been constructed and occupied.
- The proposed expansion will include the construction of an additional 228 single family units (388 total single family units).
- Access to the Bunker Ranch subdivision is provided via Bunker Ranch Boulevard at its intersection with US 290. No changes to the site access are planned with the expansion.
- Traffic Impact Analysis revised in order to address review comments received from the traffic engineering consultant for the City of Dripping Springs (HDR Engineering, Inc.) dated June 3, 2021.

Study Intersection

- US 290 with Bunker Ranch Boulevard (existing unsignalized);
- US 290 with Arrowhead Ranch Boulevard (existing unsignalized); and
- US 290 with Springs Lane (existing unsignalized).

Trip Generation and Distribution

- Trip generation of the proposed Bunker Ranch subdivision was determined using rates and formulae contained in the Institute of Transportation Engineers (ITE) publication *Trip Generation*, Tenth Edition, 2017:
  - Land Use Code 210, *Single-Family Detached Housing*, was used to determine the trip generation of the proposed 228 additional single family units.
- Estimated Trip Generation for the proposed development:

  AM Peak Hour: 40 Entering / 122 Exiting / 162 Total

  PM Peak Hour: 134 Entering / 79 Exiting / 213 Total
- Trip distribution provided by the City of Dripping Springs indicates 80% / 20% distribution with the majority of trips originating from or destined to the east of the site along US 290.

Mitigation Measures to be Constructed Concurrent with Development

- No mitigation measures recommended for the Bunker Ranch development expansion.

REVISED TRAFFIC IMPACT ANALYSIS
FOR THE PROPOSED
BUNKER RANCH SUBDIVISION EXPANSION
City of Dripping Springs, Hays County, Texas

Civil & Environmental Consultants (CEC) has completed this Revised Traffic Impact Analysis for the construction of the proposed expansion of the Bunker Ranch subdivision, which is located south of US 290, at its intersection with Bunker Ranch Boulevard, in the City of Dripping Springs, Hays County, Texas.

This Traffic Impact Analysis has been revised in order to address review comments received from the traffic engineering consultant for the City of Dripping Springs, HDR Engineering Inc., dated June 3, 2021.

The following sections of this report contain a project description, data collection, site traffic generation and distribution, projected traffic volumes, analysis, and conclusions and recommendations.

PROJECT DESCRIPTION/DATA COLLECTION/EXISTING ROADWAY DESCRIPTION

PROJECT DESCRIPTION

As shown in Figure 1, the Bunker Ranch subdivision is located south of US 290, at its intersection with Bunker Ranch Boulevard, in the City of Dripping Springs, Hays County, Texas.

The Bunker Ranch subdivision was previously approved to include 160 single family units and 42 condominium units. At the time data collection was performed for this project, 58 single family units and six (6) condominium units had been constructed and occupied. The proposed expansion will include the construction of an additional 228 single family units, for a total of 388 single family units following the proposed expansion.

A copy of the site plan for the proposed Bunker Ranch subdivision has been included with this report as Figure 2.

In accordance with a scope of study developed by the representatives of the City of Dripping Springs and provided to CEC via an email dated March 31, 2021, the following intersections were selected for study:

- US 290 with Bunker Ranch Boulevard (existing unsignalized);
- US 290 with Arrowhead Ranch Boulevard (existing unsignalized); and
- US 290 with Springs Lane (existing unsignalized).

A total of three (3) existing intersections were included in the scope of the study. A copy of the completed City of Dripping Springs/Texas Department of Transportation Traffic Impact Analysis

Scope and Study Area form provided by the City of Dripping Springs has been included in Appendix A to this report.

The study intersections with respect to the site are illustrated in Figure 3.

DATA COLLECTION

Manual turning movement counts were performed at the existing study intersections on Tuesday, April 20, 2021 from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. These time periods were assumed to include the weekday AM and weekday PM peak hours of vehicular activity for the study area. Summaries of the data collected during the turning movement counts at the study intersections have been included in Appendix C to this report.

The overall peak hours determined from these counts are as follows:

- AM Peak Hour – 8:00 AM – 9:00 AM
- PM Peak Hour – 4:30 PM – 5:30 PM

The results of the turning movement counts are presented in Figure 4.

However, as a result of measures put in place to prevent the spread of COVID-19 including stay at home orders, canceling of events and public gatherings, business closures, university and school closures, increased telecommuting, and increased jobless numbers, traffic volumes observed at the time the turning movement counts were conducted collected may be lower than under pre-COVID conditions in some locations. Therefore, at the request of the City of Dripping Springs, historic traffic count data during pre-COVID conditions was reviewed in order to determine if an adjustment factor is necessary to account for variations in traffic volumes due to the COVID-19 pandemic.

Pre-COVID 24-hour traffic volumes collected in January 2018 along US 290, west of Bell Springs Road, were provided by the City of Dripping Springs. According to this count data, the Average Daily Traffic (ADT) along US 290, west of Bell Springs Road, was 14,959 vehicles per day in 2018.

In order to project current year, 2021, traffic volumes, CEC calculated a background traffic growth rate for the study area. This growth rate was calculated based on Average Annual Daily Traffic (AADT) volume data obtained from the TXDOT Traffic Count Database System (TCDS). The data includes the five (5) most recent years of AADT count data available for three (3) count stations along US 290. Based on this count data, a background traffic growth rate of 2.44 percent per year, linear was calculated. This background traffic growth rate was approved by the City of Dripping Springs Traffic Consultant, HDR Inc., on April 30, 2021. Detailed background traffic growth rate calculations are provided in Appendix B to this report.

The background traffic growth rate of 2.44 percent per year, linear, was then applied to the 2018 ADT volumes provided by the City of Dripping Springs in order to depict existing 2021 24-hour

ADT traffic volumes along US 290, west of Bell Springs Road. The resultant 2021 ADT traffic volumes for US 290, west of Bell Springs Road, was estimated to be 16,054 vehicles per day.

An Automatic Traffic Recorder (ATR) was installed along US 290, west of Bell Springs Road, for 48-continuous hours on Tuesday, April 20, 2021 and Wednesday, April 21, 2021. Based on the data collected using the ATR, the average ADT for this location along US 290 was identified to be approximately 20,717 vehicles per day. This reflects an increase of 4,663 vehicles per day when compared to the ADT data provided by the City of Dripping Springs, grown to estimate existing 2021 conditions. As a result, it is CEC's opinion that traffic volumes within the study area do not require an adjustment factor to account for COVID-19. This evaluation was provided to and approved by the City of Dripping Spring's Traffic Consultant, HDR Inc., in a virtual meeting held on April 3, 2021.

Traffic volume comparisons to evaluate COVID-19 traffic conditions are provided in Appendix D to this report.

EXISTING CONDITIONS

A field reconnaissance of the study area was conducted by CEC to obtain information such as roadway widths, roadway grades, and posted speed limits within the environs of the study intersection. A description of the study roadways is as follows:

US 290 – Within the study area, US 290 is a State-maintained, principal arterial roadway providing a five (5) lane, 63-foot wide improved surface with a 15 foot wide center two-way left turn lane and five (5) foot-wide paved shoulders.

At its intersection with Bunker Ranch Boulevard, US 290 provides a three (3) lane approach for eastbound traffic (two (2) exclusive through lanes and an exclusive right turn lane) and a three (3) lane approach for westbound traffic (left turns from the center, two-way left turn lane and two (2) exclusive through lanes). The intersection is controlled by a Stop sign on the Bunker Ranch Boulevard approach to US 290.

At its intersection with Arrowhead Ranch Boulevard/Dripping Springs Independent School District (DSISD) Transportation Department driveway, US 290 provides a four (4) lane approach for eastbound traffic (left turns from the center, two-way left turn lane, two (2) exclusive through lanes and an exclusive right turn lane) and a three (3) lane approach for westbound traffic (left turns from the center, two-way left turn lane, an exclusive through lane, and a shared through/right turn lane). The intersection is controlled by a Stop sign on the Arrowhead Ranch Boulevard driveway approach to US 290. Although there is no Stop sign on the DSISD Transportation Department driveway approach to US 290, it is assumed that this minor street approach to US 290 is intended to stop prior to entering US 290.

At its intersection with Springs Lane, US 290 provides a three (3) lane approach for eastbound traffic (left turns from the center, two-way left turn lane and two (2) exclusive through lanes) and a two (2) lane approach for westbound traffic (an exclusive through lane and a shared through/right turn lane). The intersection is controlled by a Stop sign on the Springs Lane approach to US 290.

The posted speed limit of US 290 is 60 miles per hour west of Arrowhead Ranch Boulevard and 50 miles per hour east of Arrowhead Ranch Boulevard.

Bunker Ranch Boulevard – At its intersection with US 290, Bunker Ranch Boulevard is a privately-maintained roadway, providing a 20-foot wide lane for ingress traffic and a 20-foot wide lane for egress traffic, separated by a 20-foot wide median. Bunker Ranch Boulevard provides a one (1) lane approach to US 290 for northbound traffic. The posted speed limit on Bunker Ranch Boulevard is 25 mph.

Arrowhead Ranch Boulevard – At its intersection with US 290, Arrowhead Ranch Boulevard is a privately-maintained roadway providing a 24-foot wide lane for ingress traffic and a 24-foot wide lane for egress traffic, separated by a eight (8) foot wide median. Arrowhead Ranch Boulevard provides a one (1) lane approach to US 290 for northbound traffic. There is no posted speed limit on Arrowhead Ranch Boulevard.

Dripping Springs Independent School District (DSISD) Transportation Department Driveway – At its intersection with US 290, the Dripping Springs Independent School District (DSISD) Transportation Department driveway is a privately-maintained roadway providing a 40-foot wide improved lane with a single lane approach to US 290 for southbound traffic. There is no posted speed limit on the DSISD Transportation Department driveway.

Springs Lane – At its intersection with US 290, Springs Lane is a privately-owned roadway, providing a two (2) lane, 30-foot wide improved surface with a single lane approach to US 290 for southbound traffic. There is no posted speed limit on Springs Lane.

Photographs of each approach to the study intersections are included in Appendix E to this report.

EXISTING 2021 CONDITION CAPACITY ANALYSIS

Capacity calculations were performed for each of the existing study intersections using existing 2021 peak hour traffic volumes and the methodologies published by the Transportation Research Board in their *Highway Capacity Manual*, Sixth Edition, 2017. This methodology determines how well an intersection, approach to an intersection, or movement at an intersection operates, and assigns to it a Level of Service (LOS) A through F, with LOS A representing the best operating conditions and LOS F, the worst. Detailed definitions of LOS have been included in Appendix F to this report.

The results of the capacity calculations performed using existing 2021 peak hour traffic volumes and conditions at the existing study intersections are presented in Figure 5 for the weekday AM and weekday PM peak hours. LOS, delay, and volume to capacity ratios for each approach to each study intersection are summarized in Table 1 and Table 2 for the weekday AM and weekday PM peak hours, respectively.

The results of the capacity calculations performed using existing 2021 condition traffic volumes revealed that each of the existing study intersections currently operates at an overall intersection Level of Service A during both the weekday AM and weekday PM peak hours, with all movements

at the study intersections operating at a Level of Service C or better, with the exception of the DSISD Transportation Department driveway approach to US 290, which currently operates at a LOS D during the weekday AM peak hour and a LOS E during the weekday PM peak hour. Copies of the capacity calculations performed using existing 2021 peak hour traffic volumes and conditions at the existing study intersections are included in Appendix G to this report.

FORECASTED 2025 NO-BUILD (BASE) TRAFFIC VOLUMES

The proposed Bunker Ranch subdivision expansion is anticipated to be completed and fully occupied in 2025. Therefore, traffic volumes were projected for the study intersections for forecasted 2025 conditions.

Forecasted 2025 background traffic volumes for the weekday AM and weekday PM peak hours were determined by applying the aforementioned background traffic growth rate of 2.44 percent per year, linear, to the existing 2021 peak hour traffic volumes (Figure 4). The resultant forecasted 2025 background weekday AM and weekday PM peak hour traffic volumes are presented in Figure 6.

As previously discussed, the Bunker Ranch subdivision was previously approved to include 160 single family units and 42 condominium units but, at the time data collection was performed for this project, 58 single family units and six (6) condominium units had been constructed and occupied. Therefore, the anticipated weekday AM and PM peak hour trips to be generated by the 102 single family units and 36 condominium units that have been approved but not yet constructed or occupied have been included in the within the approved no-build (base) condition traffic volumes.

Vehicular trip generation of the 102 single family units and 36 condominium units that have been approved but not yet constructed or occupied was projected based upon data published by the Institute of Transportation Engineers (ITE) in their *Trip Generation*, Tenth Edition, 2017. Land Use Code 210, *Single-Family Detached Housing*, was used to estimate the trip generation for the 102 single family units and Land Use Code 220, *Multifamily Low-Rise*, was used to estimate the trip generation for the 36 multi-family condo units.

Using this methodology, the approved but not yet constructed or occupied residential units within the Bunker Ranch subdivision can be anticipated to generate a total of 90 trips during the weekday AM peak hour (22 trips entering and 68 trips exiting) and a total of 122 trips during the weekday PM peak hour (77 trips entering and 45 trips exiting). Copies of the trip generation calculations performed in order to estimate the anticipated trip generation of the approved but not yet constructed or occupied residential units within the Bunker Ranch subdivision are included in Appendix H to this report.

The forecasted trips to be generated by the approved but not yet constructed or occupied residential units within the Bunker Ranch subdivision were distributed onto the study roadways and through the study intersections based on an arrival/departure distribution provided by the Traffic Engineering Consultant for the City of Dripping Springs. According to this information, 80 percent of primary trips within the study area are anticipated to originate from and be destined to

the east along US 290 and the remaining 20 percent of primary trips are anticipated to originate from and be destined to the west along US 290. The anticipated distribution of the forecasted trips to be generated by the approved but not yet constructed or occupied residential units within the Bunker Ranch subdivision is presented in Figure 7.

The anticipated trips to be added to the study intersections by the approved but not yet constructed or occupied residential units within the Bunker Ranch subdivision during the weekday AM and weekday PM peak hours are presented in Figure 8.

Similarly, it is understood that approximately 181 of the 403 residential units that have been approved as part of the Arrowhead Ranch residential development have been constructed and are occupied. Therefore, the anticipated weekday AM and PM peak hour trips to be generated by the 222 single family units that have been approved but not yet constructed or occupied have been included in the within the approved no-build (base) condition traffic volumes.

Vehicular trip generation of the 222 single family units that have been approved but not yet constructed or occupied was projected based upon data published by the aforementioned *Trip Generation*. Land Use Code 210, *Single-Family Detached Housing*, was used to estimate the trip generation for the 222 single family units.

Using this methodology, the approved but not constructed or occupied residential units within the Arrowhead Ranch residential development can be anticipated to generate a total of 158 trips during the weekday AM peak hour (40 trips entering and 118 trips exiting) and a total of 207 trips during the weekday PM peak hour (131 trips entering and 76 trips exiting).

The forecasted trips to be generated by the approved but not yet constructed or occupied residential units within the Arrowhead Ranch development were distributed onto the study roadways and through the study intersections based on the aforementioned arrival/departure distribution provided by the Traffic Engineering Consultant for the City of Dripping Springs. The anticipated distribution of the forecasted trips to be generated by the approved but not yet constructed or occupied residential units within the Arrowhead Ranch residential development is presented in Figure 9.

In addition, according to representatives of the City of Dripping Springs, a 6,000 SF super convenience store with 10 vehicle fueling positions and a 1,800 SF liquor store are currently planned to be constructed as part of the Arrowhead Ranch development. It is CEC's understanding that these commercial developments have not submitted a TIA and are not currently approved by the City of Dripping Springs. However, the City of Dripping Springs has requested that the anticipated trips to be generated by these planned commercial developments be included in the background traffic projections.

The City of Dripping Springs provided a conceptual site plan for these planned Arrowhead Ranch commercial developments. Based on the site plan provided, access to these commercial developments is proposed via a new site access driveway to US 290, the centerline of which is shown to be located approximately 320 feet west of the centerline of Arrowhead Ranch Boulevard, that will be restricted to right turns in/right turns out only. A second, full-movement driveway to

Arrowhead Ranch Boulevard is also planned to provide access to these commercial developments. A copy of the conceptual site plan for the planned Arrowhead Ranch commercial developments is included in Appendix I to this report.

Vehicular trip generation for the planned Arrowhead Ranch commercial developments was projected based upon data published in the aforementioned *Trip Generation*. Land Use Code 960, *Super Convenience Market/Gas Station*, was used to estimate the trip generation for the 6,000 SF super convenience store with 10 vehicle fueling positions. Land Use Code 899, *Liquor Store*, was used to estimate the trip generation for the 1,800 SF liquor store.

Using this methodology, the proposed 6,000 SF super convenience store with 10 vehicle fueling positions can be anticipated to generate a total of 488 trips during the weekday AM peak hour (244 trips entering and 244 trips exiting) and a total of 386 trips during the weekday PM peak hour (193 trips entering and 193 trips exiting). Similarly, the proposed 1,800 SF liquor store can be anticipated to generate a total of eight (8) trips during the weekday AM peak hour (four (4) trips entering and four (4) trips exiting) and a total of 29 trips during the weekday PM peak hour (15 trips entering and 14 trips exiting).

In addition, a portion of the total trips to be generated by the proposed Arrowhead Ranch 6,000 SF super convenience store with 10 vehicle fueling positions can be anticipated to be pass-by trips (those trips that are already traveling the study roadways and will stop at the site as an intermediate stop between their primary origin and their primary destination). The forecasted pass-by trips to be generated by the planned 6,000 SF super convenience store with 10 vehicle fueling positions, as a percentage of the total site trip generation, were estimated using data published by ITE in their *Trip Generation Handbook*, Third Edition, 2017. Land Use Code 960, *Super Convenience Market/Gas Station*, was used to estimate the trip generation for the 6,000 SF super convenience store with 10 vehicle fueling positions. According to this information, a *Super Convenience Market/Gas Station* can be anticipated to generate approximately 76 percent pass-by trips during both the weekday AM and PM peak hours.

Using this methodology, approximately 370 of the 488 trips generated by the planned 6,000 SF super convenience store with 10 vehicle fueling positions during the weekday AM peak hour can be anticipated to be pass-by trips (185 trips entering/185 trips exiting) and approximately 294 of the total 386 trips generated by the planned 6,000 SF super convenience store with 10 vehicle fueling positions during the weekday PM peak hour can be anticipated to be pass-by trips (147 trips entering/147 trips exiting).

The forecasted primary trips to be generated by the planned Arrowhead Ranch commercial developments were distributed onto the study roadways and through the study intersections based on the aforementioned arrival/departure distribution provided by the Traffic Engineering Consultant for the City of Dripping Springs. The anticipated distribution of the forecasted trips to be generated by the planned Arrowhead Ranch commercial developments is presented in Figure 10.

Forecasted pass-by trips to be generated by the planned super convenience store with 10 vehicle fueling positions were distributed through the study intersections based on the existing peak hour

traffic volume distributions along US 290 during each individual peak hours analyzed for both the weekday AM and PM peak hours. The forecasted pass-by trip distribution percentages are presented in Figure 11.

The anticipated trips to be added to the study intersections by the approved but not yet constructed or occupied residential units within the Arrowhead Ranch residential development during the weekday AM and weekday PM peak hours are presented in Figure 12.

The anticipated trips to be added to the study intersections by the planned Arrowhead Ranch liquor store during the weekday AM and weekday PM peak hours are presented in Figure 13.

The forecasted primary trips to be added to the study intersections by the planned Arrowhead Ranch super convenience market/gas station are presented in Figure 14.

The forecasted pass-by trips to be added to the study intersections by the planned Arrowhead Ranch super convenience market/gas station are presented in Figure 15.

The total trips to be added to each of the study intersections by the Arrowhead Ranch development, including both primary and pass-by trips, are presented in Figure 16.

Forecasted 2025 no-build traffic volumes for the weekday AM and weekday PM peak hours were determined by adding anticipated trips to be added to the study intersections by the approved but not yet constructed or occupied residential units within the Bunker Ranch subdivision (Figure 8) and the total trips to be added to each of the study intersections by the Arrowhead Ranch development (Figure 16) to the forecasted 2025 background traffic volumes (Figure 6). The resultant 2025 no-build (base) traffic volumes are presented in Figure 17.

FORECASTED 2025 NO-BUILD (BASE) CONDITION CAPACITY CALCULATIONS

Capacity calculations were performed for each of the study intersections using forecasted 2025 no-build (base) condition traffic volumes during the weekday AM and weekday PM peak hours. The results of the capacity calculations performed using forecasted 2025 no-build (base) condition traffic volumes are presented in Figure 18 for the weekday AM and weekday PM peak hours. LOS, delay, and volume to capacity ratios for each approach to each study intersection are summarized in Table 1 and Table 2 for the weekday AM and weekday PM peak hours, respectively.

The results of the capacity calculations performed using forecasted 2025 no-build (base) condition traffic volumes revealed that the study intersections of US 290 with Bunker Ranch Boulevard and US 290 with Springs Lane are anticipated to operate at an overall intersection Level of Service A during the weekday AM and PM peak hours, with all movements at each intersection forecasted to operate at a LOS C or better during each of the peak hours analyzed.

However, the study intersection of US 290 with Arrowhead Ranch Boulevard/DSISD Transportation Department driveway is anticipated to operate at an overall intersection Level of Service F during both the weekday AM and PM peak hours, with both the northbound Arrowhead

Ranch Boulevard and the southbound DSISD Transportation Department driveway approaches to the intersection operating at LOS F during each of the peak hours analyzed.

Copies of the capacity calculations performed using forecasted 2025 no-build (base) traffic volumes and conditions are included in Appendix L to this report.

According to the City of Dripping Springs Code of Ordinances, Chapter 28, Exhibit A, Section 11.11, *"The intersections included within the traffic impact analysis shall be considered adequate to serve the proposed development if existing intersections can accommodate the existing service volume, the service volume of the proposed development, and the service volume of approved but unbuilt developments holding valid, unexpired building permits at level of service "C" or above."* Therefore, because of the forecasted decrease in Level of Service, mitigation measures will need to be considered for the intersection of US 290 with Arrowhead Ranch Boulevard.

Warrants for the installation of traffic signal control were evaluated at the study intersection of US 290 with Arrowhead Ranch Boulevard. These analyses were performed using criteria published in Chapter 4C, Traffic Control Signal Needs Studies, contained in the *Texas Manual on Uniform Traffic Control Devices* (TMUTCD). Specifically Warrant III, the *Peak Hour* warrant, was evaluated. The peak hour signal warrant is anticipated to be satisfied at the intersection of US 290 with Arrowhead Ranch Boulevard under forecasted 2025 no-build (base) conditions during both the weekday AM and weekday PM peak hours. Therefore, traffic signal control is assumed to be necessary for the planned Arrowhead Ranch development and the installation of traffic signal control at the intersection of US 290 with Arrowhead Ranch Boulevard would be the sole responsibility of the Arrowhead Ranch development.

Copies of the graphs used to verify warrants for the installation of traffic signal control are included in Appendix L to this report.

Therefore, capacity calculations were then performed for the study intersection of US 290 with Arrowhead Ranch Boulevard assuming the installation of a traffic signal at the intersection. The results of these capacity calculations revealed that the intersection of US 290 with Arrowhead Ranch Boulevard could be anticipated to operate at an overall intersection Level of Service C or better during the weekday AM and PM peak hours, with all movements operating at a LOS C or better, following installation of traffic signal control. The anticipated Levels of Service at the intersection of US 290 with Arrowhead Ranch Boulevard, assuming the installation of a traffic signal, are presented in Figure 19 for the weekday AM and weekday PM peak hours. LOS, delay, and volume to capacity ratios for each approach are summarized in Table 1 and Table 2 for the weekday AM and weekday PM peak hours, respectively.

Copies of the capacity calculations performed using forecasted 2025 no-build (base) traffic volumes including mitigations are included in Appendix M to this report.

SITE TRAFFIC GENERATION AND DISTRIBUTION

VEHICULAR TRIP GENERATION

Vehicular trip generation for the proposed Bunker Ranch subdivision expansion was projected based upon data published in the aforementioned *Trip Generation*. Land Use Code 210, *Single-Family Detached Housing*, was used to estimate the trip generation for the proposed 228 Single family units.

Using this methodology, the proposed Bunker Ranch subdivision expansion can be anticipated to generate a total of 162 trips during the weekday AM peak hour (40 trips entering and 122 trips exiting) and a total of 213 trips during the weekday PM peak hour (134 trips entering and 79 trips exiting).

SITE TRAFFIC DISTRIBUTION

As previously detailed, arrival and departure distribution for the proposed Bunker Ranch subdivision expansion was provided by the Traffic Engineering Consultant for the City of Dripping Springs. This trip distribution is summarized in Figure 7.

The forecasted trips to be added to each of the study intersections by the proposed Bunker Ranch subdivision expansion are presented in Figure 20.

FORECASTED 2025 BUILD (WITH DEVELOPMENT) TRAFFIC VOLUMES

The forecasted 2025 build traffic volumes (with development) at each of the study intersections during the weekday AM and weekday PM hours were determined by adding the forecasted trips to be added to the study intersection by the proposed Bunker Ranch subdivision expansion (Figure 20) to the forecasted 2025 no-build (base) traffic volumes (Figure 17). The resultant forecasted 2025 build (with development) traffic volumes are presented in Figure 21.

FORECASTED 2025 BUILD (WITH DEVELOPMENT) CONDITION CAPACITY CALCULATIONS

Capacity calculations were performed for each of the study intersections using forecasted 2025 build (with development) traffic volumes and conditions during the weekday AM and weekday PM peak hours. The results of the capacity calculations performed using forecasted 2025 build (with development) conditions and traffic volumes are presented in Figure 22 for the weekday AM and weekday PM peak hours. LOS, delay, and volume to capacity ratios for each approach are summarized in Table 1 and Table 2 for the weekday AM and weekday PM peak hours, respectively.

The results of the capacity calculations performed using forecasted 2025 build (with development) condition traffic volumes revealed that the study intersections of US 290 with Bunker Ranch Boulevard and US 290 with Springs Lane are anticipated to continue to operate at an overall intersection Level of Service A during the weekday AM and PM peak hours, with all movements

at each intersection forecasted to operate at a LOS D or better. Therefore, no mitigation measures are necessary for the intersections of US 290 with Bunker Ranch Boulevard and US 290 with Springs Lane following completion of the Bunker Ranch subdivision expansion.

However, similar to the analyses performed for the 2025 no-build (base) conditions, the study intersection of US 290 with Arrowhead Ranch Boulevard is anticipated to operate with an overall intersection Level of Service F during both the weekday AM and PM peak hours, with both the northbound Arrowhead Ranch Boulevard and the southbound DSISD Transportation Department driveway approaches to the intersection operating at LOS F during each of the peak hours analyzed under existing traffic control. As previously detailed, warrants for the installation of traffic signal control at the intersection of US 290 with Arrowhead Ranch Boulevard are forecasted to be satisfied under forecasted 2025 no-build (base) conditions. Therefore, traffic signal control is assumed to be necessary for the planned Arrowhead Ranch development. Installation of traffic signal control at the intersection of US 290 with Arrowhead Ranch Boulevard is the sole responsibility of the Arrowhead Ranch development.

Copies of the capacity calculations performed using forecasted 2025 build (with development) traffic volumes are included in Appendix N to this report.

Therefore, capacity calculations were then performed for the study intersection of US 290 with Arrowhead Ranch Boulevard assuming the installation of a traffic signal at the intersection. The results of these capacity calculations revealed that the intersection of US 290 with Arrowhead Ranch Boulevard could be anticipated to operate at an overall intersection Level of Service C or better during the weekday AM and PM peak hours, with all movements operating at a LOS C or better, following installation of traffic signal control. The anticipated Levels of Service at the intersection of US 290 with Arrowhead Ranch Boulevard, assuming the installation of a traffic signal, are presented in Figure 23 for the weekday AM and weekday PM peak hours. LOS, delay, and volume to capacity ratios for each approach are summarized in Table 1 and Table 2 for the weekday AM and weekday PM peak hours, respectively.

Copies of the capacity calculations performed using forecasted 2025 build (with development) traffic volumes including mitigations are included in Appendix O to this report.

ADDITIONAL ANALYSES

SIGNAL WARRANT EVALUATION

As previously discussed, warrants for the installation of traffic signal control at the study intersection of US 290 with Arrowhead Ranch Boulevard are anticipated to be satisfied under forecasted 2025 no-build (base) conditions and are forecasted to continue to be satisfied under forecasted 2025 build (with development) conditions.

According to the City of Dripping Springs Code of Ordinances, Chapter 28, Exhibit A, Section 11.11, *"The intersections included within the traffic impact analysis shall be considered adequate to serve the proposed development if existing intersections can accommodate the existing service volume, the service volume of the proposed development, and the service volume of approved but*

unbuilt developments holding valid, unexpired building permits at level of service "C" or above." Therefore, signal warrant evaluations were not performed for the intersections of US 290 with Bunker Ranch Boulevard and US 290 with Springs Lane.

QUEUING ANALYSIS

Traffic volumes at each of the study intersections were used to perform queuing analyses for each approach to each intersection. These queuing analyses were reported as the 95th percentile queue from the average of five (5) runs of SimTraffic Traffic Signal Coordination Software by TrafficWare. The results of these queuing analyses are summarized in Table 1 and Table 2 for the weekday AM and weekday PM peak hours, respectively.

As described under Existing Conditions, a center, two-way left turn lane is provided along US 290 within the study area. SimTraffic Traffic Signal Coordination Software does not account for left turns being made within a center two-way left turn lane. Therefore, in order to accurately model the intersections, the center, two-way left turn lane was treated as an exclusive left turn lane at each of the study intersections.

Based on the results of these queueing analyses, each of the existing auxiliary turn lanes at the study intersections is of sufficient length to accommodate all existing queues, as well as all forecasted 2025 queues, both without and following the proposed Bunker Ranch subdivision expansion.

However it should be noted that the right turn in/right turn out driveway proposed to be constructed as part of the planned Arrowhead Ranch commercial developments will be located in the middle of the taper of the existing eastbound right turn lane on US 290 at its intersection with Arrowhead Ranch Boulevard. Therefore, it is anticipated that the eastbound right turn lane on US 290 will need to be lengthened in order to accommodate the location of the right turn in/right turn out driveway and the increase in traffic volumes associated with the Arrowhead Ranch development.

Copies of the queuing analyses performed for existing 2021, forecasted 2025 no-build (base), forecasted 2025 no-build (base) mitigated, forecasted 2025 build (with development), and forecasted 2025 build (with development) mitigated conditions have been included in Appendix P, Appendix Q, Appendix R, Appendix S and Appendix T to this report, respectively.

STOPPING SIGHT DISTANCE

Stopping sight distance calculations were performed for the US 290 approaches to Arrowhead Ranch Boulevard, as warrants for the installation of traffic signal control at the intersection are anticipated to be satisfied and the installation of a traffic signal is anticipated to be required in order to mitigate the impacts caused by the construction of the proposed Arrowhead Ranch commercial development. Stopping sight distance calculations were completed based on the methodologies presented in the TXDOT *Roadway Design Manual*, July 2020. For analysis purposes, the stopping sight distance required for vehicles approaching a stopped vehicle along US 290 was evaluated

The posted speed limit of US 290 is 60 miles per hour west of Arrowhead Ranch Boulevard and 50 miles per hour east of Arrowhead Ranch Boulevard. Therefore, for analysis purposes, the stopping sight distance calculations were conservatively based on a posted speed limit of 60 miles per hour. According to the TXDOT Roadway Design Manual, Section 3, Table 2-1, the required stopping sight distance for a 60 mph posted speed limit is 570 feet.

The available stopping sight distance for the US 290 approaches to Arrowhead Ranch Boulevard was measured to the location of the projected back of the queues on US 290. Based on the results of the queuing analysis performed, the back of queue on the eastbound US 290 approach to Arrowhead Ranch Boulevard was identified to be approximately 230 feet back from the intersection during the weekday AM peak hour and approximately 196 feet back from the intersection during the weekday PM peak hour. The back of queue on the westbound US 290 approach to Arrowhead Ranch Boulevard was identified to be approximately 170 feet back from the intersection during the weekday AM peak hour and approximately 152 feet back from the intersection during the weekday PM peak hour.

Based on the sight distance measurements performed at the intersection of US 290 with Arrowhead Ranch Boulevard, greater than 1,000 feet of sight distance is available to the back of queue along eastbound US 290 and greater than 1,000 feet of sight distance is available to the back of queue along westbound US 290. Therefore, the available sight distance along US 290 to the back of queue at Arrowhead Ranch Boulevard exceeds the required stopping sight distance for a posted speed limit of 60 miles per hour.

CONCLUSIONS/RECOMMENDATIONS

The study concluded that the construction of the proposed Bunker Ranch Residential Development expansion will have no significant impact on the operation of the study intersections.

Following completion of the proposed Bunker Ranch Residential Development expansion, the study intersections of US 290 with Bunker Ranch Boulevard and US 290 with Springs Lane are anticipated to continue to operate at an overall intersection Level of Service A during the weekday AM and PM peak hours, with all movements operating at a LOS D or better.

However, it should be noted that, under both forecasted 2025 no-build (base) and forecasted 2025 build (with development) conditions, the study intersection of US 290 with Arrowhead Ranch Boulevard is anticipated to operate at an overall intersection Level of Service F during both the weekday AM and PM peak hours, with both the northbound Arrowhead Ranch Boulevard and the southbound DSISD Transportation Department driveway approaches to the intersection operating at LOS F during each of the peak hours analyzed. These Failure Levels of Service can be directly attributed to the traffic volumes generated by the planned Arrowhead Ranch commercial developments, including a 1,800 SF liquor store and a 6,000 SF super convenience store with 10 vehicle fueling positions.

Warrants for the installation of traffic signal control are anticipated to be satisfied at the intersection of US 290 with Arrowhead Ranch Boulevard under forecasted 2025 no-build (base)

TABLES

TABLE 1
SUMMARY OF CAPACITY ANALYSIS RESULTS - AM PEAK HOUR
Proposed Bunker Ranch Subdivision Expansion Traffic Impact Analysis
City of Dripping Springs, Hays County, Texas

Intersection/Movement	2021 Existing Conditions					2025 No-Build Conditions					2025 No-Build Mitigated Conditions [5]					2025 Build Conditions					2025 Build Mitigated Conditions [5]				
	LOS [1]	Delay [1]	V/C [2]	95th % Queue (ft) [3]	Bay Length (ft) [4]	LOS [1]	Delay [1]	V/C [2]	95th % Queue (ft) [3]	Bay Length (ft) [4]	LOS [1]	Delay [1]	V/C [2]	95th % Queue (ft) [3]	Bay Length (ft) [4]	LOS [1]	Delay [1]	V/C [2]	95th % Queue (ft) [3]	Bay Length (ft) [4]	LOS [1]	Delay [1]	V/C [2]	95th % Queue (ft) [3]	Bay Length (ft) [4]
US 290 with Bunker Ranch Boulevard																									
Eastbound US 290																									
EB Through	A	0.0	--	0'	1490'	A	0.0	--	0'	1490'	--	--	--	--	--	A	0.0	--	0'	1490'	--	--	--	--	--
EB Right			--	0'	240'			--	0'	240'			--	--	--			--	0'	240'			--	--	--
EB Approach			--	--	--			--	--	--			--	--	--			--	--	--			--	--	--
Westbound US 290																									
WB Left [6]	A	9.4	0.046	36'	150'+	A	9.9	0.075	43'	150'+	--	--	--	--	--	B	10.2	0.123	45'	150'+	--	--	--	--	--
WB Through	A	0.0	--	0'	780'	A	0.0	--	0'	780'	--	--	--	--	--	A	0.0	--	0'	780'	--	--	--	--	--
WB Approach	A	0.6	--	--	--	A	0.9	--	--	--	--	--	--	--	--	A	1.4	--	--	--	--	--	--	--	--
Northbound Bunker Ranch Blvd.																									
NB Approach	B	11.8	0.045	48'	--	B	14.4	0.213	60'	--	--	--	--	--	--	C	20.5	0.517	156'	--	--	--	--	--	--
Overall Intersection	A	0.5	--	--	--	A	1.3	--	--	--	--	--	--	--	--	A	3.3	--	--	--	--	--	--	--	--
US 290 with Arrowhead Ranch Boulevard																									
Eastbound US 290																									
EB Left [6]	A	8.9	0.001	3'	150'+	A	8.7	0.001	0'	150'+	B	16.6	0.00	5'	150'+	A	8.8	0.001	5'	150'+	B	20.0	0.00	4'	150'+
EB Through	A	0.0	--	0'	780'	A	0.0	--	2'	780'	C	23.5	0.78	201'	780'	A	0.0	--	0'	780'	C	32.2	0.85	230'	780'
EB Right	A	0.0	--	0'	250'	A	0.0	--	10'	250'	B	18.0	0.17	58'	250'	A	0.0	--	9'	250'	C	21.5	0.16	59'	250'
EB Approach	A	0.0	--	--	--	A	0.0	--	--	--	C	23.3	--	--	--	A	0.0	--	--	--	C	31.9	--	--	--
Westbound US 290																									
WB Left [6]	A	0.2	0.053	32'	150'	B	11.3	0.296	96'	150'	B	17.5	0.63	132'	150'	B	12.3	0.327	95'	150'	C	27.1	0.74	160'	150'
WB Through	A	0.0	--	0'	440'	A	0.0	--	11'	440'	B	14.8	0.45	150'	440'	A	0.0	--	21'	440'	B	18.2	0.46	170'	440'
WB Right																									
WB Approach	A	0.6	--	--	--	A	3.2	--	--	--	B	15.5	--	--	--	A	3.4	--	--	--	C	20.7	--	--	--
Northbound Arrowhead Ranch Blvd.																									
NB Approach	C	19.6	0.248	68'	--	F	2,413	6.111	358'	--	C	22.9	0.74	318'	--	F	3508.7	8.462	355'	--	C	28.5	0.67	335'	--
Southbound DSISD Driveway																									
SB Approach	D	31.9	0.017	15'	--	F	105.9	0.062	13'	--	B	15.5	0.01	9'	--	F	145.0	0.084	13'	--	B	16.9	0.00	10'	--
Overall Intersection	A	1.3	--	--	--	F	509.9	--	--	--	C	20.1	--	--	--	F	690.3	--	--	--	C	26.8	--	--	--
US 290 with Springs Lane																									
Eastbound US 290																									
EB Left [6]	A	9.1	0.003	11'	150'+	A	9.6	0.003	8'	150'+	--	--	--	--	--	A	9.7	0.003	10'	150'+	--	--	--	--	--
EB Through	A	0.0	--	0'	440'	A	0.0	--	0'	440'	--	--	--	--	--	A	0.0	--	0'	440'	--	--	--	--	--
EB Approach	A	0.0	--	--	--	A	0.0	--	--	--	--	--	--	--	--	A	0.0	--	--	--	--	--	--	--	--
Westbound US 290																									
WB Through	A	0.0	--	0'	490'	A	0.0	--	0'	490'	--	--	--	--	--	A	0.0	--	0'	490'	--	--	--	--	--
WB Right																									
WB Approach			--	--	--			--	--	--			--		--			--	--	--			--	--	--
Southbound Springs Lane																									
SB Approach	C	17.0	0.056	35'	--	C	19.7	0.067	36'	--	--	--	--	--	--	C	20.9	0.072	40'	--	--	--	--	--	--
Overall Intersection	A	0.2	--	--	--	A	0.2	--	--	--	--	--	--	--	--	A	0.2	--	--	--	--	--	--	--	--

(1) Level of service determined through the use of Synchro Traffic Simulation Software, Version 11. All calculations were performed using the methodologies published in Highway Capacity Manual 6th Edition by the Transportation Research Board.

(2) Volume to capacity ration (v/c) were calculated using Synchro Traffic Simulation Software, Version 11. All calculations were performed using the methodologies published in Highway Capacity Manual 6th Edition by the Transportation Research Board.

(3) 95th percentile queue lengths were calculated using SimTraffic Traffic Signal Coordination Software. Results of queueing analysis represent the average of five (5) SimTraffic simulation runs.

(4) Existing queue storage capacity was determined through the use of Google Earth Software and signal plans. All storage lengths were rounded up to the nearest 5 ft. increment.

(5) Results of the capacity analyses performed without mitigations indicate that the intersection of US 290 with Arrowhead Ranch Boulevard is forecasted to operate under LOS F conditions. Therefore, it is anticipated that mitigation measures will need to be constructed by the Arrowhead Ranch development in order to mitigate the projected LOS F conditions. As a result, mitigated conditions for this study represent the anticipated need to install traffic signal control at the intersection of US 290 with Arrowhead Ranch Boulevard.

TABLE 2
SUMMARY OF CAPACITY ANALYSIS RESULTS - PM PEAK HOUR
Proposed Bunker Ranch Subdivision Expansion Traffic Impact Analysis
City of Dripping Springs, Hays County, Texas

Intersection/Movement	2021 Existing Conditions					2025 No-Build Conditions					2025 No-Build Mitigated Conditions [5]					2025 Build Conditions					2025 Build Mitigated Conditions [5]				
	LOS [1]	Delay [1]	V/C [2]	95th % Queue (ft) [3]	Bay Length (ft) [4]	LOS [1]	Delay [1]	V/C [2]	95th % Queue (ft) [3]	Bay Length (ft) [4]	LOS [1]	Delay [1]	V/C [2]	95th % Queue (ft) [3]	Bay Length (ft) [4]	LOS [1]	Delay [1]	V/C [2]	95th % Queue (ft) [3]	Bay Length (ft) [4]	LOS [1]	Delay [1]	V/C [2]	95th % Queue (ft) [3]	Bay Length (ft) [4]
US 290 with Bunker Ranch Boulevard																									
Eastbound US 290																									
EB Through	A	0.0	--	0'	1490'	A	0.0	--	0'	1490'	--	--	--	--	--	A	0.0	--	0'	1490'	--	--	--	--	--
EB Right			--	0'	240'			--	0'	240'			--	--	--			--	4'	240'			--	--	--
EB Approach			--	--	--			--	--	--			--	--	--			--	--	--			--	--	--
Westbound US 290																									
WB Left [6]	A	9.1	0.016	21'	150'+	A	9.7	0.1	45'	150'+	--	--	--	--	--	B	10.9	0.254	68'	150'+	--	--	--	--	--
WB Through	A	0.0	--	0'	780'	A	0.0	--	0'	780'	--	--	--	--	--	A	0.0	--	0'	780'	--	--	--	--	--
WB Approach	A	0.1	--	--	--	A	0.8	--	--	--	--	--	--	--	--	A	1.8	--	--	--	--	--	--	--	--
Northbound Bunker Ranch Blvd.																									
NB Approach	B	12.1	0.078	50'	--	B	14.2	0.196	98'	--	--	--	--	--	--	C	20.5	0.45	196'	--	--	--	--	--	--
Overall Intersection	A	0.3	--	--	--	A	1.1	--	--	--	--	--	--	--	--	A	2.7	--	--	--	--	--	--	--	--
US 290 with Arrowhead Ranch Boulevard																									
Eastbound US 290																									
EB Left [6]	B	11.8	0.004	2'	150'+	B	11.7	0.004	8'	150'+	B	13.6	0.01	5'	150'+	B	12.5	0.004	6'	150'+	B	13.4	0.01	9'	150'+
EB Through	A	0.0	--	0'	780'	A	0.0	--	0'	780'	B	18.0	0.69	196'	780'	A	0.0	--	0'	780'	B	18.1	0.71	196'	780'
EB Right	A	0.0	--	0'	250'	A	0.0	--	10'	250'	B	14.0	0.08	45'	250'	A	0.0	--	13'	250'	B	13.8	0.08	42'	250'
EB Approach	A	0.0	--	--	--	A	0.0	--	--	--	B	17.8	--	--	--	A	0.0	--	--	--	B	17.9	--	--	--
Westbound US 290																									
WB Left [6]	A	9.4	0.068	33'	150'	B	11.4	0.352	116'	150'	B	12.3	0.62	151'	150'	B	12	0.372	148'	150'	B	12.8	0.64	152'	150'
WB Through	A	0.0	--	0'	440'	A	0.0	--	0'	440'	B	11.8	0.54	143'	440'	A	0.0	--	111'	440'	B	12.2	0.59	152'	440'
WB Right																									
WB Approach	A	0.6	--	--	--	A	3.0	--	--	--	B	11.9	--	--	--	A	2.9	--	--	--	B	12.4	--	--	--
Northbound Arrowhead Ranch Blvd.																									
NB Approach	B	14.2	0.106	42'	--	F	1,016.3	3.051	326'	--	C	21.2	0.63	183'	--	F	1362.1	3.78	321'	--	C	22.2	0.64	189'	--
Southbound DSISD Driveway																									
SB Approach	E	41.4	0.02	11'	--	F	155.1	0.079	11'	--	B	16.3	0.01	14'	--	F	204.7	0.103	20'	--	B	17.1	0.01	12'	--
Overall Intersection	A	0.8	--	--	--	F	140.0	--	--	--	B	15.2	--	--	--	F	171.2	--	--	--	B	15.5	--	--	--
US 290 with Springs Lane																									
Eastbound US 290																									
EB Left [6]	B	10.1	0.003	6'	150'+	B	11.2	0.004	12'	150'+	--	--	--	--	--	B	11.8	0.004	9'	150'+	--	--	--	--	--
EB Through	A	0.0	--	0'	440'	A	0.0	--	0'	440'	--	--	--	--	--	A	0.0	--	0'	440'	--	--	--	--	--
EB Approach	A	0.0	--	--	--	A	0.0	--	--	--	--	--	--	--	--	A	0.0	--	--	--	--	--	--	--	--
Westbound US 290																									
WB Through	A	0.0	--	0'	490'	A	0.0	--	0'	490'	--	--	--	--	--	A	0.0	--	0'	490'	--	--	--	--	--
WB Right																									
WB Approach			--	--	--			--	--	--			--		--			--	--	--			--	--	--
Southbound Springs Lane																									
SB Approach	C	18.9	0.068	46'	--	C	23.6	0.089	44'	--	--	--	--	--	--	D	26.7	0.102	46'	--	--	--	--	--	--
Overall Intersection	A	0.2	--	--	--	A	0.2	--	--	--	--	--	--	--	--	A	0.2	--	--	--	--	--	--	--	--

(1) Level of service determined through the use of Synchro Traffic Simulation Software, Version 11. All calculations were performed using the methodologies published in Highway Capacity Manual 6th Edition by the Transportation Research Board.

(2) Volume to capacity ration (v/c) were calculated using Synchro Traffic Simulation Software, Version 11. All calculations were performed using the methodologies published in Highway Capacity Manual 6th Edition by the Transportation Research Board.

(3) 95th percentile queue lengths were calculated using SimTraffic Traffic Signal Coordination Software. Results of queueing analysis represent the average of five (5) SimTraffic simulation runs.

(4) Existing queue storage capacity was determined through the use of Google Earth Software and signal plans. All storage lengths were rounded up to the nearest 5 ft. increment.

(5) Results of the capacity analyses performed without mitigations indicate that the intersection of US 290 with Arrowhead Ranch Boulevard is forecasted to operate under LOS F conditions. Therefore, it is anticipated that mitigation measures will need to be constructed by the Arrowhead Ranch development in order to mitigate the projected LOS F conditions. As a result, mitigated conditions for this study represent the anticipated need to install traffic signal control at the intersection of US 290 with Arrowhead Ranch Boulevard.

(6) A two-way center left turn lane is provided along US 290 within the environs of the study. Synchro Traffic Simulation Software, Version 11 does not account for left turns being made within a center two-way left turn lane. Therefore, in order to accurately model the intersections, the center two-way left turn lane was treated as an exclusive left turn lane at each of the study intersections. For analysis purpose, the lanes were evaluated as having a storage length of 150 feet. However, additional storage is available within this center two-way left turn lane.

Source: Analysis by CEC.

TABLE 3
APPROVED BUNKER RANCH SUBDIVISION TRIP GENERATION SUMMARY
Proposed Bunker Ranch Subdivision Expansion Traffic Impact Analysis
City of Dripping Springs, Hays County, Texas

Description/Land Use Code	Size	Time Period	Trip Generation[1]		
			Primary Trips		
			In	Out	Total
APPROVED BUNKER RANCH SUBDIVISION					
Approved Existing Bunker Ranch Subdivision					
Single-Family Detached Housing	160 units	Weekday 24 Hour	801	801	1602
		Weekday AM Peak Hour	30	88	118
		Weekday PM Peak Hour	101	59	160
Multifamily Low-Rise	42 units	Weekday 24 Hour	153	154	307
		Weekday AM Peak Hour	5	16	21
		Weekday PM Peak Hour	17	10	27
Subtotal	--	Weekday 24 Hour	954	955	1,909
		Weekday AM Peak Hour	35	104	139
		Weekday PM Peak Hour	118	69	187
Existing Bunker Ranch Subdivision Currently Constructed/Occupied [2]					
Single-Family Detached Housing	58 units	Weekday 24 Hour	315	315	630
		Weekday AM Peak Hour	12	34	46
		Weekday PM Peak Hour	38	22	60
Multifamily Low-Rise	6 units	Weekday 24 Hour	22	22	44
		Weekday AM Peak Hour	1	2	3
		Weekday PM Peak Hour	3	2	5
Subtotal	--	Weekday 24 Hour	337	337	674
		Weekday AM Peak Hour	13	36	49
		Weekday PM Peak Hour	41	24	65
Bunker Ranch Subdivison Approved Residential Units Not Yet Constructed/Occupied to be Included in Background Traffic Volumes					
Single-Family Detached Housing	102 units	Weekday 24 Hour	486	486	972
		Weekday AM Peak Hour	18	54	72
		Weekday PM Peak Hour	63	37	100
Multifamily Low-Rise	36 units	Weekday 24 Hour	131	132	263
		Weekday AM Peak Hour	4	14	18
		Weekday PM Peak Hour	14	8	22
Subtotal	--	Weekday 24 Hour	617	618	1,235
		Weekday AM Peak Hour	22	68	90
		Weekday PM Peak Hour	77	45	122

(1) Anticipated trip generation calculated based on the rates published in the Institute of Transportation Engineers (ITE) *Trip Generation* , 10th Edition publication.

(2) Data regarding the number of residential units that have yet to be constructed or occupied have been provided by the City of Dripping Springs. The Bunker Ranch Development has currently been approved for the construction of 160 single family units and 42 condo units. At this time, 102 single family units and 36 condo units have yet to be constructed or occupied.

Source: Analysis by CEC.

TABLE 4
PROPOSED BUNKER RANCH SUBDIVISION EXPANSION TRIP GENERATION SUMMARY
Proposed Bunker Subdivsion Expansion Traffic Impact Analysis
City of Dripping Springs, Hays County, Texas

Description/Land Use Code	Size	Time Period	Trip Generation[1]		
			Primary Trips		
			In	Out	Total
BUNKER RANCH RESIDENTIAL DEVELOPMENT					
Proposed Total Bunker Ranch Subdivision After Expansion					
Single-Family Detached Housing	388 units	Weekday 24 Hour	1810	1810	3620
		Weekday AM Peak Hour	70	210	280
		Weekday PM Peak Hour	235	138	373
Approved Bunker Ranch Subdivision Single Family Units [3]					
Single-Family Detached Housing	160 units	Weekday 24 Hour	801	801	1602
		Weekday AM Peak Hour	30	88	118
		Weekday PM Peak Hour	101	59	160
Proposed New Bunker Ranch Subdivsion Residential Single Family Units [3]					
Single-Family Detached Housing	228 units	Weekday 24 Hour	1,009	1,009	2,018
		Weekday AM Peak Hour	40	122	162
		Weekday PM Peak Hour	134	79	213

(1) Anticipated trip generation calculated based on the rates published in the Institute of Transportation Engineers (ITE) *Trip Generation*, 10th Edition publication.

(2) Data regarding the number of residential units that have yet to be constructed or occupied have been provided by the City of Dripping Springs. The Bunker Ranch Development has currently been approved for the construction of 160 single family units and 42 condo units. At this time, 102 single family units and 36 condo units have yet to be constructed or occupied.

(3) From Table 3.

(4) The total Bunker Ranch Subdivision Trips was calcualted by adding the existing approved Bunker Ranch Subdivison trips (160 Single Family Residential Units plus 42 Multifamily Low-Rise Residential Units shown on Table 3) to the proposed Bunker Ranch Subdivision Expansion trips (Additional 228 Single Family Residential Units shown on Table 4).

Source: Analysis by CEC.

TABLE 5
PROPOSED BUNKER RANCH SUBDIVISION APPROVED PLUS EXPANSION TRIP GENERATION SUMMARY
Proposed Bunker Subdivsion Expansion Traffic Impact Analysis
City of Dripping Springs, Hays County, Texas

Description/Land Use Code	Size	Time Period	Trip Generation[1]		
			Primary Trips		
			In	Out	Total
APPROVED BUNKER RANCH SUBDIVISION [1]					
Approved Existing Bunker Ranch Subdivision					
Single-Family Detached Housing	160 units	Weekday 24 Hour	801	801	1602
		Weekday AM Peak Hour	30	88	118
		Weekday PM Peak Hour	101	59	160
Multifamily Low-Rise	42 units	Weekday 24 Hour	153	154	307
		Weekday AM Peak Hour	5	16	21
		Weekday PM Peak Hour	17	10	27
Subtotal	--	Weekday 24 Hour	954	955	1,909
		Weekday AM Peak Hour	35	104	139
		Weekday PM Peak Hour	118	69	187
PROPOSED NEW BUNKER RANCH SUBDIVISION EXPANSION [2]					
Single-Family Detached Housing	228 units	Weekday 24 Hour	1,009	1,009	2,018
		Weekday AM Peak Hour	40	122	162
		Weekday PM Peak Hour	134	79	213
Multifamily Low-Rise	--	Weekday 24 Hour	--	--	--
		Weekday AM Peak Hour	--	--	--
		Weekday PM Peak Hour	--	--	--
Subtotal	--	Weekday 24 Hour	1,009	1,009	2,018
		Weekday AM Peak Hour	40	122	162
		Weekday PM Peak Hour	134	79	213
TOTAL APPROVED BUNKER RANCH SUBDIVISION PLUS PROPOSED NEW BUNKER RANCH SUBDIVISION EXPANSION					
Single-Family Detached Housing	388 units	Weekday 24 Hour	1,810	1,810	3,620
		Weekday AM Peak Hour	70	210	280
		Weekday PM Peak Hour	235	138	373
Multifamily Low-Rise	42 units	Weekday 24 Hour	153	154	307
		Weekday AM Peak Hour	5	16	21
		Weekday PM Peak Hour	17	10	27
Subtotal	--	Weekday 24 Hour	1,963	1,964	3,927
		Weekday AM Peak Hour	75	226	301
		Weekday PM Peak Hour	252	148	400

(1) From Table 3.

(2) From Table 4.

Source: Analysis by CEC.

TABLE 6
ARROWHEAD RANCH DEVELOPMENT TRIP GENERATION SUMMARY
Proposed Bunker Ranch Subdivision Expansion Traffic Impact Analysis
City of Dripping Springs, Hays County, Texas

Description/Land Use Code	Size	Time Period	Trip Generation[1]								
			Primary Trips			Pass-By Trips			Total Trips		
			In	Out	Total	In	Out	Total	In	Out	Total
ARROWHEAD RANCH DEVELOPMENT											
Total Approved Arrowhead Ranch Residential Development											
Single-Family Detached Housing	403 units	Weekday 24 Hour	1874	1874	3748	0	0	0	1,874	1,874	3,748
		Weekday AM Peak Hour	73	218	291	0	0	0	73	218	291
		Weekday PM Peak Hour	244	143	387	0	0	0	244	143	387
Existing Arrowhead Ranch Residential Development Currently Constructed/Occupied [2]											
Single-Family Detached Housing	181 units	Weekday 24 Hour	898	897	1795	0	0	0	898	897	1,795
		Weekday AM Peak Hour	33	100	133	0	0	0	33	100	133
		Weekday PM Peak Hour	113	67	180	0	0	0	113	67	180
Arrowhead Ranch Residential Development Approved Residential Units Not Yet Constructed/Occupied to be Included in Background Traffic Volumes											
Single-Family Detached Housing	222 units	Weekday 24 Hour	976	977	1953	0	0	0	976	977	1,953
		Weekday AM Peak Hour	40	118	158	0	0	0	40	118	158
		Weekday PM Peak Hour	131	76	207	0	0	0	131	76	207
Planned Arrowhead Ranch Development Commercial Development [3]											
Liquor Store	1,800 SF	Weekday 24 Hour	92	91	183	0	0	0	92	91	183
		Weekday AM Peak Hour	4	4	8	0	0	0	4	4	8
		Weekday PM Peak Hour	15	14	29	0	0	0	15	14	29
Super Convenience Market/Gas Station	6,000 SF	Weekday 24 Hour	No Data Available for Weekday 24-Hour Period						1,153	1,152	2,305
		Weekday AM Peak Hour	59	59	118	185	185	370	244	244	488
		Weekday PM Peak Hour	46	46	92	147	147	294	193	193	386
SubTotal		Weekday 24 Hour	--	--	--	--	--	--	1,245	1,243	2488
		Weekday AM Peak Hour	63	63	126	185	185	370	248	248	496
		Weekday PM Peak Hour	61	60	121	147	147	294	208	207	415

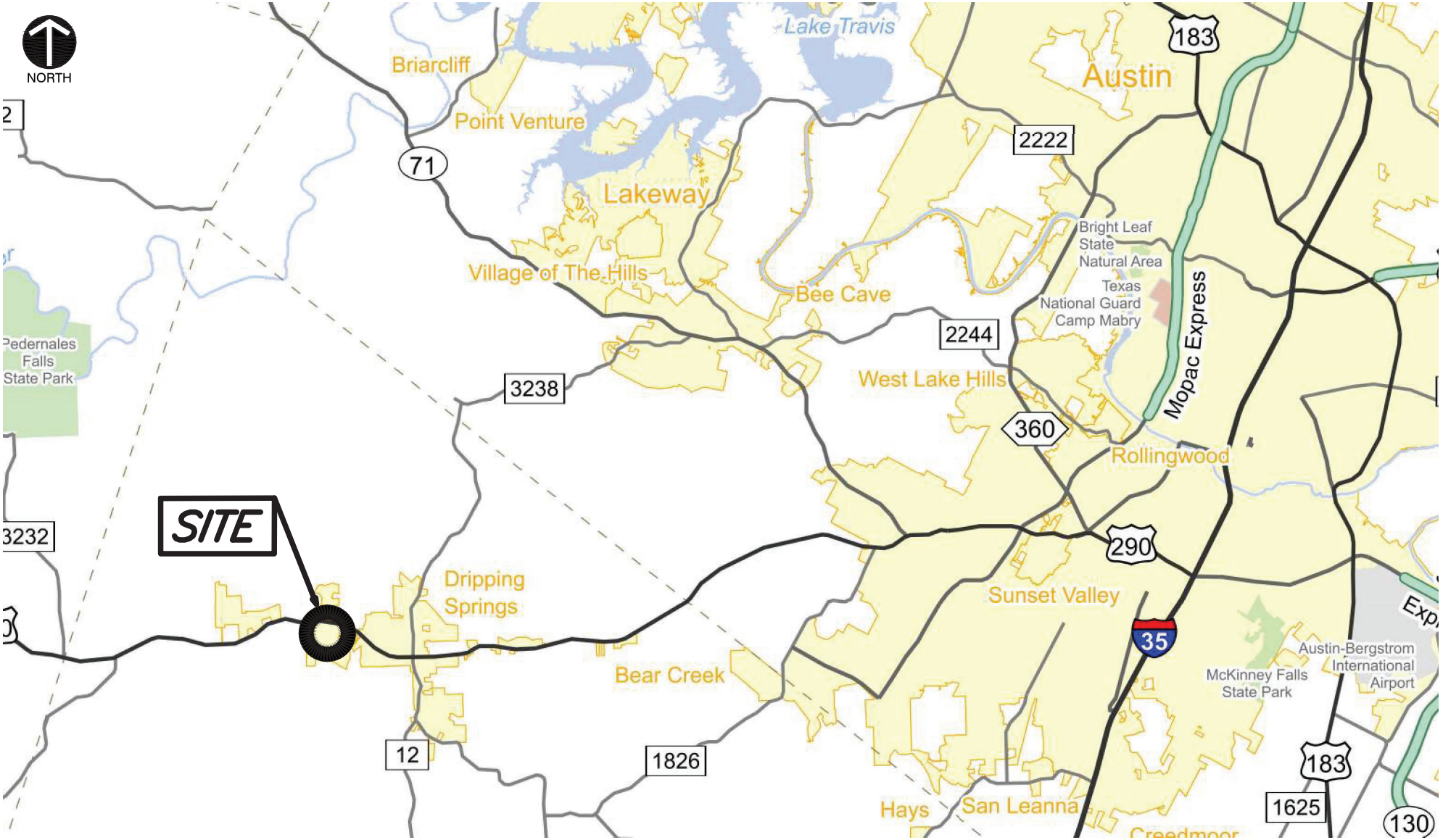
(1) Anticipated trip generation calculated based on the rates published in the Institute of Transportation Engineers (ITE) *Trip Generation*, 10th Edition publication.

(2) Data regarding the number of residential units that are currently constructed and occupied have been provided by the City of Dripping Springs.

(3) The City of Dripping Springs has requested that trips associated with the planned Arrowhead Ranch Super Convenience Market/Gas Station and Liquor Store be included in the background traffic projections. A conceptual site plan for these commercial developments has been provided by the City of Dripping Springs.

Source: Analysis by CEC.

FIGURES

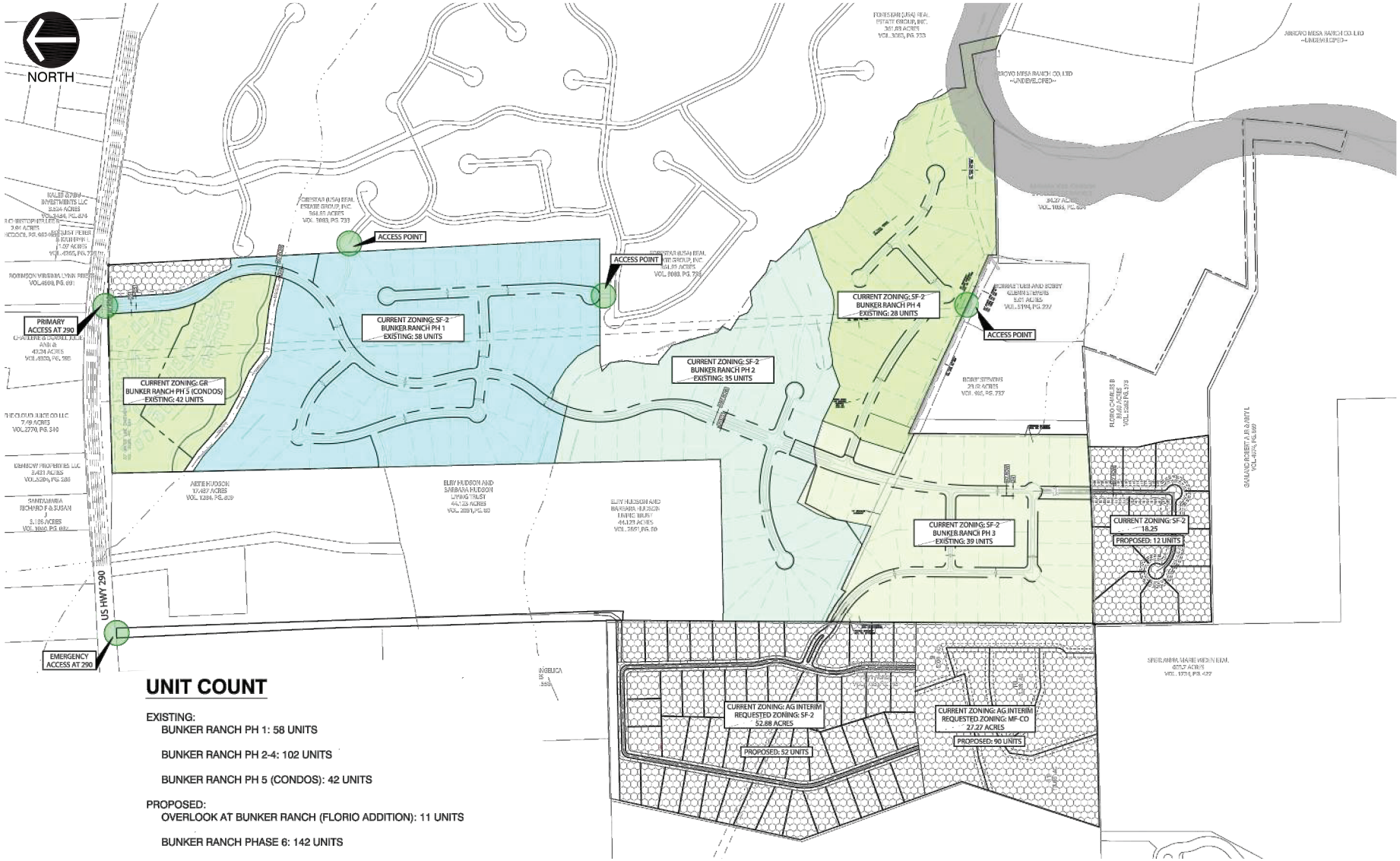


Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

SITE LOCATION

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	1
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



UNIT COUNT

EXISTING:

BUNKER RANCH PH 1: 58 UNITS

BUNKER RANCH PH 2-4: 102 UNITS

BUNKER RANCH PH 5 (CONDOS): 42 UNITS

PROPOSED:

OVERLOOK AT BUNKER RANCH (FLORIO ADDITION): 11 UNITS

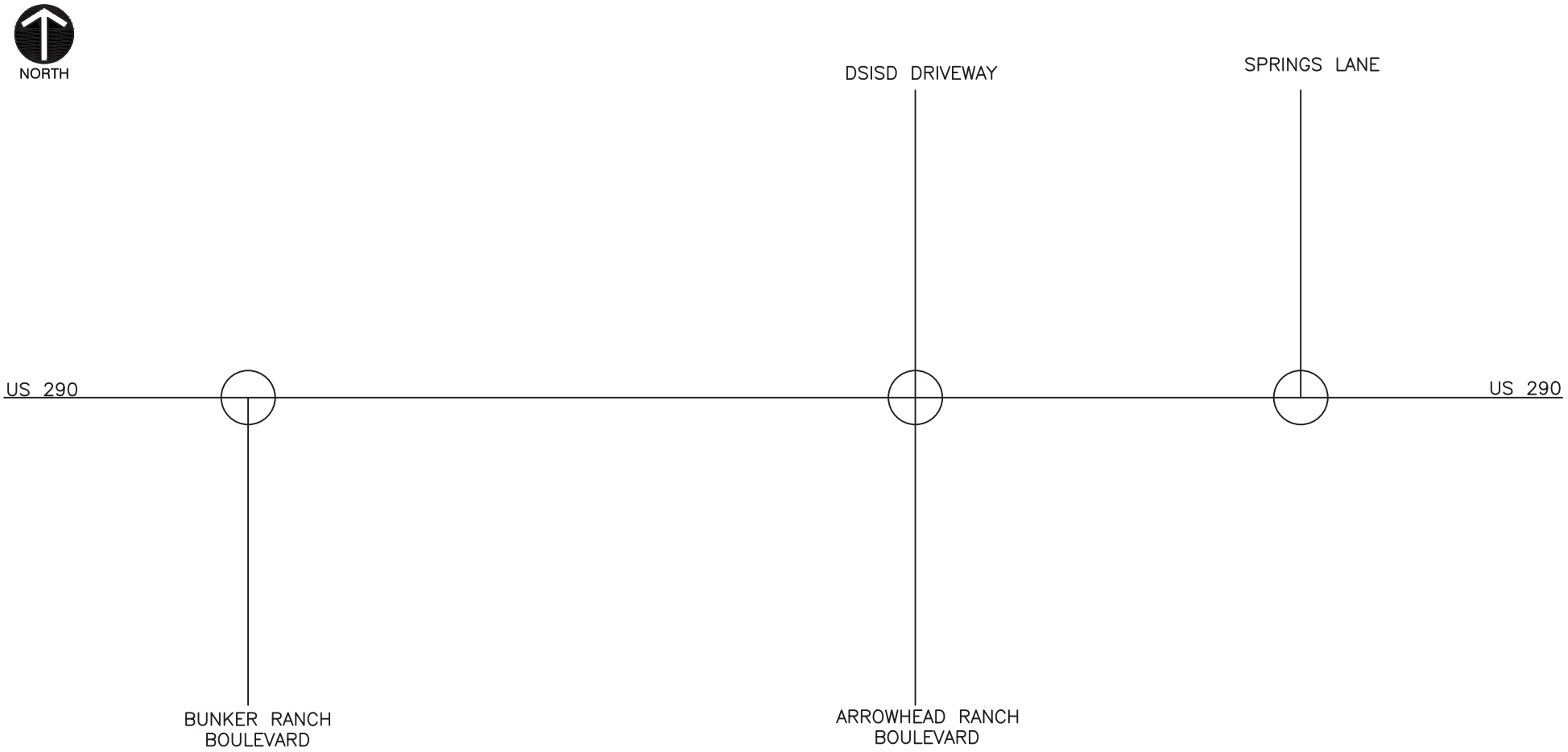
BUNKER RANCH PHASE 6: 142 UNITS

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

SITE PLAN

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	2
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

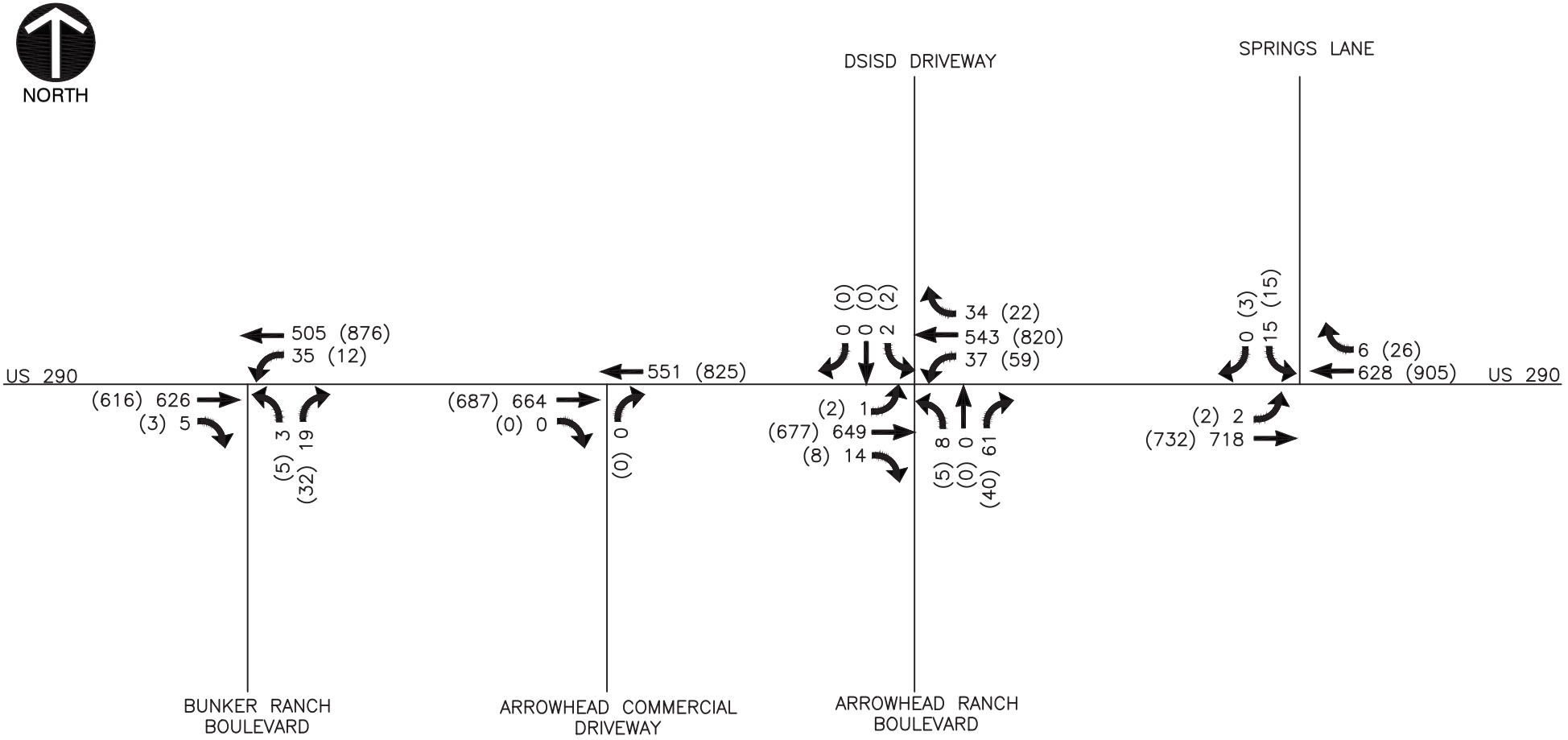
Existing Unsignalized Intersection

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

STUDY INTERSECTIONS

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	3
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

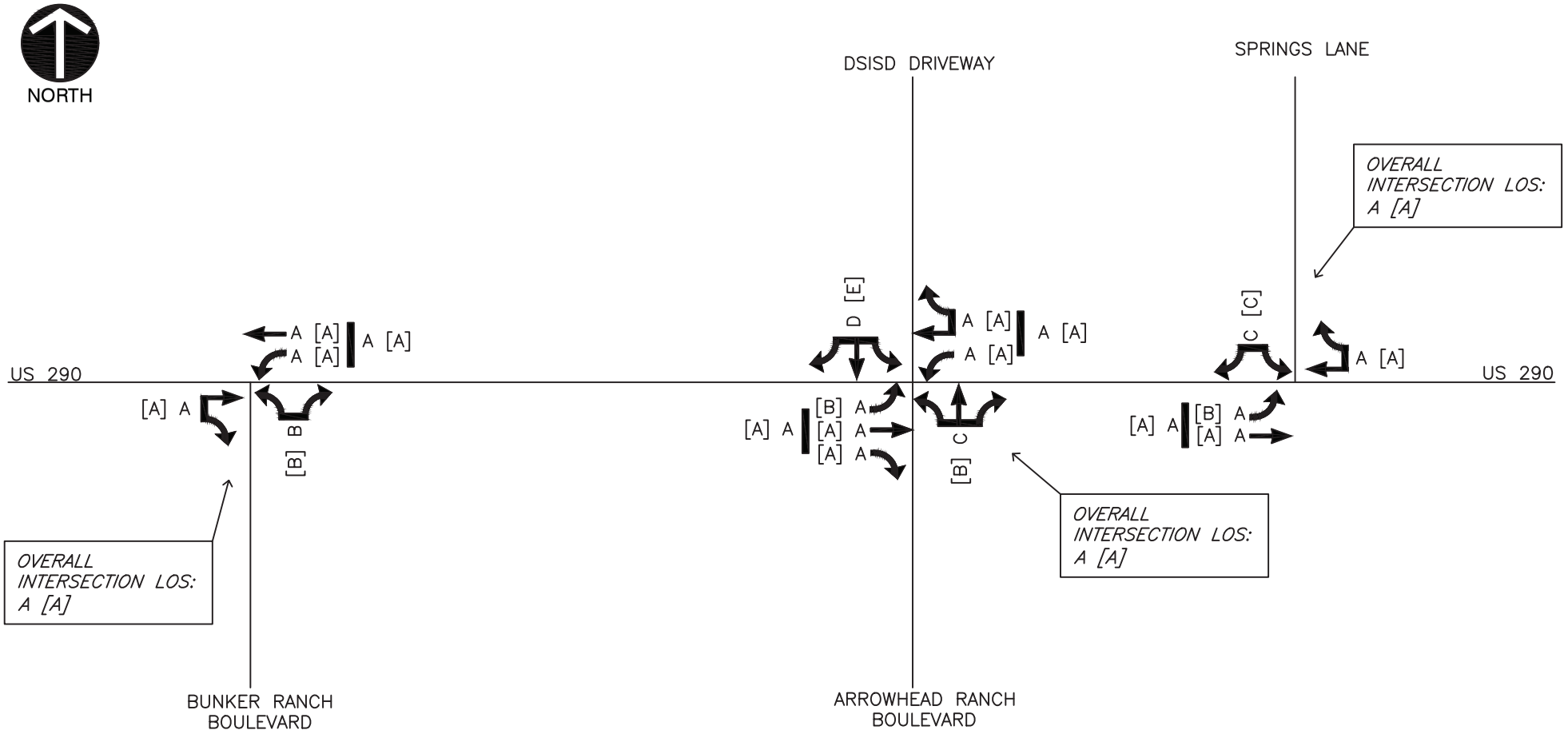
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

EXISTING 2021
PEAK HOUR TRAFFIC VOLUMES

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	4
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

A A.M. Peak Hour Levels of Service

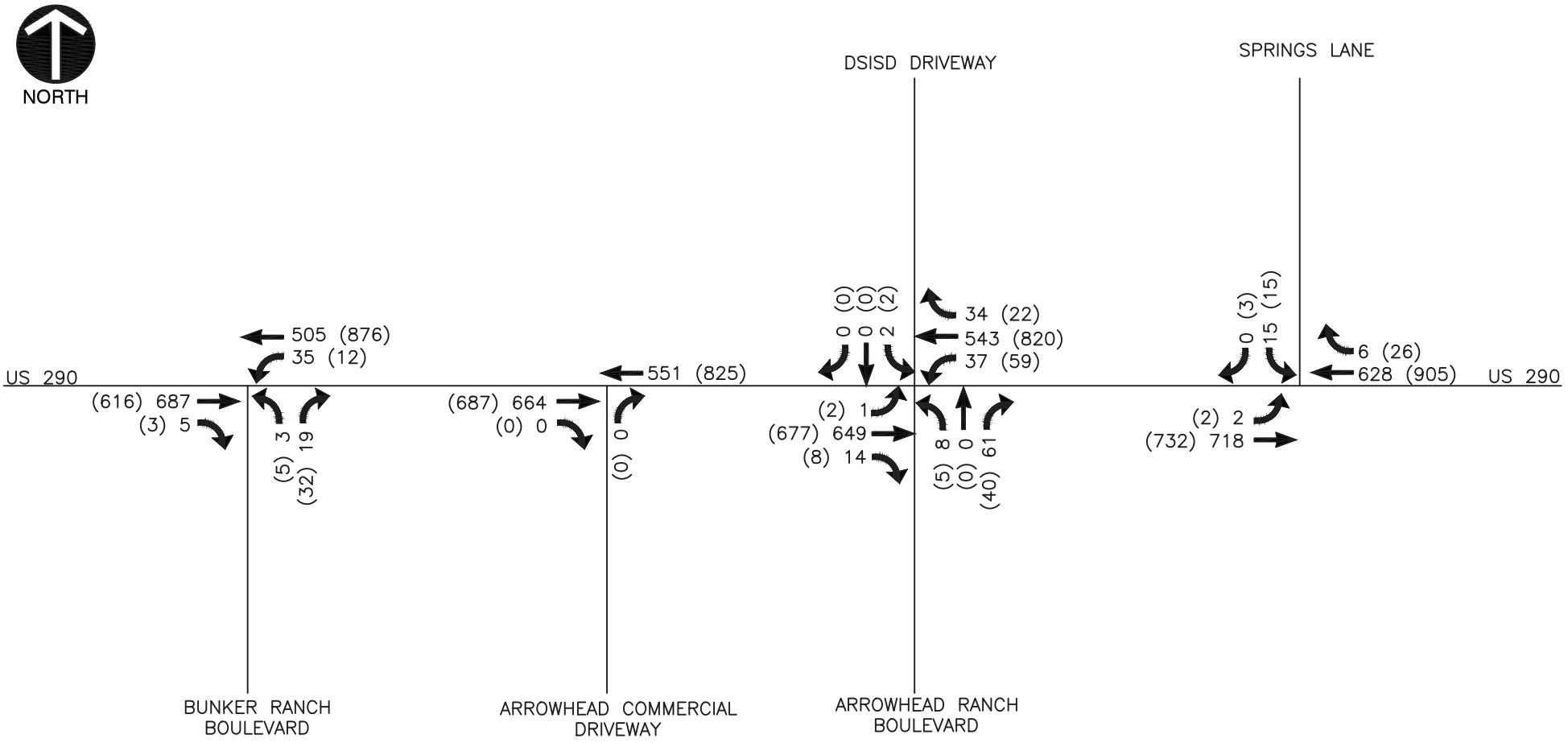
[B] P.M. Peak Hour Levels of Service

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

EXISTING 2021
PEAK HOUR LEVELS OF SERVICE

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	5
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

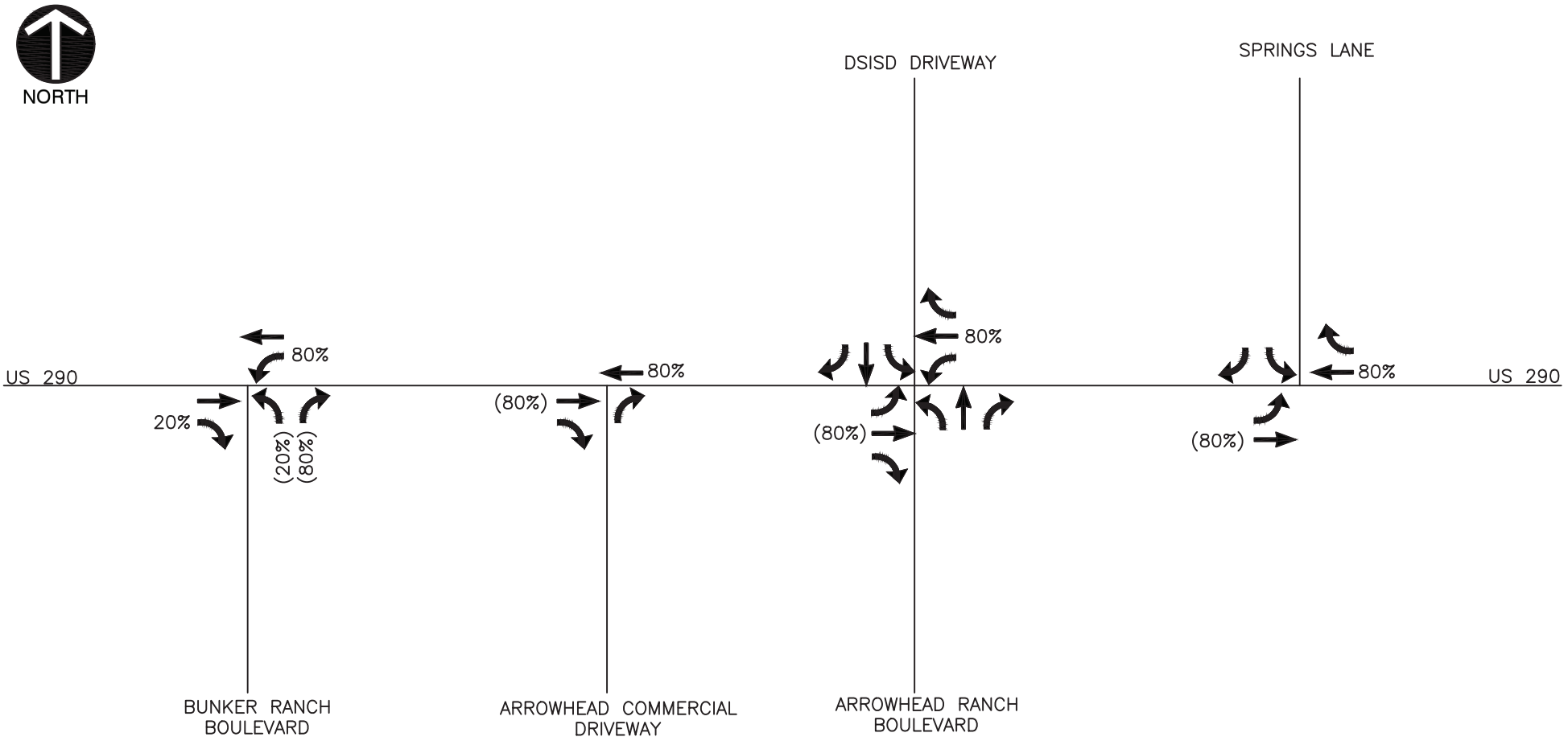
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

FORECASTED 2025 BACKGROUND PEAK HOUR TRAFFIC VOLUMES

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	6
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

12% Primary Trip Arrival Distribution

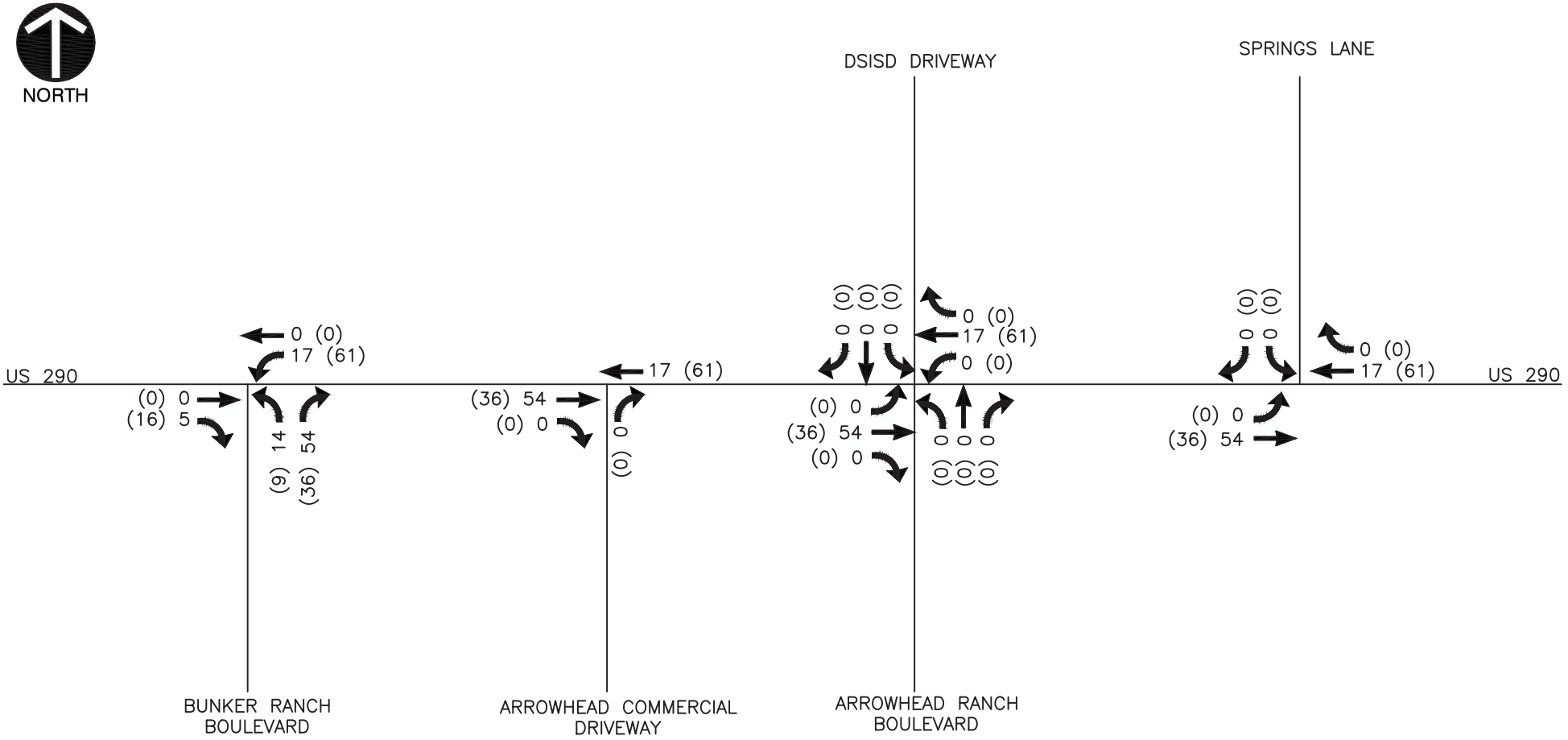
(12%) Primary Trip Departure Distribution

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED BUNKER RANCH RESIDENTIAL PRIMARY TRIP ARRIVAL/DEPARTURE DISTRIBUTION

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	7
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

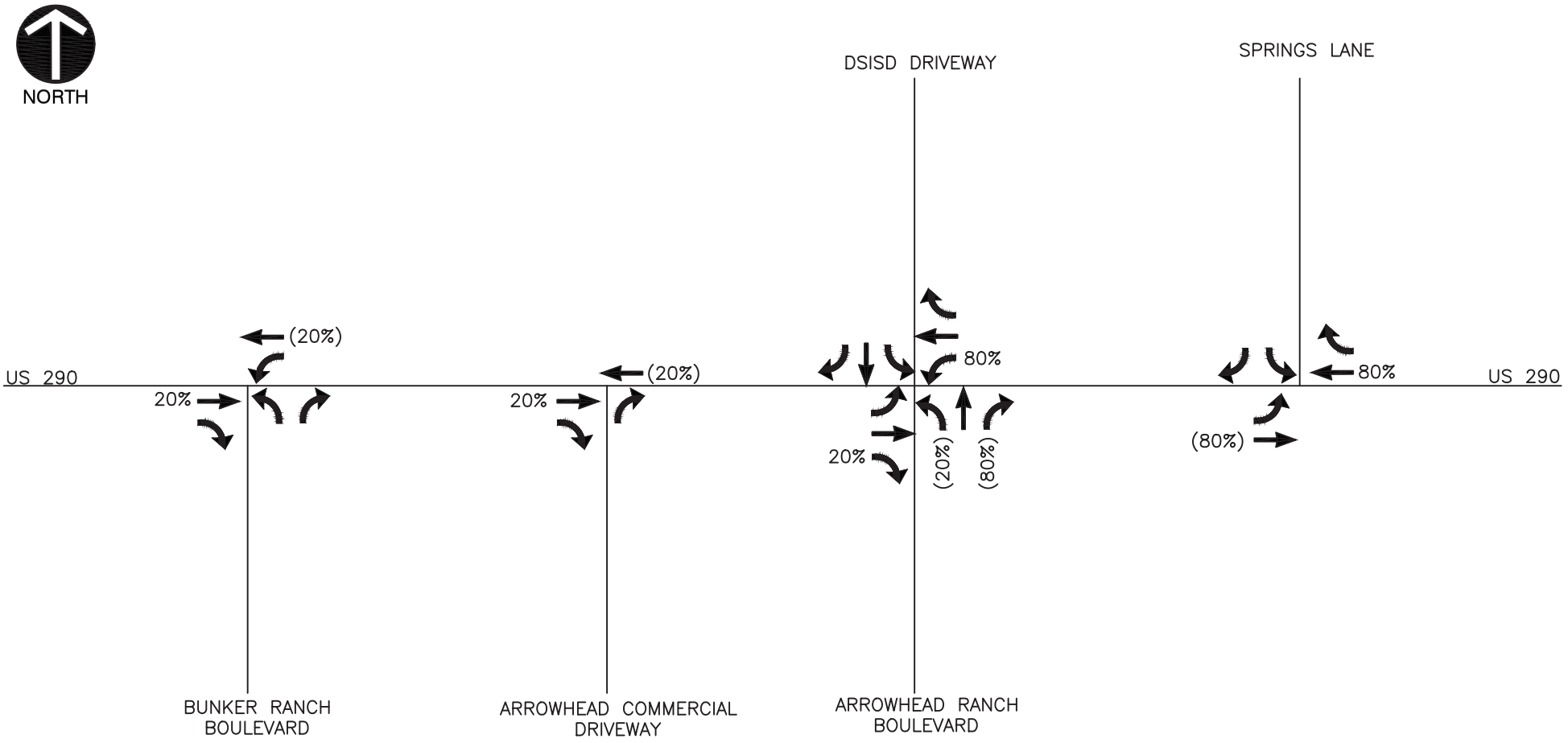
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED BUNKER RANCH APPROVED BACKGROUND PRIMARY SITE GENERATED PEAK HOUR TRIPS

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	8
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

12% Primary Trip Arrival Distribution

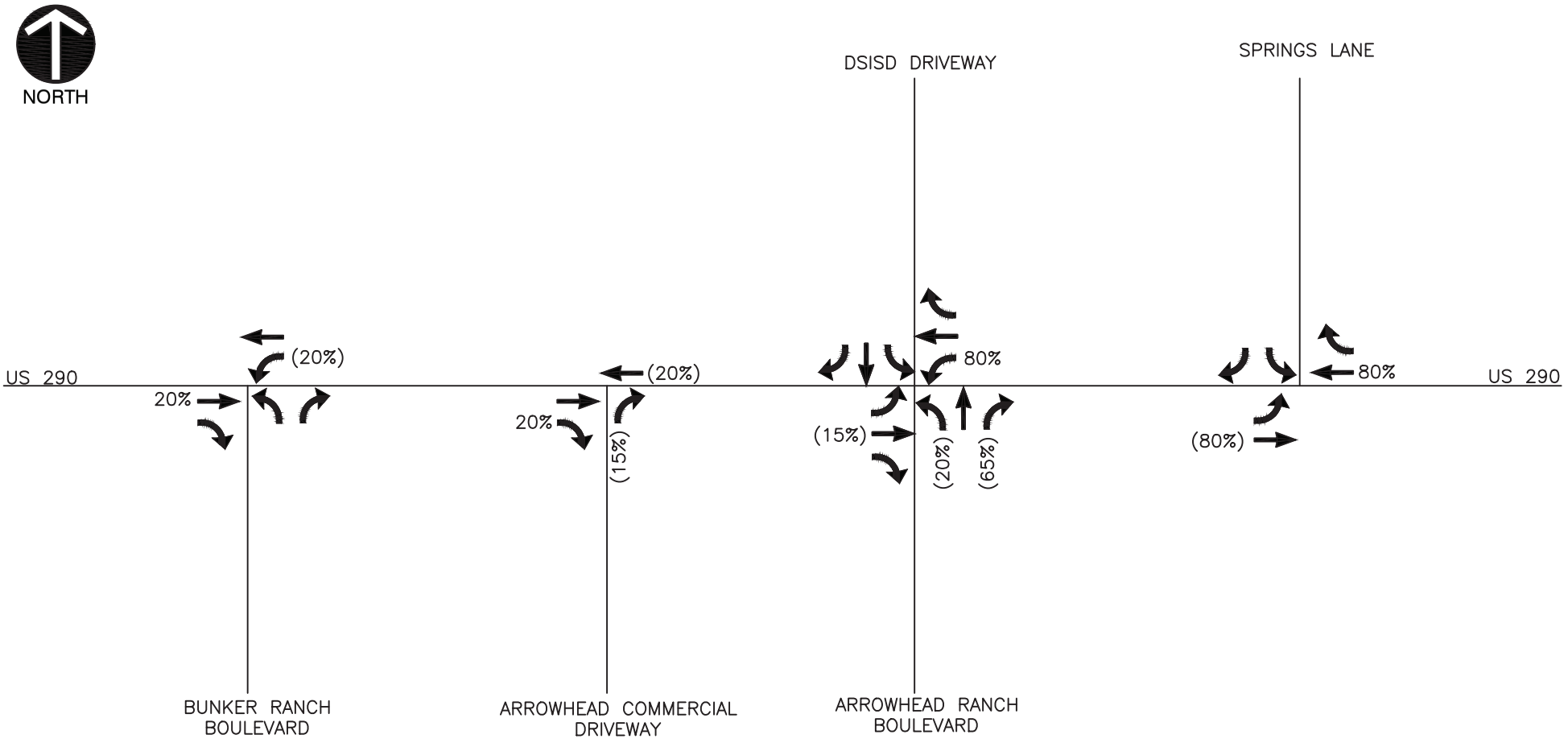
(12%) Primary Trip Departure Distribution

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED ARROWHEAD RANCH RESIDENTIAL PRIMARY TRIP ARRIVAL/DEPARTURE DISTRIBUTION

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	9
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

12% Primary Trip Arrival Distribution

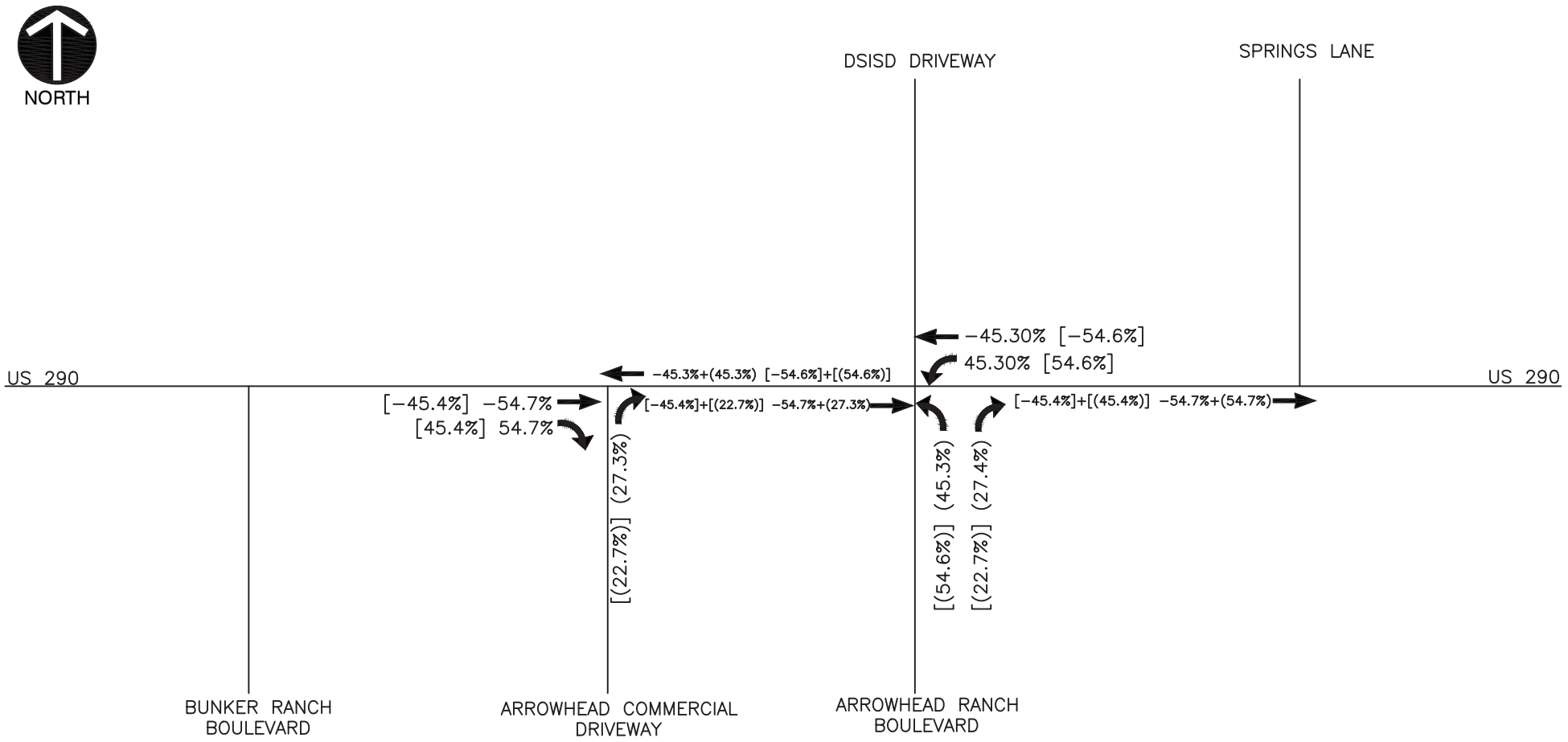
(12%) Primary Trip Departure Distribution

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED ARROWHEAD RANCH COMMERCIAL
PRIMARY TRIP ARRIVAL/DEPARTURE DISTRIBUTION

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	10
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

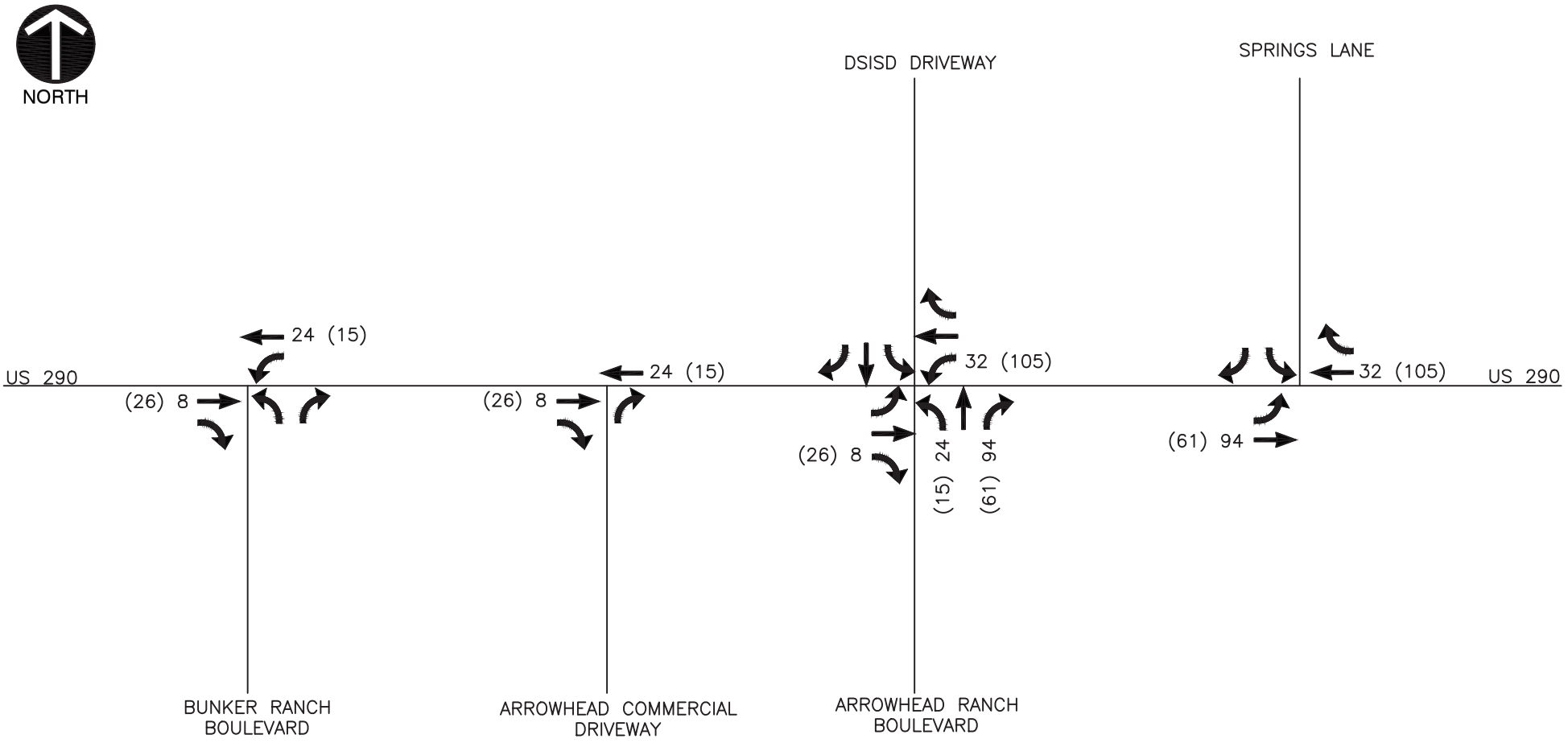
12%	AM Peak Hour Arrival Trip Distribution
(12%)	AM Peak Hour Departure Trip Distribution
[12%]	PM Peak Hour Arrival Trip Distribution
[(12%)]	PM Peak Hour Departure Trip Distribution

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED ARROWHEAD RANCH COMMERCIAL PASS-BY TRIP ARRIVAL/DEPARTURE DISTRIBUTION

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	11
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

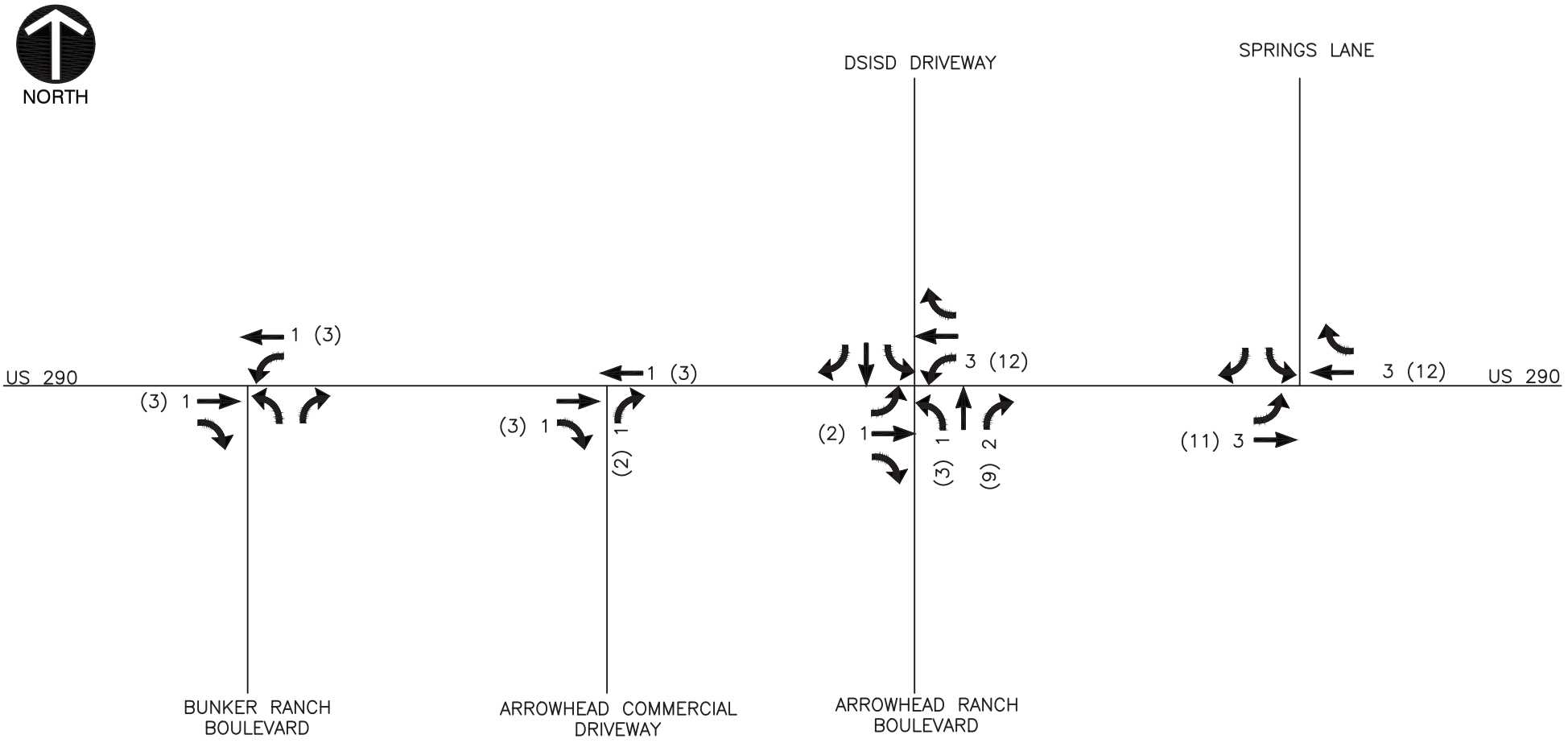
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED ARROWHEAD RANCH APPROVED BACKGROUND RESIDENTIAL SITE GENERATED PEAK HOUR TRIPS

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	12
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

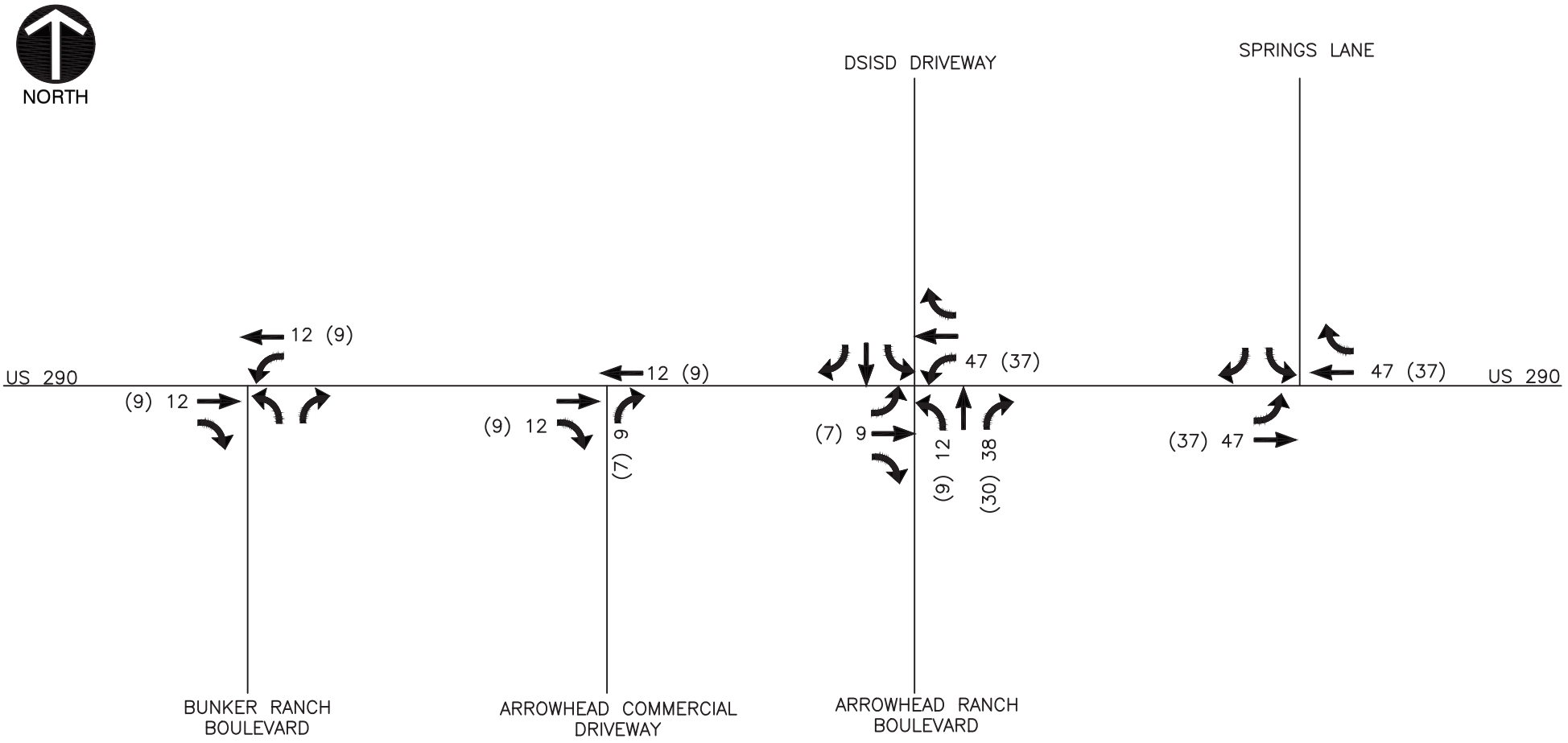
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED ARROWHEAD RANCH PLANNED LIQUOR STORE
PRIMARY SITE GENERATED PEAK HOUR TRIPS

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	13
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

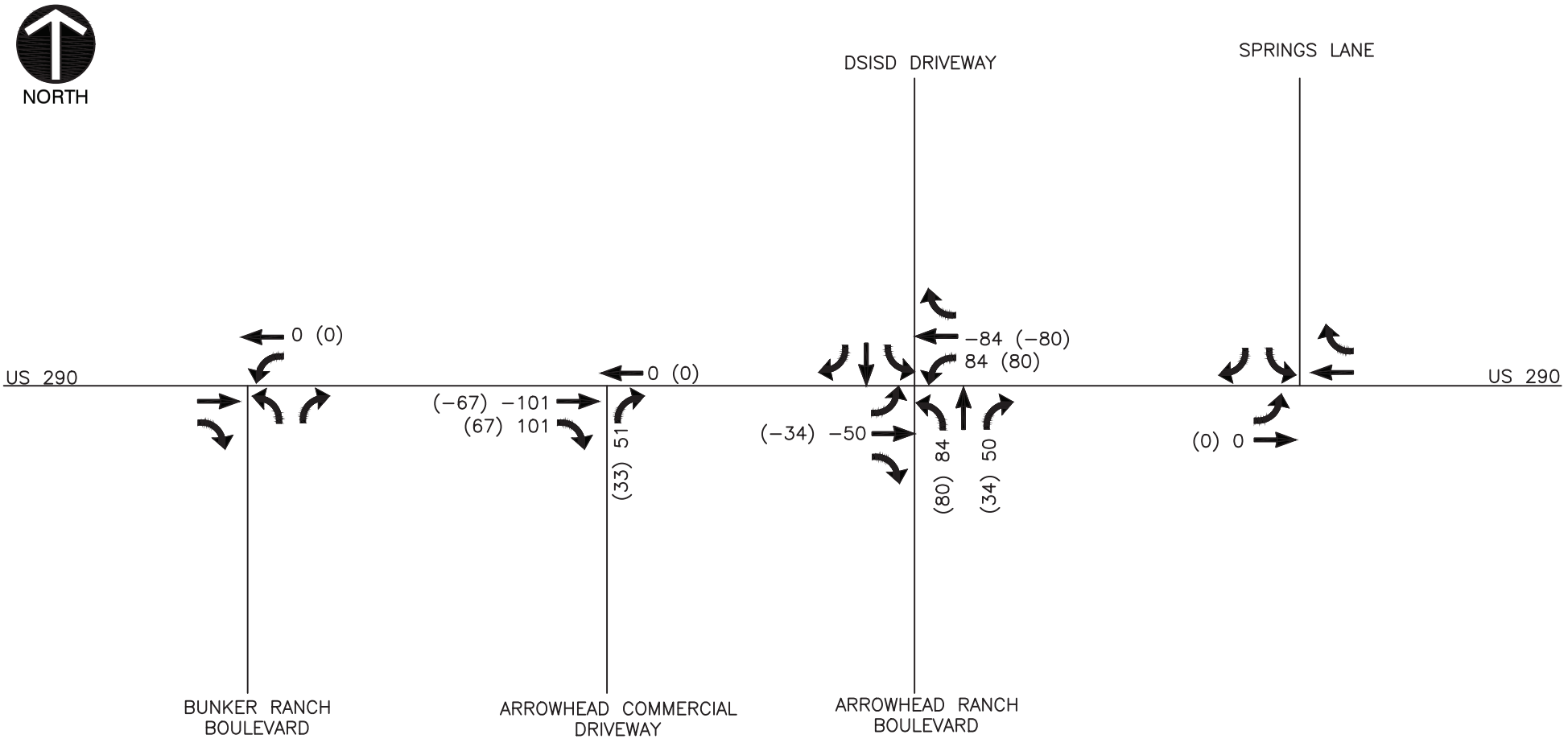
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED ARROWHEAD RANCH PLANNED GAS STATION
PRIMARY SITE GENERATED PEAK HOUR TRIPS

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	14
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

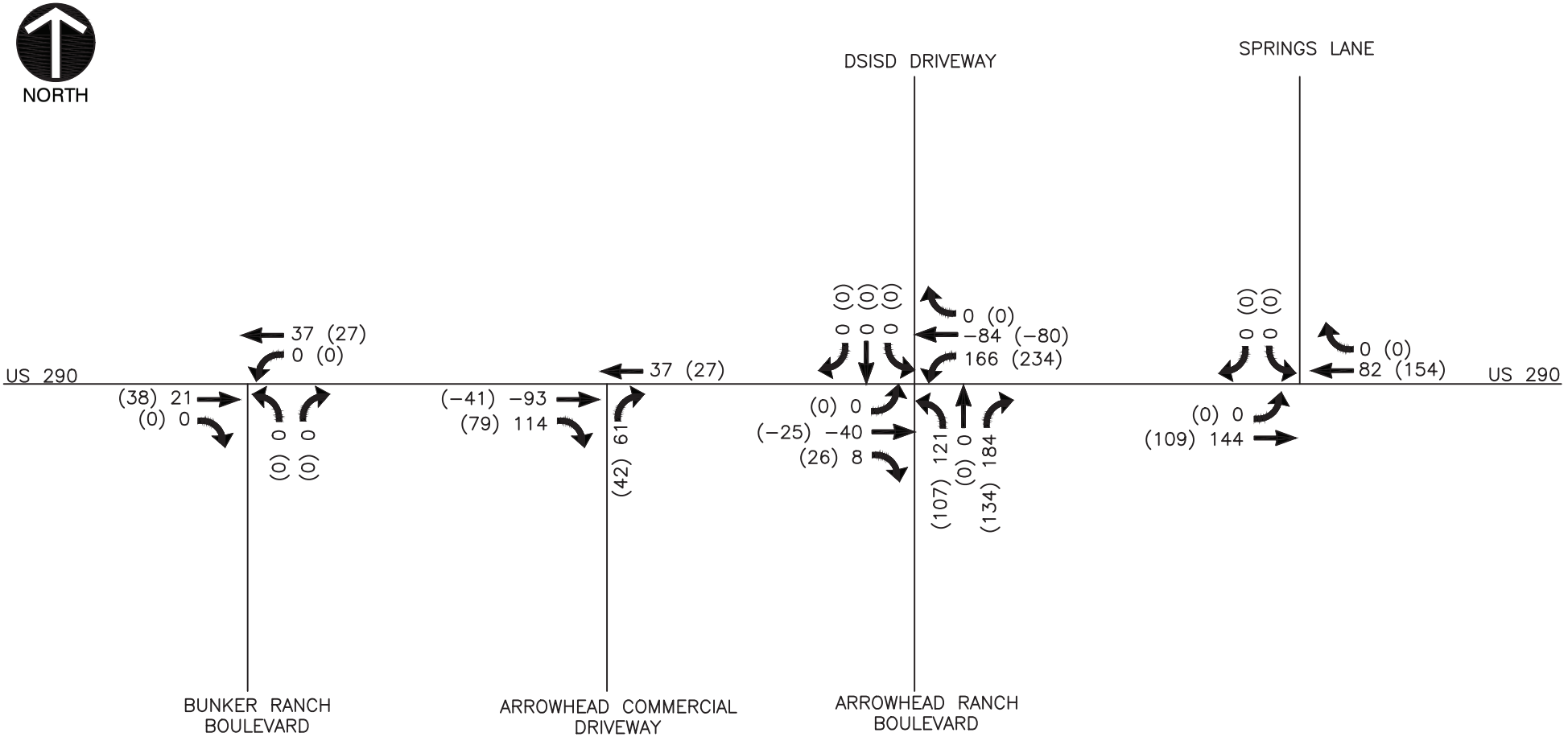
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED ARROWHEAD RANCH PLANNED GAS STATION
PASS-BY SITE GENERATED PEAK HOUR TRIPS

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	15
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

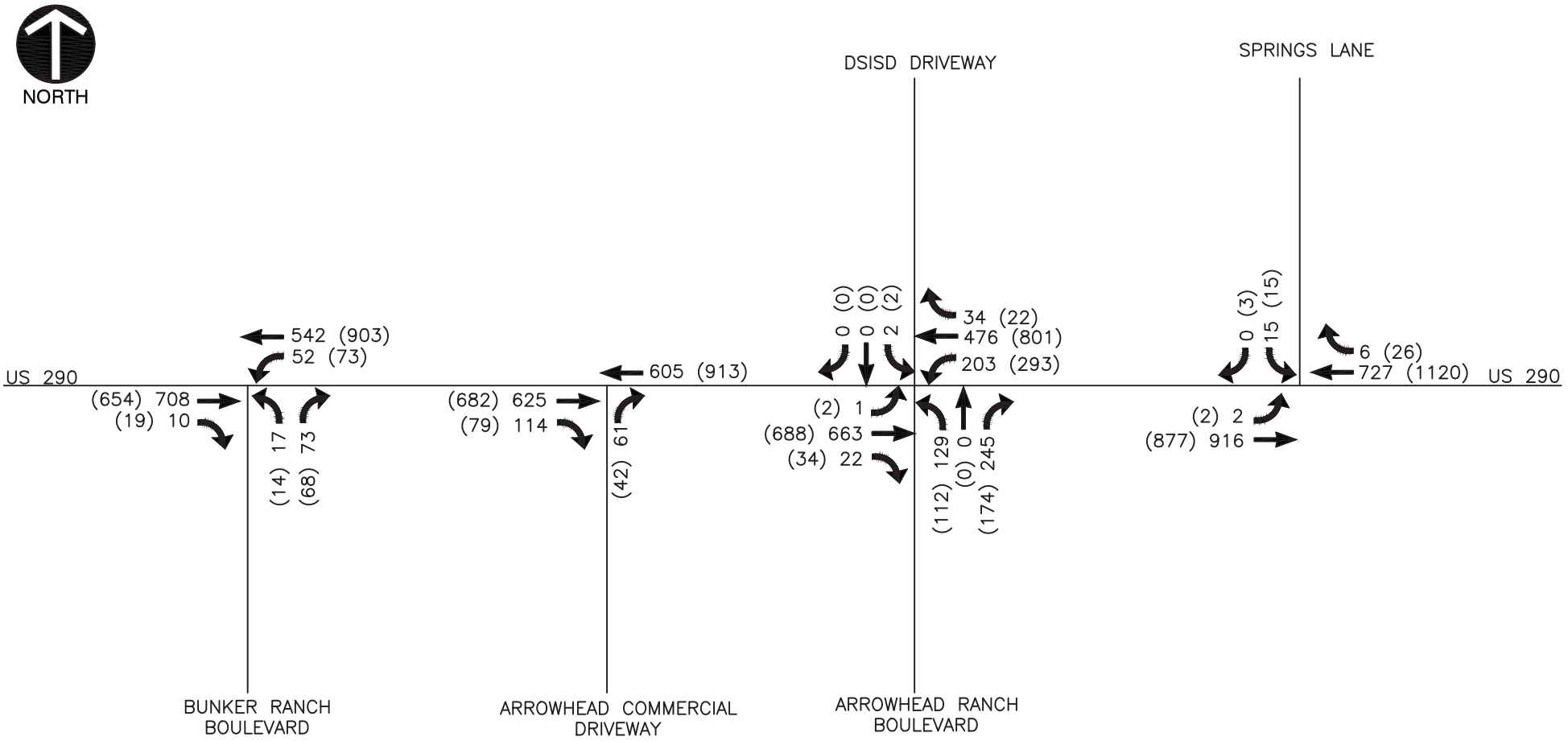
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED ARROWHEAD RANCH TOTAL BACKGROUND SITE GENERATED PEAK HOUR TRIPS

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	16
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

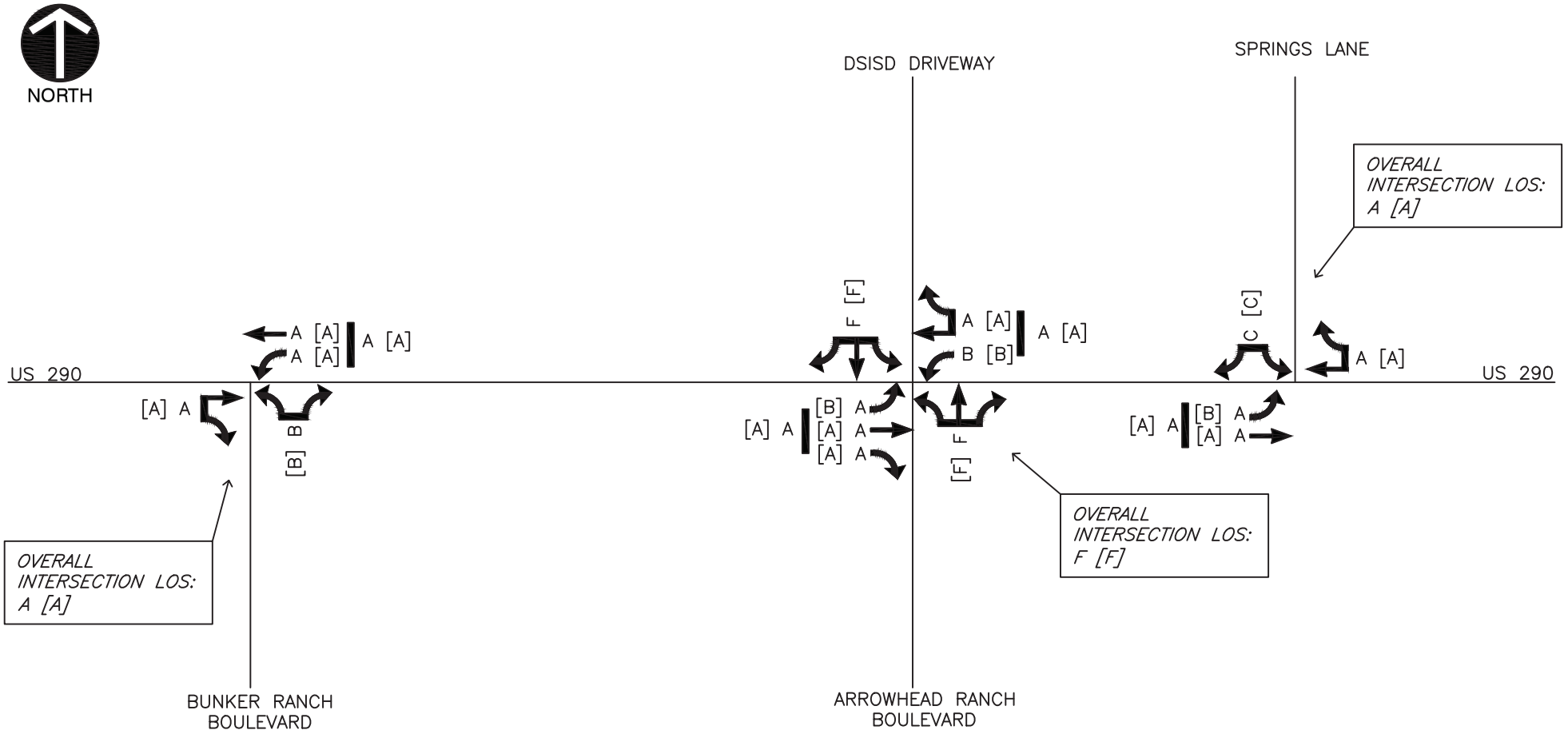
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

FORECASTED 2025 NO-BUILD (BASE) PEAK HOUR TRAFFIC VOLUMES

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	17
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

A A.M. Peak Hour Levels of Service

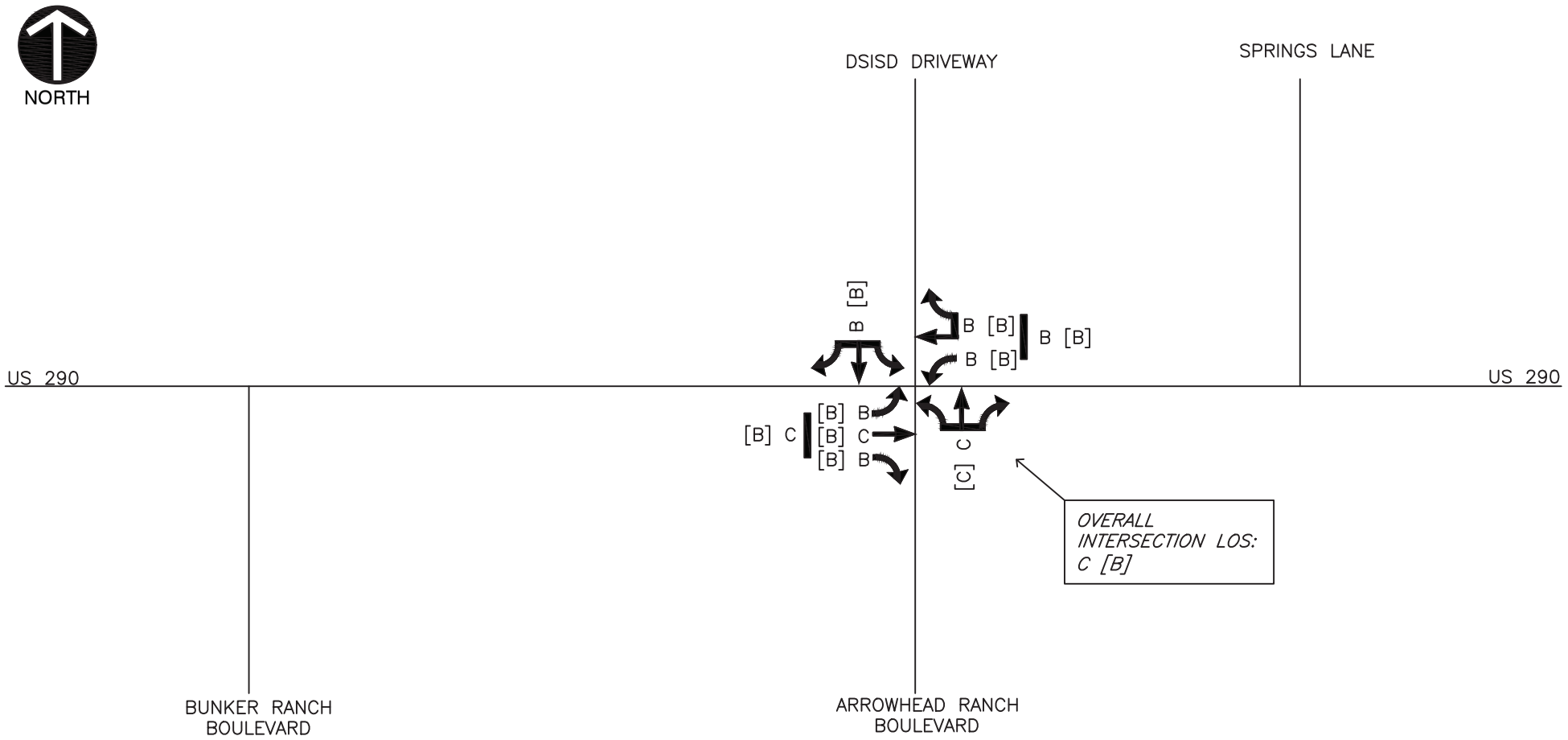
[B] P.M. Peak Hour Levels of Service

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

FORECASTED 2025 NO-BUILD(BASE) LEVELS OF SERVICE

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	18
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

A A.M. Peak Hour Levels of Service

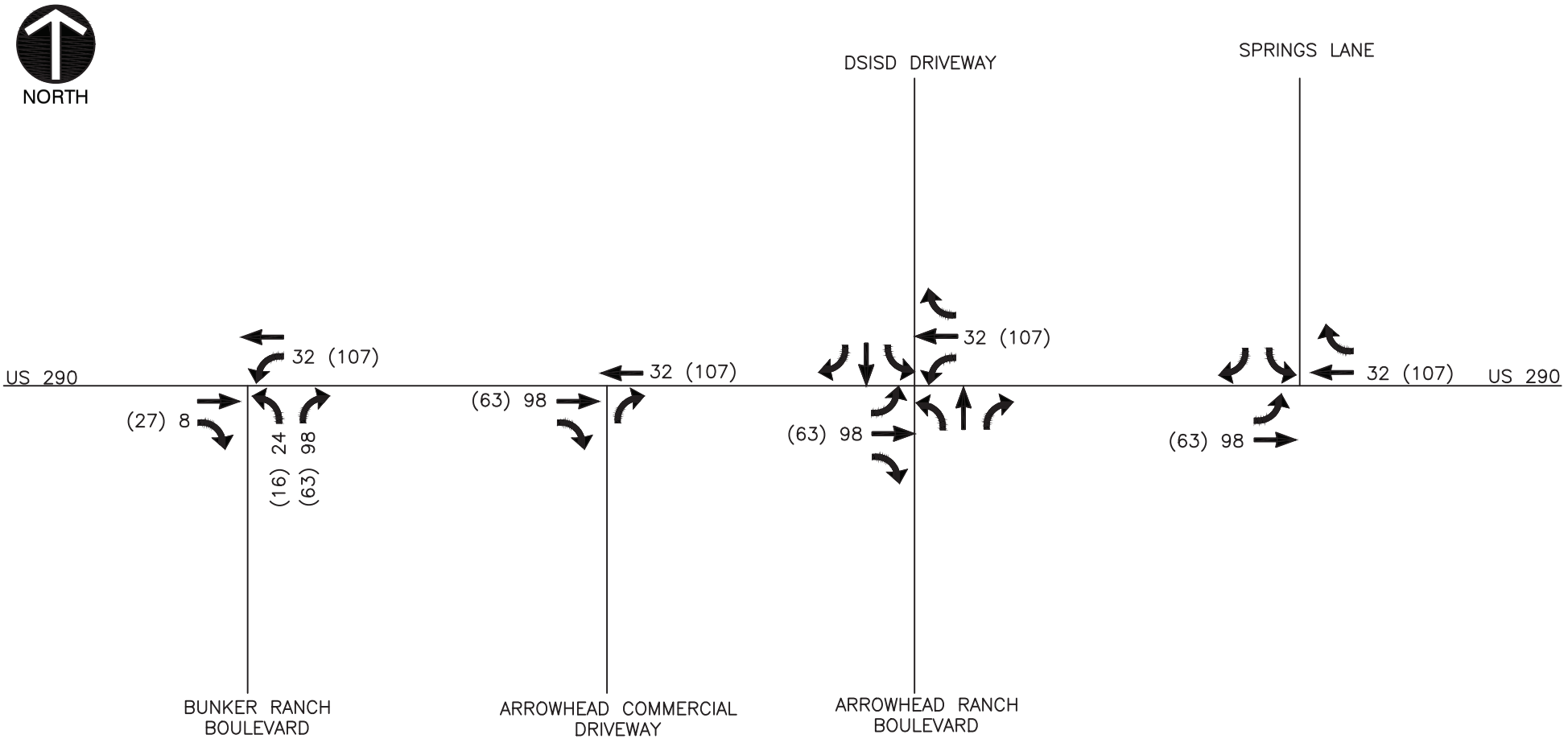
[B] P.M. Peak Hour Levels of Service

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

FORECASTED 2025 NO BUILD(BASE)-MITIGATED LEVELS OF SERVICE

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	19
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

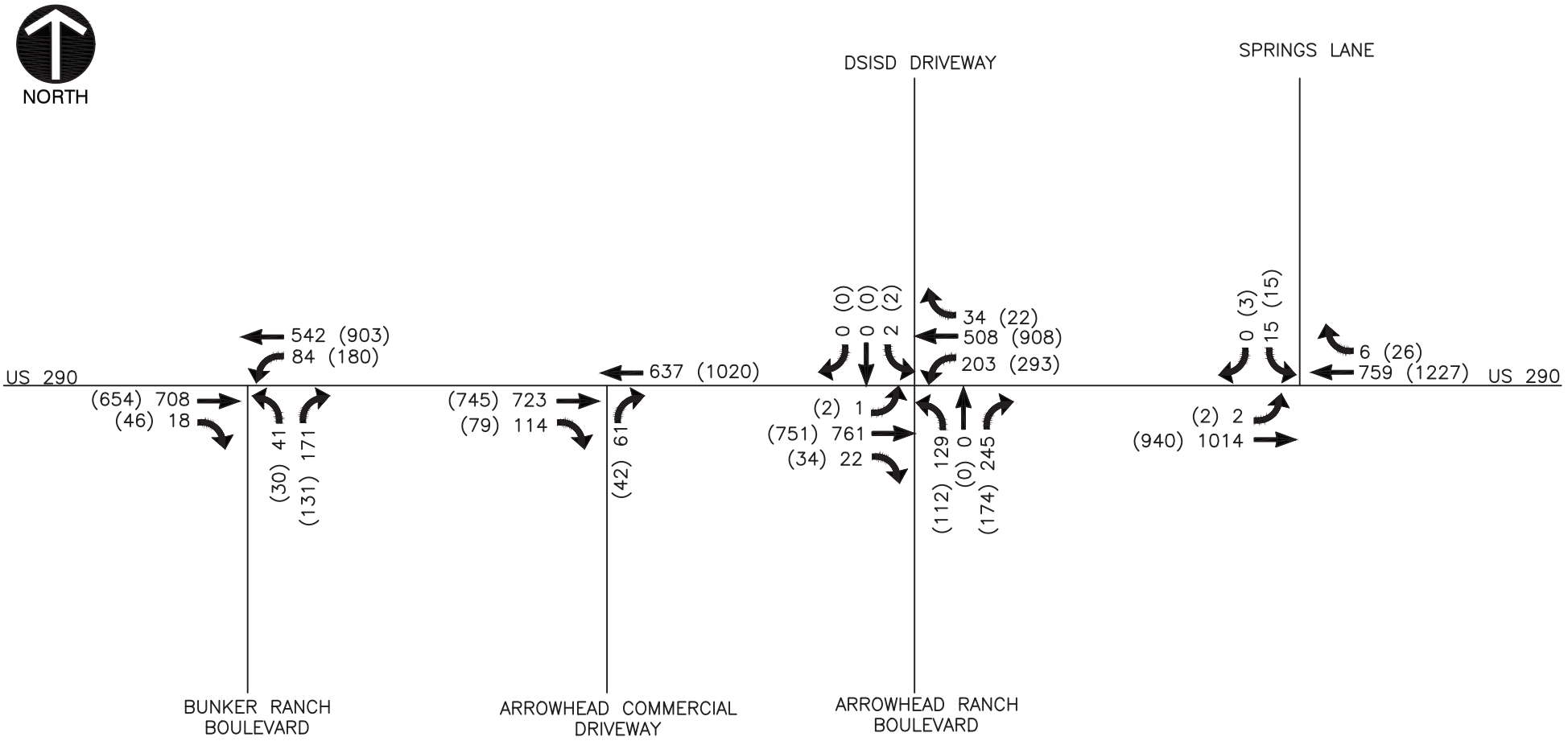
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

ANTICIPATED PROPOSED BUNKER RANCH
PRIMARY SITE GENERATED PEAK HOUR TRIPS

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	20
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

123 A.M. Peak Hour Traffic Volumes

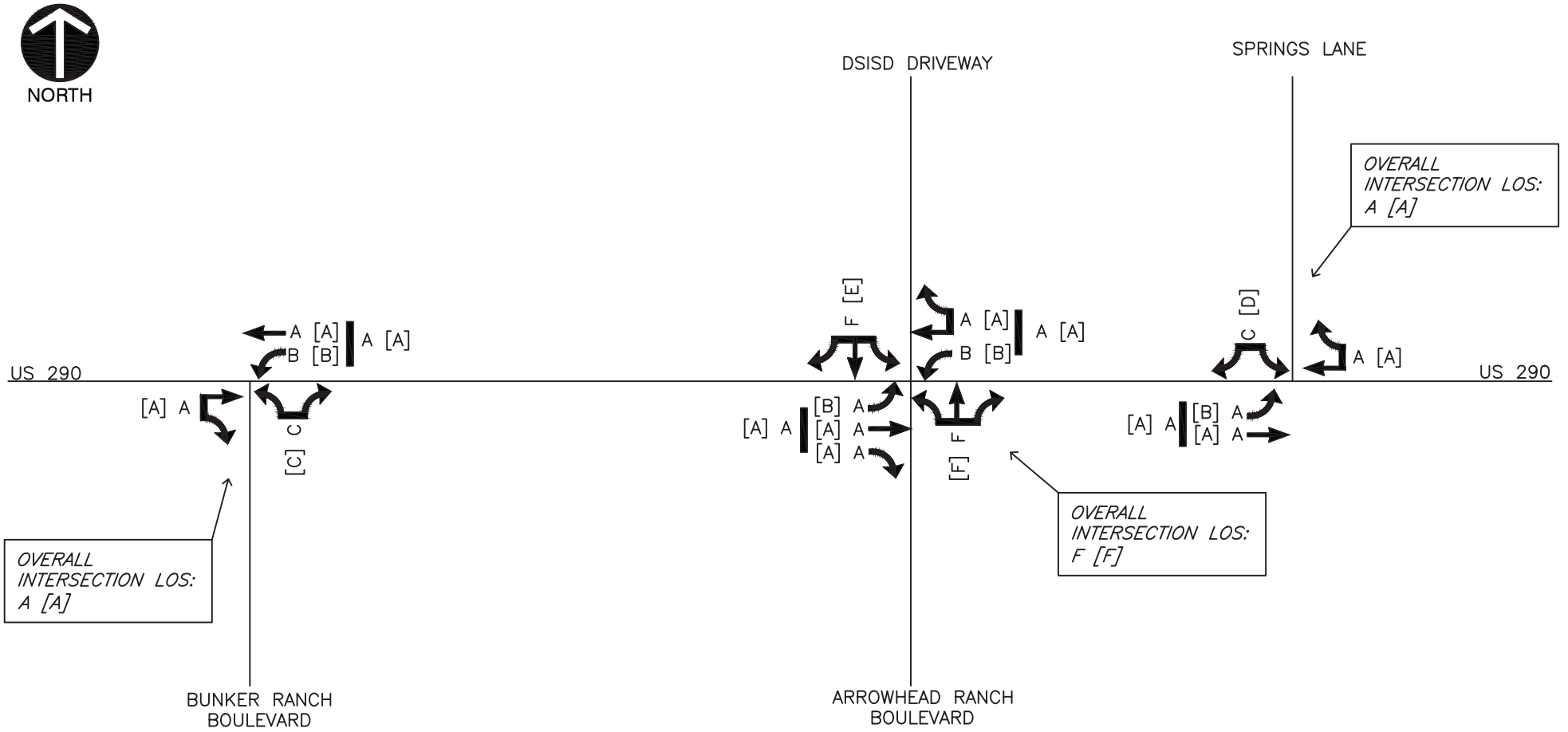
(123) P.M. Peak Hour Traffic Volumes

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

FORECASTED 2025 BUILD (WITH DEVELOPMENT)
PEAK HOUR TRAFFIC VOLUMES

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	21
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		



LEGEND

A A.M. Peak Hour Levels of Service

[B] P.M. Peak Hour Levels of Service

Civil & Environmental Consultants, Inc.
333 Baldwin Road · Pittsburgh, PA 15205
412-429-2324 · 800-365-2324
www.cecinc.com

BUNKER RANCH SUBDIVISION EXPANSION
TRAFFIC IMPACT ANALYSIS
CITY OF DRIPPING SPRINGS
HAYS COUNTY, TEXAS

FORECASTED 2025 BUILD (WITH DEVELOPMENT) PEAK HOUR LEVELS OF SERVICE

DRAWN BY:	ANL	CHECKED BY:	CAD	APPROVED BY:	JMD	FIGURE NO.:	22
DATE:	MAY 2021	DWG SCALE:	NOT TO SCALE	PROJECT NO:	304-065		

APPENDIX A
TRAFFIC IMPACT ANALYSIS SCOPE OF STUDY

TRAFFIC IMPACT ANALYSIS SCOPE AND STUDY AREA

Project Name:	Bunker Ranch	**Date:**	March 31, 2021
Location:	South of the intersection of US 290 and Bunker Ranch Boulevard		
Owner's Agent:	Civil & Environmental Consultants, Inc.	**Phone:**	512-439-0400

1. Background Information

The following information should be provided:

- Site Map or Site Plan.
- Location/Study area map specifying major roadways within the study area.
- Identify state and county roadways in the study area. Scope should be provided to all agencies impacted by the study.
- Identify adopted plans and public infrastructure improvement projects applicable to this site.

2. Intersection Level of Service

Calculations for AM and PM peak hours must be performed for the intersections listed below, showing existing traffic conditions and projected traffic conditions, identifying site, non-site, and total traffic:

- US 290 and Bunker Ranch Boulevard
- US 290 and Arrowhead Ranch Boulevard
- US 290 and Springs Lane
- All Site Driveways Accessing US 290

AM and PM peak-hour turning movement counts will be collected at the study intersections to determine existing background traffic and should be collected while school is in session. If

historical counts must be obtained due to the COVID-19 pandemic and reduced traffic, a growth rate approved by the city must be applied to reflect existing “2021” conditions. If counts are collected during the COVID-19 reduced traffic conditions, adjustments to the traffic counts should be made, and data to justify the adjustments should be provided with the submittal of the TIA.

The Intersection Capacity Analysis should include the following build-out phases/years:

- Phase 1 – Residential land use buildout year
- Phase 2 – Commercial land use buildout year

Intersection Capacity Analysis for each phase/year shall include:

- Level of Service by movements
- Delay by movements
- V/C by movements
- Queuing analysis with 95% queue length by movements, vs existing storage bay and/or distance from adjacent intersection(s)

3. Roadway Analysis

Document the projected daily volumes on Bunker Ranch Boulevard for each analysis phase/year.

4. Sight Distance Analysis

- When proposed mitigation recommends a new traffic signal be installed, an analysis of the stopping sight distance on approach to stopped queues (back of queue) should be included.
- New intersections or driveways must provide an analysis of the intersection sight distance. The intersection of US 290 and Bunker Ranch Boulevard is considered an existing driveway and does not require a sight distance analysis.

5. Transportation Improvements

The following adopted plans and public infrastructure improvement projects applicable to this site should be considered in the analysis.

- Dripping Springs Traffic Study 2020 (Dripping Springs)
- Dripping Springs Thoroughfare Plan (Dripping Springs)

Consider the following for transportation improvements related to the site:

- Improvements required to mitigate the impact of site traffic for intersections below Level of Service C, based on City of Dripping Springs Code Chapter 28, Exhibit A, Section 11.11.

6. Other Considerations

- Ensure automated traffic data captures demand. Manual observations or a multiple period analysis may be necessary.
- Capture and report data to calibrate model for existing operational analysis (i.e. queue length and approach/movement delay recommended)
- Methodology for capacity and level of service shall be Highway Capacity Manual, latest edition (i.e. Synchro, version 10).
- Discuss and illustrate model calibration (i.e. queue length and approach/movement delay recommended).

7. Study Assumptions

The following assumptions must be included in the analysis:

- Background traffic ——the average annual growth rate shall be calculated using available sources and documented in the report. Identified growth rate for use in analysis which must be approved by the City prior to submittal
- Projects for background traffic calculations:
    - Arrowhead Ranch

  The City will provide available land use information for the proposed development.
- Transit Trips/Walking/Biking Reductions – N/A
- Internal Capture Reductions – N/A
- Pass-By Trip Reductions – Appropriate pass-by trip reductions may be applied to commercial land uses based on the ITE Trip Generation Manual, 10th Edition.
- Trip distribution – To be determined based on existing and historical data. Analysis used to support distribution assumptions should be provided with the submittal of the TIA. Obtain approval by the City prior to submittal.

8. Submittal Requirements

- Submit an electronic version of the draft TIA report for agency review. Once all agency comments are resolved, submit two (2) printed copies of the final report, signed and sealed by a professional engineer licensed in the State of Texas for submittal to City of Dripping Springs. The final report should also be provided in electronic format. Submit an electronic version of the draft and final TIA report TxDOT through DropBox.
- The submittal should include the following: PDF of the TIA, Synchro Network for all conditions analyzed and background DXF or aerial format (Synchro files must be in real world coordinates), excel spreadsheets with, overall trip generation, internal and pass-by trip reduction rates if applicable, site trip distribution and assignment within roadway network and site driveways, A CAD file for the site plan, if available.
- Traffic signal modeling requirements:
    - All intersections must be modeled in one Synchro file (including unsignalized intersections).
    - Synchro signal timing sheets are to be included with the submittal.

    - Present intersection LOS by movements, Delay by movements, v/c by movements, and 95% queue length by movements in a tabular format (preferably in 11”x17”) for different scenarios noted.
- The following Maps should be included in the TIA report:
    - Site Map or Site Plan.
    - Location/Study area map specifying major roadways within the study area.
    - A map showing all bicycle routes, bus transit and bus stops within ½ mile of the site
    - A map showing all background projects and trip generation for each project,
    - A map showing all roadways and driveways analyzed (labeled and dimensioned)
    - An aerial map of all intersections with roadway improvements (dimensioned), including above ground utilities called out.

This scope and study are based upon discussions between Civil & Environmental Consultants, Inc., the City of Dripping Springs transportation consultant, and TxDOT. Any change in these assumptions may require a change in scope.

Approved by: CHAD GILPIN
Chad Gilpin, P.E., City Engineer, City of Dripping Springs

Reviewed by: Leslie D Pollack
Leslie D. Pollack, P.E., PTOE, HDR Engineering, Inc.

Approved by: Scott R Cunningham, P.E.
Scott R. Cunningham, P.E., TxDOT Austin District

Agree to follow:
Jeffrey M. DePaolis, P.E., PTOE, Civil & Environmental Consultants, Inc.

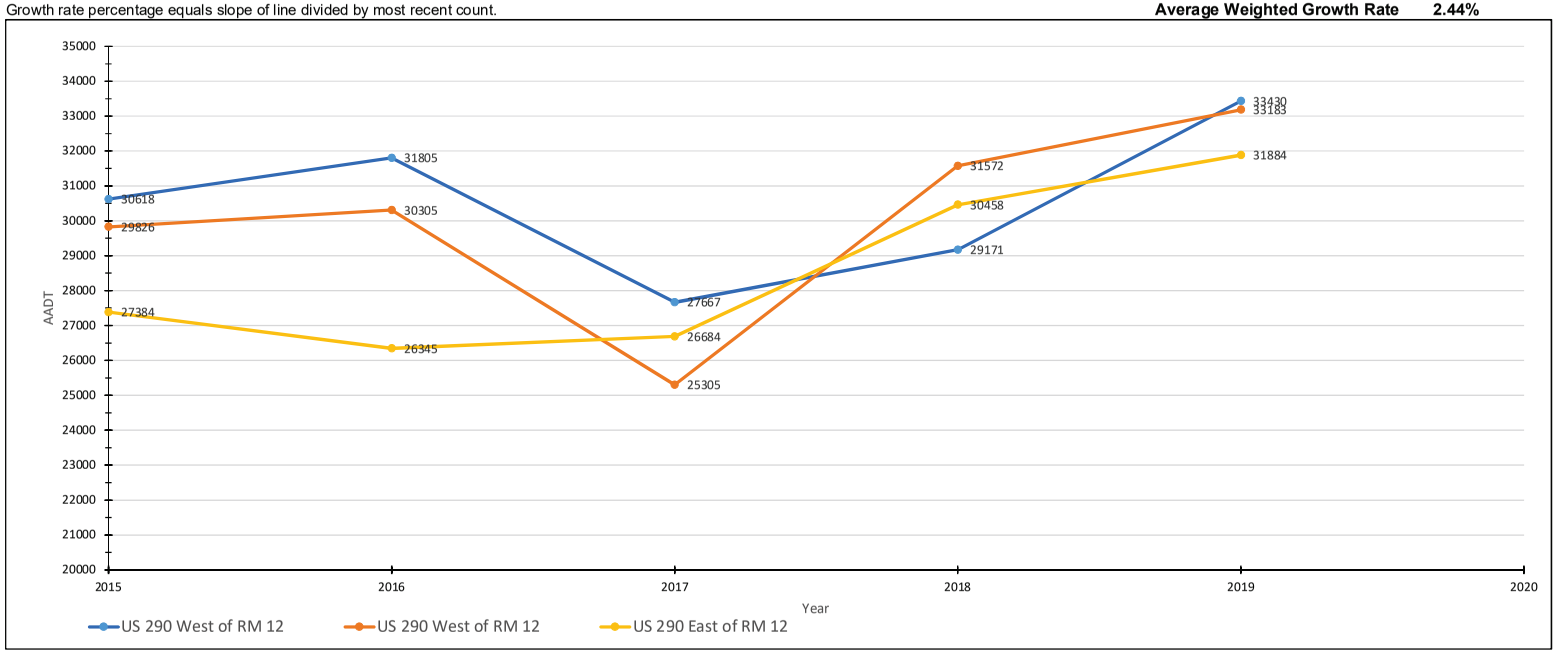
APPENDIX B
BACKGROUND TRAFFIC GROWTH RATE CALCULATIONS

TABLE A1
BACKGROUND TRAFFIC GROWTH RATE CALCULATIONS

Station ID #	Location	AADT Traffic Counts (1)											Statistics						
		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Slope	Y-Intercept	Number of Data Points	R Squared	Growth Rate (2)	Weight	Weighted Growth
109,265	US 290 West of RM 12						30618	31805	27667	29171	33430		299.0000	-572544.8	5	0.045	0.90%	0.34	0.31%
109,273	US 290 West of RM 12						29826	30305	25305	31572	33183		798.1000	-1579729.5	5	0.183	2.40%	0.34	0.81%
109,321	US 290 East of RM 12						27384	26345	26684	30458	31884		1311.3	-2616341.1	5	0.703	4.10%	0.32	1.33%
										Total	98,497							1.00	2.44%

(1) Traffic count data obtained form the TXDOT Traffic Count Database System (TCDS)
(2) Growth rate percentage equals slope of line divided by most recent count.

Average Weighted Growth Rate 2.44%



Droznek, Chris

From: Pollack, Leslie <Leslie.Pollack@hdrinc.com>
Sent: Friday, April 30, 2021 4:06 PM
To: Droznek, Chris
Subject: RE: Bunker Ranch TIA

Hi Chris, I am good with the growth rate as proposed. Thank you!

Leslie D. Pollack, P.E., PTOE
D 512.904.3728 **M** 512.560.1619

hdrinc.com/follow-us

From: Droznek, Chris <cdroznek@cecinc.com>
Sent: Friday, April 30, 2021 7:23 AM
To: Pollack, Leslie <Leslie.Pollack@hdrinc.com>
Subject: RE: Bunker Ranch TIA

Leslie,

Thank you. I'm also attaching a copy of the calculated growth rate for the study area. Since our project is located on US 290, I collected AADT data along US 290. From the TXDOT Traffic Count Database System (TCDS) I was able to locate 3 count locations along US 290 and within Dripping Springs. I utilized the most recent 5 years of AADT data available for the calculations. From this data I calculated a linear growth rate of 2.44% per year using a weighted average of the three locations.

I understand that you want to verify this information prior to submission of the TIA. Please review the attached calculated growth rate and provide me with any comments or suggestions as to what background traffic growth rate you would like to utilize for the study area.

Thank you,

Chris

Chris A. Droznek II, P.E. | *Project Manager*
Civil & Environmental Consultants, Inc.
333 Baldwin Road, Pittsburgh, PA 15205
direct 412.249.3177 **office** 412.429.2324 **mobile** 412.804.8807
www.cecinc.com

APPENDIX C
TURNING MOVEMENT COUNT SUMMARIES

GRAM Traffic Counting, Inc.
3751 FM 1105, Bldg. A
Georgetown, TX 78626
512-832-8650

File Name : Site 1 - US 290 & Bunker Ranch Blvd - AM
Site Code : 1_____
Start Date : 4/20/2021
Page No : 1

Groups Printed- Vehicles - Heavy vehicles

	Southbound					US 290 Westbound					Bunker Ranch Blvd Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
07:00	0	0	0	0	0	4	82	0	0	86	0	0	2	0	2	0	148	0	0	148	236
07:15	0	0	0	0	0	4	100	0	0	104	0	0	4	0	4	0	161	0	0	161	269
07:30	0	0	0	0	0	8	131	0	1	140	0	0	5	0	5	0	178	1	0	179	324
07:45	0	0	0	0	0	11	118	0	0	129	1	0	3	0	4	0	157	0	0	157	290
Total	0	0	0	0	0	27	431	0	1	459	1	0	14	0	15	0	644	1	0	645	1119
08:00	0	0	0	0	0	12	137	0	0	149	0	0	5	0	5	0	137	1	0	138	292
08:15	0	0	0	0	0	5	109	0	0	114	0	0	3	0	3	0	141	0	0	141	258
08:30	0	0	0	0	0	7	108	0	0	115	3	0	1	0	4	0	180	2	0	182	301
08:45	0	0	0	0	0	11	151	0	0	162	0	0	10	1	11	0	168	2	0	170	343
Total	0	0	0	0	0	35	505	0	0	540	3	0	19	1	23	0	626	5	0	631	1194
Grand Total	0	0	0	0	0	62	936	0	1	999	4	0	33	1	38	0	1270	6	0	1276	2313
Apprch %	0	0	0	0		6.2	93.7	0	0.1		10.5	0	86.8	2.6		0	99.5	0.5	0		
Total %	0	0	0	0	0	2.7	40.5	0	0	43.2	0.2	0	1.4	0	1.6	0	54.9	0.3	0	55.2	
Vehicles	0	0	0	0	0	60	825	0	1	886	3	0	32	1	36	0	1168				
% Vehicles	0	0	0	0	0	96.8	88.1	0	100	88.7	75	0	97	100	94.7	0	92	83.3	0	91.9	90.6
Heavy vehicles																					
% Heavy vehicles	0	0	0	0	0	3.2	11.9	0	0	11.3	25	0	3	0	5.3	0	8	16.7	0	8.1	9.4

	Southbound					US 290 Westbound					Bunker Ranch Blvd Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00																					
08:00	0	0	0	0	0	**12**	137	0	0	149	0	0	5	0	5	0	137	1	0	138	292
08:15	0	0	0	0	0	5	109	0	0	114	0	0	3	0	3	0	141	0	0	141	258
08:30	0	0	0	0	0	7	108	0	0	115	**3**	0	1	0	4	0	**180**	**2**	0	**182**	301
08:45	0	0	0	0	0	11	**151**	0	0	**162**	0	0	**10**	**1**	**11**	0	168	2	0	170	**343**
Total Volume	0	0	0	0	0	35	505	0	0	540	3	0	19	1	23	0	626	5	0	631	1194
% App. Total	0	0	0	0		6.5	93.5	0	0		13	0	82.6	4.3		0	99.2	0.8	0		
PHF	.000	.000	.000	.000	.000	.729	.836	.000	.000	.833	.250	.000	.475	.250	.523	.000	.869	.625	.000	.867	.870
Vehicles	0	0	0	0	0	34	433	0	0	467	3	0	18	1	22	0	569	4	0	573	1062
% Vehicles						97.1	85.7	0	0	86.5	100	0	94.7	100	95.7	0	90.9	80.0	0	90.8	88.9
Heavy vehicles																					
% Heavy vehicles	0	0	0	0	0	2.9	14.3	0	0	13.5	0	0	5.3	0	4.3	0	9.1	20.0	0	9.2	11.1

GRAM Traffic Counting, Inc.
3751 FM 1105, Bldg. A
Georgetown, TX 78626
512-832-8650

File Name : Site 1 - US 290 & Bunker Ranch Blvd - PM
Site Code : 1_____
Start Date : 4/20/2021
Page No : 1

Groups Printed- Vehicles - Heavy vehicles

	Southbound					US 290 Westbound					Bunker Ranch Blvd Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
16:00	0	0	0	0	0	6	151	0	0	157	2	0	10	0	12	0	172	1	0	173	342
16:15	0	0	0	0	0	8	188	0	0	196	0	0	10	0	10	0	155	0	0	155	361
16:30	0	0	0	0	0	5	295	0	0	300	0	0	7	0	7	0	141	1	0	142	449
16:45	0	0	0	0	0	5	196	0	0	201	2	0	5	0	7	0	156	1	0	157	365
Total	0	0	0	0	0	24	830	0	0	854	4	0	32	0	36	0	624	3	0	627	1517
17:00	0	0	0	0	0	2	186	0	0	188	2	0	10	0	12	0	157	1	0	158	358
17:15	0	0	0	0	0	0	199	0	0	199	1	0	10	0	11	0	162	0	0	162	372
17:30	0	0	0	0	0	6	178	0	0	184	2	0	8	0	10	0	162	1	0	163	357
17:45	0	0	0	0	0	2	164	0	0	166	0	0	10	0	10	0	142	1	0	143	319
Total	0	0	0	0	0	10	727	0	0	737	5	0	38	0	43	0	623	3	0	626	1406
Grand Total	0	0	0	0	0	34	1557	0	0	1591	9	0	70	0	79	0	1247	6	0	1253	2923
Apprch %	0	0	0	0		2.1	97.9	0	0		11.4	0	88.6	0		0	99.5	0.5	0		
Total %	0	0	0	0	0	1.2	53.3	0	0	54.4	0.3	0	2.4	0	2.7	0	42.7	0.2	0	42.9	
Vehicles	0	0	0	0	0	32	1508										1186				
% Vehicles	0	0	0	0	0	94.1	96.9	0	0	96.8	100	0	95.7	0	96.2	0	95.1	100	0	95.1	96.1
Heavy vehicles																					
% Heavy vehicles	0	0	0	0	0	5.9	3.1	0	0	3.2	0	0	4.3	0	3.8	0	4.9	0	0	4.9	3.9

	Southbound					US 290 Westbound					Bunker Ranch Blvd Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:30																					
16:30	0	0	0	0	0	**5**	**295**	0	0	**300**	0	0	7	0	7	0	141	**1**	0	142	**449**
16:45	0	0	0	0	0	5	196	0	0	201	**2**	0	5	0	7	0	156	1	0	157	365
17:00	0	0	0	0	0	2	186	0	0	188	2	0	**10**	0	**12**	0	157	1	0	158	358
17:15	0	0	0	0	0	0	199	0	0	199	1	0	10	0	11	0	**162**	0	0	**162**	372
Total Volume	0	0	0	0	0	12	876	0	0	888	5	0	32	0	37	0	616	3	0	619	1544
% App. Total	0	0	0	0		1.4	98.6	0	0		13.5	0	86.5	0		0	99.5	0.5	0		
PHF	.000	.000	.000	.000	.000	.600	.742	.000	.000	.740	.625	.000	.800	.000	.771	.000	.951	.750	.000	.955	.860
Vehicles	0	0	0	0	0	12	860	0	0	872	5	0	31	0	36	0	583	3	0	586	1494
% Vehicles							98.2	0	0	98.2	100	0	96.9	0	97.3	0	94.6	100	0	94.7	96.8
Heavy vehicles																					
% Heavy vehicles	0	0	0	0	0	0	1.8	0	0	1.8	0	0	3.1	0	2.7	0	5.4	0	0	5.3	3.2

GRAM Traffic Counting, Inc.
3751 FM 1105, Bldg. A
Georgetown, TX 78626
512-832-8650

File Name : Site 2 - US 290 & Arrowhead Ranch Blvd - AM
Site Code : 2_____
Start Date : 4/20/2021
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

	Bus Barn Driveway Southbound					US 290 Westbound					Arrowhead Ranch Blvd Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
07:00	0	0	0	0	0	4	97	0	0	101	1	0	22	0	23	0	156	0	0	156	280
07:15	3	0	0	0	3	9	106	0	0	115	1	0	20	0	21	0	160	2	0	162	301
07:30	1	0	1	0	2	12	138	3	1	154	2	0	21	0	23	0	176	0	0	176	355
07:45	1	0	0	0	1	11	143	4	0	158	2	0	10	0	12	0	168	0	0	168	339
Total	5	0	1	0	6	36	484	7	1	528	6	0	73	0	79	0	660	2	0	662	1275
08:00	0	0	0	0	0	6	144	0	0	150	2	0	15	0	17	0	142	2	0	144	311
08:15	1	0	0	0	1	11	119	2	0	132	3	0	16	0	19	0	155	3	0	158	310
08:30	0	0	0	0	0	8	126	6	0	140	2	0	13	0	15	1	173	4	0	178	333
08:45	1	0	0	0	1	12	154	26	0	192	1	0	17	0	18	0	179	5	0	184	395
Total	2	0	0	0	2	37	543	34	0	614	8	0	61	0	69	1	649	14	0	664	1349
Grand Total	7	0	1	0	8	73	1027	41	1	1142	14	0	134	0	148	1	1309	16	0	1326	2624
Apprch %	87.5	0	12.5	0		6.4	89.9	3.6	0.1		9.5	0	90.5	0		0.1	98.7	1.2	0		
Total %	0.3	0	0	0	0.3	2.8	39.1	1.6	0	43.5	0.5	0	5.1	0	5.6	0	49.9	0.6	0	50.5	
Vehicles	4	0	0	0	4	69	919	7	1	996	7	0	130	0	137	1	1223				
% Vehicles	57.1	0	0	0	50	94.5	89.5	17.1	100	87.2	50	0	97	0	92.6	100	93.4	12.5	0	92.5	90.1
Heavy Vehicles																					
% Heavy Vehicles	42.9	0	100	0	50	5.5	10.5	82.9	0	12.8	50	0	3	0	7.4	0	6.6	87.5	0	7.5	9.9

	Bus Barn Driveway Southbound					US 290 Westbound					Arrowhead Ranch Blvd Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00																					
08:00	0	0	0	0	0	6	144	0	0	150	2	0	15	0	17	0	142	2	0	144	311
08:15	**1**	0	0	0	**1**	11	119	2	0	132	**3**	0	16	0	**19**	0	155	3	0	158	310
08:30	0	0	0	0	0	8	126	6	0	140	2	0	13	0	15	**1**	173	4	0	178	333
08:45	1	0	0	0	1	**12**	**154**	**26**	0	**192**	1	0	**17**	0	18	0	**179**	**5**	0	**184**	**395**
Total Volume	2	0	0	0	2	37	543	34	0	614	8	0	61	0	69	1	649	14	0	664	1349
% App. Total	100	0	0	0		6	88.4	5.5	0		11.6	0	88.4	0		0.2	97.7	2.1	0		
PHF	.500	.000	.000	.000	.500	.771	.881	.327	.000	.799	.667	.000	.897	.000	.908	.250	.906	.700	.000	.902	.854
Vehicles	2	0	0	0	2	36	476	3	0	515	1	0	59	0	60	1	601	2	0	604	1181
% Vehicles						97.3	87.7	8.8	0	83.9	12.5	0	96.7	0	87.0	100	92.6	14.3	0	91.0	87.5
Heavy Vehicles																					
% Heavy Vehicles	0	0	0	0	0	2.7	12.3	91.2	0	16.1	87.5	0	3.3	0	13.0	0	7.4	85.7	0	9.0	12.5

GRAM Traffic Counting, Inc.
3751 FM 1105, Bldg. A
Georgetown, TX 78626
512-832-8650

File Name : Site 2 - US 290 & Arrowhead Ranch Blvd - PM
Site Code : 2_____
Start Date : 4/20/2021
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

	Bus Barn Driveway Southbound					US 290 Westbound					Arrowhead Ranch Blvd Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
16:00	2	0	0	0	2	7	161	0	0	168	2	0	8	0	10	0	183	2	0	185	365
16:15	1	0	0	0	1	14	205	2	0	221	0	0	16	0	16	0	161	1	0	162	400
16:30	0	0	0	0	0	18	236	2	0	256	0	0	11	0	11	1	152	2	0	155	422
16:45	1	0	0	0	1	13	189	1	0	203	0	0	12	0	12	0	166	4	0	170	386
Total	4	0	0	0	4	52	791	5	0	848	2	0	47	0	49	1	662	9	0	672	1573
17:00	0	0	0	0	0	9	198	5	0	212	3	0	11	0	14	1	182	0	0	183	409
17:15	1	0	0	0	1	19	197	14	0	230	2	0	6	0	8	0	177	2	0	179	418
17:30	3	0	2	0	5	15	175	10	0	200	0	0	8	0	8	2	182	0	0	184	397
17:45	6	0	0	0	6	12	157	6	0	175	0	0	11	0	11	0	158	4	0	162	354
Total	10	0	2	0	12	55	727	35	0	817	5	0	36	0	41	3	699	6	0	708	1578
Grand Total	14	0	2	0	16	107	1518	40	0	1665	7	0	83	0	90	4	1361	15	0	1380	3151
Apprch %	87.5	0	12.5	0		6.4	91.2	2.4	0		7.8	0	92.2	0		0.3	98.6	1.1	0		
Total %	0.4	0	0.1	0	0.5	3.4	48.2	1.3	0	52.8	0.2	0	2.6	0	2.9	0.1	43.2	0.5	0	43.8	
Vehicles	13	0	2	0	15	105	1464										1302				
% Vehicles	92.9	0	100	0	93.8	98.1	96.4	7.5	0	94.4	85.7	0	97.6	0	96.7	75	95.7	93.3	0	95.6	95
Heavy Vehicles																					
% Heavy Vehicles	7.1	0	0	0	6.2	1.9	3.6	92.5	0	5.6	14.3	0	2.4	0	3.3	25	4.3	6.7	0	4.4	5

	Bus Barn Driveway Southbound					US 290 Westbound					Arrowhead Ranch Blvd Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:30																					
16:30	0	0	0	0	0	18	**236**	2	0	**256**	0	0	11	0	11	**1**	152	2	0	155	**422**
16:45	**1**	0	0	0	**1**	13	189	1	0	203	0	0	**12**	0	12	0	166	**4**	0	170	386
17:00	0	0	0	0	0	9	198	5	0	212	**3**	0	11	0	**14**	1	**182**	0	0	**183**	409
17:15	1	0	0	0	1	**19**	197	**14**	0	230	2	0	6	0	8	0	177	2	0	179	418
Total Volume	2	0	0	0	2	59	820	22	0	901	5	0	40	0	45	2	677	8	0	687	1635
% App. Total	100	0	0	0		6.5	91	2.4	0		11.1	0	88.9	0		0.3	98.5	1.2	0		
PHF	.500	.000	.000	.000	.500	.776	.869	.393	.000	.880	.417	.000	.833	.000	.804	.500	.930	.500	.000	.939	.969
Vehicles	2	0	0	0	2	58	796	1	0	855	5	0	38	0	43	1	647	7	0	655	1555
% Vehicles						98.3	97.1	4.5	0	94.9	100	0	95.0	0	95.6	50.0	95.6	87.5	0	95.3	95.1
Heavy Vehicles																					
% Heavy Vehicles	0	0	0	0	0	1.7	2.9	95.5	0	5.1	0	0	5.0	0	4.4	50.0	4.4	12.5	0	4.7	4.9

GRAM Traffic Counting, Inc.
3751 FM 1105, Bldg. A
Georgetown, TX 78626
512-832-8650

File Name : Site 3 - US 290 & Springs Ln - AM
Site Code : 3_____
Start Date : 4/20/2021
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

	Springs Ln Southbound					US 290 Westbound					Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
07:00	9	0	1	0	10	0	97	2	0	99	0	0	0	0	0	1	181	0	0	182	291
07:15	7	0	2	0	9	0	122	2	0	124	0	0	0	0	0	1	191	0	0	192	325
07:30	6	0	1	0	7	0	146	6	0	152	0	0	0	0	0	0	208	0	0	208	367
07:45	9	0	1	0	10	0	158	4	0	162	0	0	0	0	0	0	177	0	0	177	349
Total	31	0	5	0	36	0	523	14	0	537	0	0	0	0	0	2	757	0	0	759	1332
08:00	5	0	0	0	5	0	158	1	0	159	0	0	0	0	0	0	159	0	0	159	323
08:15	5	0	0	0	5	0	135	0	0	135	0	0	0	0	0	1	173	0	0	174	314
08:30	2	0	0	0	2	0	138	3	0	141	0	0	0	0	0	0	187	0	1	188	331
08:45	3	0	0	0	3	0	197	2	0	199	0	0	0	0	0	1	199	0	0	200	402
Total	15	0	0	0	15	0	628	6	0	634	0	0	0	0	0	2	718	0	1	721	1370
Grand Total	46	0	5	0	51	0	1151	20	0	1171	0	0	0	0	0	4	1475	0	1	1480	2702
Apprch %	90.2	0	9.8	0		0	98.3	1.7	0		0	0	0	0		0.3	99.7	0	0.1		
Total %	1.7	0	0.2	0	1.9	0	42.6	0.7	0	43.3	0	0	0	0	0	0.1	54.6	0	0	54.8	
Vehicles	44	0	4	0	48	0	1004										1372				
% Vehicles	95.7	0	80	0	94.1	0	87.2	90	0	87.3	0	0	0	0	0	75	93	0	100	93	90.5
Heavy Vehicles																					
% Heavy Vehicles	4.3	0	20	0	5.9	0	12.8	10	0	12.7	0	0	0	0	0	25	7	0	0	7	9.5

	Springs Ln Southbound					US 290 Westbound					Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total		Thru	Right	U-TURN	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 08:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:00																					
08:00	**5**	0	0	0	**5**	0	158	1	0	159	0	0	0	0	0	0	159	0	0	159	323
08:15	5	0	0	0	5	0	135	0	0	135	0	0	0	0	0	**1**	173	0	0	174	314
08:30	2	0	0	0	2	0	138	**3**	0	141	0	0	0	0	0	0	187	0	**1**	188	331
08:45	3	0	0	0	3	0	**197**	2	0	**199**	0	0	0	0	0	1	**199**	0	0	**200**	**402**
Total Volume	15	0	0	0	15	0	628	6	0	634	0	0	0	0	0	2	718	0	1	721	1370
% App. Total	100	0	0	0		0	99.1	0.9	0		0	0	0	0		0.3	99.6	0	0.1		
PHF	.750	.000	.000	.000	.750	.000	.797	.500	.000	.796	.000	.000	.000	.000	.000	.500	.902	.000	.250	.901	.852
Vehicles	15	0	0	0	15	0	525	6	0	531	0	0	0	0	0	2	667	0	1	670	1216
% Vehicles							83.6	100	0	83.8	0	0	0	0	0	100	92.9	0	100	92.9	88.8
Heavy Vehicles																					
% Heavy Vehicles	0	0	0	0	0	0	16.4	0	0	16.2	0	0	0	0	0	0	7.1	0	0	7.1	11.2

GRAM Traffic Counting, Inc.
3751 FM 1105, Bldg. A
Georgetown, TX 78626
512-832-8650

File Name : Site 3 - US 290 & Springs Ln - PM
Site Code : 3_____
Start Date : 4/20/2021
Page No : 1

Groups Printed- Vehicles - Heavy Vehicles

	Springs Ln Southbound					US 290 Westbound					Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
16:00	3	0	0	0	3	0	185	4	0	189	0	0	0	0	0	0	203	0	0	203	395
16:15	4	0	1	0	5	0	226	6	0	232	0	0	0	0	0	0	182	0	0	182	419
16:30	4	0	0	0	4	0	260	6	0	266	0	0	0	0	0	1	162	0	0	163	433
16:45	2	0	2	0	4	0	192	7	0	199	0	0	0	0	0	1	187	0	0	188	391
Total	13	0	3	0	16	0	863	23	0	886	0	0	0	0	0	2	734	0	0	736	1638
17:00	7	0	1	0	8	0	211	6	0	217	0	0	0	0	0	0	190	0	0	190	415
17:15	2	0	0	0	2	0	242	7	0	249	0	0	0	0	0	0	193	0	0	193	444
17:30	3	0	0	0	3	0	193	4	0	197	0	0	0	0	0	1	195	0	0	196	396
17:45	3	0	0	0	3	0	189	4	0	193	0	0	0	0	0	0	169	0	0	169	365
Total	15	0	1	0	16	0	835	21	0	856	0	0	0	0	0	1	747	0	0	748	1620
Grand Total	28	0	4	0	32	0	1698	44	0	1742	0	0	0	0	0	3	1481	0	0	1484	3258
Apprch %	87.5	0	12.5	0		0	97.5	2.5	0		0	0	0	0		0.2	99.8	0	0		
Total %	0.9	0	0.1	0	1	0	52.1	1.4	0	53.5	0	0	0	0	0	0.1	45.5	0	0	45.5	
Vehicles	28	0	3	0	31	0	1613										1419				
% Vehicles	100	0	75	0	96.9	0	95	97.7	0	95.1	0	0	0	0	0	100	95.8	0	0	95.8	95.4
Heavy Vehicles																					
% Heavy Vehicles	0	0	25	0	3.1	0	5	2.3	0	4.9	0	0	0	0	0	0	4.2	0	0	4.2	4.6

	Springs Ln Southbound					US 290 Westbound					Northbound					US 290 Eastbound					
Start Time	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Left	Thru	Right	U-TURN	App. Total	Int. Total
Peak Hour Analysis From 16:00 to 17:45 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 16:30																					
16:30	4	0	0	0	4	0	**260**	6	0	**266**	0	0	0	0	0	**1**	162	0	0	163	433
16:45	2	0	**2**	0	4	0	192	**7**	0	199	0	0	0	0	0	1	187	0	0	188	391
17:00	**7**	0	1	0	**8**	0	211	6	0	217	0	0	0	0	0	0	190	0	0	190	415
17:15	2	0	0	0	2	0	242	7	0	249	0	0	0	0	0	0	**193**	0	0	**193**	**444**
Total Volume	15	0	3	0	18	0	905	26	0	931	0	0	0	0	0	2	732	0	0	734	1683
% App. Total	83.3	0	16.7	0		0	97.2	2.8	0		0	0	0	0		0.3	99.7	0	0		
PHF	.536	.000	.375	.000	.563	.000	.870	.929	.000	.875	.000	.000	.000	.000	.000	.500	.948	.000	.000	.951	.948
Vehicles	15	0	2	0	17	0	864	25	0	889	0	0	0	0	0	2	700	0	0	702	1608
% Vehicles			66.7	0	94.4	0	95.5	96.2	0	95.5	0	0	0	0	0	100	95.6	0	0	95.6	95.5
Heavy Vehicles																					
% Heavy Vehicles	0	0	33.3	0	5.6	0	4.5	3.8	0	4.5	0	0	0	0	0	0	4.4	0	0	4.4	4.5

GRAM Traffic Counting, Inc.
3751 FM 1105, Bldg. A
Georgetown, TX 78626
512-832-8650

Site Code: 1
Station ID:
US 290
East of CR 239
Latitude: 0' 0.0000 Undefined

Start Time	20-Apr-21 Tue	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		9	167			7	192				
12:15		11	164			4	179				
12:30		6	219			5	148				
12:45		4	183	30	733	4	140	20	659	50	1392
01:00		4	182			1	159				
01:15		3	216			2	153				
01:30		4	202			8	154				
01:45		3	177	14	777	4	162	15	628	29	1405
02:00		2	216			2	139				
02:15		1	201			3	189				
02:30		5	190			4	216				
02:45		4	164	12	771	3	176	12	720	24	1491
03:00		6	215			3	201				
03:15		3	234			4	184				
03:30		3	209			5	168				
03:45		3	173	15	831	6	184	18	737	33	1568
04:00		4	197			8	189				
04:15		5	225			7	221				
04:30		9	261			24	182				
04:45		16	211	34	894	21	188	60	780	94	1674
05:00		12	212			28	200				
05:15		26	241			33	190				
05:30		51	210			56	197				
05:45		70	180	159	843	59	173	176	760	335	1603
06:00		66	210			89	155				
06:15		71	169			99	157				
06:30		66	167			132	164				
06:45		86	135	289	681	141	134	461	610	750	1291
07:00		101	104			173	108				
07:15		122	118			195	100				
07:30		165	131			218	117				
07:45		170	96	558	449	177	88	763	413	1321	862
08:00		159	107			167	92				
08:15		138	71			163	70				
08:30		163	66			173	65				
08:45		190	81	650	325	187	62	690	289	1340	614
09:00		193	77			175	52				
09:15		133	61			172	52				
09:30		159	45			166	38				
09:45		161	43	646	226	171	41	684	183	1330	409
10:00		162	40			175	25				
10:15		178	30			175	24				
10:30		168	23			153	21				
10:45		158	36	666	129	150	16	653	86	1319	215
11:00		159	28			171	19				
11:15		153	14			164	11				
11:30		176	13			209	17				
11:45		139	12	627	67	182	6	726	53	1353	120
Total		3700	6726			4278	5918			7978	12644
Percent		35.5%	64.5%			42.0%	58.0%			38.7%	61.3%

GRAM Traffic Counting, Inc.
3751 FM 1105, Bldg. A
Georgetown, TX 78626
512-832-8650

Site Code: 1
Station ID:
US 290
East of CR 239
Latitude: 0' 0.0000 Undefined

Start Time	21-Apr-21 Wed	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		12	159			3	173				
12:15		9	197			7	157				
12:30		4	189			3	152				
12:45		8	181	33	726	1	151	14	633	47	1359
01:00		3	153			0	152				
01:15		4	208			2	158				
01:30		6	188			9	170				
01:45		2	158	15	707	2	146	13	626	28	1333
02:00		2	176			4	151				
02:15		3	180			3	186				
02:30		3	177			5	222				
02:45		4	182	12	715	3	176	15	735	27	1450
03:00		4	152			1	174				
03:15		6	207			2	160				
03:30		5	184			5	168				
03:45		2	200	17	743	8	192	16	694	33	1437
04:00		10	194			8	219				
04:15		5	232			9	200				
04:30		8	225			21	176				
04:45		13	220	36	871	15	168	53	763	89	1634
05:00		12	243			23	172				
05:15		23	227			45	194				
05:30		47	219			39	194				
05:45		61	266	143	955	65	180	172	740	315	1695
06:00		66	201			64	184				
06:15		68	178			117	163				
06:30		80	193			112	166				
06:45		96	168	310	740	151	136	444	649	754	1389
07:00		81	130			187	115				
07:15		139	118			194	123				
07:30		155	124			188	95				
07:45		183	128	558	500	188	89	757	422	1315	922
08:00		149	102			187	91				
08:15		144	93			170	105				
08:30		149	82			172	91				
08:45		175	88	617	365	196	89	725	376	1342	741
09:00		171	80			177	59				
09:15		175	67			164	51				
09:30		166	60			167	36				
09:45		154	44	666	251	170	38	678	184	1344	435
10:00		148	38			173	58				
10:15		163	33			164	30				
10:30		161	25			177	28				
10:45		188	23	660	119	177	28	691	144	1351	263
11:00		168	17			162	32				
11:15		156	23			174	14				
11:30		184	8			182	13				
11:45		184	17	692	65	169	5	687	64	1379	129
Total		3759	6757			4265	6030			8024	12787
Percent		35.7%	64.3%			41.4%	58.6%			38.6%	61.4%
Grand Total		7459	13483			8543	11948			16002	25431
Percent		35.6%	64.4%			41.7%	58.3%			38.6%	61.4%
ADT		ADT 20,716		AADT 20,716							

APPENDIX D
COVID-19 TRAFFIC VOLUME FACTOR EVALUATION

Volume Comparison for COVID-19 Factor Determination

Data Source	ADT Traffic Volumes		
	Eastbound	Westbound	Total
Tuesday, January 30, 2018	7,570	7,389	14,959
Grown to 2021 (2.44% per year linear)	8,124	7,930	16,054
Tuesday, April 20, 2021	10,196	10,426	20,622
Wednesday, April 21, 2021	10,295	10,516	20,811
Average	10,246	10,471	20,717
Difference	2,122	2,541	4,663

Linear Growth Rate	2.44%
2018	**2021**
1.0732	

Based on data, no factor to adjust 2021 traffic volumes to account for COVID conditions will be applied.

2018 traffic count data provided by the City of Dripping Springs

GRAM Traffic Counting Inc.
3751 FM 1105 Bldg A
Georgetown, TX 78626
512-832-8650

Site Code: 2
Station ID:
Hwy 290
West of Bell Springs Rd
Latitude: 0' 0.0000 Undefined

Start Time	30-Jan-18 Tue	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		4	131			18	124				
12:15		3	110			5	132				
12:30		6	133			6	120				
12:45		4	122	17	496	3	122	32	498	49	994
01:00		1	145			1	125				
01:15		2	135			4	113				
01:30		4	115			2	124				
01:45		2	117	9	512	1	116	8	478	17	990
02:00		3	113			3	121				
02:15		2	152			2	125				
02:30		1	170			1	115				
02:45		3	142	9	577	2	148	8	509	17	1086
03:00		4	136			5	161				
03:15		1	107			2	146				
03:30		12	100			0	173				
03:45		7	105	24	448	3	130	10	610	34	1058
04:00		6	107			3	150				
04:15		3	121			5	160				
04:30		10	97			6	171				
04:45		19	101	38	426	8	156	22	637	60	1063
05:00		23	123			9	195				
05:15		35	129			20	170				
05:30		55	164			34	142				
05:45		67	130	180	546	52	166	115	673	295	1219
06:00		91	125			36	159				
06:15		108	109			60	151				
06:30		134	106			51	145				
06:45		123	83	456	423	64	101	211	556	667	979
07:00		118	69			65	115				
07:15		166	70			84	60				
07:30		168	63			89	95				
07:45		153	55	605	257	106	85	344	355	949	612
08:00		152	32			90	66				
08:15		144	43			92	63				
08:30		164	36			95	78				
08:45		166	26	626	137	122	55	399	262	1025	399
09:00		147	17			104	69				
09:15		150	30			109	49				
09:30		127	36			126	36				
09:45		147	24	571	107	123	30	462	184	1033	291
10:00		141	23			89	24				
10:15		117	15			93	34				
10:30		116	20			122	32				
10:45		134	12	508	70	108	23	412	113	920	183
11:00		133	16			97	16				
11:15		134	5			120	15				
11:30		114	6			118	10				
11:45		116	4	497	31	109	6	444	47	941	78
Total		3540	4030			2467	4922			6007	8952
Percent		46.8%	53.2%			33.4%	66.6%			40.2%	59.8%
Grand Total		3540	4030			2467	4922			6007	8952
Percent		46.8%	53.2%			33.4%	66.6%			40.2%	59.8%
ADT		ADT 3,815		AADT 3,815							

APPENDIX E
INTERSECTION APPROACH PHOTOGRAPHS

Intersection: US 290 with Bunker Ranch Boulevard

Eastbound US 290 Approach

Westbound US 290 Approach

Intersection: US 290 with Bunker Ranch Boulevard

Northbound Bunker Ranch Boulevard

Intersection: US 290 with Arrowhead Ranch Boulevard/DSISD Driveway

Eastbound US 290 Approach

Westbound US 290 Approach

Intersection: US 290 with Arrowhead Ranch Boulevard/DSISD Driveway

Northbound Arrowhead Ranch Boulevard Approach

Looking at Southbound DSISD Driveway

Intersection: US 290 with Springs Lane Road

Eastbound US 290 Approach

Westbound US 290 Approach

Intersection: US 290 with Springs Lane Road

Southbound Springs Lane Approach

APPENDIX F
LEVEL OF SERVICE DEFINITIONS

LEVELS OF SERVICE

Intersection levels of service (LOS) were determined through implementation of the methodology presented in the *Highway Capacity Manual 6th Edition*, published by the Transportation Research Board.

i. Signalized Intersections

An explanation of level of service at signalized intersections is as follows:

This subsection describes the LOS criteria for the motorized vehicle mode. The criteria for the motorized vehicle mode are different from those for other modes. Specifically, the motorized vehicle mode criteria are based on performance measures that are field measurable and perceivable by travelers. The criteria for other modes are based on scores reported by travelers indicating their perception of service quality.

LOS can be characterized for the entire intersection, each intersection approach, and each lane group. Control delay alone is used to characterize LOS for the entire intersection of an approach. Control delay and volume-to-capacity ratio are used to characterize LOS for a lane group. Delay quantifies the increase in travel time due to traffic signal control. It is also a surrogate measure of driver discomfort and fuel consumption. The volume-to-capacity ratio quantifies the degree to which a phases's capacity is utilized by a lane group. The following paragraphs describe each LOS.

LOS A describes operations with a control delay of 10 s/veh or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B describes operations with control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

LOS C describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

A lane group can incur a delay less than 80 s/veh when the volume-to-capacity ratio exceeds 1.0. This condition typically occurs when the cycle length is short, the signal progression is favorable, or both. As a result, both the delay and volume-to-capacity ratio are considered when lane group LOS is established. A ratio of 1.0 or more indicates that cycle capacity is fully utilized and represents failure from a capacity perspective (just as delay in excess of 80 s/veh represents failure from a delay perspective).

Exhibit 19-8 lists the LOS thresholds established for the motor vehicle mode at a signalized intersection.

Exhibit 19-8
LOS Criteria: Signalized Intersection

Control Delay (s/veh)	LOS by Volume-to-Capacity (v/c) Ratio[1]	
	v/c ≤ 1.0	v/c > 1.0
≤ 10	A	F
> 10 – 20	B	F
> 20 – 35	C	F
> 35 – 55	D	F
> 55 – 80	E	F
> 80	F	F

(1) For approach-based and intersectionwide assessments, LOS is defined solely by control delay.

ii. Unsignalized Intersections

The following level-of-service criteria for two-way stop-controlled and all-way stop-controlled intersections differ from the criteria for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from various kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Thus, a higher level of control delay is acceptable at a signalized intersection for the same level of service.

Level of service for two-way stop-controlled (TWSC) intersections and an all-way stop control intersections is determined by the computed or measured control delay. For motor vehicles, LOS is determined for each minor-street movement (or shared movement), as well as the major-street left turns, by using the criteria given in Exhibit 20-2 and Exhibit 21-8. For TWSC intersections, LOS is not defined for the intersection as a whole or for major –street approaches for three primary reasons: (a) major-street through vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through vehicles a typical TWSC intersection skews the weighted average of all movements, resulting in a very low overall average delay for all vehicles; and (c) the resulting low delay can mask LOS deficiencies for minor movements. Level of service for two-way stop control is not defined for the intersection as a whole, while level of service for all-way stop control is defined for the intersection as a whole. Level of service criteria are given in Exhibit 20-2 (two-way stop-controlled intersections) and Exhibit 21-8 (all-way stop controlled intersections).

Exhibit 20-2 and Exhibit 21-8
LOS Criteria: Two-Way and All-Way Stop Controlled Intersections

Control Delay (s/veh)	LOS by Volume-to-Capacity (v/c) Ratio (1)(2)	
	v/c ≤ 1.0	v/c > 1.0
0 – 10	A	F
> 10 – 15	B	F
> 15 – 25	C	F
> 25 – 35	D	F
> 35 – 50	E	F
> 50	F	F

(1) TWSC: The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.
(2) AWSC: For approaches and intersectionwide assessment, LOS is defined solely by control delay.

APPENDIX G
EXISTING 2021 CAPACITY CALCULATIONS

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	626	5	35	505	3	19
Future Vol, veh/h	626	5	35	505	3	19
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	240	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	10	20	3	15	0	6
Mvmt Flow	720	6	40	580	3	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	726	0	1090	360
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	370	-
Critical Hdwy	-	-	4.16	-	6.8	7.02
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.23	-	3.5	3.36
Pot Cap-1 Maneuver	-	-	866	-	213	625
Stage 1	-	-	-	-	448	-
Stage 2	-	-	-	-	675	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	866	-	203	625
Mov Cap-2 Maneuver	-	-	-	-	329	-
Stage 1	-	-	-	-	448	-
Stage 2	-	-	-	-	644	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	11.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	557	-	-	866	-
HCM Lane V/C Ratio	0.045	-	-	0.046	-
HCM Control Delay (s)	11.8	-	-	9.4	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	649	14	37	543	34	8	0	61	2	0	0
Future Vol, veh/h	1	649	14	37	543	34	8	0	61	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	8	86	3	13	92	88	0	4	0	0	0
Mvmt Flow	1	764	16	44	639	40	9	0	72	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	679	0	0	780	0	0	1174	1533	382	1131	1529	340
Stage 1	-	-	-	-	-	-	766	766	-	747	747	-
Stage 2	-	-	-	-	-	-	408	767	-	384	782	-
Critical Hdwy	4.1	-	-	4.16	-	-	9.26	6.5	6.98	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	8.26	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	8.26	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.23	-	-	4.38	4	3.34	3.5	4	3.3
Pot Cap-1 Maneuver	923	-	-	827	-	-	75	118	610	161	118	662
Stage 1	-	-	-	-	-	-	218	415	-	376	423	-
Stage 2	-	-	-	-	-	-	409	414	-	616	408	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	923	-	-	827	-	-	72	112	610	136	112	662
Mov Cap-2 Maneuver	-	-	-	-	-	-	72	112	-	136	112	-
Stage 1	-	-	-	-	-	-	218	415	-	376	401	-
Stage 2	-	-	-	-	-	-	387	392	-	543	408	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	19.6	31.9
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	327	923	-	-	827	-	-	136
HCM Lane V/C Ratio	0.248	0.001	-	-	0.053	-	-	0.017
HCM Control Delay (s)	19.6	8.9	-	-	9.6	-	-	31.9
HCM Lane LOS	C	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1	0	-	-	0.2	-	-	0.1

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	718	628	6	15	0
Future Vol, veh/h	2	718	628	6	15	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	8	17	0	0	0
Mvmt Flow	2	845	739	7	18	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	746	0	-	0	1170	373
Stage 1	-	-	-	-	743	-
Stage 2	-	-	-	-	427	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	871	-	-	-	189	630
Stage 1	-	-	-	-	436	-
Stage 2	-	-	-	-	632	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	871	-	-	-	189	630
Mov Cap-2 Maneuver	-	-	-	-	317	-
Stage 1	-	-	-	-	435	-
Stage 2	-	-	-	-	632	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	17
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	871	-	-	-	317
HCM Lane V/C Ratio	0.003	-	-	-	0.056
HCM Control Delay (s)	9.1	-	-	-	17
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	616	3	12	876	5	32
Future Vol, veh/h	616	3	12	876	5	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	240	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	6	0	0	2	0	4
Mvmt Flow	716	3	14	1019	6	37

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	719	0	1254	358
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	538	-
Critical Hdwy	-	-	4.1	-	6.8	6.98
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.34
Pot Cap-1 Maneuver	-	-	892	-	167	633
Stage 1	-	-	-	-	450	-
Stage 2	-	-	-	-	555	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	892	-	164	633
Mov Cap-2 Maneuver	-	-	-	-	299	-
Stage 1	-	-	-	-	450	-
Stage 2	-	-	-	-	546	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	550	-	-	892	-
HCM Lane V/C Ratio	0.078	-	-	0.016	-
HCM Control Delay (s)	12.1	-	-	9.1	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	677	8	59	820	22	5	0	40	2	0	0
Future Vol, veh/h	2	677	8	59	820	22	5	0	40	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	50	5	13	2	3	96	0	0	5	0	0	0
Mvmt Flow	2	698	8	61	845	23	5	0	41	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	868	0	0	706	0	0	1247	1692	349	1332	1689	434
Stage 1	-	-	-	-	-	-	702	702	-	979	979	-
Stage 2	-	-	-	-	-	-	545	990	-	353	710	-
Critical Hdwy	5.1	-	-	4.14	-	-	7.5	6.5	7	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.7	-	-	2.22	-	-	3.5	4	3.35	3.5	4	3.3
Pot Cap-1 Maneuver	530	-	-	888	-	-	132	94	638	114	94	576
Stage 1	-	-	-	-	-	-	400	443	-	272	331	-
Stage 2	-	-	-	-	-	-	495	327	-	642	440	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	530	-	-	888	-	-	125	87	638	101	87	576
Mov Cap-2 Maneuver	-	-	-	-	-	-	125	87	-	101	87	-
Stage 1	-	-	-	-	-	-	398	441	-	271	308	-
Stage 2	-	-	-	-	-	-	461	304	-	598	438	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.6	14.2	41.4
HCM LOS			B	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	438	530	-	-	888	-	-	101
HCM Lane V/C Ratio	0.106	0.004	-	-	0.068	-	-	0.02
HCM Control Delay (s)	14.2	11.8	-	-	9.4	-	-	41.4
HCM Lane LOS	B	B	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	0.1

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	732	905	26	15	3
Future Vol, veh/h	2	732	905	26	15	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	5	5	4	0	34
Mvmt Flow	2	771	953	27	16	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	980	0	-	0	1357	490
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	390	-
Critical Hdwy	4.1	-	-	-	6.8	7.58
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.64
Pot Cap-1 Maneuver	712	-	-	-	143	447
Stage 1	-	-	-	-	334	-
Stage 2	-	-	-	-	659	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	712	-	-	-	143	447
Mov Cap-2 Maneuver	-	-	-	-	257	-
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	659	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	18.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	712	-	-	-	277
HCM Lane V/C Ratio	0.003	-	-	-	0.068
HCM Control Delay (s)	10.1	-	-	-	18.9
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

APPENDIX H
BUNKER RANCH TRIP GENERATION CALCULATIONS

Trip Generation Calculations
Bunker Ranch Development
City of Dripping Springs, Hays County, Texas

Proposed Total Bunker Ranch Development Single Family Homes (160 Approved plus 228 Proposed)

388	units	ITE Land Use Code			210				Single-Family Detached Housing							
	Weekday 24-Hour	=======>	Ln(T) =	0.92	Ln(	X	) +	2.71		(	50	% Entering/	50	% Exiting)		
			Ln(T) =	0.92	Ln(	388	) +	2.71								
			Ln(T) =	0.92	(	5.961	) +	2.71								
			Ln(T) =			8.19				(	1810	Entering/	1810	Exiting)		
			T =			3619.622										
			T =			3620										
	A.M. Peak Hour	=======>	T =	0.71	(	X	) +	4.8		(	25	% Entering/	75	% Exiting)		
			T =	0.71	(	388.00	) +	4.80								
			T =			280.28										
			T =			280				(	70	Entering/	210	Exiting)		
	P.M. Peak Hour	=======>	Ln(T) =	0.96	Ln(	X	) +	0.2		(	63	% Entering/	37	% Exiting)		
			Ln(T) =	0.96	Ln(	388	) +	0.2								
			Ln(T) =	0.96	(	5.961	) +	0.2								
			Ln(T) =			5.92				(	235	Entering/	138	Exiting)		
			T =			373.368										
			T =			373										

Trip Generation Calculations
Bunker Ranch Development
City of Dripping Springs, Hays County, Texas

Bunker Ranch Approved Single Family Units

160	units	ITE Land Use Code			210				Single-Family Detached Housing							
	Weekday 24-Hour	=======>	Ln(T) =	0.92	Ln(	X	) +	2.71		(	50	% Entering/	50	% Exiting)		
			Ln(T) =	0.92	Ln(	160	) +	2.71								
			Ln(T) =	0.92	(	5.075	) +	2.71								
			Ln(T) =			7.38				(	801	Entering/	801	Exiting)		
			T =			1602.243										
			T =			1602										
	A.M. Peak Hour	=======>	T =	0.71	(	X	) +	4.8		(	25	% Entering/	75	% Exiting)		
			T =	0.71	(	160.00	) +	4.80								
			T =			118.4										
			T =			118				(	30	Entering/	88	Exiting)		
	P.M. Peak Hour	=======>	Ln(T) =	0.96	Ln(	X	) +	0.2		(	63	% Entering/	37	% Exiting)		
			Ln(T) =	0.96	Ln(	160	) +	0.2								
			Ln(T) =	0.96	(	5.075	) +	0.2								
			Ln(T) =			5.07				(	101	Entering/	59	Exiting)		
			T =			159.520										
			T =			160										

Trip Generation Calculations
Bunker Ranch Development
City of Dripping Springs, Hays County, Texas

Bunker Ranch Single Family Homes Currently Built and Occupied

58	units	ITE Land Use Code			210				Single-Family Detached Housing							
	Weekday 24-Hour	=======>	Ln(T) =	0.92	Ln(	X	) +	2.71		(	50	% Entering/	50	% Exiting)		
			Ln(T) =	0.92	Ln(	58	) +	2.71								
			Ln(T) =	0.92	(	4.060	) +	2.71								
			Ln(T) =			6.45				(	315	Entering/	315	Exiting)		
			T =			629.929										
			T =			630										
	A.M. Peak Hour	=======>	T =	0.71	(	X	) +	4.8		(	25	% Entering/	75	% Exiting)		
			T =	0.71	(	58.00	) +	4.80								
			T =			45.98										
			T =			46				(	12	Entering/	34	Exiting)		
	P.M. Peak Hour	=======>	Ln(T) =	0.96	Ln(	X	) +	0.2		(	63	% Entering/	37	% Exiting)		
			Ln(T) =	0.96	Ln(	58	) +	0.2								
			Ln(T) =	0.96	(	4.060	) +	0.2								
			Ln(T) =			4.10				(	38	Entering/	22	Exiting)		
			T =			60.221										
			T =			60										

Trip Generation Calculations
Bunker Ranch Development
City of Dripping Springs, Hays County, Texas

Bunker Ranch Development Approved Multifamily Units

42	units	ITE Land Use Code			220					Multfamily Low-Rise							
	Weekday 24-Hour	=======>	T =	7.32	(	X	)				(	50	% Entering/	50	% Exiting)
			T =	7.32	(	42.00	)								
			T =			307.44									
			T =			307					(	153	Entering/	154	Exiting)
	A.M. Peak Hour	=======>	Ln(T) =	0.95	Ln(	X	)	-	0.51		(	23	% Entering/	77	% Exiting)
			Ln(T) =	0.95	Ln(	42	)	-	0.51						
			Ln(T) =	0.95	(	3.738	)	-	0.51						
			Ln(T) =			3.04					(	5	Entering/	16	Exiting)
			T =			20.922									
			T =			21									
	P.M. Peak Hour	=======>	Ln(T) =	0.89	Ln(	X	)	-	0.02		(	63	% Entering/	37	% Exiting)
			Ln(T) =	0.89	Ln(	42	)	-	0.02						
			Ln(T) =	0.89	(	3.738	)	-	0.02						
			Ln(T) =			3.31					(	17	Entering/	10	Exiting)
			T =			27.290									
			T =			27									

Trip Generation Calculations
Bunker Ranch Development
City of Dripping Springs, Hays County, Texas

Bunker Ranch Development Multifamily Units Currently Constructed and Occupied

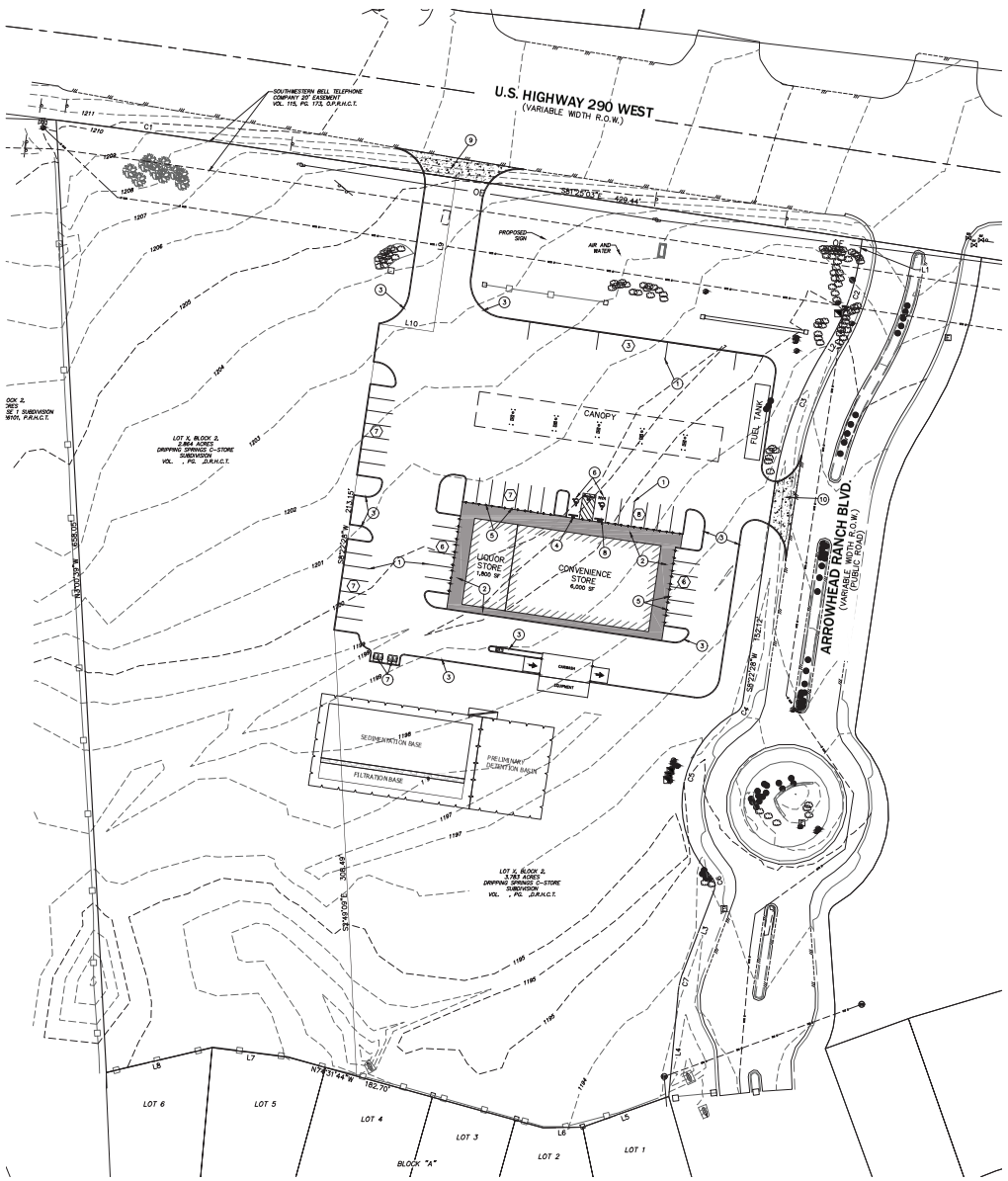
6	units	ITE Land Use Code			220					Multfamily Low-Rise						
	Weekday 24-Hour	=======>	T =	7.56	(	X	)	-	40.86		(	50	% Entering/	50	% Exiting)
			T =	7.56	(	6.00	)	-	40.86						
			T =			4.5									
			T =			5					(	2	Entering/	3	Exiting)
	A.M. Peak Hour	=======>	Ln(T) =	0.95	Ln(	X	)	-	0.51		(	23	% Entering/	77	% Exiting)
			Ln(T) =	0.95	Ln(	6	)	-	0.51						
			Ln(T) =	0.95	(	1.792	)	-	0.51						
			Ln(T) =			1.19					(	1	Entering/	2	Exiting)
			T =			3.294									
			T =			3									
	P.M. Peak Hour	=======>	Ln(T) =	0.89	Ln(	X	)	-	0.02		(	63	% Entering/	37	% Exiting)
			Ln(T) =	0.89	Ln(	6	)	-	0.02						
			Ln(T) =	0.89	(	1.792	)	-	0.02						
			Ln(T) =			1.57					(	3	Entering/	2	Exiting)
			T =			4.829									
			T =			5									

APPENDIX I
ARROWHEAD RANCH CONCEPTUAL SITE PLAN

TRAFFIC SUMMARY TABLE

SITE USE CONVENIENCE STORE	6,000 SF
PARKING STORAGE STANDARDS MINIMUM PARKING RATIO	1 PER 200 SF GFA
SITE USE LIQUOR STORE	1,800 SF
PARKING STORAGE STANDARDS MINIMUM PARKING RATIO	1 PER 200 SF GFA
SITE USE CAR WASH	910 SF
PARKING STORAGE STANDARDS MINIMUM PARKING RATIO	1 PER WASHING BAY
REGULAR MINIMUM REQUIRED PARKING PARKING SPACES PARKING BY GAS PUMPS ACTUAL/PROPOSED PARKING (INCLUDING H.C. PARKING)	40 44 10 54
HANDICAPPED (ADA) REQUIRED REGULAR H.C. PARKING PROPOSED H.C. PARKING REQUIRED V.A. PARKING	2 TOTAL 2 (1 V.A., INCLUDED) 1 (1 INCLUDED IN TOTAL)

	TOTAL ACRES	IMPERVIOUS COVER (SF)	IMPERVIOUS COVER (AC)	IMPERVIOUS COVER (%)
LOT A C-STORE	3.783	70,430	1.617	42.74 %
LOT B RETAIL	2.864	32,346	0.743	25.94 %
TOTAL SITE	6.647	102,776	2.36	35.50 %



SCALE: 1" = 30'

LEGEND

	BOUNDARY / RIGHT OF WAY LINE
	CONCRETE CURB
	EASEMENT / SETBACK LINE
FIRE LANE	FIRE LANE
OU OU	OVERHEAD UTILITIES
G G	EXISTING GAS MAIN
	EXISTING EDGE OF ASPHALT
E.G.T.CA. ESMT	ELECTRIC, GAS, TELEPHONE AND CABLE T.V. EASEMENT
B.S.L.	BUILDING SETBACK LINE
V.N.A.E.	VEHICULAR NON-ACCESS EASEMENT
DS	DOWNSPOUT
	LIGHT POLES
	EXISTING LIGHT POLES
	EXISTING UTILITY POLE
	EXISTING GUY WIRE
	EXISTING FIRE HYDRANT
	EXISTING WATER VALVE
P	EXISTING TRAFFIC SIGNAL POLE
	EXISTING WATER METER
E	EXISTING ELECTRIC METER
T	EXISTING TELEPHONE PEDESTAL
E	EXISTING CABLE BOX
	CONCRETE WHEEL STOP
	SIGN
9	PARKING STALL COUNT
	ACCESSIBLE PARKING
	CONCRETE DRIVEWAY

CIVIL KEY NOTES

1	PAVEMENT STRIPING (TYPICAL) (REFERENCE SHEET C13)
2	CONCRETE SIDEWALK (REFERENCE SHEET C13)
3	6" CONCRETE CURB (TYPICAL) (REFERENCE SHEET C13)
4	HANDICAP SIGN (REFERENCE ARCHITECTURAL PLANS FOR DETAILS)
5	BOLLARDS (REFERENCE SHEET C13)
6	ACCESSIBILITY STRIPING (REFERENCE SHEET C13)
7	GARBAGE DUMPSTER (REFERENCE ARCHITECTURAL PLANS FOR DETAILS)
8	CONCRETE WHEEL STOP (REFERENCE SHEET C13)
9	TXDOT CONCRETE DRIVEWAY (REFERENCE SHEET C13)
10	CONCRETE DRIVEWAY (REFERENCE SHEET C14)
11	CURB RAMP (REFERENCE SHEET C13)
12	DOWNSPOUT (REFERENCE ARCHITECTURAL PLANS FOR DETAILS)

NOTES:

1. REFERENCE STRUCTURAL PLANS FOR FOUNDATION.
2. ALL CURB RADII ARE 3' UNLESS OTHERWISE NOTED.
3. REFER TO GENERAL NOTE SHEET FOR ADDITIONAL SITE NOTES.
4. "C" IN PARKING SPACE DENOTES COMPACT SPACE. COMPACT SPACES ARE 8' X 16'.
5. PAVEMENT MARKINGS IN BEXAR COUNTY R.O.W. MUST BE THERMOPLASTIC.
6. PAVEMENT DESIGN FOR AUXILIARY LANES ABUTTING AN EXISTING ROAD SHALL BE MINIMUM 2" HMAC TYPE D (OR TYPE C) AND 12" HMAC TYPE B OR MATCH EXISTING PAVEMENT SECTION (IF KNOWN).
7. REFERENCE CANOPY PLANS FOR CANOPY AND FUEL TANK DETAILS.
8. REFERENCE ARCHITECTURAL PLANS FOR CAR WASH CONFIGURATION AND DETAILS.

UP ENGINEERING + SURVEYING
11903 JONES MALTSBERGER ROAD, SUITE 102
SAN ANTONIO, TEXAS 78216
WWW.UPENGINEERINGTX.COM TEL: 512-774-3924
TBPE FIRM #: F-17992
TBPELS FIRM #: 10194406

PRELIMINARY
NOT FOR CONSTRUCTION, BIDDING, OR PERMIT PURPOSES.

PREPARED UNDER THE SUPERVISION OF MATTHEW P. SCHLOSSER, P.E. #138406
March 26, 2021

DRIPPING SPRINGS REAL ESTATE, LLC
7410 BLANCO ROAD, SUITE 225
SAN ANTONIO, TEXAS 78216

DRIPPING SPRINGS C-STORE
PLAT NO. ##########

REV#	DATE	DESCRIPTION	BY

DESIGNED BY: WPF
DRAFTED BY: JWH
CHECKED BY: NRU

SHEET
##
OF C17

Date: Mar 26, 2021, 4:33pm User ID: Jwh
File: C:\Projects\DRIPPING SPRINGS C-Store\Civil\Exhibits\Site Exhibit.dwg

APPENDIX J
ARROWHEAD RANCH TRIP GENERATION CALCULATIONS

Trip Generation Calculations
Arrowhead Ranch Development
City of Dripping Springs, Hays County, Texas

Approved Arrowhead Ranch Residential Units

403 units ITE Land Use Code 210 Single-Family Detached Housing

Weekday 24-Hour	=======>	Ln(T) =	0.92	Ln(	X	) +	2.71	(	50	% Entering/	50	% Exiting)		
		Ln(T) =	0.92	Ln(	403	) +	2.71							
		Ln(T) =	0.92	(	5.999	) +	2.71							
		Ln(T) =			8.23			(	1874	Entering/	1874	Exiting)		
		T =			3748.165									
		T =			3748									
A.M. Peak Hour	=======>	T =	0.71	(	X	) +	4.8	(	25	% Entering/	75	% Exiting)		
		T =	0.71	(	403.00	) +	4.80							
		T =			290.93									
		T =			291			(	73	Entering/	218	Exiting)		
P.M. Peak Hour	=======>	Ln(T) =	0.96	Ln(	X	) +	0.2	(	63	% Entering/	37	% Exiting)		
		Ln(T) =	0.96	Ln(	403	) +	0.2							
		Ln(T) =	0.96	(	5.999	) +	0.2							
		Ln(T) =			5.96			(	244	Entering/	143	Exiting)		
		T =			387.215									
		T =			387									

Trip Generation Calculations
Arrowhead Ranch Development
City of Dripping Springs, Hays County, Texas

Arrowhead Ranch Single Family Residential Units Currently Constructed and Occupiec

181	units	ITE Land Use Code			210				Single-Family Detached Housing						
	Weekday 24-Hour	=======>	Ln(T) =	0.92	Ln(	X	) +	2.71		(	50	% Entering/	50	% Exiting)
			Ln(T) =	0.92	Ln(	181	) +	2.71						
			Ln(T) =	0.92	(	5.198	) +	2.71						
			Ln(T) =			7.49				(	898	Entering/	897	Exiting)
			T =			1794.743								
			T =			1795								
	A.M. Peak Hour	=======>	T =	0.71	(	X	) +	4.8		(	25	% Entering/	75	% Exiting)
			T =	0.71	(	181.00	) +	4.80						
			T =			133.31								
			T =			133				(	33	Entering/	100	Exiting)
	P.M. Peak Hour	=======>	Ln(T) =	0.96	Ln(	X	) +	0.2		(	63	% Entering/	37	% Exiting)
			Ln(T) =	0.96	Ln(	181	) +	0.2						
			Ln(T) =	0.96	(	5.198	) +	0.2						
			Ln(T) =			5.19				(	113	Entering/	67	Exiting)
			T =			179.569								
			T =			180								

Trip Generation Calculations
Arrowhead Ranch Development
City of Dripping Springs, Hays County, Texas

1,800	Square Feet	ITE Land Use Code		899				Liquor Store						
	Weekday 24-Hour	=======>	T =	101.49	(	X	)		(	50	% Entering/	50	% Exiting)
			T =	101.49	(	1.80	)						
			T =			182.682							
			T =			183			(	92	Entering/	91	Exiting)
	A.M. Peak Hour	=======>	T =	4.55	(	X	)		(	51	% Entering/	49	% Exiting)
	Peak Hour of Generator		T =	4.55	(	1.80	)						
			T =			8.19							
			T =			8			(	4	Entering/	4	Exiting)
	P.M. Peak Hour	=======>	T =	16.37	(	X	)		(	50	% Entering/	50	% Exiting)
			T =	16.37	(	1.80	)						
			T =			29.466							
			T =			29			(	15	Entering/	14	Exiting)

Trip Generation Calculations
Arrowhead Ranch Development
City of Dripping Springs, Hays County, Texas

10	Vehicle Fueling Positions																		
6,000	Square Feet	ITE Land Use Code		960					Super Convenience Market/Gas Station										
	Weekday 24-Hour	=======>	T =	230.52	(	X	)									(	50	% Entering/	50 % Exiting)
			T =	230.52	(	10	)												
			T =			2305.2													
			T =			2305										(	1153	Entering/	1152 Exiting)
	A.M. Peak Hour	=======>	T =	[(VFP Factor	) x	(Number of VFP	)] +	[(GFA Factor	) x	(GFA	)] +	(Constant)				(	50	% Entering/	50 % Exiting)
			T =	(16.1	x	10	) +	(135	x	6	) +	-483							
			T =					488											
			T =					488								(	244	Entering/	244 Exiting)
	P.M. Peak Hour	=======>	T =	[(VFP Factor	) x	(Number of VFP	)] +	[(GFA Factor	) x	(GFA	)] +	(Constant)				(	50	% Entering/	50 % Exiting)
			T =	(11.5	x	10	) +	(82.9	x	6	) +	-226							
			T =					386.4											
			T =					386								(	193	Entering/	193 Exiting)

Pass-By Trip Generation

	A.M. Peak Hour	=======>	76	%	Pass-By Trips									
						Primary	=	59	Entering /	59	Exiting			
						Pass-By	=	185	Entering /	185	Exiting			
	P.M. Peak Hour	=======>	76	%	Pass-By Trips									
						Primary	=	46	Entering /	46	Exiting			
						Pass-By	=	147	Entering /	147	Exiting			

APPENDIX K
FORECASTED 2025 NO-BUILD (BASE) CAPACITY CALCULATIONS

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	708	10	52	542	17	73
Future Vol, veh/h	708	10	52	542	17	73
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	240	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	10	20	3	15	0	6
Mvmt Flow	814	11	60	623	20	84

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	825	0	1246	407
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	432	-
Critical Hdwy	-	-	4.16	-	6.8	7.02
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.23	-	3.5	3.36
Pot Cap-1 Maneuver	-	-	795	-	169	582
Stage 1	-	-	-	-	401	-
Stage 2	-	-	-	-	628	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	795	-	156	582
Mov Cap-2 Maneuver	-	-	-	-	284	-
Stage 1	-	-	-	-	401	-
Stage 2	-	-	-	-	581	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.9	14.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	486	-	-	795	-
HCM Lane V/C Ratio	0.213	-	-	0.075	-
HCM Control Delay (s)	14.4	-	-	9.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.8	-	-	0.2	-

Intersection	
Int Delay, s/veh	509.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	663	22	203	476	34	129	0	245	2	0	0
Future Vol, veh/h	1	663	22	203	476	34	129	0	245	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	8	86	3	13	92	88	0	4	0	0	0
Mvmt Flow	1	780	26	239	560	40	152	0	288	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	600	0	0	806	0	0	1540	1860	390	1450	1866	300
Stage 1	-	-	-	-	-	-	782	782	-	1058	1058	-
Stage 2	-	-	-	-	-	-	758	1078	-	392	808	-
Critical Hdwy	4.1	-	-	4.16	-	-	9.26	6.5	6.98	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	8.26	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	8.26	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.23	-	-	4.38	4	3.34	3.5	4	3.3
Pot Cap-1 Maneuver	987	-	-	808	-	-	~ 35	74	603	94	73	702
Stage 1	-	-	-	-	-	-	212	408	-	244	304	-
Stage 2	-	-	-	-	-	-	221	297	-	610	397	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	987	-	-	808	-	-	~ 27	52	603	38	51	702
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 27	52	-	38	51	-
Stage 1	-	-	-	-	-	-	212	408	-	244	214	-
Stage 2	-	-	-	-	-	-	156	209	-	318	397	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.2	$ 2413.3	105.9
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	72	987	-	-	808	-	-	38
HCM Lane V/C Ratio	6.111	0.001	-	-	0.296	-	-	0.062
HCM Control Delay (s)	$ 2413.3	8.7	-	-	11.3	-	-	105.9
HCM Lane LOS	F	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	49.3	0	-	-	1.2	-	-	0.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	916	727	6	15	0
Future Vol, veh/h	2	916	727	6	15	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	8	17	0	0	0
Mvmt Flow	2	1078	855	7	18	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	862	0	-	0	1402	431
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	543	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	789	-	-	-	133	578
Stage 1	-	-	-	-	380	-
Stage 2	-	-	-	-	552	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	789	-	-	-	133	578
Mov Cap-2 Maneuver	-	-	-	-	263	-
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	552	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	19.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	789	-	-	-	263
HCM Lane V/C Ratio	0.003	-	-	-	0.067
HCM Control Delay (s)	9.6	-	-	-	19.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	654	19	73	903	14	68
Future Vol, veh/h	654	19	73	903	14	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	240	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	6	0	0	2	0	4
Mvmt Flow	760	22	85	1050	16	79

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	782	0	1455	380
Stage 1	-	-	-	-	760	-
Stage 2	-	-	-	-	695	-
Critical Hdwy	-	-	4.1	-	6.8	6.98
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.34
Pot Cap-1 Maneuver	-	-	845	-	123	612
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	462	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	845	-	111	612
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	415	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	14.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	486	-	-	845	-
HCM Lane V/C Ratio	0.196	-	-	0.1	-
HCM Control Delay (s)	14.2	-	-	9.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.7	-	-	0.3	-

Intersection	
Int Delay, s/veh	140

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	688	34	293	801	22	112	0	178	2	0	0
Future Vol, veh/h	2	688	34	293	801	22	112	0	178	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	50	5	13	2	3	96	0	0	5	0	0	0
Mvmt Flow	2	709	35	302	826	23	115	0	184	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	849	0	0	744	0	0	1730	2166	355	1801	2190	425
Stage 1	-	-	-	-	-	-	713	713	-	1442	1442	-
Stage 2	-	-	-	-	-	-	1017	1453	-	359	748	-
Critical Hdwy	5.1	-	-	4.14	-	-	7.5	6.5	7	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.7	-	-	2.22	-	-	3.5	4	3.35	3.5	4	3.3
Pot Cap-1 Maneuver	541	-	-	859	-	-	~ 58	48	633	51	46	583
Stage 1	-	-	-	-	-	-	394	438	-	142	199	-
Stage 2	-	-	-	-	-	-	258	197	-	637	423	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	541	-	-	859	-	-	~ 42	31	633	26	30	583
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 42	31	-	26	30	-
Stage 1	-	-	-	-	-	-	392	436	-	141	129	-
Stage 2	-	-	-	-	-	-	167	128	-	451	421	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3	$ 1016.3	155.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	98	541	-	-	859	-	-	26
HCM Lane V/C Ratio	3.051	0.004	-	-	0.352	-	-	0.079
HCM Control Delay (s)	$ 1016.3	11.7	-	-	11.4	-	-	155.1
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	29	0	-	-	1.6	-	-	0.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	877	1120	26	15	3
Future Vol, veh/h	2	877	1120	26	15	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	5	5	4	0	34
Mvmt Flow	2	923	1179	27	16	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1206	0	-	0	1659	603
Stage 1	-	-	-	-	1193	-
Stage 2	-	-	-	-	466	-
Critical Hdwy	4.1	-	-	-	6.8	7.58
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.64
Pot Cap-1 Maneuver	586	-	-	-	90	371
Stage 1	-	-	-	-	254	-
Stage 2	-	-	-	-	604	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	586	-	-	-	90	371
Mov Cap-2 Maneuver	-	-	-	-	195	-
Stage 1	-	-	-	-	253	-
Stage 2	-	-	-	-	604	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	23.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	586	-	-	-	212
HCM Lane V/C Ratio	0.004	-	-	-	0.089
HCM Control Delay (s)	11.2	-	-	-	23.6
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3

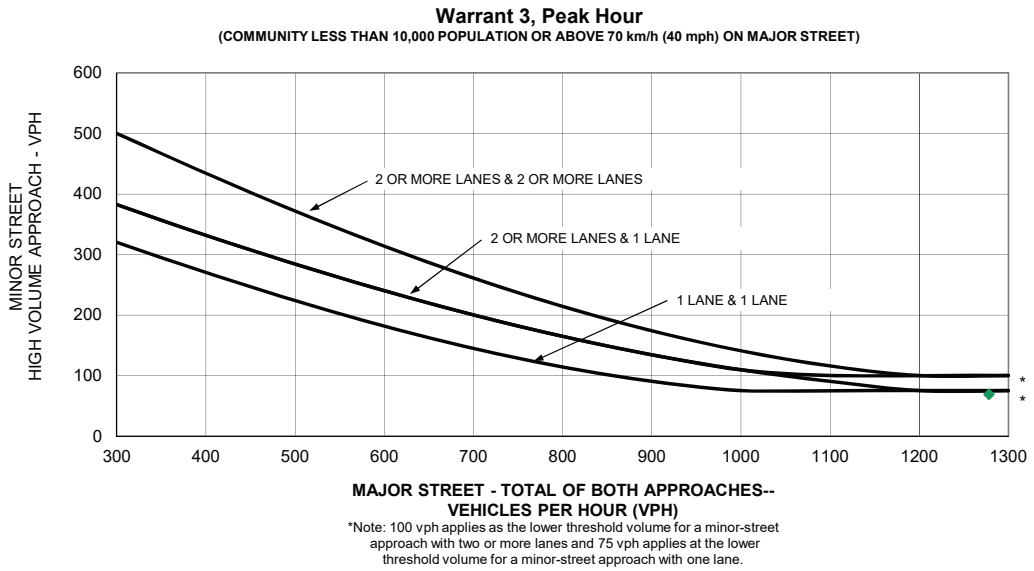
APPENDIX L
TRAFFIC SIGNAL WARRANT EVALUATION

Project:		Bunker Ranch TIA	**Calculations:**	CAD
Major Street	**Name:**	US 290	**Date:**	5/6/21
	Speed Limit (mph):	50-60	**Checked by:**	JMD
	Approach Lanes:	2	**Date:**	5/6/21
Minor Street	**Name:**	Arrowhead Ranch Blvd		
	Speed Limit (mph):	25		
	Approach Lanes:	1		
Population < 10000?		Yes		

Civil & Environmental Consultants, Inc.

Warrant 3 - Peak Hour

Signal Warrant Satisfied? [X] Yes [ ] No



Scenario	Major Street (vph)	Minor Street (vph)	Warrant Volume Minor Street	Warrant Satisfied?
2021 Existing, AM Peak	1278	69	75	NO
2021 Existing, PM Peak	1588	45	75	NO
2025 No-Build, AM Peak	1399	374	75	YES
2025 No-Build, PM Peak	1840	286	75	YES
2025 Build, AM Peak	1529	374	75	YES
2025 Build, PM Peak	2010	286	75	YES

Signal warrant satisfied if hourly threshold satisfied for any 1 hour of an average day.

APPENDIX M
FORECASTED 2025 NO-BUILD (BASE) MITIGATED CAPACITY CALCULATIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	663	22	203	476	34	129	0	245	2	0	0
Future Volume (veh/h)	1	663	22	203	476	34	129	0	245	2	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1976	1781	625	1930	1707	537	596	1976	1841	1900	1976	1900
Adj Flow Rate, veh/h	1	780	26	239	560	40	152	0	288	2	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	8	86	3	13	92	88	0	4	0	0	0
Cap, veh/h	350	1002	157	377	1256	90	233	19	342	387	0	0
Arrive On Green	0.00	0.30	0.30	0.11	0.41	0.41	0.32	0.00	0.32	0.32	0.00	0.00
Sat Flow, veh/h	1882	3385	530	1838	3071	219	501	60	1063	870	0	0
Grp Volume(v), veh/h	1	780	26	239	295	305	440	0	0	2	0	0
Grp Sat Flow(s),veh/h/ln	1882	1692	530	1838	1622	1668	1624	0	0	871	0	0
Q Serve(g_s), s	0.0	14.2	2.4	5.6	8.8	8.9	14.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	14.2	2.4	5.6	8.8	8.9	16.9	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.13	0.35		0.65	1.00		0.00
Lane Grp Cap(c), veh/h	350	1002	157	377	663	682	594	0	0	387	0	0
V/C Ratio(X)	0.00	0.78	0.17	0.63	0.45	0.45	0.74	0.00	0.00	0.01	0.00	0.00
Avail Cap(c_a), veh/h	487	1412	221	440	797	820	892	0	0	600	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	16.6	21.6	17.5	14.9	14.3	14.3	21.1	0.0	0.0	15.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	1.9	0.5	2.3	0.5	0.5	1.8	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.9	0.3	2.0	2.6	2.7	6.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	23.5	18.0	17.3	14.8	14.8	22.9	0.0	0.0	15.5	0.0	0.0
LnGrp LOS	B	C	B	B	B	B	C	A	A	B	A	A
Approach Vol, veh/h		807			839			440			2	
Approach Delay, s/veh		23.3			15.5			22.9			15.5	
Approach LOS		C			B			C			B	

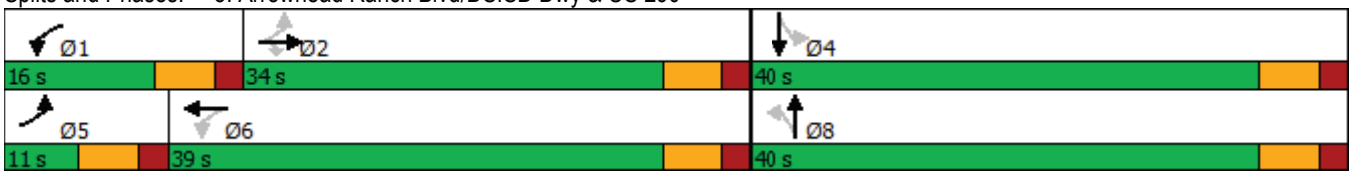
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.7	25.9		27.6	6.1	33.4		27.6				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	10.0	28.0		34.0	5.0	33.0		34.0				
Max Q Clear Time (g_c+I1), s	7.6	16.2		2.1	2.0	10.9		18.9				
Green Ext Time (p_c), s	0.2	3.7		0.0	0.0	3.0		2.7				

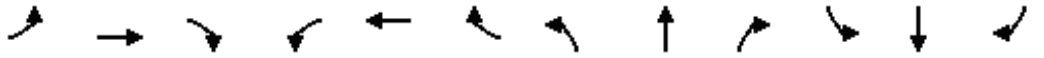
Intersection Summary			
HCM 6th Ctrl Delay		20.1	
HCM 6th LOS		C	

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	1	663	22	203	476	129	0	2	0
Future Volume (vph)	1	663	22	203	476	129	0	2	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	5	2	2	1	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0	16.0	11.0	16.0	11.0	11.0	11.0	11.0
Total Split (s)	11.0	34.0	34.0	16.0	39.0	40.0	40.0	40.0	40.0
Total Split (%)	12.2%	37.8%	37.8%	17.8%	43.3%	44.4%	44.4%	44.4%	44.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0		6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	Min	Min	None	Min	None	None	None	None
Act Effct Green (s)	27.9	22.7	22.7	38.3	36.7		25.3		25.3
Actuated g/C Ratio	0.37	0.30	0.30	0.50	0.48		0.33		0.33
v/c Ratio	0.00	0.78	0.08	0.62	0.41		0.86		0.01
Control Delay	12.0	31.8	0.5	19.8	15.8		34.8		17.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	12.0	31.8	0.5	19.8	15.8		34.8		17.5
LOS	B	C	A	B	B		C		B
Approach Delay		30.8			16.9		34.8		17.5
Approach LOS		C			B		C		B

Intersection Summary			
Cycle Length: 90			
Actuated Cycle Length: 76.3			
Natural Cycle: 55			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 26.1		Intersection LOS: C	
Intersection Capacity Utilization 64.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	688	34	293	801	22	112	0	174	2	0	0
Future Volume (veh/h)	2	688	34	293	801	22	112	0	174	2	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1205	1826	1707	1945	1856	477	1900	1976	1826	1900	1976	1900
Adj Flow Rate, veh/h	2	709	35	302	826	23	115	0	179	2	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	50	5	13	2	3	96	0	0	5	0	0	0
Cap, veh/h	246	1023	427	490	1541	43	215	22	227	389	0	0
Arrive On Green	0.00	0.30	0.30	0.15	0.44	0.44	0.23	0.00	0.23	0.23	0.00	0.00
Sat Flow, veh/h	1148	3469	1447	1853	3503	98	542	94	989	1124	0	0
Grp Volume(v), veh/h	2	709	35	302	416	433	294	0	0	2	0	0
Grp Sat Flow(s),veh/h/ln	1148	1735	1447	1853	1763	1838	1625	0	0	1124	0	0
Q Serve(g_s), s	0.1	9.9	1.0	5.6	9.5	9.5	7.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	9.9	1.0	5.6	9.5	9.5	9.3	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.05	0.39		0.61	1.00		0.00
Lane Grp Cap(c), veh/h	246	1023	427	490	775	809	464	0	0	389	0	0
V/C Ratio(X)	0.01	0.69	0.08	0.62	0.54	0.54	0.63	0.00	0.00	0.01	0.00	0.00
Avail Cap(c_a), veh/h	348	2088	871	824	1479	1542	710	0	0	585	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.6	17.1	14.0	11.0	11.3	11.3	19.8	0.0	0.0	16.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.1	1.3	0.6	0.6	1.4	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.1	0.3	1.6	2.6	2.7	3.4	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.6	18.0	14.0	12.3	11.8	11.8	21.2	0.0	0.0	16.3	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	C	A	A	B	A	A
Approach Vol, veh/h		746			1151			294			2	
Approach Delay, s/veh		17.8			11.9			21.2			16.3	
Approach LOS		B			B			C			B	

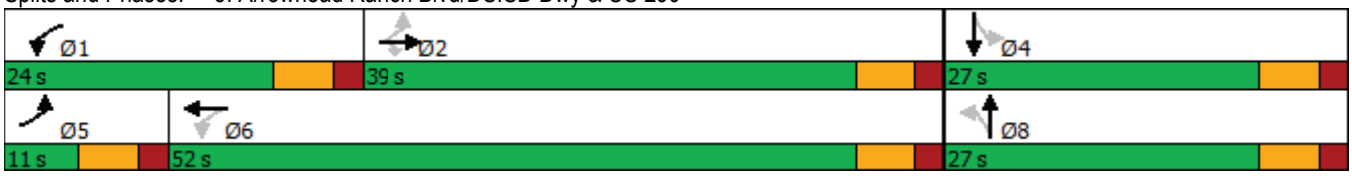
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.1	22.2		18.6	6.2	30.1		18.6				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	18.0	33.0		21.0	5.0	46.0		21.0				
Max Q Clear Time (g_c+I1), s	7.6	11.9		2.1	2.1	11.5		11.3				
Green Ext Time (p_c), s	0.6	4.2		0.0	0.0	4.9		1.3				

Intersection Summary												
HCM 6th Ctrl Delay			15.2									
HCM 6th LOS			B									

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	688	34	293	801	112	0	2	0
Future Volume (vph)	2	688	34	293	801	112	0	2	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	5	2	2	1	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0	16.0	11.0	16.0	11.0	11.0	11.0	11.0
Total Split (s)	11.0	39.0	39.0	24.0	52.0	27.0	27.0	27.0	27.0
Total Split (%)	12.2%	43.3%	43.3%	26.7%	57.8%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0		6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	23.8	18.5	18.5	35.0	33.5		10.4		10.4
Actuated g/C Ratio	0.41	0.32	0.32	0.60	0.58		0.18		0.18
v/c Ratio	0.01	0.65	0.06	0.54	0.43		0.65		0.01
Control Delay	7.0	20.6	0.2	9.6	9.1		17.6		22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	7.0	20.6	0.2	9.6	9.1		17.6		22.5
LOS	A	C	A	A	A		B		C
Approach Delay		19.6			9.2		17.6		22.5
Approach LOS		B			A		B		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 58.1	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 13.9	Intersection LOS: B
Intersection Capacity Utilization 65.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290



APPENDIX N
FORECASTED 2025 BUILD (WITH DEVELOPMENT) CAPACITY CALCULATIONS

Intersection	
Int Delay, s/veh	3.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	708	18	84	542	41	171
Future Vol, veh/h	708	18	84	542	41	171
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	240	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	10	20	3	15	0	6
Mvmt Flow	814	21	97	623	47	197

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	835	0	1320	407
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	506	-
Critical Hdwy	-	-	4.16	-	6.8	7.02
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.23	-	3.5	3.36
Pot Cap-1 Maneuver	-	-	788	-	151	582
Stage 1	-	-	-	-	401	-
Stage 2	-	-	-	-	576	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	788	-	132	582
Mov Cap-2 Maneuver	-	-	-	-	263	-
Stage 1	-	-	-	-	401	-
Stage 2	-	-	-	-	505	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	20.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	471	-	-	788	-
HCM Lane V/C Ratio	0.517	-	-	0.123	-
HCM Control Delay (s)	20.5	-	-	10.2	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	2.9	-	-	0.4	-

Intersection	
Int Delay, s/veh	690.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	761	22	203	508	34	129	0	245	2	0	0
Future Vol, veh/h	1	761	22	203	508	34	129	0	245	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	0	8	86	3	13	92	88	0	4	0	0	0
Mvmt Flow	1	895	26	239	598	40	152	0	288	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	638	0	0	921	0	0	1674	2013	448	1546	2019	319
Stage 1	-	-	-	-	-	-	897	897	-	1096	1096	-
Stage 2	-	-	-	-	-	-	777	1116	-	450	923	-
Critical Hdwy	4.1	-	-	4.16	-	-	9.26	6.5	6.98	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	8.26	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	8.26	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.2	-	-	2.23	-	-	4.38	4	3.34	3.5	4	3.3
Pot Cap-1 Maneuver	956	-	-	731	-	-	~ 26	59	553	79	59	683
Stage 1	-	-	-	-	-	-	172	361	-	231	292	-
Stage 2	-	-	-	-	-	-	214	285	-	564	351	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	956	-	-	731	-	-	~ 19	40	553	28	40	683
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 19	40	-	28	40	-
Stage 1	-	-	-	-	-	-	172	361	-	231	197	-
Stage 2	-	-	-	-	-	-	~ 144	192	-	270	351	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.4	$ 3508.7	145
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	52	956	-	-	731	-	-	28
HCM Lane V/C Ratio	8.462	0.001	-	-	0.327	-	-	0.084
HCM Control Delay (s)	$ 3508.7	8.8	-	-	12.3	-	-	145
HCM Lane LOS	F	A	-	-	B	-	-	F
HCM 95th %tile Q(veh)	51.7	0	-	-	1.4	-	-	0.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	1014	759	6	15	0
Future Vol, veh/h	2	1014	759	6	15	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	8	17	0	0	0
Mvmt Flow	2	1193	893	7	18	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	900	0	-	0	1498	450
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	601	-
Critical Hdwy	4.1	-	-	-	6.8	6.9
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	763	-	-	-	115	562
Stage 1	-	-	-	-	363	-
Stage 2	-	-	-	-	516	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	763	-	-	-	115	562
Mov Cap-2 Maneuver	-	-	-	-	244	-
Stage 1	-	-	-	-	362	-
Stage 2	-	-	-	-	516	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	20.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	763	-	-	-	244
HCM Lane V/C Ratio	0.003	-	-	-	0.072
HCM Control Delay (s)	9.7	-	-	-	20.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	654	46	180	903	30	131
Future Vol, veh/h	654	46	180	903	30	131
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	240	150	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	6	0	0	2	0	4
Mvmt Flow	760	53	209	1050	35	152

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	813	0	1703	380
Stage 1	-	-	-	-	760	-
Stage 2	-	-	-	-	943	-
Critical Hdwy	-	-	4.1	-	6.8	6.98
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.34
Pot Cap-1 Maneuver	-	-	823	-	84	612
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	344	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	823	-	63	612
Mov Cap-2 Maneuver	-	-	-	-	173	-
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	257	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	20.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	416	-	-	823	-
HCM Lane V/C Ratio	0.45	-	-	0.254	-
HCM Control Delay (s)	20.5	-	-	10.9	-
HCM Lane LOS	C	-	-	B	-
HCM 95th %tile Q(veh)	2.3	-	-	1	-

Intersection	
Int Delay, s/veh	171.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	751	34	293	908	22	112	0	174	2	0	0
Future Vol, veh/h	2	751	34	293	908	22	112	0	174	2	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	250	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	50	5	13	2	3	96	0	0	5	0	0	0
Mvmt Flow	2	774	35	302	936	23	115	0	179	2	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	959	0	0	809	0	0	1850	2341	387	1943	2365	480
Stage 1	-	-	-	-	-	-	778	778	-	1552	1552	-
Stage 2	-	-	-	-	-	-	1072	1563	-	391	813	-
Critical Hdwy	5.1	-	-	4.14	-	-	7.5	6.5	7	7.5	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.5	5.5	-	6.5	5.5	-
Follow-up Hdwy	2.7	-	-	2.22	-	-	3.5	4	3.35	3.5	4	3.3
Pot Cap-1 Maneuver	481	-	-	812	-	-	~ 47	37	603	40	36	537
Stage 1	-	-	-	-	-	-	360	410	-	121	176	-
Stage 2	-	-	-	-	-	-	239	174	-	610	395	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	481	-	-	812	-	-	~ 33	23	603	20	23	537
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 33	23	-	20	23	-
Stage 1	-	-	-	-	-	-	359	408	-	121	111	-
Stage 2	-	-	-	-	-	-	150	109	-	427	393	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.9	$ 1362.1	204.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	78	481	-	-	812	-	-	20
HCM Lane V/C Ratio	3.78	0.004	-	-	0.372	-	-	0.103
HCM Control Delay (s)	$ 1362.1	12.5	-	-	12	-	-	204.7
HCM Lane LOS	F	B	-	-	B	-	-	F
HCM 95th %tile Q(veh)	30.7	0	-	-	1.7	-	-	0.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	2	940	1227	26	15	3
Future Vol, veh/h	2	940	1227	26	15	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	5	5	4	0	34
Mvmt Flow	2	989	1292	27	16	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1319	0	-	0	1805	660
Stage 1	-	-	-	-	1306	-
Stage 2	-	-	-	-	499	-
Critical Hdwy	4.1	-	-	-	6.8	7.58
Critical Hdwy Stg 1	-	-	-	-	5.8	-
Critical Hdwy Stg 2	-	-	-	-	5.8	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.64
Pot Cap-1 Maneuver	531	-	-	-	72	338
Stage 1	-	-	-	-	221	-
Stage 2	-	-	-	-	581	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	531	-	-	-	72	338
Mov Cap-2 Maneuver	-	-	-	-	170	-
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	581	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	26.7
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	531	-	-	-	185
HCM Lane V/C Ratio	0.004	-	-	-	0.102
HCM Control Delay (s)	11.8	-	-	-	26.7
HCM Lane LOS	B	-	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0.3

APPENDIX O
FORECASTED 2025 BUILD (WITH DEVELOPMENT) MITIGATED CAPACITY CALCULATIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	761	22	203	508	34	129	0	245	2	0	0
Future Volume (veh/h)	1	761	22	203	508	34	129	0	245	2	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1976	1781	625	1930	1707	537	596	1976	1841	1900	1976	1900
Adj Flow Rate, veh/h	1	895	26	239	598	40	152	0	288	2	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	8	86	3	13	92	88	0	4	0	0	0
Cap, veh/h	320	1054	165	323	1289	86	245	19	390	417	0	0
Arrive On Green	0.00	0.31	0.31	0.11	0.42	0.42	0.37	0.00	0.37	0.37	0.00	0.00
Sat Flow, veh/h	1882	3385	530	1838	3086	206	509	51	1062	901	0	0
Grp Volume(v), veh/h	1	895	26	239	314	324	440	0	0	2	0	0
Grp Sat Flow(s),veh/h/ln	1882	1692	530	1838	1622	1670	1622	0	0	901	0	0
Q Serve(g_s), s	0.0	20.9	3.0	7.0	11.8	11.8	17.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	20.9	3.0	7.0	11.8	11.8	19.7	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.12	0.35		0.65	1.00		0.00
Lane Grp Cap(c), veh/h	320	1054	165	323	677	697	654	0	0	417	0	0
V/C Ratio(X)	0.00	0.85	0.16	0.74	0.46	0.46	0.67	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	429	1244	195	343	692	713	654	0	0	417	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.0	27.2	21.0	19.3	17.7	17.7	23.0	0.0	0.0	16.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	5.0	0.4	7.8	0.5	0.5	5.5	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.1	0.4	3.2	3.8	4.0	8.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0	32.2	21.5	27.1	18.2	18.2	28.5	0.0	0.0	16.9	0.0	0.0
LnGrp LOS	B	C	C	C	B	B	C	A	A	B	A	A
Approach Vol, veh/h		922			877			440			2	
Approach Delay, s/veh		31.9			20.7			28.5			16.9	
Approach LOS		C			C			C			B	

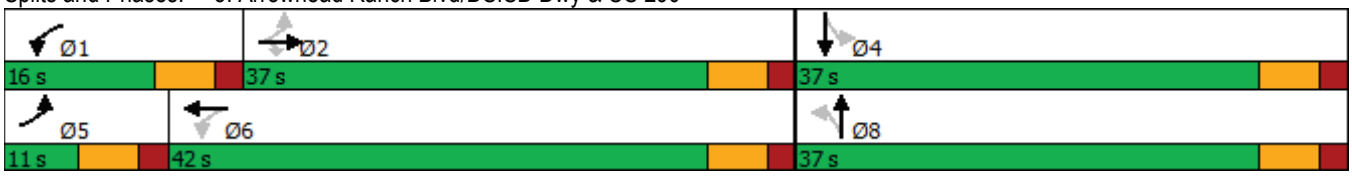
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.1	32.3		37.0	6.1	41.2		37.0				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	10.0	31.0		31.0	5.0	36.0		31.0				
Max Q Clear Time (g_c+I1), s	9.0	22.9		2.1	2.0	13.8		21.7				
Green Ext Time (p_c), s	0.1	3.4		0.0	0.0	3.3		2.1				

Intersection Summary												
HCM 6th Ctrl Delay			26.8									
HCM 6th LOS			C									

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	1	761	22	203	508	129	0	2	0
Future Volume (vph)	1	761	22	203	508	129	0	2	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	5	2	2	1	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0	16.0	11.0	16.0	11.0	11.0	11.0	11.0
Total Split (s)	11.0	37.0	37.0	16.0	42.0	37.0	37.0	37.0	37.0
Total Split (%)	12.2%	41.1%	41.1%	17.8%	46.7%	41.1%	41.1%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0		6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Max	Max	Max	Max
Act Effct Green (s)	32.6	27.6	27.6	43.1	41.2		31.1		31.1
Actuated g/C Ratio	0.38	0.32	0.32	0.50	0.48		0.36		0.36
v/c Ratio	0.00	0.84	0.07	0.72	0.44		0.81		0.01
Control Delay	11.0	35.4	0.4	27.5	16.5		32.7		19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	11.0	35.4	0.4	27.5	16.5		32.7		19.5
LOS	B	D	A	C	B		C		B
Approach Delay		34.4			19.5		32.7		19.5
Approach LOS		C			B		C		B

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 86.4	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 28.2	Intersection LOS: C
Intersection Capacity Utilization 67.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	751	34	293	908	22	112	0	174	2	0	0
Future Volume (veh/h)	2	751	34	293	908	22	112	0	174	2	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1205	1826	1707	1945	1856	477	1900	1976	1826	1900	1976	1900
Adj Flow Rate, veh/h	2	774	35	302	936	23	115	0	179	2	0	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	50	5	13	2	3	96	0	0	5	0	0	0
Cap, veh/h	226	1090	455	473	1598	39	211	21	224	377	0	0
Arrive On Green	0.00	0.31	0.31	0.14	0.45	0.45	0.23	0.00	0.23	0.23	0.00	0.00
Sat Flow, veh/h	1148	3469	1447	1853	3516	86	544	91	989	1106	0	0
Grp Volume(v), veh/h	2	774	35	302	469	490	294	0	0	2	0	0
Grp Sat Flow(s),veh/h/ln	1148	1735	1447	1853	1763	1840	1624	0	0	1106	0	0
Q Serve(g_s), s	0.1	11.2	1.0	5.6	11.3	11.3	8.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	11.2	1.0	5.6	11.3	11.3	9.7	0.0	0.0	0.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.05	0.39		0.61	1.00		0.00
Lane Grp Cap(c), veh/h	226	1090	455	473	801	836	456	0	0	377	0	0
V/C Ratio(X)	0.01	0.71	0.08	0.64	0.59	0.59	0.64	0.00	0.00	0.01	0.00	0.00
Avail Cap(c_a), veh/h	324	2070	863	761	1423	1486	683	0	0	558	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	13.4	17.2	13.7	11.3	11.6	11.6	20.7	0.0	0.0	17.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.9	0.1	1.4	0.7	0.7	1.5	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.5	0.3	1.6	3.1	3.2	3.6	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.4	18.1	13.8	12.8	12.2	12.2	22.2	0.0	0.0	17.1	0.0	0.0
LnGrp LOS	B	B	B	B	B	B	C	A	A	B	A	A
Approach Vol, veh/h		811			1261			294			2	
Approach Delay, s/veh		17.9			12.4			22.2			17.1	
Approach LOS		B			B			C			B	

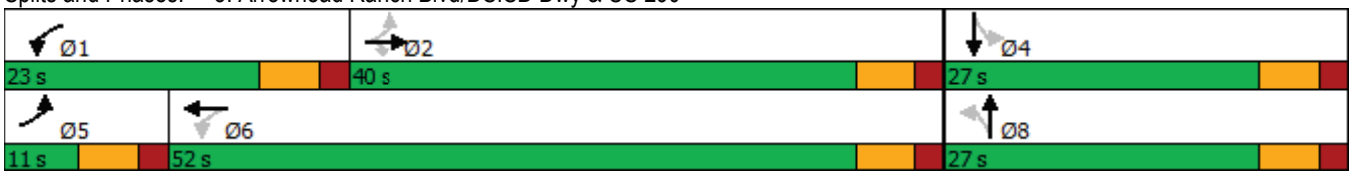
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.1	23.9		18.9	6.2	31.9		18.9				
Change Period (Y+Rc), s	6.0	6.0		6.0	6.0	6.0		6.0				
Max Green Setting (Gmax), s	17.0	34.0		21.0	5.0	46.0		21.0				
Max Q Clear Time (g_c+I1), s	7.6	13.2		2.1	2.1	13.3		11.7				
Green Ext Time (p_c), s	0.6	4.7		0.0	0.0	5.8		1.3				

Intersection Summary												
HCM 6th Ctrl Delay			15.5									
HCM 6th LOS			B									

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	751	34	293	908	112	0	2	0
Future Volume (vph)	2	751	34	293	908	112	0	2	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	5	2	2	1	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	16.0	16.0	11.0	16.0	11.0	11.0	11.0	11.0
Total Split (s)	11.0	40.0	40.0	23.0	52.0	27.0	27.0	27.0	27.0
Total Split (%)	12.2%	44.4%	44.4%	25.6%	57.8%	30.0%	30.0%	30.0%	30.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0		6.0		6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes				
Recall Mode	None	None	None	None	None	Min	Min	Min	Min
Act Effct Green (s)	25.5	20.2	20.2	36.8	35.2		10.6		10.6
Actuated g/C Ratio	0.42	0.34	0.34	0.61	0.59		0.18		0.18
v/c Ratio	0.01	0.67	0.06	0.56	0.48		0.66		0.01
Control Delay	7.0	20.8	0.2	10.0	9.3		18.3		23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	7.0	20.8	0.2	10.0	9.3		18.3		23.5
LOS	A	C	A	A	A		B		C
Approach Delay		19.9			9.5		18.3		23.5
Approach LOS		B			A		B		C

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 60	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 67.1%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290



APPENDIX P
EXISTING 2021 QUEUING ANALYSIS

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:45	7:45	7:45	7:45	7:45	7:45
End Time	9:00	9:00	9:00	9:00	9:00	9:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1423	1415	1417	1350	1407	1402
Vehs Exited	1423	1421	1416	1351	1403	1404
Starting Vehs	20	20	17	14	9	15
Ending Vehs	20	14	18	13	13	15
Travel Distance (mi)	728	716	724	689	709	713
Travel Time (hr)	15.2	15.2	15.1	14.5	14.9	15.0
Total Delay (hr)	1.0	1.2	1.0	1.0	1.0	1.0
Total Stops	146	163	145	152	138	148
Fuel Used (gal)	24.0	24.0	23.8	23.0	23.2	23.6

Interval #0 Information Seeding

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:00
End Time	9:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1423	1415	1417	1350	1407	1402
Vehs Exited	1423	1421	1416	1351	1403	1404
Starting Vehs	20	20	17	14	9	15
Ending Vehs	20	14	18	13	13	15
Travel Distance (mi)	728	716	724	689	709	713
Travel Time (hr)	15.2	15.2	15.1	14.5	14.9	15.0
Total Delay (hr)	1.0	1.2	1.0	1.0	1.0	1.0
Total Stops	146	163	145	152	138	148
Fuel Used (gal)	24.0	24.0	23.8	23.0	23.2	23.6

Intersection: 2: Bunker Ranch Blvd & US 290

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	48	59
Average Queue (ft)	13	20
95th Queue (ft)	36	48
Link Distance (ft)		357
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	4	46	101	30
Average Queue (ft)	0	11	27	2
95th Queue (ft)	3	32	68	15
Link Distance (ft)			292	108
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	150		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: US 290 & Spring Lane

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	26	36
Average Queue (ft)	2	11
95th Queue (ft)	11	35
Link Distance (ft)		207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1759	1821	1717	1816	1742	1771
Vehs Exited	1762	1804	1712	1813	1739	1766
Starting Vehs	16	7	18	15	17	13
Ending Vehs	13	24	23	18	20	19
Travel Distance (mi)	890	914	860	922	879	893
Travel Time (hr)	18.6	19.1	17.9	19.2	18.4	18.7
Total Delay (hr)	1.3	1.4	1.1	1.4	1.3	1.3
Total Stops	144	148	141	139	130	141
Fuel Used (gal)	30.0	30.9	28.9	31.0	29.4	30.0

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	5:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1759	1821	1717	1816	1742	1771
Vehs Exited	1762	1804	1712	1813	1739	1766
Starting Vehs	16	7	18	15	17	13
Ending Vehs	13	24	23	18	20	19
Travel Distance (mi)	890	914	860	922	879	893
Travel Time (hr)	18.6	19.1	17.9	19.2	18.4	18.7
Total Delay (hr)	1.3	1.4	1.1	1.4	1.3	1.3
Total Stops	144	148	141	139	130	141
Fuel Used (gal)	30.0	30.9	28.9	31.0	29.4	30.0

Intersection: 2: Bunker Ranch Blvd & US 290

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	32	57
Average Queue (ft)	4	25
95th Queue (ft)	21	50
Link Distance (ft)		357
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	4	38	64	24
Average Queue (ft)	0	15	17	1
95th Queue (ft)	2	33	42	11
Link Distance (ft)			292	108
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150	150		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: US 290 & Spring Lane

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	15	57
Average Queue (ft)	1	16
95th Queue (ft)	6	46
Link Distance (ft)		207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

APPENDIX Q
FORECASTED 2025 NO-BUILD (BASE) QUEUING ANALYSIS

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:45	7:45	7:45	7:45	7:45	7:45
End Time	9:00	9:00	9:00	9:00	9:00	9:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1725	1757	1766	1806	1744	1759
Vehs Exited	1736	1754	1768	1802	1740	1761
Starting Vehs	39	23	27	29	24	27
Ending Vehs	28	26	25	33	28	28
Travel Distance (mi)	754	767	777	786	757	768
Travel Time (hr)	188.2	192.6	205.5	178.7	148.8	182.8
Total Delay (hr)	172.4	176.6	189.0	162.2	132.7	166.6
Total Stops	297	253	272	335	293	290
Fuel Used (gal)	60.4	62.6	66.3	60.9	53.1	60.7

Interval #0 Information Seeding

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:00
End Time	9:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1725	1757	1766	1806	1744	1759
Vehs Exited	1736	1754	1768	1802	1740	1761
Starting Vehs	39	23	27	29	24	27
Ending Vehs	28	26	25	33	28	28
Travel Distance (mi)	754	767	777	786	757	768
Travel Time (hr)	188.2	192.6	205.5	178.7	148.8	182.8
Total Delay (hr)	172.4	176.6	189.0	162.2	132.7	166.6
Total Stops	297	253	272	335	293	290
Fuel Used (gal)	60.4	62.6	66.3	60.9	53.1	60.7

Intersection: 2: Bunker Ranch Blvd & US 290

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	51	72
Average Queue (ft)	19	36
95th Queue (ft)	43	60
Link Distance (ft)		357
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290

Movement	EB	EB	WB	WB	NB	SB
Directions Served	T	R	L	T	LTR	LTR
Maximum Queue (ft)	4	24	122	19	355	24
Average Queue (ft)	0	1	51	1	326	2
95th Queue (ft)	2	10	96	11	358	13
Link Distance (ft)	780			451	292	108
Upstream Blk Time (%)					100	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)		250	150			
Storage Blk Time (%)			0			
Queuing Penalty (veh)			0			

Intersection: 4: US 290 & Spring Lane

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	16	40
Average Queue (ft)	1	11
95th Queue (ft)	8	36
Link Distance (ft)		207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2088	2118	2059	2049	2112	2086
Vehs Exited	2082	2113	2055	2044	2108	2080
Starting Vehs	28	27	40	33	33	31
Ending Vehs	34	32	44	38	37	36
Travel Distance (mi)	975	992	973	966	1004	982
Travel Time (hr)	161.3	154.7	177.2	173.6	159.4	165.2
Total Delay (hr)	141.0	133.9	157.0	153.6	138.7	144.8
Total Stops	378	390	344	356	374	369
Fuel Used (gal)	66.9	66.0	69.8	69.3	66.7	67.7

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	5:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2088	2118	2059	2049	2112	2086
Vehs Exited	2082	2113	2055	2044	2108	2080
Starting Vehs	28	27	40	33	33	31
Ending Vehs	34	32	44	38	37	36
Travel Distance (mi)	975	992	973	966	1004	982
Travel Time (hr)	161.3	154.7	177.2	173.6	159.4	165.2
Total Delay (hr)	141.0	133.9	157.0	153.6	138.7	144.8
Total Stops	378	390	344	356	374	369
Fuel Used (gal)	66.9	66.0	69.8	69.3	66.7	67.7

Intersection: 2: Bunker Ranch Blvd & US 290

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	56	135
Average Queue (ft)	21	45
95th Queue (ft)	45	98
Link Distance (ft)		357
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290

Movement	EB	EB	WB	NB	SB
Directions Served	L	R	L	LTR	LTR
Maximum Queue (ft)	11	24	134	345	18
Average Queue (ft)	0	1	68	301	1
95th Queue (ft)	8	10	116	326	11
Link Distance (ft)				292	108
Upstream Blk Time (%)				100	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)	150	250	150		
Storage Blk Time (%)			0		
Queuing Penalty (veh)			0		

Intersection: 4: US 290 & Spring Lane

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	27	52
Average Queue (ft)	2	16
95th Queue (ft)	12	44
Link Distance (ft)		207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

APPENDIX R
FORECASTED 2025 NO-BUILD (BASE) MITIGATED QUEUING ANALYSIS

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:45	7:45	7:45	7:45	7:45	7:45
End Time	9:00	9:00	9:00	9:00	9:00	9:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1998	2020	2035	1992	2016	2012
Vehs Exited	2018	2017	2066	2005	1996	2021
Starting Vehs	42	33	53	33	20	37
Ending Vehs	22	36	22	20	40	25
Travel Distance (mi)	842	857	854	836	851	848
Travel Time (hr)	29.6	30.2	31.6	29.3	30.7	30.3
Total Delay (hr)	10.9	11.2	12.4	10.6	11.8	11.4
Total Stops	1135	1186	1231	1135	1221	1183
Fuel Used (gal)	34.9	35.3	36.0	34.9	35.8	35.4

Interval #0 Information Seeding

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:00
End Time	9:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1998	2020	2035	1992	2016	2012
Vehs Exited	2018	2017	2066	2005	1996	2021
Starting Vehs	42	33	53	33	20	37
Ending Vehs	22	36	22	20	40	25
Travel Distance (mi)	842	857	854	836	851	848
Travel Time (hr)	29.6	30.2	31.6	29.3	30.7	30.3
Total Delay (hr)	10.9	11.2	12.4	10.6	11.8	11.4
Total Stops	1135	1186	1231	1135	1221	1183
Fuel Used (gal)	34.9	35.3	36.0	34.9	35.8	35.4

Intersection: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290

Movement	EB	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LTR	LTR
Maximum Queue (ft)	9	241	221	64	163	182	162	340	18
Average Queue (ft)	0	133	112	19	74	81	61	178	1
95th Queue (ft)	5	201	184	58	132	150	135	318	9
Link Distance (ft)		780	780			451	451	292	108
Upstream Blk Time (%)								2	
Queuing Penalty (veh)								0	
Storage Bay Dist (ft)	150			250	150				
Storage Blk Time (%)		4	0		0	1			
Queuing Penalty (veh)		0	0		1	2			

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2332	2349	2228	2258	2295	2292
Vehs Exited	2336	2340	2229	2262	2293	2294
Starting Vehs	41	35	42	32	29	35
Ending Vehs	37	44	41	28	31	37
Travel Distance (mi)	1064	1088	1010	1052	1049	1053
Travel Time (hr)	35.8	36.0	33.5	34.3	35.6	35.1
Total Delay (hr)	12.8	12.5	11.3	11.7	12.8	12.2
Total Stops	1278	1276	1209	1209	1252	1243
Fuel Used (gal)	43.7	43.8	41.1	42.7	42.7	42.8

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	5:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2332	2349	2228	2258	2295	2292
Vehs Exited	2336	2340	2229	2262	2293	2294
Starting Vehs	41	35	42	32	29	35
Ending Vehs	37	44	41	28	31	37
Travel Distance (mi)	1064	1088	1010	1052	1049	1053
Travel Time (hr)	35.8	36.0	33.5	34.3	35.6	35.1
Total Delay (hr)	12.8	12.5	11.3	11.7	12.8	12.2
Total Stops	1278	1276	1209	1209	1252	1243
Fuel Used (gal)	43.7	43.8	41.1	42.7	42.7	42.8

Intersection: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290

Movement	EB	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LTR	LTR
Maximum Queue (ft)	14	203	185	56	164	199	152	214	18
Average Queue (ft)	1	127	106	13	91	78	57	98	1
95th Queue (ft)	8	187	169	40	150	144	115	179	10
Link Distance (ft)		780	780			451	451	292	108
Upstream Blk Time (%)								0	
Queuing Penalty (veh)								0	
Storage Bay Dist (ft)	150			250	150				
Storage Blk Time (%)		3			2	0			
Queuing Penalty (veh)		0			6	0			

APPENDIX S
FORECASTED 2025 BUILD (WITH DEVELOPMENT) QUEUING ANALYSIS

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:45	7:45	7:45	7:45	7:45	7:45
End Time	9:00	9:00	9:00	9:00	9:00	9:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	1897	1884	1853	1951	1875	1891
Vehs Exited	1907	1894	1845	1939	1874	1892
Starting Vehs	41	34	24	18	30	29
Ending Vehs	31	24	32	30	31	28
Travel Distance (mi)	831	815	817	855	815	827
Travel Time (hr)	226.8	235.8	279.0	194.6	213.3	229.9
Total Delay (hr)	209.0	218.4	261.6	176.3	195.7	212.2
Total Stops	439	402	373	426	435	414
Fuel Used (gal)	71.8	74.1	82.8	67.1	68.7	72.9

Interval #0 Information Seeding

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:00
End Time	9:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	1897	1884	1853	1951	1875	1891
Vehs Exited	1907	1894	1845	1939	1874	1892
Starting Vehs	41	34	24	18	30	29
Ending Vehs	31	24	32	30	31	28
Travel Distance (mi)	831	815	817	855	815	827
Travel Time (hr)	226.8	235.8	279.0	194.6	213.3	229.9
Total Delay (hr)	209.0	218.4	261.6	176.3	195.7	212.2
Total Stops	439	402	373	426	435	414
Fuel Used (gal)	71.8	74.1	82.8	67.1	68.7	72.9

Intersection: 2: Bunker Ranch Blvd & US 290

Movement	WB	NB
Directions Served	L	LR
Maximum Queue (ft)	58	218
Average Queue (ft)	22	76
95th Queue (ft)	45	156
Link Distance (ft)		357
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	R	L	T	LTR	LTR
Maximum Queue (ft)	11	17	115	29	353	24
Average Queue (ft)	0	1	52	1	322	2
95th Queue (ft)	5	9	95	21	355	13
Link Distance (ft)				451	292	108
Upstream Blk Time (%)					100	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	150	250	150			
Storage Blk Time (%)			0	0		
Queuing Penalty (veh)			1	0		

Intersection: 4: US 290 & Spring Lane

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	21	49
Average Queue (ft)	1	13
95th Queue (ft)	10	40
Link Distance (ft)		207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 1

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2247	2322	2298	2290	2217	2275
Vehs Exited	2235	2315	2293	2293	2214	2270
Starting Vehs	32	32	36	44	41	36
Ending Vehs	44	39	41	41	44	42
Travel Distance (mi)	1038	1084	1068	1068	1041	1060
Travel Time (hr)	210.3	204.7	191.7	183.5	171.6	192.4
Total Delay (hr)	188.1	181.9	169.0	160.7	149.7	169.9
Total Stops	500	543	524	553	485	520
Fuel Used (gal)	80.3	80.7	77.6	75.9	71.7	77.3

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	5:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2247	2322	2298	2290	2217	2275
Vehs Exited	2235	2315	2293	2293	2214	2270
Starting Vehs	32	32	36	44	41	36
Ending Vehs	44	39	41	41	44	42
Travel Distance (mi)	1038	1084	1068	1068	1041	1060
Travel Time (hr)	210.3	204.7	191.7	183.5	171.6	192.4
Total Delay (hr)	188.1	181.9	169.0	160.7	149.7	169.9
Total Stops	500	543	524	553	485	520
Fuel Used (gal)	80.3	80.7	77.6	75.9	71.7	77.3

Intersection: 2: Bunker Ranch Blvd & US 290

Movement	EB	WB	NB
Directions Served	R	L	LR
Maximum Queue (ft)	9	83	262
Average Queue (ft)	0	38	84
95th Queue (ft)	4	68	196
Link Distance (ft)			357
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)	240	150	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290

Movement	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	R	L	T	TR	LTR	LTR
Maximum Queue (ft)	8	35	160	183	92	329	35
Average Queue (ft)	0	1	79	15	6	301	4
95th Queue (ft)	6	13	148	111	65	321	20
Link Distance (ft)				451	451	292	108
Upstream Blk Time (%)						100	
Queuing Penalty (veh)						0	
Storage Bay Dist (ft)	150	250	150				
Storage Blk Time (%)			2	0			
Queuing Penalty (veh)			10	0			

Intersection: 4: US 290 & Spring Lane

Movement	EB	SB
Directions Served	L	LR
Maximum Queue (ft)	11	54
Average Queue (ft)	1	17
95th Queue (ft)	9	46
Link Distance (ft)		207
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	150	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 10

APPENDIX T
FORECASTED 2025 BUILD (WITH DEVELOPMENT) MITIGATED QUEUING ANALYSIS

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	7:45	7:45	7:45	7:45	7:45	7:45
End Time	9:00	9:00	9:00	9:00	9:00	9:00
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2194	2168	2165	2115	2205	2168
Vehs Exited	2195	2164	2162	2120	2197	2169
Starting Vehs	47	36	31	37	31	37
Ending Vehs	46	40	34	32	39	35
Travel Distance (mi)	933	909	916	884	913	911
Travel Time (hr)	38.0	36.9	35.7	34.0	37.1	36.3
Total Delay (hr)	16.9	16.3	15.0	14.0	16.1	15.7
Total Stops	1432	1476	1425	1367	1483	1436
Fuel Used (gal)	40.8	39.7	39.6	38.1	39.2	39.5

Interval #0 Information Seeding

Start Time	7:45
End Time	8:00
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	8:00
End Time	9:00
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2194	2168	2165	2115	2205	2168
Vehs Exited	2195	2164	2162	2120	2197	2169
Starting Vehs	47	36	31	37	31	37
Ending Vehs	46	40	34	32	39	35
Travel Distance (mi)	933	909	916	884	913	911
Travel Time (hr)	38.0	36.9	35.7	34.0	37.1	36.3
Total Delay (hr)	16.9	16.3	15.0	14.0	16.1	15.7
Total Stops	1432	1476	1425	1367	1483	1436
Fuel Used (gal)	40.8	39.7	39.6	38.1	39.2	39.5

Intersection: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290

Movement	EB	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LTR	LTR
Maximum Queue (ft)	9	254	249	72	171	202	160	337	24
Average Queue (ft)	0	162	142	18	90	99	73	189	1
95th Queue (ft)	4	230	219	59	160	170	141	335	10
Link Distance (ft)		780	780			451	451	292	108
Upstream Blk Time (%)								4	
Queuing Penalty (veh)								0	
Storage Bay Dist (ft)	150			250	150				
Storage Blk Time (%)		10	0		1	1			
Queuing Penalty (veh)		0	0		3	2			

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	4:15	4:15	4:15	4:15	4:15	4:15
End Time	5:30	5:30	5:30	5:30	5:30	5:30
Total Time (min)	75	75	75	75	75	75
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	2	2	2	2	2	2
# of Recorded Intervals	1	1	1	1	1	1
Vehs Entered	2498	2531	2518	2541	2481	2514
Vehs Exited	2511	2537	2512	2563	2485	2521
Starting Vehs	49	34	32	47	43	42
Ending Vehs	36	28	38	25	39	34
Travel Distance (mi)	1126	1159	1150	1157	1121	1143
Travel Time (hr)	40.4	40.9	39.9	41.5	39.7	40.5
Total Delay (hr)	15.4	15.4	14.7	15.8	14.8	15.2
Total Stops	1408	1465	1362	1503	1398	1427
Fuel Used (gal)	46.7	48.2	47.5	48.7	46.7	47.5

Interval #0 Information Seeding

Start Time	4:15
End Time	4:30
Total Time (min)	15

Volumes adjusted by Growth Factors.

No data recorded this interval.

Interval #1 Information Recording

Start Time	4:30
End Time	5:30
Total Time (min)	60

Volumes adjusted by Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	2498	2531	2518	2541	2481	2514
Vehs Exited	2511	2537	2512	2563	2485	2521
Starting Vehs	49	34	32	47	43	42
Ending Vehs	36	28	38	25	39	34
Travel Distance (mi)	1126	1159	1150	1157	1121	1143
Travel Time (hr)	40.4	40.9	39.9	41.5	39.7	40.5
Total Delay (hr)	15.4	15.4	14.7	15.8	14.8	15.2
Total Stops	1408	1465	1362	1503	1398	1427
Fuel Used (gal)	46.7	48.2	47.5	48.7	46.7	47.5

Intersection: 3: Arrowhead Ranch Blvd/DSISD Dwy & US 290

Movement	EB	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	T	R	L	T	TR	LTR	LTR
Maximum Queue (ft)	14	220	209	50	170	192	160	261	24
Average Queue (ft)	1	127	108	15	93	84	58	100	1
95th Queue (ft)	9	196	179	42	152	152	122	189	12
Link Distance (ft)		780	780			451	451	292	108
Upstream Blk Time (%)								0	
Queuing Penalty (veh)								0	
Storage Bay Dist (ft)	150			250	150				
Storage Blk Time (%)		3	0		1	0			
Queuing Penalty (veh)		0	0		5	1			

conditions during both the weekday AM and weekday PM peak hours, and can be anticipated to continue to be satisfied under forecasted 2025 build (with development) conditions. Therefore, the installation of traffic signal control at the intersection of US 290 with Arrowhead Ranch Boulevard is required to accommodate the traffic volumes generated by the proposed Arrowhead Ranch commercial development and the installation of traffic signal control at the intersection would be the sole responsibility of the Arrowhead Ranch development.

The available sight distance along US 290 to the back of queue at Arrowhead Ranch Boulevard exceeds the required stopping sight distance for a posted speed limit of 60 miles per hour.

Capacity calculations performed for the intersection of US 290 with Arrowhead Ranch Boulevard assuming the installation of a traffic signal at the intersection revealed that the intersection can be anticipated to operate at an overall intersection Level of Service C or better during the weekday AM and PM peak hours, with all movements operating at a LOS C or better, following installation of traffic signal control.

The right turn in/right turn out driveway proposed to be constructed as part of the planned Arrowhead Ranch commercial developments will be located in the middle of the taper of the existing eastbound right turn lane on US 290 at its intersection with Arrowhead Ranch Boulevard. Therefore, it is anticipated that the eastbound right turn lane on US 290 will need to be lengthened in order to accommodate the location of the right turn in/right turn out driveway and the increase in traffic volumes associated with the Arrowhead Ranch development.

According to the City of Dripping Springs Code of Ordinances, Chapter 28, Exhibit A, Section 11.11, *"The intersections included within the traffic impact analysis shall be considered adequate to serve the proposed development if existing intersections can accommodate the existing service volume, the service volume of the proposed development, and the service volume of approved but unbuilt developments holding valid, unexpired building permits at level of service "C" or above."* Therefore, signal warrant evaluations were not performed for the intersections of US 290 with Bunker Ranch Boulevard and US 290 with Springs Lane.

The results of queueing analyses performed for the remaining study intersections revealed that each of the existing auxiliary turn lanes at the study intersections is of sufficient length to accommodate all existing queues, as well as all forecasted 2025 queues, both without and following the proposed Bunker Ranch subdivision expansion.

Therefore, no mitigations to the existing study intersections are anticipated to be required in order to accommodate the traffic volumes anticipated to be generated by the proposed Bunker Ranch subdivision expansion.

This concludes CEC's Revised Traffic Impact Analysis for the construction of the proposed Bunker Ranch subdivision expansion, located south of US 290 at its intersection with Bunker Ranch Boulevard in the City of Dripping Springs, Hays County, Texas.

Included with this report is a Technical Appendix containing all counts, analyses and calculations.

Exhibit H

City of Dripping Springs
511 Mercer Street • PO Box 384 • Dripping Springs, TX 78620 • 512.858.4725
cityofdrippingsprings.com
Open spaces, friendly faces.

DRIPPING SPRINGS
Texas

Date: **May 20, 2022**

Name: **Steve Harren**
Email: **Steveharren@aol.com**

Dear **Mr. Harren**:

This letter is to inform you that the Development Review Committee reviewed **VAR2022-0005**, a variance requesting to be relieved from the sidewalk requirements for the road from US290 to the Hardy Tract.

The development review committee has approved the variance request with the following conditions:

1. **Sidewalks are required along the entire length of one side of the road; and**
2. **Sidewalks along the other side of the road are deferred until the adjacent property is developed.**

Per section 28.04.015(k), this decision can be appealed to the Planning & Zoning Commission. An appeal can be requested in writing via email.

Should you have any questions or concerns, please feel free to reach out to the planning department.

Regards,

Tory Carpenter, AICP
Senior Planner

Exhibit I

City of Dripping Springs

Physical: 511 Mercer Street • Mailing: PO Box 384 • Dripping Springs, TX 78620

512.858.4725 • www.cityofdrippingsprings.com

Gateway to the Hill Country

May 4, 2020

Attn: Steve Harren
Overlook at Bunker Ranch, LLC
317 Grace Lane, Suite 240,
Austin Texas 78746
JBock@sunlandgrp.com

RE: Decision by Development Team Review Committee – Sidewalk Fee-in-Lieu for Overlook at Bunker Ranch

Project Number: SFL2021-0001
Project Name: Overlook at Bunker Ranch
Project Address: 2004 Creek Road

Mr. Harren:

The City of Dripping Springs has finished the review of SFL2021-0001 Overlook at Bunker Ranch. The applicant is requesting to not construct 10,810 square feet of sidewalk with the Overlook at Bunker Ranch due to the proposed sidewalk not providing any beneficial pedestrian connectivity. The applicant is requesting to pay fee-in-lieu for 10,810 square feet of the sidewalk. Per Chapter 28, Article 28.04 Subdivision Ordinances, Section 28.04.019 Sidewalks of the City of Dripping Springs Code of Ordinances:

The Development Review Committee shall consider the following criteria when evaluating a request for fee-in-lieu of construction for sidewalks:

I. Proximity to the nearest existing sidewalk;
II. Proximity to public facilities, such as public or private schools, libraries, and other government buildings;
III. Whether any public sidewalk improvements are planned or contemplated in the area; and
IV. Any other information deemed appropriate by the Development Review Committee.

The Development Review Committee has found that the sidewalk would currently provide no beneficial pedestrian connectivity to the adjacent subdivisions. There are no proposed sidewalks planned or contemplated in this area and this development is not near any public facilities. The City ***approves the sidewalk fee-in-lieu request for the entire 10,810 square feet of sidewalk.***

City of Dripping Springs

Physical: 511 Mercer Street • Mailing: PO Box 384 • Dripping Springs, TX 78620

512.858.4725 • www.cityofdrippingsprings.com

Please provide the Sidewalk Fee-in-lieu per the City's Fee Schedule prior to approval of the Preliminary Plat:

> Sidewalk Fee-in-Lieu: $8.00/square foot of approved fee-in-lieu of sidewalk construction

Should you have any questions or concerns in the meantime, please feel free to reach out to the Planning Department.

Sincerely,

Michelle Fischer

Michelle Fischer
City Administrator

City of ~~BR~~ 75K
Dr'P

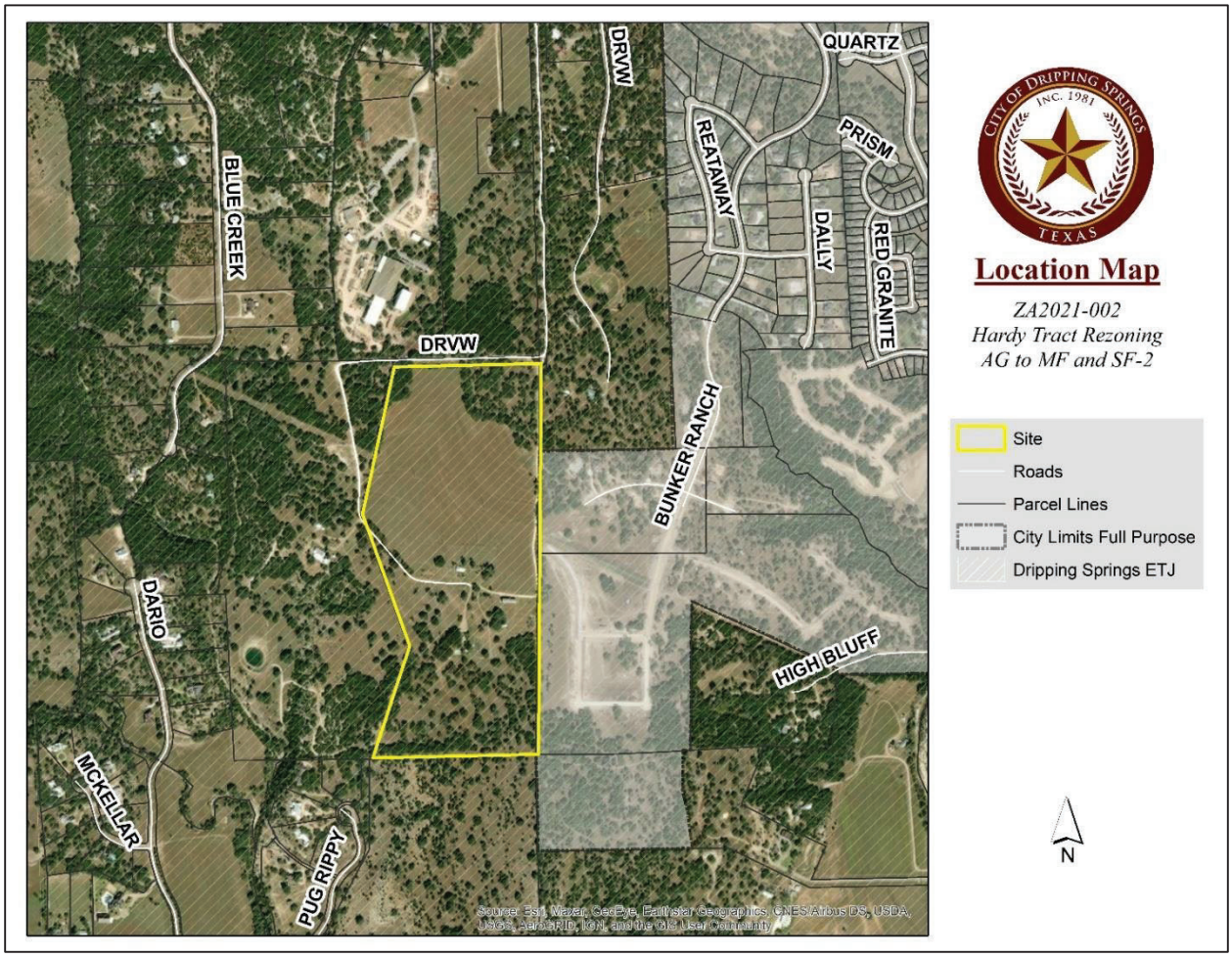
$86,480

sidewalk fee
in lieu

Exhibit J

Planning and Zoning Commission
Planning Department Staff Report

Planning and Zoning Commission Meeting:	June 22, 2021
Project No:	ZA2021-0002
Project Planner:	Amanda Padilla, Senior Planner
Item Details	
Project Name:	Hardy Tract
Property Location:	2901 W US Highway 290, Dripping Springs, Texas 78620 (R15103)
Legal Description:	Approximately 79.61 acres, situated in the Benjamin F. Hanna Survey No. 28, Abstract No. 222
Applicant:	Steve Harren c/o Brian Estes, P.E.
Property Owners:	P& H Family Limited Partnership No. 1
Request:	Zoning Map Amendment to zone a 78.021-acre tract of land to SF-2, Moderate Density Residential zoning district, upon annexation.
Staff Recommendation:	Staff is recommending approval of the SF-2 Zoning district



Planning Department Staff Report

Overview

The applicant submitted a petition for voluntary annexation of the approximately 78.021 acres, therefore should the annexation be approved by City Council at the July 20, 2021 meeting, the applicant would like to request the zoning designation of SF-2, Moderate Density Residential. The applicant's intention for development of the 78.021-acre tract is a similar build to the property east of this tract, Bunker Ranch Phase 3. The applicant had previously requested SF-2 for the northern portion and MF for the southern portion of the tract but has since removed the MF zoning.

Site Information

Location:

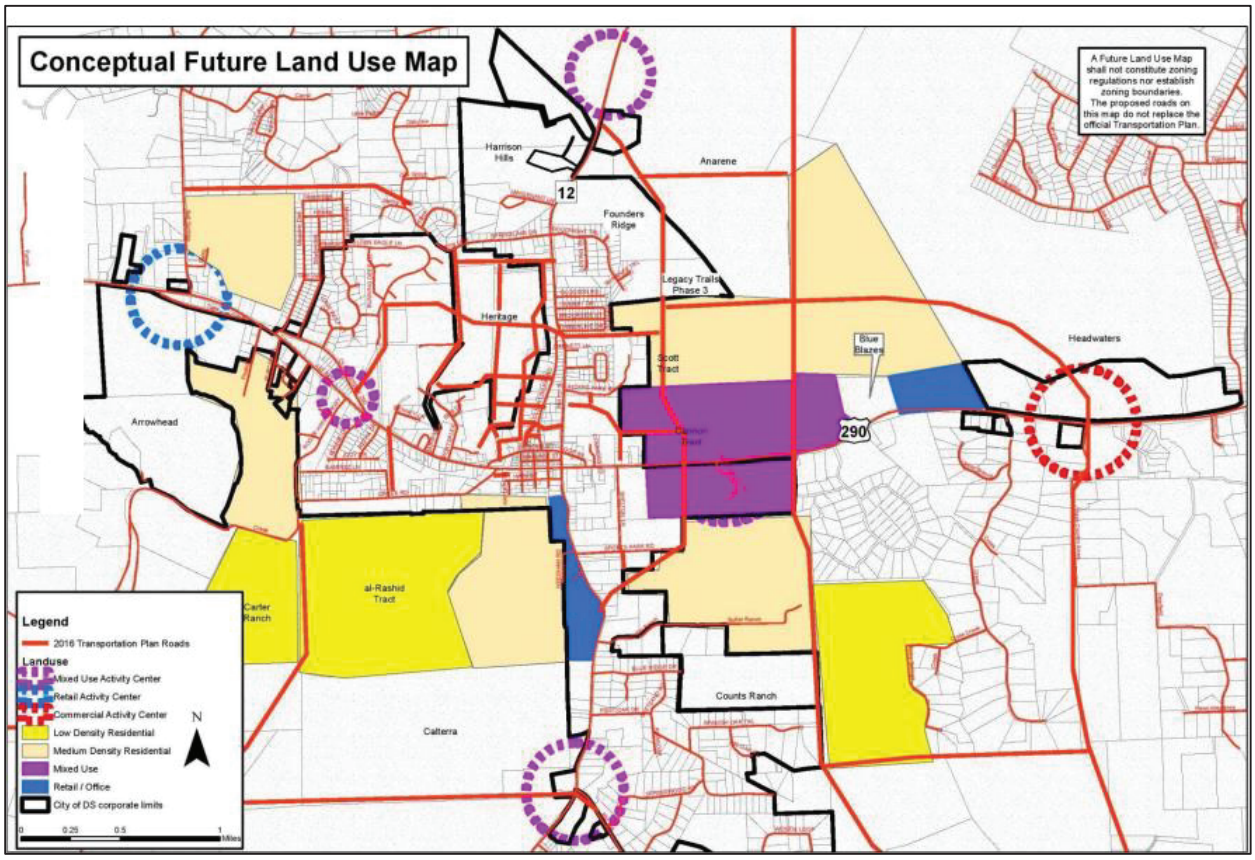
The subject property is located south of US Highway 290, along the western boundary of Bunker Ranch Phase 3 and north of Creek Road.

Physical and Natural Features:

The subject property is open in the norther portion and heavily treed in the southern portion. The property has a residential home that will be removed for development with a 60-foot access easement that extends out to US Highway 290.

Future Land Use and Zoning Designations:

The subject property is not indicated on the Future Land Use Map. There is currently no zoning designation on the property because at the time of application the property was within the City's Extraterritorial Jurisdiction.



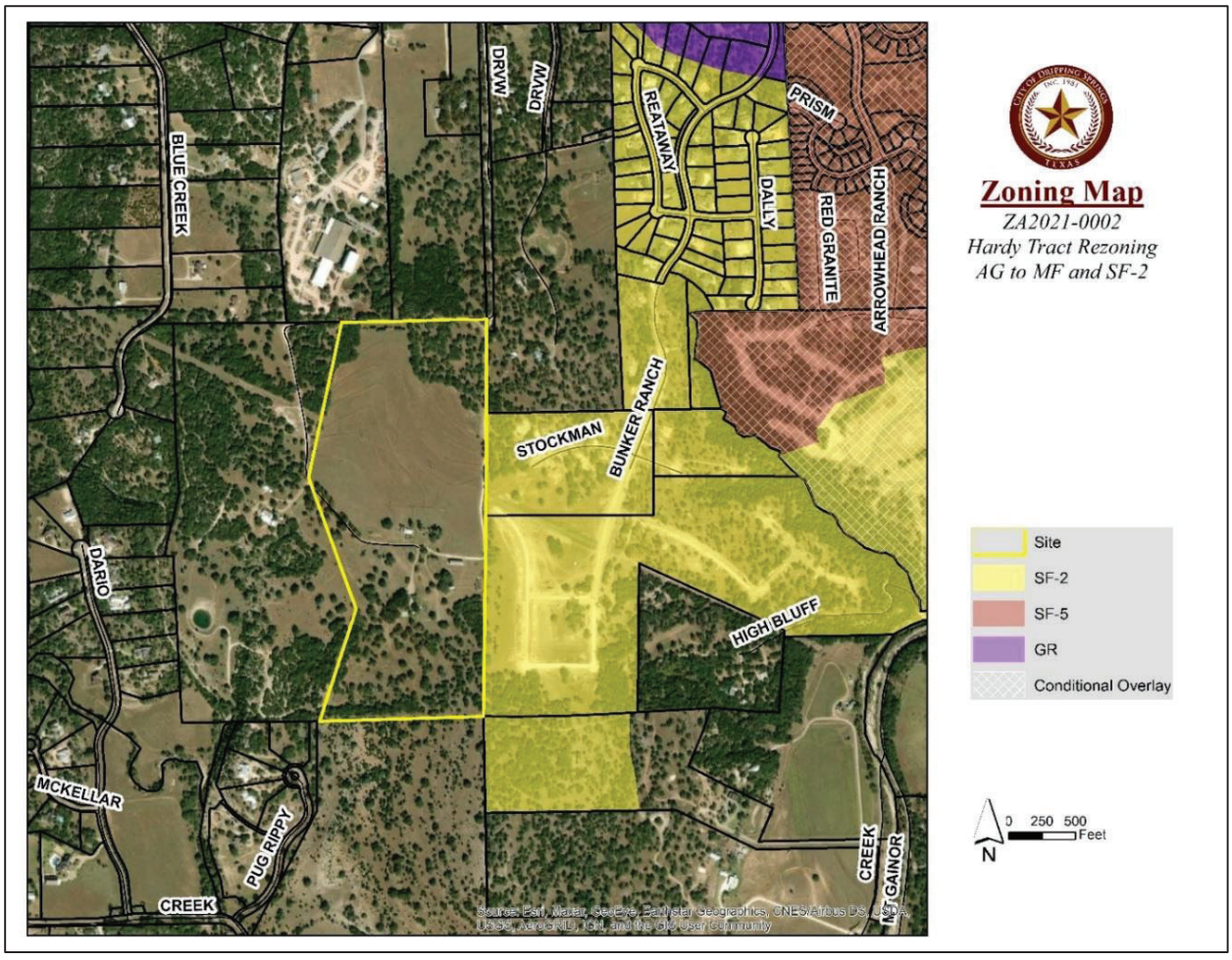
Planning Department Staff Report

Surrounding Properties:

The Subject property is just west of the City Limits. The surrounding lots had originally been large tract residential but in recent years the adjacent City Limit tracts have become zoned SF-2, which allows for tracts greater than a ½ acre. The tracts to the north, west, and south are within the ETJ and are larger than 1 acre.

The current zoning and existing uses of the adjacent properties to the north, south, east, and west are outlined in the table below:

Direction	Zoning District	Existing Use	Comprehensive Plan
North	ETJ	Residential	The properties are not within in the Comprehensive Plan or Future Land Use Map.
East	SF-2, Moderate Density Residential	Residential (Bunker Ranch Subdivision)	
South	ETJ	Residential	
West	ETJ	Residential	



Planning Department Staff Report

Property History:

The applicant has come before the commission on April 27, 2021 for a zoning map amendment to zone the property to SF-2 and MF with a conditional overlay. The Planning and Zoning Commission had unanimously voted to postpone the zoning amendment. The applicant met with staff and submitted a new application which is being presented today.

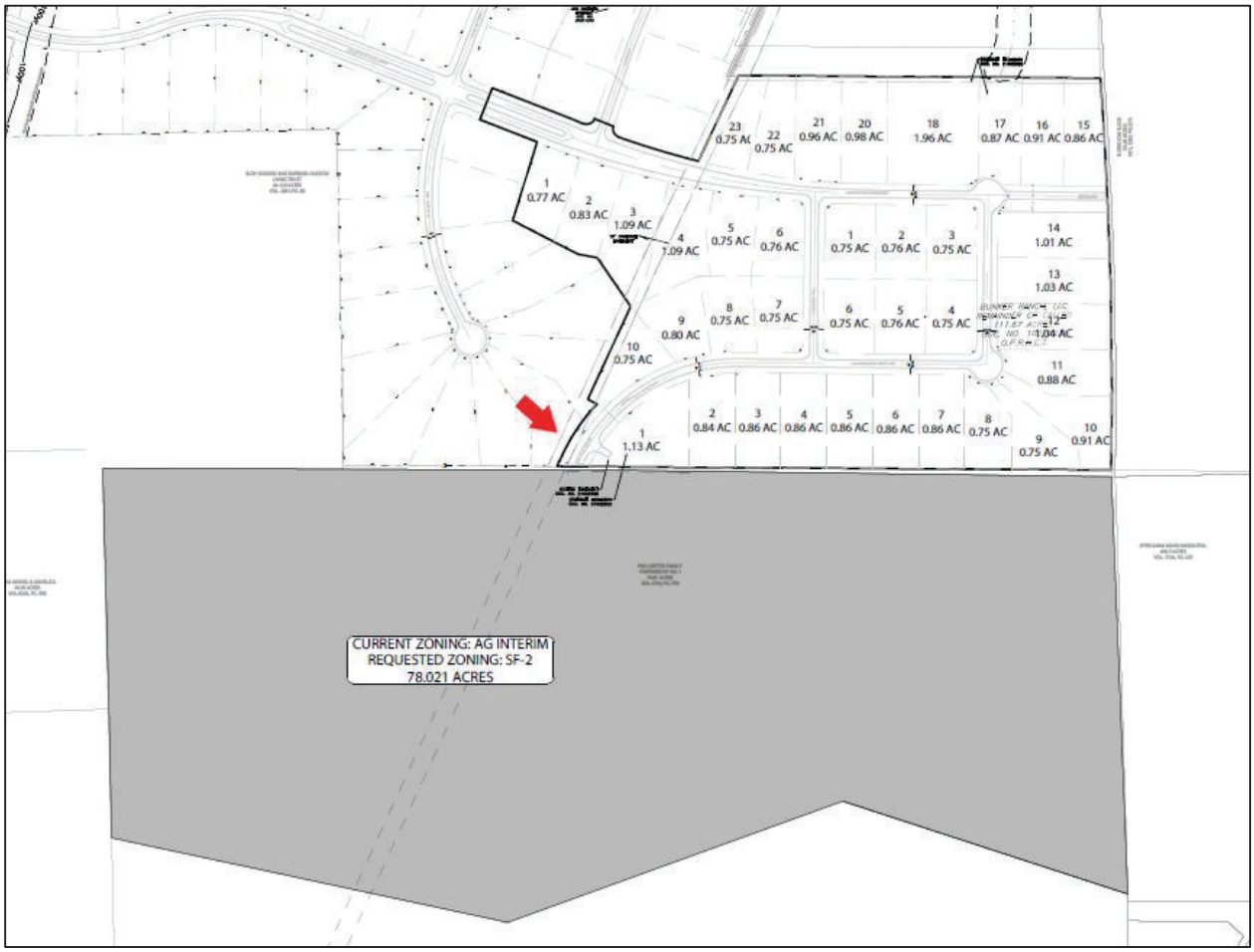
Utilities

The subject property is located within the Dripping Springs Water Supply Corporation service area for Water, Pedernales Electric Cooperative (PEC) service area for electricity and will be utilizing on-site septic facilities for wastewater.

Transportation

The subject property will have ingress and egress through Phase 3 of the Bunker Ranch Development. The access would be through local streets which provide primary land access and connectivity between land parcels and other streets and collectors.

A Traffic Impact Analysis is currently being reviewed by the City's Transportation Engineer.



Planning Department Staff Report

Proposed Zoning District

Single-family residential district—Moderate density (SF-2)

The Single-family residential district – moderate density (SF-2) is intended to provide for development of primarily moderate-density detached, single-family residences on lots of at least ½ acre in size.

Permitted uses: Those uses listed for the SF-2 district or any less intense residential district in appendix C [appendix E] (Use Charts) as "P" or "C" are authorized uses permitted by right or conditionally permitted uses, respectively.

Development Standards for SF-2	
Size of Lots	
Minimum Lot area	½ acre
Setback Requirements	
Minimum Front Yard	25 feet
Minimum Side Yard	15 feet
Minimum Rear Yard	25 feet
Height Regulations	
Main Building	2 ½ stories, or 40', whichever is less, for the main buildings
Accessory Building	25'
Other Development Standards	
Impervious Cover	40% total, including main buildings and accessory buildings

Special requirements:

a) On-site dwellings: Recreational vehicles, manufactured homes, travel trailers or motor homes may not be used for on-site dwelling purposes.
b) Open storage: Open storage is prohibited (except for materials for the resident's personal use or consumption such as firewood, garden materials, etc.).
c) Side-entry garages: Single-family homes with side-entry garages where lot frontage is only to one street (not a corner lot) shall have a minimum of 25 feet from the door face of the garage or carport to the side property line for maneuvering.
d) Swimming pools: Swimming pools shall be constructed and enclosed in accordance with the city building code.
e) Nonresidential uses: Site plan approval shall be required for any nonresidential use (such as a school, church, child-care center, private recreation facility, etc.) in the SF-2 district. Any nonresidential land use that may be permitted in this district shall conform to the local retail district standards.
f) Temporary facilities: There shall be no permanent use of temporary facilities or buildings.
g) Other regulations: Refer to section 5, Development Standards and Use Regulations.
h) OSSFs: On-site sewage facilities (OSSFs) are prohibited in this district on lots of less than three-quarters of an acre.

Criteria

Staff has reviewed the proposed rezoning request based on the criteria outlined in Chapter 30 Zoning

Planning Department Staff Report

Exhibit A Zoning Ordinance Section 2.28.2, see below:

Zoning Map Amendment Criteria
1. Whether the proposed change will be appropriate in the immediate area concerned;
The applicant is proposing to zone the subject property to SF-2. The SF-2 Zoning district is consistent with the surrounding areas, and due to the proximity to the ETJ and the surrounding properties, it would serve as a transition to more rural parts of the city's ETJ. The lots to the east are single-family lots that are equal to or greater to 0.75 acre lots and have the same designation as the zoning requested for the subject property. To the north, south, and west are residential large lots that are over 30 acres and are within the City's ETJ. SF-2 zoning requires that lots be a minimum of ½ acre and if the wastewater is being provided via an OSSF the lots are required to be a minimum of ¾ acres. Based on the proposed zoning, adjacent City Limits zoning, and the ETJ lots the proposed zoning is appropriate in the area.
2. Their relationship to the general area and the City as a whole;
The SF-2 zoning uses proposed will fit in with the surrounding areas zoning districts and will be compatible with the ETJ properties. Though this property is not within the City's Conceptual Future Land Use Map, the current map shows low density and moderate density on the outer edges of the City Limits, which shows that low density should occur away from the city center.
3. Whether the proposed change is in accord with any existing or proposed plans for providing public schools, streets, water supply, sanitary sewers, and other utilities to the area;
The subject property is not shown on any existing or proposed plans for public schools, streets, water supply, sanitary sewers, and other utilities to the area.
4. The amount of undeveloped land currently classified for similar development in the vicinity and elsewhere in the City, and any special circumstances which may make a substantial part of such undeveloped land unavailable for development;
The City is seeing an increase in residential development within the city limits and the extraterritorial jurisdiction. Within the vicinity of the subject property to the east are tracts zoned SF-2 the land is currently being developed. Rezoning the subject property to SF-2 is appropriate and will not affect any similar zoned lots within the vicinity. The City has not seen any issues with undeveloped land for properties rezoned to SF-2.
5. The recent rate at which land is being developed in the same zoning classification, particularly in the vicinity of the proposed change;

Planning Department Staff Report

As stated above the adjacent lot to the east is currently being developed for SF-2 zoning. The rate of land being developed in this area has increased within the last few years.
6. How other areas designated for similar development will be, or are unlikely to be, affected if the proposed amendment is approved;
Based on the area, the proposed rezone to SF-2 will not affect the surrounding area and will complement the adjacent lots.
7. Whether the proposed change treats the subject parcel of land in a manner which is significantly different from decisions made involving other, similarly situated parcels; and
This property is being treated similarly to other similarly situated parcels within the City Limits.
8. Any other factors which will substantially affect the public health, safety, morals, or general welfare.
Staff does not see this zoning change affecting the public health, safety, morals, or general welfare.

Based on the Criteria listed above, staff finds that the requested zoning amendment is a compatible use that will ensure conformity with the character of the area and will promote the orderly development of the city.

Meetings

June 22, 2021- Planning and Zoning Commission (Zoning)
July 20, 2021- City Council (Annexation and Zoning)

Public Notification

A legal notice advertising the public hearing was placed in the Dripping Springs Century-News, signs were posted on the-site, notice was placed on the City Website, and all property owners within a 300-foot radius of the site were notified of the request.

Attachments

Attachment 1: Rezoning Application
Attachment 2: Zoning Use Chart
Attachment 3: Site Exhibit
Attachment 4: Deed

Recommended Action:	Recommend approval of the Single-Family residential district – Moderate Density (SF-2) Zoning district.
Alternatives/Options:	Recommend denial of the Single-Family residential district – Moderate Density (SF-2) Zoning district.
Budget/Financial Impact:	None calculated at this time.

Planning Department Staff Report

Public Comments:	No public comment was received for this request.
Enforcement Issues:	N/A

CITY OF DRIPPING SPRINGS

PHYSICAL: 511 Mercer Street • MAILING: PO Box 384

Dripping Springs, TX 78620

• 512.858.4725 • www.cityofdrippingsprings.com

ZONING/PDD AMENDMENT APPLICATION

Case Number (staff use only): _____-____

CONTACT INFORMATION

PROPERTY OWNER NAME P & H Family Limited Partnership No. 1

STREET ADDRESS P O BOX 1696

CITY Dripping Springs STATE TX ZIP CODE 78620

PHONE _____ EMAIL _____

APPLICANT NAME Brian Estes

COMPANY Civil and Environmental Consultants Inc.

STREET ADDRESS 3711 S. Mo Pac Expy Suite 550

CITY Austin STATE Texas ZIP CODE 78746

PHONE 512-439-0400 EMAIL bestes@cecinc.com

REASONS FOR AMENDMENT

☐ TO CORRECT ANY ERROR IN THE REGULATION OR MAP

☐ TO RECOGNIZE CHANGES IN TECHNOLOGY, STYLE OF LIVING, OR MANNER OF CONDUCTING BUSINESS

☐ TO RECOGNIZE CHANGED CONDITIONS OR CIRCUMSTANCES IN A PARTICULAR LOCALITY

■ TO MAKE CHANGES IN ORDER TO IMPLEMENT POLICIES REFLECTED WITHIN THE COMPREHENSIVE PLAN

PROPERTY & ZONING INFORMATION	
PROPERTY OWNER NAME	P & H Family Family Limited Partnership No. 1
PROPERTY ADDRESS	2901 W US 290, DRIPPING SPRINGS, TX 78620
CURRENT LEGAL DESCRIPTION	A0222 BENJAMIN F HANNA SURVEY, ACRES 77
TAX ID#	R15103
LOCATED IN	☐ CITY LIMITS ☐ EXTRATERRITORIAL JURISDICTION
CURRENT ZONING	AG
REQUESTED ZONING/AMENDMENT TO PDD	SF-2
REASON FOR REQUEST *(Attach extra sheet if necessary)*	Annex into full purpose city limits
INFORMATION ABOUT PROPOSED USES *(Attach extra sheet if necessary)*	Will comprise etirely of single family home lots.

COMPLIANCE WITH OUTDOOR LIGHTING ORDINANCE? *

(See attached agreement).

■ YES (REQUIRED)* ☐ YES (VOLUNTARY)* ☐ NO*

* If proposed subdivision is in the City Limits, compliance with Lighting Ordinance is **mandatory**. If proposed subdivision is in the ETJ, compliance is **mandatory** when required by a Development Agreement or as a condition of an Alternative Standard/Special Exception/Variance/Waiver.
Voluntary compliance is strongly encouraged by those not required by above criteria (*see Outdoor Lighting tab on the CODS webpage and online Lighting Ordinance under Code of Ordinances tab for more information*).

APPLICANT'S SIGNATURE

The undersigned, hereby confirms that he/she/it is the owner of the above described real property and further, that Brian Estes (Civil & Environmental Consultants, Inc.) is authorized to act as my agent and representative with respect to this Application and the City's zoning amendment process.
(As recorded in the Hays County Property Deed Records, Vol. _____, Pg. _____.)

_____
Name

PRINCIPAL
_____
Title

STATE OF TEXAS §
§
COUNTY OF HAYS §

This instrument was acknowledged before me on the 5th day of March, 2021 by Hardy E. Thompson, III.

_____
Notary Public, State of Texas Susan Rosson

My Commission Expires: 12-10-2024

Hardy E. Thompson, III
Name of Applicant

SUSAN ROSSON
Notary Public, State of Texas
Comm. Expires 12-10-2024
Notary ID 10188174

ZONING AMENDMENT SUBMITTAL

All required items and information (including all applicable above listed exhibits and fees) must be received by the City for an application and request to be considered complete. ***Incomplete submissions will not be accepted.*** *By signing below, I acknowledge that I have read through and met the above requirements for a complete submittal:*

5/24/2021

Applicant Signature | Date

CHECKLIST

STAFF	APPLICANT	
☐	☑	Completed Application Form - including all required signatures and notarized
☐	☑	Application Fee-Zoning Amendment or PDD Amendment (*refer to Fee Schedule*)
☐	☑	PDF/Digital Copies of all submitted Documents **When submitting digital files, a cover sheet must be included outlining what digital contents are included.**
☐	☑	Billing Contact Form
☐	☑	GIS Data
☐	☑	Outdoor Lighting Ordinance Compliance Agreement - signed with attached photos/drawings *(required if marked "Yes (Required)" on above Lighting Ordinance Section of application)*
☐	☑	Legal Description
☑	☑	Concept Plan
☐	☐	Plans
☐	☑	Maps
☐	☐	Architectural Elevation
☐	☑	Explanation for request (*attach extra sheets if necessary)*
☐	☑	Information about proposed uses (*attach extra sheets if necessary)*
☐	☑	Public Notice Sign (*refer to Fee Schedule*)
☐	☑	Proof of Ownership-Tax Certificate or Deed
☐	☐ n/a	Copy of Planned Development District (*if applicable*)
☐	☐ n/a	Digital Copy of the Proposed Zoning or Planned Development District Amendment

Received on/by: _____

Project Number: _____-_____
Only filled out by staff

Date, initials

BILLING CONTACT FORM

Project Name: Bunker Ranch Phase 6 (Hardy Tract 79.61 Acres)

Project Address: 2901 W US 290, Dripping Springs, TX 78620

Project Applicant Name: Cristina Cordoba / Brian Estes

Billing Contact Information

Name: Steve Harren

Mailing Address: 317 Grace Lane #240
Austin, Texas 78746

Email: steveharren@aol.com Phone Number: (512)644-6800

Type of Project/Application (check all that apply):

- ☐ Alternative Standard
- ☐ Certificate of Appropriateness
- ☐ Conditional Use Permit
- ☐ Development Agreement
- ☐ Exterior Design
- ☐ Landscape Plan
- ☐ Lighting Plan
- ☐ Site Development Permit
- ☐ Special Exception
- ☐ Street Closure Permit
- ☐ Subdivision
- ☐ Waiver
- ☐ Wastewater Service
- ☐ Variance
- ☑ Zoning
- ☐ Other _____

Applicants are required to pay all associated costs associated with a project's application for a permit, plan, certificate, special exception, waiver, variance, alternative standard, or agreement, regardless of City approval. Associated costs may include, but are not limited to, public notices and outside professional services provided to the City by engineers, attorneys, surveyors, inspectors, landscape consultants, lighting consultants, architects, historic preservation consultants, and others, as required. Associated costs will be billed at cost plus 20% to cover the City's additional administrative costs. ***Please see the online Master Fee Schedule for more details.*** *By signing below, I am acknowledging that the above listed party is financially accountable for the payment and responsibility of these fees.*

_____ 5/24/2021
Signature of Applicant Date

E.1. Use regulations (charts).

E.1.1. The use of land or buildings shall be in accordance with those listed in the following use charts. No land or building shall hereafter be used and no building or structure shall be erected, altered, or converted other than for those uses specified in the zoning district in which it is located.

(a) The legend for interpreting the permitted uses in the use charts is:

P Designates that the use is permitted in the zoning district indicated.
Designates that the use is prohibited in the zoning district indicated.
C Designates that the use may be permitted in the zoning district only pursuant to issuance of a conditional use permit.
** Designates that the use is defined in this chapter.

(b) Definitions : See definitions in section 1.6 of this chapter for further description of uses.

(c) Uses not listed : If a use is not listed in the use charts, it is not allowed in any zoning district.

(d) Use chart organization : The following use categories are listed in the use charts:

Agricultural uses.

Residential uses.

Office uses.

Personal and business service uses.

Retail uses.

Transportation and auto service uses.

Amusement and recreational service uses.

Institutional/governmental uses.

Commercial and wholesale trade uses.

Manufacturing and light industrial uses.

Use Chart
Adopted February 17, 2015

Permitted Uses "P"

Conditional Uses "C"

	Residential Uses						Nonresidential Uses								
AGRICULTURE	AG	SF-1	SF-2	SF-4	SF-5	MF-1	O	LR	GR	CS	HO	I	GUI	PR	PP
Bulk Grain and/or Feed Storage	P										X	P			
Farms, General (Crops), Commercial	P	C	C								X				

Greenhouse (Non-Retail)	P	P	P	P							P				
Livestock Sales	P										X				
Orchard/Crop Propagation	P	P	C	C	C	C	C	C	C	C	P	C			
Plant Nursery (Commercial)	P								P	P	X	C			
Small Scale Farm	P	C	C			C	C	C	C	C	P				
Stable, Commercial	P	C									X				
Stables (Private, accessory use)	P	C	C								P				
Stables (Private, principal use)	P	C									X				
Garden (Non-Retail)	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Farm Animals (Exempt - FFA, 4H)	P	C	C	C	C	C	C	C	C	C	P	C			
Farm Animals (Non-Exempt)	P	C	C	C	C	C	C	C	C	C	P	C			

	Residential Uses						Nonresidential Uses								
RESIDENTIAL	AG	SF-1	SF-2	SF-4	SF-5	MF-1	O	LR	GR	CS	HO	I	GUI	PR	PP
Accessory Bldg./Structure (Nonresidential)							P	P	P	P	P	P			
Accessory Bldg./Structure (Residential)	P	P	P	P	P	P					P				
Accessory Dwelling	P	C	C								P		P		
Caretaker's/Guard Residence	P	P	P								P				

Community or Group Home	C	C	C	C	C						P				
Duplex/Two-Family				P	P	P	P	P	P		P				
Garage Residential Conversion	P	P	C	C							P				
Garden Home/Townhome					P	P	P	P	P		P				
Home Occupation	P	P	P	P	P	P	P	P	P		P				
HUD-Code Manufactured Home	C			C	C	C					X				
Living Quarters on Site with a Business							P	P	P	P	P				
Multiple-Family Dwelling						P	P	P	P		P				
Residential Loft							P	P	P		P				
Rooming/Boarding House						P		P			P				
Single-Family Dwelling, Detached	P	P	P	P	P	P					P				
Single-Family Industrialized Housing	P	P	P	P	P	P					P				
Swimming Pool, Private	P	P	P	P	P	P	P	P	P		P				

	Residential Uses						Nonresidential Uses								
OFFICE	AG	SF-1	SF-2	SF-4	SF-5	MF-1	O	LR	GR	CS	HO	I	GUI	PR	PP
Armed Services Recruiting Center							P	P	P	P	P				
Bank										C	X				
Check Cashing Service								P	P	P	X				
Credit Agency							P	P	P	P	X				
Insurance Agency Offices							P	P	P	P	P				

Offices, General/Professional							P	P	P	P	P				
Office, Brokerage Services							P	P	P	P	P				
Offices, Health Services							P	P	P	P	P				
Offices, Legal Services							P	P	P	P	P				
Offices, Parole/Probation											X		P		
Offices, Professional							P	P	P	P	P				
Offices, Real Estate Office							P	P	P	P	P				
Saving and Loan										C	X				
Security Monitoring Company							P	P	P	P	X				
Telemarketing Center							P	P	P	P	X				

	Residential Uses						Nonresidential Uses								
PERSONAL AND BUSINESS SERVICES	AG	SF-1	SF-2	SF-4	SF-5	MF-1	O	LR	GR	CS	HO*	I	GUI	PR	PP
All-Terrain Vehicle									P	P	X				
Dealer (Sales Only)											X				
Ambulance Service (Private)										P	X				
Antique Shop								P	P	P	P				
Appliance Repair								P	P	P	X				
Art Dealer/Gallery								P	P	P	P				
Artisan's Shop	P							P	P	P	P				
Artist Studio	P	P	P	P	P	P	P	P	P	P	P				
Auto Sales (New and Used)									C	P	X				
Auto Supply Store									P	P	X				
Bakery or Confectionary (Retail)								P	P	P	P				
Bar								C	C	C	C				
Barbershop								P	P	P	P				
Beauty Shop								P	P	P	P				
Bed and Breakfast Inn or Facility	C	C	C					P	P	P	P				

Bicycle Sales and Repair								P	P	P	P				
Book Store								P	P	P	P				
Building Materials Sales									C	P	X				
Cabinet/Counter/Woodworking Shop (Custom) Retail										C	X	P			
Cabinet/Counter/Woodworking Shop (Manufacturing) Wholesale											X	P			
Cafeteria							C	C	P	P	P				
Communication Equipment Repair										P	X				
Computer Sales								P	P	P	P				
Consignment Shop								P	P	P	P				
Convenience Store (With Gas Sales)									P	P	X				
Convenience Store (Without Gas Sales)								C	P	P	P				
Cooking School								P	P	P	P				
Dance/Drama/Music Studio or School								P	P	P	P				
Department Store									P	P	P				
Drapery, Blind Upholstery Store								P	P	P	P				
Exterminator Services										P	X				
Financial Services								P	P	P	P				
Florist Shop								P	P	P	P				
Food or Grocery Store (General)									P	P	P				
Food or Grocery Store (Limited)								P	P	P	P				
Funeral Home or Mortuary										P	X				
Furniture Store (New and/or Used)								P	P	P	X				
Garden Shop (Inside Storage)								P	P	P	P				
General or Community Retail Store									P	P	P				
Gravestone/Tombstone Sales										P	X				
Hardware Store								P	P	P	P				
Home Improvement Center									P	P	X				
Laundry/Dry Cleaning										P	X				
Lawnmower Sales & Repair									P	P	X				
Live-in Security Quarters							P	P	P	P	P				
Locksmith								P	P	P	X				

Major Appliance Sales									P	P	X				
Market (Public)								P	P	P	P				
Mini-Warehouse - Self Storage										C	X				
Mobile food vendor - 10 days or less							P	P	P	P	P	P	P	P	P
Mobile food vendor - longer than 10 days							C	C	C	C	C	C	C		
Mobile food vendor court							C	C	C	C	C	C	C		
Motorcycle Dealer (Sales, Repair)									P	P	X				
Motel or Hotel									P	P	P				
Needlework Shop								P	P	P	P				
Pet Shop/Supplies								P	P	P	P				
Pharmacy								P	P	P	P				
Photocopying/Duplicating								P	P	P	P				
Photography Studio								P	P	P	P				
Plant Nursery (Retail Sales, Outdoors)									P	P	X				
Radio or Television Studio									P	P	X				
Recycling Center										C	X	P			
Restaurant (No Drive-Through Service)								P	P	P	P				
Restaurant (With Drive-Through)									P	P	X				
Security Systems Installation Company									C	P	X				
Sexually Oriented Business										C	X	C			
Shoe Repair								P	P	P	P				
Studio, Tattoo or Body Piercing								C	C	C	P				
Tailor Shop								P	P	P	P				
Tool and Machinery Rental (Indoor Storage)								P	P	P	X				
Tool and Machinery Rental (Outdoor Storage)										P	X				
Travel Agency							P	P	P	P	P				
Temporary Outdoor Sales/Promotion							C	P	P	P	P				
Upholstery Shop									P	P	P				
Used Merchandise/Furniture								P	P	P	P				
Vacuum Cleaner Sales and Repair								P	P	P	X				

Veterinarian Clinic (Indoor Kennels)								P	P	P	P				
Woodworking Shop (Ornamental, Handmade								P	P	P	P				

*Permitted in HO district per requirements of chapter 30, article 30.05, Mobile Food Vendors.

	Residential Uses						Nonresidential Uses								
TRANSPORTATION AND AUTO SERVICES	AG	SF-1	SF-2	SF-4	SF-5	MF-1	O	LR	GR	CS	HO	I	GUI	PR	PP
Antique Vehicle Restoration										P	X				
Auto Body Repair										P	X				
Auto Financing and Leasing								P	P	P	X				
Auto Muffler Shop										P	X				
Auto Paint Shop										P	X				
Auto Tire Sales and Repair									P	P	X				
Auto Upholstery Shop										P	X				
Auto Washing Facility, Attended									P	P	X				
Auto Washing Facility, Unattended									P	P	X				
Auto Wrecker Service										P	X				
Automobile Repair, Major										P	X				
Automobile Repair, Minor								C	C	P	X				
Heliport												P	P		
Helistop												P	P		
Limousine/Taxi Service										P	X				
Oil Change and Inspection									P	P	X				
Parking Lot, Commercial										C					

Parking Structure, Commercial							C	C	C	P	P				
Tire Dealer, Indoor Storage								P	P	P	X				

	Residential Uses						Nonresidential Uses								
AMUSEMENT/ RECREATION	AG	SF-1	SF-2	SF-4	SF-5	MF-1	O	LR	GR	CS	HO	I	GUI	PR	PP
Amusement Arcade (Four or more devices)									P	P	P				
Amusement Services (Indoor)									P	P	P				
Amusement Services (Outdoor)									P	P	X				
Billiard/Pool Facility									P	P	P				
Bingo Hall									P	P	P			P	
Bowling Center									P	P	P			P	
Broadcast Station (With Tower)											X	P			
Country Club (Private)									P		X				
Dance Hall									P	P	P			P	
Day Camp for Children	C	C					C		P	P					
Civic/Conference Center											P		P		
Dinner Theater									P	P	P				
Driving Range														P	
Fairgrounds/Exhibition Area	C													P	
Gaming Club (private)								C	C	C					
Golf Course (Miniature)									P	P				P	
Golf Course (Public, Private)	C								P	P				P	
Health Club							C	P	P	P	P			P	
Motion-Picture Studio, Commercial										P		P			
Motion-Picture Theater									P	P	P				
Museum								P	P	P	P				
Park accessory uses															P

Park and/or Playground	P	P	P	P	P	P	P	P	P	P	P				P
Psychic Reading Services								P	P	P	P				
Rodeo Grounds	C									C		C			
Skating Rink										P				P	
Tennis Court	P	P	P	P	P	P					P			P	
Theater (Stage)									P	P	P			P	
Video Rentals/Sales								P	P	P	P				

	Residential Uses						Nonresidential Uses								
INSTITUTIONAL/ GOVERNMENT	AG	SF-1	SF-2	SF-4	SF-5	MF-1	O	LR	GR	CS	HO	I	GUI	PR	PP
Assisted Living Facility						C		C	C	C	P				
Broadcast Tower (Commercial)												C			
Cemetery or Mausoleum	C												P		
Child Day-Care Facility	C	C	C	C	C	C	C	P	P	P	P				
Church, Religious Assembly	P	P	P	P	P	P	P	P	P	P	P		P		
Civic Club							P	P	P	P	P				
Community Center (Municipal)											P		P		
Electrical Generating Plant												P	P		
Electrical Substation												P	P		
Emergency Care Clinic									P	P					
Fire Station	P	P	P	P	P	P	P	P	P	P			P		
Fraternal Lodge or Union							P	P	P	P	P				
Government Building (Mun., St., Fed.)										P	P		P		
Group Day-Care Home	C	C	C	C	C	C	C	P	P	P					
Medical Clinic or Office							P	P	P	P	P				

Wireless Communications Tower	C	C	C			C	C	C	C	C		C			
Heliport												P			
Home for the Aged, Residential	C	C	C	C	C	C	C	C	P	P	P				
Hospice								C	P	P	P				
Hospital (Acute Care, General)							C	C	P	P					
Library							P	P	P	P	P		P		
Maternity Home							C	C	P	P	P				
Nursing/Convalescent Home							C	C	P	P					
Orphanage						C	C	C	P	P	P				
Philanthropic Organization							P	P	P	P	P				
Post Office	P	P	P	P	P	P	P	P	P	P	P		P		
Radio, Television, Microwave Tower									C	C		C			
School, K Through 12 (public or private)	P	P	P	P	P	P	P	P	P	P	P		P		
Sewage Pumping Station	C	C	C	C	C	C	C	C	C	C	P	P	P		
Telephone Switching/Exchange Bldg.							C	C	C	P	P		P		
Wastewater Treatment Plant	C	C	C	C	C	C	C	C	C	C		C	P		
Water Supply (Elevated Storage Tank)	C	C	C	C	C	C	C	C	C	C	P	C	P		
Water Supply Facility (Private)	P	P	P	P	P	P		C	C	C		C	P		

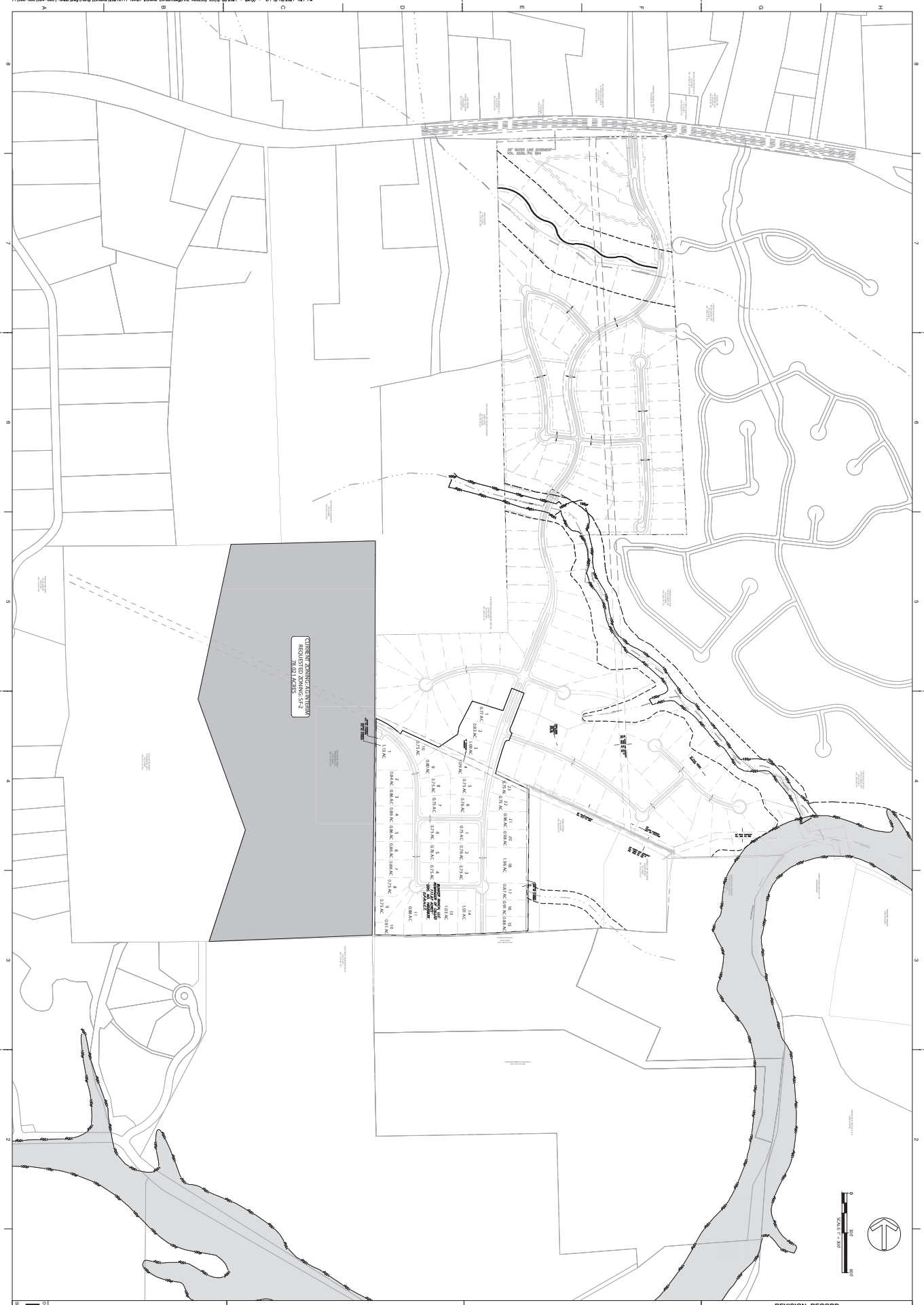
	Residential Uses						Nonresidential Uses								
COMM. AND WHOLESALE TRADE	AG	SF-1	SF-2	SF-4	SF-5	MF-1	O	LR	GR	CS	HO	I	GUI	PR	PP
Book Bindery										P	P				
Feed and Grain Store									P	P					

Furniture Manufacture												P			
Heating and Air-Conditioning Sales/Service									P	P					
Pawnshop									C	C					
Propane Sales (Retail)										P					
Taxidermist										P					
Transfer Station/Refuse Pickup												P			
Veterinarian (Outdoor Kennels or Pens)	C									P					
Warehouse/Office										C		P			
Welding Shop										C		P			

	Residential Uses						Nonresidential Uses								
LIGHT INDUSTRIAL/ MFG.	AG	SF-1	SF-2	SF-4	SF-5	MF-1	O	LR	GR	CS	HO	I	GUI	PR	PP
Contractor's Office (No Outside Storage)								P	P	P	P	P			
Contractor's Office (With Outside Storage)										C		P			
Contractor's Temporary On-site Office	C	C	C	C	C	C	C	C	C	C	P	C			
Electronic Assembly										C		P			
Engine Repair or Manufacture												P			
Laboratory Equipment Manufacture												P			
Machine Shop												P			

Maintenance and Repair Services for Bldgs.									P					
Open Storage/Outside Storage	C								C		P			
Plumbing Shop								P	P					
Research Lab (Nonhazardous)								C	C		P			
Sand/Gravel/Stone Sales or Storage	C								C		P			
Sand/Gravel Quarrying											C			
Sign Manufacturing									C	P	P			
Stone/Clay/Glass Manufacturing									C		P			

(Ordinance 1220.10, adopted 9/12/06; Ordinance 1220.99, adopted 2/17/15; Ordinance 1220.140, att. B, adopted 4/11/17; Ordinance 1220.149, adopted 11/14/17; Ordinance 1220.151, adopted 12/12/17; Ordinance 2018-09, adopted 4/10/18; Ordinance 2019-44, adopted 12/10/19; Ordinance 2020-01, adopted 1/14/20)



EXHIBIT

DRAWING NO. SHEET 1 OF 1

ZONING EXHIBIT

DATE:	MAY. 2021	DRAWN BY:	DRAFT
DWG SCALE:	1"=300'	CHECKED BY:	DRAFT
PROJECT NO:			304-065
APPROVED BY:			DRAFT

OVERLOOK AT BUNKER RANCH, LLC
HARDY T LAND
DRIPPING SPRINGS
HAYS COUNTY, TEXAS

Texas Registered Engineering Firm F-38
Civil & Environmental Consultants, Inc.
3711 South MoPac Expressway · Building 1, Suite 550 · Austin, TX 78746
Ph: 512.439.0400 · Fax: 512.329.0096
www.cecinc.com

REVISION RECORD

NO	DATE	DESCRIPTION

Item 3

SPECIAL WARRANTY DEED

STATE OF TEXAS §
§ KNOW ALL MEN BY THESE PRESENTS
COUNTY OF HAYS §

THAT the undersigned, Hardy E. Thompson, Jr., and Patty King Thompson, husband and wife (hereinafter referred to as "Grantors"), have GRANTED and CONVEYED, and by these presents do hereby GRANT and CONVEY unto the P & H Family Limited Partnership No. 1, a Texas Limited Partnership, whose mailing address is 1034 Liberty Park Drive, Apt. G2, Austin, Texas 78746 (hereinafter referred to as "Grantee"), the following:

1. The real property described in Exhibit A, which is attached hereto and incorporated herein for all pertinent purposes (hereinafter referred to as "Tract A");

2. A one-half (1/2) undivided interest in the real property described in Exhibit C, which is attached hereto and incorporated herein for all pertinent purposes, (hereinafter referred to as the "Road"), subject to a non-exclusive easement of ingress and egress in the entire Road in the event of a subsequent partition;

3. A one-half (½) undivided interest in any other easements of ingress and egress appurtenant to either Tract A or to the real property described in Exhibit B, which is attached hereto and incorporated herein for all pertinent purposes (hereinafter referred to as "Tract B"); and

4. A nonexclusive easement of ingress and egress sixty (60) feet in width lying south of and adjacent to the northern boundary of Tract B and running from the eastern boundary of Tract B to a point where the northern boundary of Tract B intersects with the western boundary of any easement of ingress and egress to and from Tract B to U.S. Highway 290.

Said real property interests are hereinafter referred to collectively as the "Property."

This conveyance is expressly made and accepted subject to all valid and subsisting liens, leases of surface acreage, oil, gas, and mineral leases, all prior mineral conveyances of any nature, easements, restrictions, reservations, covenants, conditions and other matters relating to the Property to the extent that the same are valid and enforceable against said Property, as same are shown by instruments filed for record in the office of the County Clerk of Hays County, Texas, or as same are evident upon inspection of the Property.

TO HAVE AND TO HOLD the Property, together with all and singular the rights and appurtenances thereto in anywise belonging, subject to the foregoing terms and provisions, unto the said Grantee, its successors and/or assigns forever; and Grantors do hereby bind Grantors' heirs, executors, administrators, successors and/or assigns, to WARRANT AND FOREVER DEFEND all and singular the Property, subject, however, as aforesaid, unto the said Grantee, its successors and/or assigns, against every person whomsoever claiming or to claim the same or any part thereof, by, through or under Grantors, but not otherwise.

EXECUTED this 23rd day of October, 2000.

Hardy Evans Thompson Jr.

Hardy E. Thompson, Jr.

Patty King Thompson

Patty King Thompson

STATE OF TEXAS §
§
COUNTY OF TRAVIS §

The foregoing instrument was acknowledged before me on the 23rd day of October, 2000, by **Hardy E. Thompson, Jr.**

Thomas O. Barton

Notary Public, State of Texas

THOMAS O. BARTON
NOTARY PUBLIC
State of Texas
Comm. Exp. 06-23-2001

STATE OF TEXAS §
§
COUNTY OF TRAVIS §

The foregoing instrument was acknowledged before me on the 23rd day of October, 2000, by **Patty King Thompson**.

Thomas O. Barton

Notary Public, State of Texas

THOMAS O. BARTON
NOTARY PUBLIC
State of Texas
Comm. Exp. 06-23-2001

After Recording Return To:

Thomas O. Barton
McGinnis, Lochridge & Kilgore, L.L.P.
919 Congress Ave., Suite 1300
Austin, Texas 78701

EXHIBIT A

79.61 acres of land out of and a part of quarter section No. 15 of the B. F. Hanna League, situated in Hays County, Texas, said 79.61 acre tract being more particularly described as being a portion of that certain 159.0 acre tract of land conveyed from Katherine Roberts, a widow, to Hardy E. Thompson, and wife Patty Thompson by deed of record in Volume 239, Pages 521-524 of the Deed Records of Hays County, Texas, said 79.61 acre tract being more fully described by metes and bounds as follows

Beginning at a steel pin found at a fence corner at the northeast corner of said quarter section No. 15, same being the common corner of quarter sections No. 14, 15, 16, and 17 of said Hanna League, for the northeast corner of the tract herein described, said point also being the northeast corner of said 159.0 acre tract;

THENCE with the fence along the common line of said quarter sections No. 14 and 15, same being the east line of said 159.0 acre tract, S 00°06'E 2983.98 feet to a steel pin set at a fence corner post for the southeast corner of the tract herein described;

THENCE with a new fence along the south line of this Survey S 88°12'W 1243.27 feet to a steel pin set a fence corner for the southwest corner of the tract herein described:

THENCE with the west line of this survey the following three (3) courses;

1. N 17°46'E, with a fence, 882.44 feet to a steel pin set at a fence corner;
2. N 20°12'W, leaving said fence, 1048.31 feet to a steel pin set at a fence corner;
3. N 11°45'E, with a fence, 1190.68 feet to a steel pin set at a fence corner in the north line of said 159.0 acre tract for the northwest corner of the tract herein described;

THENCE with the fence along the north line of said 159.0 acre tract N 88°15'E 1087.93 feet to the place of BEGINNING containing 79.61 acres of land.

EXHIBIT A

79.39 acres of land out of and a part of quarter section No. 15 of the B. F. Hanna League, and a portion of the A. J. Holford Survey, situated in Hays County, Texas, said 79.39 acre tract being more particularly described as being a portion of that certain 159.0 acre tract of land conveyed from Katherine Roberts, a widow, to Hardy E. Thompson, and wife Patty Thompson by deed of record in Volume 239, Pages 521-524 of the Deed Records of Hays County, Texas, said 79.39 acre tract being more fully described by metes and bounds as follows:

BEGINNING at a steel pin found at a fence corner at the northwest corner of said 159.0 acre tract for the northwest corner of the tract herein described;

THENCE with the fence along the north line of said 159.0 acre tract the following two (2) courses;

1. N 89°44'E 832.80 feet to an iron stake found at a bend in said fence at a fence corner on the east side of a gate;
2. S 88°52'E 426.95 feet to a steel pin set at a fence corner for the northeast corner of the tract herein described;

THENCE with the east line of this survey the following three (3) courses;

1. S 11°45'W, with a fence, 1190.68 feet to a steel pin set at a fence corner;
2. S 20°12'E, leaving said fence, 1048.31 feet to a steel pin set at a fence corner;
3. S 17°46'W, with a fence, 882.44 feet to a steel pin set at a fence corner for the southeast corner of the tract herein described;

THENCE with a new fence along the south line of this survey N 89°59'W 571.9 feet to a steel pin found at the top of a bluff;

THENCE continue with the fence along the south line of said 159.0 acre tract N 83°00'W 233.9 feet to a steel pin at a fence corner for the southwest corner of the tract herein described, same being the southwest corner of said 159.0 acre tract;

THENCE with the fence along the west line of said 159.0 acre tract the following twelve (12) courses;

1. N 01°12'W 71.2 feet;
2. N 37°07'W 383.7 feet;
3. N 15°10'W 92.6 feet;
4. N 53°25'E 44.2 feet;
5. N 18°26'W 157.4 feet;
6. N 01°23'W 32.74 feet;
7. N 12°00'W 230.6 feet;
8. N 02°15'W 263.5 feet;
9. N 10°36'E 131.8 feet
10. N 01°54'E 406.5 feet;
11. N 02°44'W 214.3 feet;
12. N 00°11'W 1052.3 feet to the place of BEGINNING Containing 79.39 acres of land.

A 4.25 acre tract of land out of and a part of Quarter Section, Numbers 14 and 17 of the B. F. Hanna League, situated in Hays County, Texas, being more particularly described as being part of those certain two tracts of land that were conveyed to Clayton S. Brown and wife, Henry Louise Brown, by deeds of record in Volume 166, Page 264-266 and Volume 268, Page 594-596 of the Hays County, Texas Deed Records, said 4.25 acre tract being more fully described by metes and bounds as follows:

BEGINNING at a steel pin set at a corner fence post at the southwest corner of the above said Quarter Section No. 17, it being also the southwest corner of that certain 160.0 acre tract conveyed to Clayton S. Brown by the above said deed of record in Volume 166, Pages 264-266 of the Hays County, Texas Deed Records;

THENCE with the fence along the west line of the Clayton S. Brown 160.0 acre tract, North 2993.2 feet to a corner fence post set in concrete in the south line of Highway No. 290 for the northwest corner of the 4.25 acre tract herein described;

THENCE with the south line of Highway No. 290, S 89°33'E, 60.0 feet to a steel pin set for the northeast corner of this 4.25 acre tract;

THENCE South 2990.0 feet to a steel pin set in the common line between said Quarter Sections 14 and 17, said steel pin being also in the north line of that certain 23.0 acre tract of land that was conveyed to Clayton S. Brown by the above said deed found of record in Volume 268, Pages 594-596 of the Hayes County, Texas Deed Records;

THENCE S 0°06'E, 100.00 feet to a steel pin set for the southeast corner of this 4.25 acre tract;

THENCE S 88°15'W, 56.0 feet to a steel pin in the fence on the east line of that certain 159.0 acre tract of land that was conveyed to Hardy E. Thompson and wife, Patty Thompson by deed of record in Volume 239, pages 521-524 of the Hays County, Texas Deed Records;

THENCE with the fence between the said Clayton S. Brown 23.0 acre tract and the said Hardy E. Thompson 159.0 acre tract, N 0°06'E, 100.0 feet to a steel pin found at a fence corner at the northeast corner of said Thompson 159.0 acre tract, said point being also the northwest corner of the above said Clayton S. Brown 23.0 acre tract;

THENCE S 88°15'W, 4.0 feet to the place of beginning; and containing 4.25 acres of land.

EXHIBIT C

Doc	Bk	Vol	Pg
00025538	OPR	1733	761

FILED AND RECORDED
OFFICIAL PUBLIC RECORDS
On: Oct 26,2000 at 03:09P

Document Number: 00025538

Amount 21.00

By
Lynn Curry
Lee Carlisle, County Clerk
Hays County

Exhibit K

To: Jamie Rose

From: Chad Gilpin, P.E., City Engineer; Laura Mueller, City Attorney

Date: May 2, 2024

RE: Takings Impact Assessment for Required Infrastructure for the Hardy Tract

INTRODUCTION

The City of Dripping Springs has required, due to site development and fire requirements, that the project commonly known as the Hardy Tract build a road as specified in Exhibit "A." The property owner has requested a Takings Impact Assessment related to this requirement. For the City to impose this requirement it must show that "the required dedication is related both in nature and extent to the project's anticipated impact, though a precise mathematical calculation is not required."[1] This assessment will show that the road requirement is roughly proportional to the impact of the Bunker Ranch/Hardy Tract project.

REQUIREMENTS

The City, in consultation with the Fire Department (North Hays County Fire – ESD), requires a minimum twenty-six (26) foot roadway and a five (5) foot sidewalk on one side. This was based on the representation by the developer that multi-family may be placed on the tract. If no multi-family is on the tract, the roadway only must be twenty-four (24) feet. This is a fire requirement. Section 11.3.4 of the City Subdivision Ordinance requires all subdivisions with fifty (50) or more lots or units have at least two points of vehicular access and must be connected via improved roadways. The standard is to require sidewalks on both sides of the roadway, but the City waived the requirement for the second side on request of the developer in return for payment of fee-in-lieu. In addition, drainage improvements are required, but are only those needed to meet the Water Quality and Drainage mitigation as required by the Water Quality Ordinance Article 22.05.[2] The extent of the drainage improvements are only those that directly affect the required roadway and the sidewalk. These improvements are not required to be oversized for any other development.

The purpose of requiring two points of vehicular access is to provide safety and adequate traffic circulation to the residents of the subdivision. The subdivision ordinance is attached as Exhibit "A." The requirement of adequate drainage and water quality is to ensure that any required or planned improvements do not burden other private or public parties with adverse stormwater flows. In addition, it aids in protecting all waterways in the area from pollutants. The Ordinance adopted Article 22.05 is attached to this assessment as Exhibit "C." The remoteness requirement is from the Fire Code Section D106.3. It is attached as Exhibit "B." These required improvements

[1] *Dolan v. City of Tigard*, 512 U.S. 374, 391 (1994).

[2] All references to Ordinances or Sections are to the City of Dripping Springs Code of Ordinances unless otherwise stated. City of Dripping Springs Code of Ordinances are available on the City's website and municode.com.

are reasonably related to and accomplish the legitimate municipal goal of public safety while ensuring that neighboring properties are not burdened by new development.

The roadway only needs to be twenty-four (24) feet in width unless multi-family is built adjacent to the roadway. This is the minimum for any subdivision within the City of Dripping Springs. Fire requires twenty-six (26) feet if there will be multi-family.

IMPACT OF DEVELOPMENT

The Hardy Tract will add an additional seventy-five lots. In addition, the development is seventy-eight acres. This roadway is only for the residents of this development and does not have to be open to the public. In addition, the City is not asking that it be oversized to meet the needs of the public in general, only to meet the minimum city and fire requirements. Detention and Water Quality are required by the Hardy Tract subdivision to mitigate increased flows to neighboring properties caused by the roadway. The issue of the expense of the drainage is the fact that the second access point, the roadway in question, is between two parcels that are currently not owned by the developer. This requires that the drainage, sidewalk, and roadway must be included in their owned property.

DISCUSSION AND ANALYSIS

The requirements the City and Fire require are the minimum for roads and drainage for any residential development. In addition, the minimum normally required for a sidewalk on a two-lane rural roadway (which is the roadway required by the City) is five feet on both sides. The City waived the requirement that the sidewalk be on both sides, instead only requiring it on one side. These requirements are required for safety and are also sized to an extent appropriate to a development of this size. The nature of a subdivision as proposed is a two-lane rural road with sidewalks including adequate drainage.

ALTERNATIVES

The development could build a second point of access in another part of the development. In addition, the City has offered to review the possibility of allowing drainage to be stored on an adjacent agricultural lot. Finally, the developer could also appeal the partial waiver of the sidewalk to the Planning & Zoning Commission.

CONCLUSION AND RECOMMENDATIONS

The City and Fire is open to limiting the roadway to twenty-four feet so long as no multi-family is built in this development or adjacent to this roadway. If any other variances or waivers are requested, or decisions to be appealed, the processes must be followed. The City is not requiring that the development pay for any additional city infrastructure or fees that are not the minimum required by the number of lots and acres within this subdivision. The Hardy Drive and related infrastructure is not for the public or the City, it is solely to benefit the safety of the future residents of the proposed development.

Exhibit L

HARDY ROAD PROJECT WITH THE SIDEWALK

HARDY ROAD **12/4/24**

Civil Improvements

Item	Unit	QTY	PRICE	2023 TOTAL	12/24 TOTAL
Mobilization	EA	1	$ 50,000.00	$ 7,500	$ 8,625.0
Surveying and Layout	EA	1	$ 45,000.00	$ 45,000	$ 51,750.0
Clearing	EA	1	$ 13,000.00	$ 13,000	$ 14,950.0
Silt Fence	LF	5000	$ 3.75	$ 18,750	$ 21,562.5
Rock Berm	LF	150	$ 30.00	$ 4,500	$ 5,175.0
*Revegetation	EA	1	$ 35,000.00	$ 35,000	$ 40,250.0
SUB_TOTAL				**$ 123,750**	**$ 142,312.5**

Street Improvements

Item	Unit	QTY	PRICE	2023 TOTAL	12/24 TOTAL
Street Embankment Material	CT	20388	$18	$ 366,978	$ 422,024
Site Equipment	EA	1	$375,000	$ 375,000	$ 431,250
Subgrade Preperation	CT	20388	$ 5.00	$ 101,938	$ 117,229
Street Signs	EA	1	$ 5,000.00	$ 5,000	$ 5,750
Limestone Butterstick Blocks	ea	5155	$ 150.00	$ 773,190	$ 889,169
Footing Allowance	ea		$ 175,000.00	$ 175,000	$ 201,250
Handrail Allowance	lf	1400	$ 95.00	$ 133,000	$ 152,950
Testing Allowance		1	$ 55,000.00	$ 55,000	$ 63,250
Haull Off Allowance	EA	1	$ 50,000.00	$ 50,000	$ 57,500
Tree Disposal	EA	1	$ 25,000.00	$ 25,000	$ 28,750
SUB-TOTAL				**$ 2,060,106**	**$ 2,369,122**

Concrete

6" Concrete Allowance	SF	81900	$ 11.00	$ 900,900	$ 1,036,035
Sidewalk Allowance	SF	15750	$ 5.00	$ 78,750	$ 90,563
Retaining Wall Allowance				$ 300,000	$ 345,000
SUB-TOTAL				**$ 1,279,650**	**$ 1,471,598**

Drainage Improvements

Item	Unit	QTY	PRICE	2023 TOTAL	12/24 TOTAL
HDPE	EA	1	$ 135,777	$ 135,777	$ 156,144
6x4 Grate Inlet	EA	5	$ 13,000	$ 65,000	$ 74,750
5x5 grate inlets	EA	3	$ 9,500	$ 28,500	$ 32,775
4x4 Grate Inlets	EA	2	$ 5,600	$ 11,200	$ 12,880
3x3 grate inlets	EA	10	$ 3,250	$ 32,500	$ 37,375
2.5x2.5 grate inlets	EA	9	$ 2,400	$ 21,600	$ 24,840
2x2 Grate Inlets	EA	1	$ 1,600	$ 1,600	$ 1,840
Misc Parts		1	$ 35,000	$ 35,000	$ 40,250
5' Curb Inlet	EA	2	$ 8,250	$ 16,500	$ 18,975
					$ -
DRAINAGE GRADING	EA	1	$ 75,000	$ 75,000	$ 86,250
					$ -
Pond Allowance	EA	4	$ 50,000	$ 200,000	$ 230,000
					$ -
Underground Detention System	EA	1	$ 275,000	$ 275,000	$ 316,250
SUB-TOTAL				**$ 897,677**	**$ 1,032,329**

Supervision

Project Manager				$ 75,000	$ 86,250
Superintendent				$ 125,000	$ 143,750
Overhead				$ 75,000	$ 86,250
GC Fee				$ 500,000	$ 575,000
Onsite Engineer				$ 150,000	$ 172,500
SUB-TOTAL				**$ 925,000**	**$ 1,063,750**

Sidewalk Fee in Lue				**$ 185,700**	**$ 185,700**

Item	Unit	QTY	PRICE	2023 TOTAL	12/24 TOTAL
ROAD ESTIMATE				**$5,471,183**	**$ 6,264,810**

Exhibit M

HARDY ROAD PROJECT WITHOUT THE SIDEWALK

HARDY ROAD **12/4/24**

Civil Improvements

Item	Unit	QTY	TOTAL 12/24
Mobilization	EA	1	$ 8,250.0
Surveying and Layout	EA	1	$ 49,500.0
Clearing	EA	1	$ 14,300.0
Silt Fence	LF	5000	$ 20,625.0
Rock Berm	LF	150	$ 4,950.0
*Revegetation	EA	1	$ 38,500.0
SUB_TOTAL			**$ 136,125.0**

Street Improvements

Item	Unit	QTY	TOTAL 12/24
Street Embankment Material	CT	20388	$ 238,535
Site Equipment	EA	1	$ 243,750
Subgrade Preperation	CT	20388	$ 66,260
Street Signs	EA	1	$ 3,250
Limestone Butterstick Blocks	ea	5155	$ 502,574
Footing Allowance	ea		$ 113,750
Handrail Allowance	lf	1400	$ 86,450
Testing Allowance		1	$ 35,750
Haull Off Allowance	EA	1	$ 32,500
Tree Disposal	EA	1	$ 16,250
SUB-TOTAL			**$ 1,339,069**

Concrete

6" Concrete Allowance	SF	81900	$ 990,990
Sidewalk Allowance	SF	15750	$ -
Retaining Wall Allowance			
SUB-TOTAL			**$ 990,990**

Drainage Improvements

Item	Unit	QTY	TOTAL 12/24
HDPE	EA	1	$ 88,255
6x4 Grate Inlet	EA	5	$ 42,250
5x5 grate inlets	EA	3	$ 18,525
4x4 Grate Inlets	EA	2	$ 7,280
3x3 grate inlets	EA	10	$ 21,125
2.5x2.5 grate inlets	EA	9	$ 14,040
2x2 Grate Inlets	EA	1	$ 1,040
Misc Parts		1	$ 22,750
5' Curb Inlet	EA	2	$ 10,725
			$ -
DRAINAGE GRADING	EA	1	$ 48,750
			$ -
Pond Allowance	EA	4	$ 130,000
			$ -
Underground Detention System	EA	1	$ 178,750
			$ -
SUB-TOTAL			**$ 583,490**

Supervision

Project Manager			$ 82,500
Superintendent			$ 137,500
Overhead			$ 82,500
GC Fee			$ 550,000
Onsite Engineer			$ 165,000
SUB-TOTAL			**$ 1,017,500**

Sidewalk Fee in Lue **$ 185,700**

	TOTAL 12/24
ROAD ESTIMATE	**$ 4,252,874**

Exhibit N

GT GreenbergTraurig

Jamie A Rose
Tel 512.320.7281
Fax 512.320.7210
Jamie.Rose@gtlaw.com

April 3, 2024

Laura Mueller
City Attorney
Dripping Springs, Texas
511 Mercer Street
Dripping Springs, Texas 78620

Via email:
lmueller@cityofdrippingsprings.com

Re: Project No. SUB2023-0042, Hardy subdivision construction plans (the "Hardy Development"); and Project No. SD2022-0025, site development plans for the Hardy Driveway (the "Hardy Driveway")

Dear Ms. Mueller:

This firm represents Hardy T. Land, LLC and Bunker Ranch, LLC in regards to the above projects and specifically unreasonable conditions the City of Dripping Springs (the "City") has imposed on the approval of the Hardy Driveway site development plans – and by extension on the approval of the subdivision plat for the Hardy Development – which constitute exactions and a regulatory taking without proper compensation in violation of Local Government Code §212.904 and other applicable law. My clients' efforts to reach an amicable resolution of these issues have been unsuccessful to date. We are prepared to engage with the City to promptly resolve this matter. We have been instructed to pursue all appropriate legal remedies on behalf of the client starting with an application for determination under Local Government Code §212.904 and with obtaining the City's takings impact assessment required by Government Code §2007.043.

Please accept this letter as Hardy T. Land, LLC's (i) request under the Texas Public Information Act for all reports, evaluations, and other information the City maintains, or has access to, that demonstrates that "rough proportionality" test required by Local Government Code §212.904 has been met for its property, (ii) request under the Texas Public Information Act for all reports, evaluations, and other information the City maintains, or has access to, that constitute, support, reference or demonstrate the City's taking impact analysis under §2007.043 of the Government Code, (iii) request for determination under §212.904(a) of the Local Government Code, (iv) request for the City's takings impact analysis under §2007.043 of the Government Code, and (v) request for determination as to whether, pursuant to the current Interlocal Cooperation Agreement Between Hays County and the City of Dripping Springs, the City has assumed exclusive responsibility for approving the Hardy Driveway site development plans, such that my client does not have to seek the same approvals from the County.

The City has conditioned its approval of the client's subdivision plat for the Hardy Development on my client's construction and funding of extensive and costly improvements to an existing private driveway, which the City is requiring to be improved as a secondary point of access to the proposed Hardy Development consisting of approximately 78 acres and 72 lots. The City's requirements for the Hardy Driveway include significant expansion of the road, and construction of extensive and costly infrastructure for drainage and water flow, as well as sidewalks, all of which have little or no discernable relationship to the impact of the proposed subdivision development, and which are estimated to cost between $4,142,747 and $4,350,131.76, destroying the economic viability of the Hardy Development. Bear in mind, the Hardy Driveway (i) is not situated within the Hardy Development, (ii) is in the City's extra-territorial jurisdiction ("ETJ"), and (iii) is co-owned by Hardy T. Land, LLC as a tenant in common with an unaffiliated, third-party landowner.

The City has never offered engineering or other data that would explain how its position that Hardy T. Land, LLC must pay for such extensive improvements to the private driveway meets the "rough proportionality" standard required by Local Government Code §212.904, and we do not believe a legitimate explanation exists. For example, the available water flow information indicates that the subdivision to the south would not be affected by the addition of culverts, storm drains, and other drainage requirements that are not already in place, as the water flowing to the driveway is flowing west to east, not south. Additionally, the required sidewalks extend to undeveloped regions, implying no foreseeable increase in connectivity or community integration. In fact, the adjacent Bunker Ranch subdivision has no such sidewalks. Further, a traffic impact analysis ("TIA") for the proposed subdivision demonstrates that Bunker Ranch Boulevard (being the primary, existing point of vehicular access to the subdivision) can support the anticipated traffic arising from the proposed subdivision.

The City is mechanically applying UDC 11.3.4, requiring two points of vehicular access to all subdivisions with 50 or more lots. However, the City's engineer has the ability to waive the requirement of a second point of access, and the Hardy Driveway could be minimally improved to provide emergency access for public safety vehicles without the onerous requirements the City seeks to impose. In fact, comparing the treatment of the adjacent Arrowhead subdivision, which consists of more than 400 lots and has one entrance and one exit, casts considerable doubt on any necessity and reasonableness of the onerous requirements of secondary access being imposed in the instant case.

In sum, we think the City can and should proceed with a far less onerous development plan for the Hardy Driveway, consistent with the unified development code, and my client has made various proposals to no avail. However, we intend to ensure that the City must bear its proportionate cost, and compensate my client, for the exactions and regulatory takings imposed by the City on Hardy T. Land's projects.

We look forward to receiving the materials requested herein and, provided we can do so without delay, working with you to reach an amicable resolution of this matter. I am happy to have a preliminary call with you to discuss the foregoing in advance of a call that includes staff, engineers, clients, etc. If that would be helpful, please let me know your availability.

Sincerely,

/s/ Jamie A. Rose
Jamie A. Rose
Shareholder

JAR:cs

cc: Steve Harren
Jim Boushka
Sue Savage
Joe Shaneyfelt (firm)

Andrea Cunningham, City Secretary & Records Management Officer, City of Dripping Springs, via email: acunningham@cityofdrippingsprings.com

Exhibit O

Dominguez, Sylvia (LSS-AUS-LT)

From: Laura Mueller <lmueller@cityofdrippingsprings.com>
Sent: Monday, September 16, 2024 2:11 PM
To: Rose, Jamie (Shld-AUS-LT)
Cc: Shaneyfelt, Joe (Assoc-AUS-LT); ssavage@hsvllp.com
Subject: RE: Hardy Driveway; Hardy Subdivision

Thank you for reaching out. We do not have an established procedure for this so we will treat this like other planning appeals.

1. Submit your written appeal two Fridays before the Tuesday meetings so that it can be placed on the agenda in accordance with our approved agenda policy.
    a. October 1, 2024 Meeting – need appeal by September 20, 2024
    b. October 15, 2024 Meeting – need appeal by October 4, 2024
    c. November 5, 2024 Meeting – need appeal by October 25, 2024
2. All backup materials (other than the meeting presentation) is due the Wednesday before the meeting.
    a. October 1, 2024 Meeting – need materials by September 25, 2024
    b. October 15, 2024 Meeting – need materials by October 9, 2024
    c. November 5, 2024 Meeting – need materials by October 30, 2024.
3. Presentation is due 5 p.m. the day before the Meeting.

This will be an evidentiary hearing will you all will be able to make a presentation on the analysis. Afterwards, the City Council will have 30 days to issue a written decision on the appeal.

Submit your appeal to planning@cityofdrippingsprings.com.

Please let me know if you have any questions.

DRIPPING SPRINGS
Texas
Open spaces, friendly faces.

Laura Mueller
City Attorney

lmueller@cityofdrippingsprings.com
512.858.4725 City Hall

511 Mercer Street • PO Box 384
Dripping Springs, TX 78620

cityofdrippingsprings.com

From: Jamie.Rose@gtlaw.com <Jamie.Rose@gtlaw.com>
Sent: Monday, September 16, 2024 10:37 AM
To: Laura Mueller <lmueller@cityofdrippingsprings.com>
Cc: Joe.Shaneyfelt@gtlaw.com; ssavage@hsvllp.com
Subject: RE: Hardy Driveway; Hardy Subdivision

Laura – following up on the email below, and the procedures that will apply to the appeal of the Takings/Rough Proportionality assessment.

Jamie Rose
Shareholder

Greenberg Traurig, LLP
300 West 6th Street, Suite 2050 | Austin, Texas 78701
T +1 512.320.7281 | F +1 512.320.7210
Jamie.Rose@gtlaw.com | www.gtlaw.com | View GT Biography

From: Laura Mueller <lmueller@cityofdrippingsprings.com>
Sent: Friday, September 6, 2024 2:32 PM
To: Rose, Jamie (Shld-AUS-LT) <Jamie.Rose@gtlaw.com>
Cc: Shaneyfelt, Joe (Assoc-AUS-LT) <Joe.Shaneyfelt@gtlaw.com>; ssavage@hsvllp.com
Subject: RE: Hardy Driveway; Hardy Subdivision

EXTERNAL TO GT

Jamie,

There is no appeal from the variances. You can appeal the takings assessment to City Council. I will see if there are any requirements for this appeal, and I will let you know next week.

Sincerely,

Laura Mueller
City Attorney

lmueller@cityofdrippingsprings.com
512.858.4725 City Hall

511 Mercer Street • PO Box 384
Dripping Springs, TX 78620

cityofdrippingsprings.com

From: Jamie.Rose@gtlaw.com <Jamie.Rose@gtlaw.com>
Sent: Friday, September 6, 2024 1:16 PM
To: Laura Mueller <lmueller@cityofdrippingsprings.com>
Cc: Joe.Shaneyfelt@gtlaw.com; ssavage@hsvllp.com
Subject: Hardy Driveway; Hardy Subdivision

Laura –

Please confirm that there is no further right of appeal from the P&Z decisions on the appeals/variances heard last week. Assuming that is the case, my clients want to appeal the Takings Impact Assessment and request a hearing before Council on the matter. Please advise of the procedures that will apply to that appeal.

Regards,

Jamie Rose
Shareholder

Greenberg Traurig, LLP
300 West 6th Street, Suite 2050 | Austin, Texas 78701

T +1 512.320.7281 | F +1 512.320.7210
Jamie.Rose@gtlaw.com | www.gtlaw.com | View GT Biography

GT GreenbergTraurig

Dominguez, Sylvia (LSS-AUS-LT)

From: Laura Mueller <lmueller@cityofdrippingsprings.com>
Sent: Wednesday, January 8, 2025 3:11 PM
To: Rose, Jamie (Shld-AUS-LT)
Cc: Sgovio, Sydney (Assoc-AUS-LT); Aniz Alani
Subject: RE: Hardy T Land Subdivision / Hardy Driveway
Attachments: Takings Assessment Procedures.pdf

Jamie,

In advance of our meeting today, I wanted to send you the Appeal Procedures City Council adopted last night.

Sincerely,

DRIPPING SPRINGS
Texas

Laura Mueller
City Attorney
lmueller@cityofdrippingsprings.com
512.858.4725 City Hall
511 Mercer Street • PO Box 384
Dripping Springs, TX 78620
cityofdrippingsprings.com

From: Jamie.Rose@gtlaw.com <Jamie.Rose@gtlaw.com>
Sent: Tuesday, January 7, 2025 10:00 AM
To: Laura Mueller <lmueller@cityofdrippingsprings.com>
Cc: Sydney.Sgovio@gtlaw.com
Subject: RE: Hardy T Land Subdivision / Hardy Driveway

Laura – could you do 3:30pm (or another time in the afternoon) tomorrow?

Jamie Rose
Shareholder

Greenberg Traurig, LLP
300 West 6th Street, Suite 2050 | Austin, Texas 78701
T +1 512.320.7281 | F +1 512.320.7210
Jamie.Rose@gtlaw.com | www.gtlaw.com | View GT Biography

GT GreenbergTraurig

From: Laura Mueller <lmueller@cityofdrippingsprings.com>
Sent: Monday, January 6, 2025 4:38 PM
To: Rose, Jamie (Shld-AUS-LT) <Jamie.Rose@gtlaw.com>
Cc: Sgovio, Sydney (Assoc-AUS-LT) <Sydney.Sgovio@gtlaw.com>
Subject: Re: Hardy T Land Subdivision / Hardy Driveway

Yes. Tomorrow. I can do 2p or 330p. I also have availability on Wednesday or Thursday if those times don't work.

Get Outlook for iOS

From: Jamie.Rose@gtlaw.com <Jamie.Rose@gtlaw.com>
Sent: Monday, January 6, 2025 12:35:19 PM
To: Laura Mueller <lmueller@cityofdrippingsprings.com>
Cc: Sydney.Sgovio@gtlaw.com <Sydney.Sgovio@gtlaw.com>
Subject: RE: Hardy T Land Subdivision / Hardy Driveway

Laura – do you have time to confer this afternoon or tomorrow regarding this matter?

Jamie Rose
Shareholder

Greenberg Traurig, LLP
300 West 6th Street, Suite 2050 | Austin, Texas 78701
T +1 512.320.7281 | F +1 512.320.7210
Jamie.Rose@gtlaw.com | www.gtlaw.com | View GT Biography

GT GreenbergTraurig

From: Laura Mueller <lmueller@cityofdrippingsprings.com>
Sent: Monday, December 16, 2024 1:22 PM
To: Rose, Jamie (Shld-AUS-LT) <Jamie.Rose@gtlaw.com>
Cc: Sgovio, Sydney (Assoc-AUS-LT) <Sydney.Sgovio@gtlaw.com>
Subject: RE: Hardy T Land Subdivision / Hardy Driveway

Wednesday, January 15 for Backup Materials.
5 p.m. on January 20th should be fine.

Sincerely,

DRIPPING SPRINGS
Texas

Laura Mueller
City Attorney
lmueller@cityofdrippingsprings.com
512.858.4725 City Hall
511 Mercer Street • PO Box 384
Dripping Springs, TX 78620
cityofdrippingsprings.com

From: Jamie.Rose@gtlaw.com <Jamie.Rose@gtlaw.com>
Sent: Monday, December 16, 2024 11:38 AM
To: Laura Mueller <lmueller@cityofdrippingsprings.com>
Cc: Sydney.Sgovio@gtlaw.com
Subject: RE: Hardy T Land Subdivision / Hardy Driveway

Laura –

We want to confirm the deadlines associated with the January 21 Council Meeting.

All backup materials due on Monday, January 13
Presentation due at 5:00 pm on Monday, January 20 **this is MLK Day, so we want to double check this deadline*

Thanks,

Jamie Rose
Shareholder

Greenberg Traurig, LLP
300 West 6th Street, Suite 2050 | Austin, Texas 78701
T +1 512.320.7281 | F +1 512.320.7210
Jamie.Rose@gtlaw.com | www.gtlaw.com | View GT Biography

From: Laura Mueller <lmueller@cityofdrippingsprings.com>
Sent: Thursday, December 12, 2024 11:14 AM
To: Rose, Jamie (Shld-AUS-LT) <Jamie.Rose@gtlaw.com>
Subject: RE: Hardy T Land Subdivision / Hardy Driveway

I'll move it.

DRIPPING SPRINGS
Texas

Laura Mueller
City Attorney

lmueller@cityofdrippingsprings.com
512.858.4725 City Hall

511 Mercer Street • PO Box 384
Dripping Springs, TX 78620

cityofdrippingsprings.com

From: Jamie.Rose@gtlaw.com <Jamie.Rose@gtlaw.com>
Sent: Thursday, December 12, 2024 11:05 AM
To: Laura Mueller <lmueller@cityofdrippingsprings.com>
Subject: RE: Hardy T Land Subdivision / Hardy Driveway

We need to shift to January 21. Amended notice coming.

Thanks,

Jamie Rose
Shareholder

Greenberg Traurig, LLP
300 West 6th Street, Suite 2050 | Austin, Texas 78701
T +1 512.320.7281 | F +1 512.320.7210
Jamie.Rose@gtlaw.com | www.gtlaw.com | View GT Biography

From: Laura Mueller <lmueller@cityofdrippingsprings.com>
Sent: Wednesday, December 11, 2024 2:04 PM
To: Rose, Jamie (Shld-AUS-LT) <Jamie.Rose@gtlaw.com>
Cc: Shaneyfelt, Joe (Assoc-AUS-LT) <Joe.Shaneyfelt@gtlaw.com>; Sgovio, Sydney (Assoc-AUS-LT) <Sydney.Sgovio@gtlaw.com>
Subject: RE: Hardy T Land Subdivision / Hardy Driveway

EXTERNAL TO GT

Okay.

Laura Mueller
City Attorney
lmueller@cityofdrippingsprings.com
512.858.4725 City Hall
511 Mercer Street • PO Box 384
Dripping Springs, TX 78620
cityofdrippingsprings.com

From: Jamie.Rose@gtlaw.com <Jamie.Rose@gtlaw.com>
Sent: Wednesday, December 11, 2024 11:03 AM
To: Laura Mueller <lmueller@cityofdrippingsprings.com>
Cc: Joe.Shaneyfelt@gtlaw.com; Sydney.Sgovio@gtlaw.com
Subject: RE: Hardy T Land Subdivision / Hardy Driveway

Laura – I may have a snag on January 7. Please hold and let me confirm if that date works or we need to do January 21.

Thanks,

Jamie Rose
Shareholder

Greenberg Traurig, LLP
300 West 6th Street, Suite 2050 | Austin, Texas 78701
T +1 512.320.7281 | F +1 512.320.7210
Jamie.Rose@gtlaw.com | www.gtlaw.com | View GT Biography

GT GreenbergTraurig

From: Rose, Jamie (Shld-AUS-LT) <Jamie.Rose@gtlaw.com>
Sent: Tuesday, December 10, 2024 4:34 PM
To: Laura Mueller <lmueller@cityofdrippingsprings.com>
Cc: Shaneyfelt, Joe (Assoc-AUS-LT) <Joe.Shaneyfelt@gtlaw.com>; Sgovio, Sydney (Assoc-AUS-LT) <Sydney.Sgovio@gtlaw.com>
Subject: Hardy T Land Subdivision / Hardy Driveway

Laura – please see attached revised Notice of Appeal for the January 7, 2025 Council Meeting.

Thanks,

Jamie Rose
Shareholder

Greenberg Traurig, LLP
300 West 6th Street, Suite 2050 | Austin, Texas 78701
T +1 512.320.7281 | F +1 512.320.7210
Jamie.Rose@gtlaw.com | www.gtlaw.com | View GT Biography

GT GreenbergTraurig

DECLARATION OF MICHAEL THEONE

Pursuant to Section 132.001 of the Texas Civil Practice and Remedies Code, Declarant Michael Theone hereby makes the following declaration under penalty of perjury:

1. My name is Michael Theone. I am over the age of eighteen and am fully competent to make this declaration. The facts stated in this declaration are true and correct and based upon my personal knowledge and/or experience.

2. This Declaration is given on behalf of Hardy T Land, LLC in support of its Appeal of the May 2, 2024 Takings Impact Assessment for Requested Infrastructure for the Hardy Tract, from Chad Gilpin, P.E., City Engineer, relating to Project No. SUB2023-0042 (known as the "Hardy Subdivision") and Project No. SD2022-0025 (known as the "Hardy Driveway").

3. I have eight (8) years of experience as a Professional Engineer, Texas License No. 142972, with the following certifications: 1.4.1 Land Planning/Engineering, TxDot; 4.2.1 Roadway Design, TxDOT; 17.5.1 Civil Engineering, TxDOT; 18.3.1 Utility Adjustment Coordination, TxDOT; and 18.4.1 Utility Engineering, TxDOT.

4. Currently, I am a Senior Project Manager for Civil & Environmental Consultants, Inc. My project experience focuses on land development that includes site plan design, grading and drainage, water quality, stormwater management, erosion and sedimentation control design, small and large roadway design, utility design / coordination, and traffic control plan design. A copy of my Resume is attached to this Declaration as **Exhibit A.**

5. As one of the project engineers for the Hardy Driveway, I was asked to provide an explanation regarding the engineering complexities and costs associated with constructing a sidewalk along one side of the Hardy Driveway, as currently required by the City.

6. The Hardy Driveway project (SD2022-0025) is located on a 60' wide tract that stretches roughly 3,100 LF from the US HWY 290 right-of-way to the proposed Hardy Subdivision (SUB2023- 0042). Roughly 105 acres of upgradient drainage traverse through the subject tract via existing stormwater culverts. With a relatively narrow tract and large off-site drainage conditions, there are several construction challenges to accommodate the city requirements for drainage analysis points, detention, water quality, and accessibility.

7. The cost of requiring a sidewalk on one side of a long, single road is significantly higher due to the unique challenges associated with water quality, stormwater detention, and off-site drainage routing. When constructing sidewalks on a roadway, the available area for managing stormwater runoff is greatly reduced. This forces designers to look for alternative/atypical solutions, where costs escalate rapidly (drainage swales with stormwater inlet improvements, underground detention, etc.).

8. In a typical roadway project with space to spare, detention ponds, bioswales, or other above-ground stormwater management features can be installed alongside the road. These options are generally more cost-effective and easier to maintain. However, when space is constrained-such as in urban or densely developed corridors-there may not be enough room to implement these above-ground systems or traditional drainage swales. In such cases, stormwater detention and/or water quality treatment must be integrated beneath the road itself, and drainage swales will require extensive stormwater improvements. An example of such a road is attached as **Exhibit B**. These improvements will cause the costs associated with the construction of the sidewalk to substantially increase.

9. This underground approach requires complex engineering solutions. For example, detention vaults, oversized culverts, or modular storage systems need to be buried beneath the

roadway. These systems involve heavy excavation, specialized materials, and the reinforcement of the roadbed to maintain its structural integrity. Furthermore, these installations often require precise grading, advanced filtration technologies, and access points for maintenance, all of which contribute to higher costs.

10. If a sidewalk is required along one side of the Hardy Driveway, this will necessarily result in the road and the sidewalk having to be elevated to accommodate the storage and treatment of stormwater discharge under the roadway. This accommodation of these facilities under the roadway, as well as the increased costs associated with the complex engineering, limited working space, and logistical challenges of doing so, will make this project significantly more expensive than those with more flexible site layouts.

11. I have reviewed the costs that Jim Boushka concludes that the Hardy Driveway Project is expected to incur with and without a sidewalk. I believe Mr. Boushka's conclusions to be reasonable based on my knowledge of the engineered plans and requirements of the City.

My name is Michael Theone, my date of birth is March 23, 1994, and my business address is 1221 S. Mopac Expressway, Suite 350, Austin, Texas 78746. I declare under penalty of perjury that the foregoing is true and correct.

Executed in Travis County, State of Texas, on the 15th day of January 2025

MTheone

_____

Michael Theone

Exhibit A

Michael Theone, P.E.
Senior Project Manager

8 YEARS OF EXPERIENCE

EDUCATION

B.S., Civil Engineering, University of Texas at San Antonio, 2017

My experience in land development includes site plan design, grading and drainage, water quality, stormwater management, erosion and sedimentation control design, small and large roadway design, utility design / coordination, and traffic control plan design. I utilize these skills to ensure my projects stay on budget and on schedule. I understand the importance of being responsive and take pride in maintaining excellent client communication.

PROJECT EXPERIENCE

NFM - Cedar Park, NFM, Cedar Park
Role: Civil PM
118 ac mixed use development with over super-regional destination retail.

Lot 2 - Arrowpoint Subivision, RCPDevco LLC, Cedar Park texas
Role: Civil PM
1 ac pad site development for QSR (shake shack)

Lot 4 - Arrowpoint Subdivision, RCPDevco LLC, Cedar Park texas
Role: Civil PM
Roughly 1.5 ac pad site development with multi-tenant retail building.

Lot 3 Arrowpoint Subdivision, Glen Irby, Cedar Park texas
Role: Civil PM
1 ac pad site development for QSR (black rock coffee)

707 W. Slaughter Lane, Jounreyman Construction inc., Austin Texas
Role: Civil Pm
300 unit multi family development

1208 East Howard Lane, Journeyman Construction INC., Austin Texas
Role: Civil PM
300 unit multifamily development on tract containing floodplains and CEFs

Arrowpoint Subdivision, Realtex Ventures, LP, Cedar Park, Texas
Role: Assistant Project Manager
Mr. Theone served as the sole client contact for the development of a 25 acre commercial subdivision in Cedar Park, Texas. Responsibilities included final design, platting/permitting, construction phase services, and pad site lot marketing assistance. Design activities included extensive site grading, roadway design, detention, water quality management, utility design and franchise utility coordination.

EXPERTISE

Site design. Especially: grading, stormwater management, water quality, and floodplain design

Client and team communication

REGISTRATIONS

Professional Engineer
- TX 142972

CERTIFICATIONS

1.4.1 Land Planning / Engineering, TxDOT

4.2.1 Roadway Design, TxDOT

17.5.1 Civil Engineering, TXDOT

18.3.1 Utility Adjustment Coordination, TxDOT

18.4.1 Utility Engineering, TxDOT

Michael Theone, P.E.

Senior Project Manager

QuikTrip No. 4129, QuikTrip Corporation, Austin, Texas
Role: Assistant Project Manager
Mr. Theone served as Assistant Project Manager for the development of a 21.7 acre tract in Austin, Texas. The development included platting, subdivision improvements, relocation of public storm water infrastructure, and civil site development plans for a proposed QuikTrip store. Responsibilities included site grading, storm water management, water quality, and QuikTrip Prototype coordination.

QuikTrip No. 4128, QuikTrip Corporation, Bastrop, Texas
Role: Assistant Project Manager
Mr. Theone served as the Assistant Project Manager for a QuikTrip Travel Center in Bastrop, Texas. Responsibilities included final site design, permitting, QuikTrip Prototype coordination, and construction phase services. Design activities included site grading, underground detention design, and franchise utility coordination.

Pond Springs Mixed-Use, David Spatz, Austin, Texas
Role: Assistant Project Manager
Mr. Theone served as the Assistant project Manager for a proposed Mixed-Use development including 72 units of multi-family and live/work units in Austin, Texas. Responsible for final site design, permitting and construction phase services. Design activities included site grading, innovative water quality management, utility design and coordination with franchise utility providers.

Rooms to Go Expansion, Roomstogo.com, Inc. dba Rooms To Go, Round Rock, Texas
Role: Assistant Project Manager
Mr. Theone served as the Assistant Project Manager for expansion of an existing Rooms To Go in Round Rock, Texas. Responbilies included final site design, floodplain investigation, permitting, and construction phase services. Design activities included deceleration lane deisgn, franchise utility relolcations, right of way donation, and encroachment agreements with the City of Round Rock.

Wolf Lakes Village Section 5, Novak Commercial LLC, Georgetown texas
Role: Civil PM
Multifamily development with a master development community (PUD) containing over 250 units.

Bar W Ranch Commercial, Barshop & Oles Company, Leander, Texas
Role: Assistant Project Manager
Mr.Theone served as the Assistance Project Manager for 50 acres of civil subdivision improvements including civil site development plans for retail and anchor tenant use (HEB). Responsibilities included drainage design, platting/permitting, construction phase services, and client marketing assistance. Design activities included unmapped floodplain modifications, wet pond design, and sedimentation/filtration ponds to serve the ultimate build out of the 50 acre commercial development.

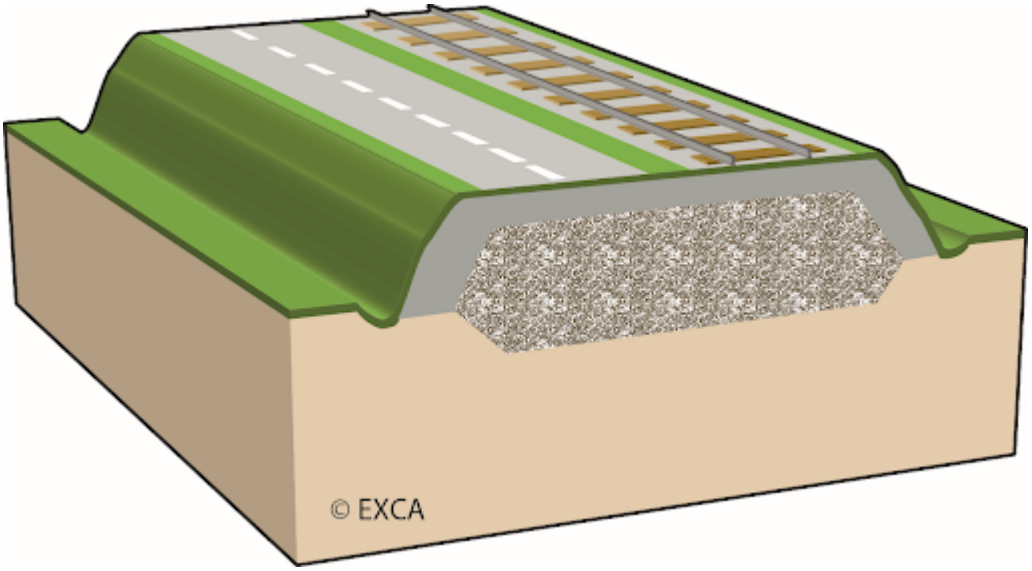
Dairy Queen Hutto, Robert Mayfield, Hutto, Texas
Role: Assistant Project Manager
Mr. Theone served as Assistant Project Manger for a proposed Dairy Queen Restaurant in Hutto, Texas. Responsibilities included final design, permitting, subdivision improvement coordination, and construction phase services. Design activities included site grading, site layout, and utility design/coordination with the concurrent subdivision improvements.

Shady Oaks Gun Range, Shady Oaks Gun Range, Cedar Park, Texas
Mr. Theone served as the sole client contact for the proposed gun range expansion in Cedar Park, Texas. Responsibilities included final site design, permitting, and construction phase services. Design activities included utilization of natural filter strips and earthen berm detention included in the overall site grading.

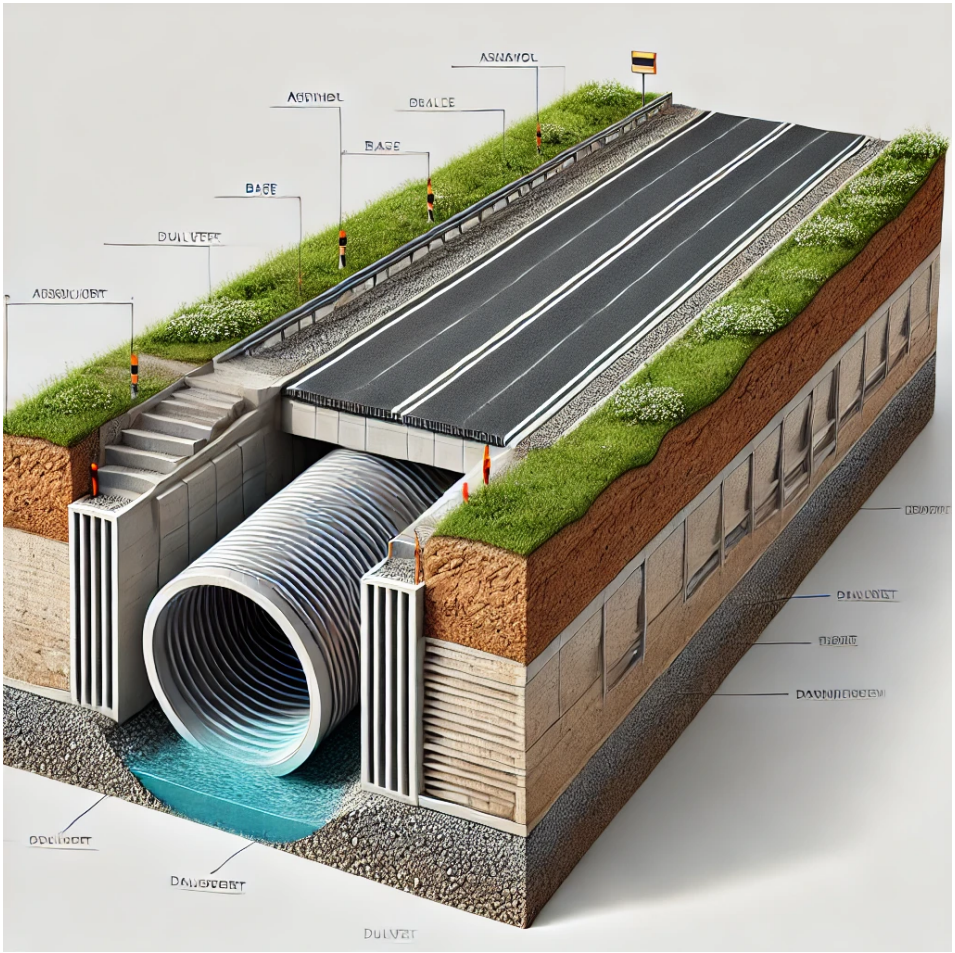
PROFESSIONAL AFFILIATIONS

Real Estate Council of Austin

Exhibit B



ELEVATED ROADWAY WITH ROADSIDE DRAINAGE SWALES



ELEVATED ROADWAY WITH UNDERGROUND DETENTION

11.3. Adequacy of streets and thoroughfares.

11.3.1.Responsibility for adequacy. The property owner shall assure that the subdivision is served by adequate streets and thoroughfares, and shall be responsible for the costs of rights-of-way and street improvements, in accordance with the following policies and standards, and subject to the city's cost participation policies on oversized facilities, and in accordance with the technical standards and transportation plan.

11.3.2.General adequacy policy. Every subdivision shall be served by improved streets and thoroughfares adequate to accommodate the vehicular traffic to be generated by the development. Proposed streets shall provide a safe, convenient and functional system for traffic circulation; shall be properly related to the city's transportation plan, road classification system, comprehensive plan and any amendments thereto; and shall be appropriate for the particular traffic characteristics of each development.

11.3.3.Road network. New subdivisions shall be supported by a road network having adequate capacity, ingress/egress, and safe and efficient traffic circulation. The adequacy of the road network for developments of 200 or more dwelling units, or for developments generating 2,000 or more "one-way" trips per day, or for developments involving collector or arterial streets not appearing on the city's adopted transportation plan, shall be demonstrated by preparation and submission, prior to the preliminary plat application, of a traffic impact analysis prepared, which takes into consideration the need to accommodate traffic generated by the development, land to be developed in common ownership and other developed property. In the event that the property to be developed is intended as a phase in a larger development project, or constitutes a portion of the land to be ultimately developed, the planning and zoning commission may require a demonstration of adequacy pursuant to this section for additional phases or portions of the property as a condition of approval for the proposed preliminary plat. In the event that the applicant submits a traffic impact analysis for an entire phased development project, the city may require an update of the study for each subsequent phase of the development which reflects any applicable changed conditions. If the preliminary plat is in conformance with the transportation plan and if the preliminary plat is for a development of less than 200 dwelling units or for a development generating less than 2,000 "one-way" trips per day, then a traffic impact analysis is not required.

11.3.4.Approach roads and access. All subdivisions with 50 or more lots or units must have at least two points of vehicular access and must be connected via improved roadways to the improved thoroughfare and street system (city, county and state, as may be applicable) by one or more approach roads of such dimensions and improved to such standards as are hereinafter set forth. Requirements for dedication of right-of-way and improvement of approach roads may be increased depending upon the size or density of the proposed development, or if such need is demonstrated by traffic impact analysis. This requirement shall be waived by the city upon demonstration by the applicant that the required access points are prohibited by TxDOT.

(a) "Two points of vehicular access" shall be construed to mean that the subdivision has at least two improved roads accessing the subdivision from the improved thoroughfare system, and the subdivision has at least two road entrances. The planning and zoning commission may, at its discretion and upon a finding that such will not compromise public safety or impede emergency access, accept a single median-divided entrance from the city's improved thoroughfare system provided that the median extends into the subdivision for an unbroken length of at least 200 feet to an intersecting internal street which provides at least two routes to the interior of the subdivision. For example, the entrance street is not a dead-end or cul-de-sac, and it does not create a "bottleneck" allowing only one emergency route into the interior of the subdivision.

(b) The subdivision shall be designed to provide adequate emergency access for public safety vehicles. Each residential lot in the subdivision shall have a minimum frontage on a dedicated public street as required by applicable zoning or 35 feet, whichever is greater, unless other provisions have been authorized through planned development district approval. Each nonresidential lot shall have a

minimum frontage on a dedicated public street as required by applicable zoning or 50 feet, whichever is greater, unless other provisions have been authorized through planned development approval.

(c) At the discretion of the city engineer, the second access point may take the form of an unimproved dedicated public right-of-way without requiring improvement. The city engineer may waive the requirement for a second access point if justified by the presence of a multiple-lane entrance and exit, the width of the single access point, and any geographical or topographical considerations.

ARTICLE 22.05. WATER QUALITY PROTECTION[1]

Sec. 22.05.001. Title.

This article shall be commonly cited as the water quality protection ordinance.

(Ordinance 3500.11, § 1.1, adopted 2/20/07)

Sec. 22.05.002. Authority.

Section 26.177 of the Texas Water Code provides an opportunity for municipalities to regulate water protection, water pollution, and pollution abatement.

(Ordinance 3500.11, § 1.2, adopted 2/20/07)

Sec. 22.05.003. Purpose.

(a) This article provides standards and procedures for municipal determination of the nonpoint source pollution control management policies which govern the planning, design, construction, operation and maintenance of drainage, erosion, and water quality facilities within the city's jurisdiction.

(b) This article sets forth the minimum requirements necessary to provide and maintain a safe, efficient and effective nonpoint source pollution control system and to establish the various public and private responsibilities for the provision thereof. Further, it is the purpose of this article to:

(1) Protect human life, health and property;

(2) Prevent losses of endangered species and habitat of endangered species;

(3) Protect the integrity of local ecological systems;

(4) Minimize the expenditure of public money for building and maintaining nonpoint source pollution control projects and cleaning sediments out of storm drains, streets, sidewalks and watercourses;

(5) Help maintain a stable tax base and preserve land values;

(6) Preserve the natural beauty and aesthetics of the community;

(7) Control and manage the quality of stormwater runoff, and the sediment load in that runoff, from points and surfaces within subdivisions;

(8) Establish a reasonable standard of design and performance for development which prevents erosion and sediment damage and which reduces the pollutant loading to streams, ponds and other watercourses; and

[1]State law reference(s)—Water quality control, V.T.C.A., Water Code, § 26.001 et seq.; sanitary standards of drinking water and protection of public water supplies and bodies of water, V.T.C.A., Health and Safety Code, § 341.031 et seq.

(9) Prevent degradation and pollution of groundwater resources.

(Ordinance 3500.11, § 1.3, adopted 2/20/07)

Sec. 22.05.004. Program description.

The city's water quality protection program is comprehensive and practical. The regulations enacted to implement the program are found throughout the city's development code, and include but are not limited to:

Element of Program	Document	Code Citation
Rural vision	Comprehensive plan	
Public education	Water quality	Article 22.05
Land use	Zoning	Chapter 30, exhibit A
Lot size in city limits	Zoning	Chapter 30, exhibit A
Lot size in ETJ	Subdivision	Chapter 28, exhibit A
Impervious cover	Zoning (city)	Chapter 30, exhibit A
	Water quality (ETJ)	Article 22.05
Drainage	TCSS	
	Flood damage prevention	
	Site development	Article 28.04
	Water quality	Article 22.05
	Subdivision	Chapter 28, exhibit A
Vegetation	Landscaping	Article 28.06
Open space	Parkland dedication	Article 28.03
	Conservation design	Article 28.05
Water supply	Subdivision	Chapter 28, exhibit A
Water pollution	Water quality protection	Article 22.05
Wastewater	Subdivision	Chapter 28, exhibit A
	OSSF	Article 20.03
Preferred growth areas	Zoning	Chapter 30, exhibit A
Buffer zones	TCSS	
Development agreements	Development agreements	Article 22.02

(Ordinance 3500.11, § 1.4, adopted 2/20/07)

Sec. 22.05.005. Scope.

(a) This article applies to all property within the city limits and the ETJ.

(b) This article applies to projects when considered as a whole, even if comprised of more than one lot. These regulations may not be circumvented by aggregating small lots, when in fact the lots share a common development scheme as part of a joint project.

(Ordinance 3500.11, § 1.5, adopted 2/20/07)

Sec. 22.05.006. Exemptions.

(a) This article shall not apply to public school facilities.

(b) The city encourages all public school facilities.

(Ordinance 3500.11, § 1.6, adopted 2/20/07)

Sec. 22.05.007. TCSS manual.

The technical construction standards and specifications (TCSS) manual establishes uniform design practices; it neither replaces the need for engineering judgment nor precludes the use of any information relevant to the accomplishment of the purposes of this article. Other generally accepted or innovative and effective engineering procedures may be used in conjunction with, or instead of, those prescribed by the TCSS manual if approved by the city engineer. The TCSS manual is maintained and available for inspection at city hall.

(Ordinance 3500.11, § 1.7, adopted 2/20/07)

Sec. 22.05.008. Applicability; compliance.

(a) Any person proposing to develop real property within the jurisdiction of the city is subject to the provisions of this article.

(b) Requirements of this article shall be addressed in applications for subdivision plats, site development permits, rezoning, planned development districts (PDs), conditional use permits, development agreements, and construction permits.

(c) It shall be an offense for any person to develop or improve real property in violation of this article.

(Ordinance 3500.11, § 1.8, adopted 2/20/07)

Sec. 22.05.009. Preferred growth areas.

(a) Preferred growth areas (PGAs) are defined herein.

(b) Through the designation of PGAs, the city council finds it reasonable and prudent to encourage growth within the mostly-developed urban core of the municipality, and discourage heavy development in the ETJ.

(c) PGA status is attained by a tract of land upon the granting of zoning, not upon annexation.

(Ordinance 3500.11, § 1.9, adopted 2/20/07)

Sec. 22.05.010. Definitions.

(a) Rules of interpretation . Words and phrases used in this article shall have the meanings set forth in this section. Terms that are not defined below, but are defined elsewhere in the Code of Ordinances, shall be given the meanings set forth in the code. Words and phrases not defined in the Code of Ordinances shall be given their common, ordinary meaning unless the context clearly requires otherwise. When not inconsistent with the context, words used in the present tense shall include the future tense, words in the plural number shall include the singular number (and vice versa), and words in the masculine gender shall include the feminine gender (and vice versa). The word "shall" is always mandatory, while the word "may" is merely directory. Headings and captions are for reference purposes only.

(b) Specific definitions .

Agricultural activities : Pasturing of livestock or use of the land for planting, growing, cultivating, and harvesting crops for human or animal consumption.

Agricultural stormwater runoff : Any stormwater runoff from orchards, cultivated crops, pastures, range land, and other nonpoint source agricultural activities, but not discharges from concentrated animal feeding operations as defined in 40 CFR section 122.23 or discharges from concentrated aquatic animal production facilities as defined in 40 CFR section 122.24.

Applicant : A person who submits an application for approval required by this article. The applicant shall be the owner of the property subject to this article, acting in person or by and through the owner's authorized representative. Documentation, in a form acceptable to the city, evidencing ownership of the property or the authority of the authorized agent must be submitted along with the application. For example, written power of attorney or letter of agency will be sufficient to prove agency. A deed or tax letter will be adequate to establish ownership of the property.

Application : A written request for an approval required by this article.

Background pollutant load : The amount of pollution in stormwater runoff that is discharged from a site before development. The method used for calculating background pollutant load is to be found in the TCSS (or the technical standards section of this article).

Best management practices (BMP) : Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the nonpoint source pollution of waters in the state. The two basic types of BMPs for purposes of this article are "structural BMPs" (which include engineered and constructed systems that are designed to provide for water quantity and/or water quality control of stormwater runoff) and "nonstructural BMPs" (which include institutional and pollution-prevention type practices designed to prevent pollutants from entering stormwater runoff or to reduce the volume of stormwater requiring management). This term expressly includes both structural and nonstructural BMPs.

Board of adjustment : This term is the same as defined and applied in the zoning ordinance for the city.

City limits : The incorporated municipal boundaries of the city.

Contributing zone : The area or watershed where runoff from precipitation flows downgradient to the recharge zone of the Edwards Aquifer.

Critical environmental features (CEFs) : Geologic or manmade features that are critically important to assure protection of water quality in:

(1) The hydraulic interconnectedness between the ground surface and the Edwards Aquifer; and

(2) The rapid infiltration to the subsurface.

Features of critical importance to protect may include, but are not limited to, bluffs, springs, caves, solution cavities, solution-enlarged fractures and sinkholes.

Developer : A person who owns a tract of land and who is engaged in clearing, grubbing, filling, mining, excavating, grading, installing streets and utilities or otherwise preparing that tract of land for the eventual division into one or more lots on which building(s) or other structure(s) will be constructed or placed.

Development : All land modification activity, including the construction of buildings, roads, paved storage areas, and parking lots. "Development" also includes any land-disturbing construction activities or human-made change of the land surface, including clearing of vegetative cover, excavating, filling and grading, mining, and dredging, and the deposit of refuse, waste or fill. The following activities are excluded from the definition: care and maintenance of lawns, gardens, and trees; minimal clearing (maximum ten feet (10') wide) for surveying and testing; and agricultural activities.

Discharge : Any addition or introduction of any pollutant, stormwater, or any other substance in a harmful quantity into a stormwater drainage system or into waters in the state.

Discharge (hydraulics) : The rate of fluid flow, expressed as the volume of fluid passing a point per unit time, commonly expressed as cubic feet per second.

Domestic sewage : Human excrement, gray water from home clothes washing, bathing, showers, dishwashing, and food preparation, other wastewater from household and residential drains, and waterborne waste normally discharged from the sanitary conveniences of apartment houses, hotels, office buildings, factories, institutions and other dwellings, but excluding industrial waste.

Drainage area : The horizontal projection of the area contributing runoff to a single control or design point.

EPA : The federal Environmental Protection Agency, or a successor agency.

ETJ : The extraterritorial jurisdiction of the city.

Erosion : The detachment and movement of soil, sediment, or rock fragments by wind, water, ice or gravity.

Facility : Any building, structure, installation, process, or activity from which there is or may be discharge of a pollutant.

Fertilizer : A solid or non-solid substance or compound that contains an essential plant nutrient element in a form available to plants that is used primarily for its essential plant nutrient element content in promoting or stimulating growth of a plant or improving the quality of a crop, or a mixture of one or more fertilizers. The term does not include the excreta of an animal, plant remains, or a mixture of those substances, for which no claim of essential plant nutrients is made.

Fill : The man-made deposition and compaction of material to effect a rise in elevation.

Flood : A general and temporary condition of partial or complete inundation of normally dry land areas from:

(1) The overflow of inland or tidal waters; or

(2) The unusual and rapid accumulation or runoff of surface waters from any source.

Floodplain : For the purposes of water quality buffer zones, this term shall mean either of one or the other following definitions:

(1) A FEMA studied floodplain identified on the FIRM (flood insurance rate maps) as zone AE or equivalent; or

(2) A studied floodplain as provided through engineering data prepared and certified by a professional engineer.

Grade : The vertical location or elevation of a surface, or the degree of rise or descent of a slope.

Harmful quantity : The amount of any substance that will cause pollution of water in the state.

Hazardous household waste (HHW) : Any material generated in a household (including single and multiple residences, hotels, motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds, and day use recreational areas) by a consumer which, except for the exclusion provided in 40 CFR section 261.4(b)(1), would be classified as a hazardous waste under 40 CFR part 261.

Hazardous substance : Any substance listed in table 302.4 of 40 CFR part 302.

Hazardous waste : Any substance identified or listed as a hazardous waste by the EPA pursuant to 40 CFR part 261.

Herbicide : A substance or mixture of substances used to destroy a plant or to inhibit plant growth.

Impervious cover : Buildings, parking areas, roads, and other impermeable man-made improvements covering the natural land surface that prevent infiltration. For purposes of compliance with this article, the term

expressly excludes storage tanks for rainwater collection systems, or the structure covering specifically the rainwater collection tanks.

Industrial waste : Any waterborne liquid or solid substance that results from any process of industry, manufacturing, mining, production, trade, or business.

Infiltration : The passage or movement of water into the subsurface of the natural land.

Island annexation : Any annexation of land that is not contiguous to the city's corporate limits as defined by the most current official city limits map.

Licensed professional engineer : A person who possesses an active license and is registered by the state board of registration for professional engineers to engage in the practice of engineering in the state. The term also includes a professional engineer (PE).

Local governmental agencies : Any department or agency related to the subdivision of the state in the form of the county or municipality.

Natural state : The condition of the land existing prior to any development activities.

Nonpoint source (NPS) pollution : Pollution that is caused by or attributable to diffuse sources. Such pollution results in the human-made or human-induced alteration of the chemical, physical, biological, or radiological integrity of water. Typically, NPS pollution results from land runoff, precipitation, atmospheric disposition, or percolation.

Oil : Any kind of petroleum substance, including but not limited to petroleum, fuel oil, crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure, sludge, oil refuse, and oil mixed with waste.

Owner : The person who owns a facility or part of a facility subject to the requirements of this article.

Person : Any individual, association, firm, corporation, governmental agency, political subdivision, or legal entity of any kind.

Pesticide : A substance or mixture of substances intended to prevent, destroy, repel, or mitigate any pest, or any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant, as these terms are defined in Texas Agriculture Code section 76.001.

Petroleum storage tank (PST) : Any one or combination of aboveground or underground storage tanks that contain oil, petroleum products or petroleum substances, and any connecting underground pipes.

Pollutant : Eroded or displaced sediment, soil, silt or sand resulting from development activities; dredged spoil; solid waste; sewage; garbage; chemical waste; biological materials; radioactive materials; abandoned or discarded appliances or equipment; and industrial, municipal, and agricultural waste which is or may be discharged into waters in the state. This term shall be limited to those substances listed herein, or monitored or regulated by the TCEQ or EPA.

Pollution : The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

Preferred growth area (PGA) : That area as defined by the contiguous city limits as reflected in the most current official city limits map, and is affected by the current zoning ordinance defining areas of higher-density development (specifically zoning categories of MF, CS, LR, GR, I, O, and SF-5), as may be determined from time to time to be deemed as appropriate for higher-density development. This area allows for change through future contiguous annexations. This is not to reflect the areas of land annexed as "island annexations."

Recharge zone : That area where the stratigraphic units constituting the Edwards Aquifer crop out, including the outcrops of other geologic formations in proximity to the Edwards Aquifer where caves, sinkholes, faults, fractures or other permeable features create a potential for recharge of surface waters into the Edwards Aquifer.

Release : Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into a stormwater drainage system or into waters in the state.

Residence : Any building, or portion thereof, which is designed for or used as living quarters for one or more families.

Riparian corridor : The ecological areas within and adjacent to a floodplain that are or can be comprised of the following plant species: Pecan, American Elm, Arizona Walnut, Bald Cypress, Black Walnut, Bur Oak, Cedar Elm, Little Walnut, Green Ash, Texas Sugarberry, American Sycamore, Eastern Cottonwood, Black Willow, and Live Oak.

Rubbish : Nonputrescible solid waste, excluding ashes, that consists of:

(1) Combustible waste materials, including paper, rags, cartons, wood, excelsior, furniture, rubber, plastics, yard trimmings, leaves, and similar materials; and

(2) Noncombustible waste materials, including glass, crockery, tin cans, aluminum cans, metal furniture, and similar materials that do not burn at ordinary incinerator temperatures (1,600 to 1,800 degrees Fahrenheit).

Runoff : That portion of precipitation or precipitation drainage that flows by force of gravity across the ground surface as sheet flow or in a stormwater drainage system towards water in the state.

Septic tank waste : Any domestic sewage from holding tanks such as vessels, chemical toilets, campers, trailers, and septic tanks.

Sewage (or sanitary sewage) : The domestic sewage and/or industrial waste that is discharged into a sanitary sewer system and passes through the sanitary sewer system to a sewage treatment plant for treatment.

Site development permit : The permit required by the city's Code of Ordinances.

Solid waste : Any garbage, rubbish, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including, solid, liquid, semi-solid, or contained gaseous material resulting from industrial, municipal, commercial, mining, and agricultural operations, and from community and institutional activities.

Spring : A point or zone of natural groundwater discharge having measurable flow, or a pool, and characterized by the presence of a mesic plant community adapted to the moist conditions of the site.

Steep slope : Defined as a 400 percent grade, as defined for the purposes of setbacks.

Stormwater drainage system : A conveyance or system of conveyances including roads with drainage systems, catchbasins, curbs, gutters, ditches, man-made channels, or storm drains designed or used for collecting or conveying stormwater.

Streams : Perennial and intermittent watercourses identified through site inspection and USGS maps. Perennial streams are those which are depicted on a USGS map with a solid blue line. Intermittent streams are those which are depicted on a USGS map with a dotted blue line.

Subdivision : A division, or redivision, of any tract of land situated within the city's jurisdiction into two or more parts, lots or sites, for the purpose, whether immediate or in the future, of sale, division of ownership or building development. "Subdivision" includes resubdivisions of land or lots which are part of previously recorded subdivisions.

TCEQ : The state commission on environmental quality or its predecessor or successor agencies as defined by law.

Transferable development right (TDR) : Authorization to exceed the uniform intensity levels otherwise imposed under this article on a less environmentally sensitive tract of land resulting from voluntary relinquishment of development rights otherwise allowed under this article on a more environmentally sensitive tract of land (e.g., through dedicated conservation easement). A TDR can also result from voluntary retrofitting of existing development with water quality protection measures not otherwise required by this article.

Waiver : A grant of relief to a person from the requirements of this article when specific enforcement would result in unjustifiable or unnecessary hardship due to out-of-the-ordinary or extenuating circumstances.

Water in the state (or water) : Any groundwater, percolating or otherwise, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, or canals inside the territorial limits of the state, and all other bodies of surface water, natural or artificial, navigable or non-navigable, and including the beds and banks of all watercourses and bodies of surface water, that are inside the jurisdiction of the state.

Watershed : The total area contributing runoff to a stream or drainage system.

Wetland : An area that is inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, and conforms to the U.S. Army Corps of Engineers' definition. Wetlands generally include swamps, marshes, bogs, and similar areas.

Yard waste : Leaves, grass clippings, yard and garden debris, and brush that results from landscaping maintenance and land-clearing operations.

(Ordinance 3500.11, § 2, adopted 2/20/07; Ordinance 3500.12, adopted 2/17/09)

Sec. 22.05.011. Enforcement; penalties.

(a) Enforcement . The city shall have the power to administer and enforce the provisions of this article as may be required by governing law. Any person violating any provision of this article is subject to suit for injunctive relief as well as prosecution for criminal violations. Any violation of this article is hereby declared to be a nuisance.

(b) Criminal penalty . Any person violating any provision of this article shall, upon conviction, be fined a sum not exceeding $2,000.00. Each day that a provision of this article is violated shall constitute a separate offense. An offense under this article is a misdemeanor.

(c) Civil remedies . Nothing in this article shall be construed as a waiver of the city's right to bring a civil action to enforce the provisions of this article and to seek remedies as allowed by law, including but not limited to the following:

(1) Injunctive relief to prevent specific conduct that violates this article or to require specific conduct that is necessary for compliance with this article;

(2) A civil penalty up to $1,000.00 a day when it is shown that the defendant was actually notified of the provisions of this article and after receiving notice committed acts in violation of this article or failed to take action necessary for compliance with this article; and

(3) Other available relief.

(d) Administrative actions .

(1) Stop work orders . When an appropriate authorized official of the city determines that there has been noncompliance with any material term, condition, requirement or agreement under this article, the person obtaining such approved plan shall be ordered by the city in writing to cease and desist from further development or construction material to the alleged noncompliance until corrected by compliance.

(2) Withholding authorizations . The city may refuse to grant development, construction, or occupancy approvals for improvements for a property that does not fully and completely comply with all terms and conditions of this article. Without limiting the type or number of approvals the city may withhold, the city is specifically authorized to refuse to grant site development permits, building permits, utility connections, and certificates of occupancy.

(Ordinance 3500.11, § 20, adopted 2/20/07)

Sec. 22.05.012. Waivers.

(a) Presumption . There shall be a presumption against waivers. However, if the applicant requests a waiver in writing, the board of adjustment may authorize a waiver from these regulations when, in its opinion, undue hardship will result from requiring strict compliance.

(b) Identification . All waivers requested for a project must be identified during the platting and/or site plan approval process (as may be applicable).

(c) Conditions . In granting a waiver, the board of adjustment shall prescribe upon the applicant only conditions that it deems necessary to or desirable in the public interest.

(d) Considerations . In making the findings required below, the board of adjustment shall take into account the nature of the proposed use of the land involved, existing uses of land in the vicinity, the number of persons who will reside or work in the proposed development, and the probable effect of such waiver on the public health, safety, convenience and welfare in the vicinity.

(e) Findings . No waiver shall be granted unless the board of adjustment finds that all of the following provisions are met, and the burden shall be on the developer to show that these provisions are satisfied:

(1) That there are special circumstances or conditions affecting the land involved, such that the strict application of the provisions of this article would deprive the applicant of the reasonable use of this land;

(2) That the waiver is necessary for the preservation and enjoyment of a substantial property right of the applicant;

(3) That the granting of the waiver will not be detrimental to the public health, safety or welfare, or injurious to other property in the area; and

(4) That the granting of the waiver will not have the effect of preventing the orderly development of other land in the area in accordance with the provisions of this article.

(f) Pecuniary hardship . Pecuniary hardship to the applicant, property owner or developer, standing alone, shall not be deemed sufficient to constitute undue hardship.

(g) Minimum departure . When the board of adjustment determines that a waiver is warranted, the waiver permitted shall be the minimum departure from the terms of this article necessary to avoid such deprivation of privileges enjoyed by such other property to facilitate a reasonable use, and which will not create significant probabilities of harmful environmental consequences.

(h) Adequate basis option 1 . It may be determined by the city to be an adequate basis for granting a waiver that doing so will enable the applicant to create additional open space, preserve trees, maintain critical environmental features, ensure more wildlife preservation, or bring nonconforming structures (including but not limited to signs) into compliance with current regulations. This section is designed to achieve a more favorable outcome for the general public than would be possible complying with the strict mandates of this article.

(i) Adequate basis option 2 . It may be determined by the city to be an adequate basis for granting a waiver that the applicant provides the city with a proposal pursuant to which the applicant presents a site exceeding the standard impervious cover rates with a mitigation plan that compensates for the additional impervious cover. Examples of potential mitigation include, but are not limited to, the applicant's acquisition of transferable development rights (TDRs) to offset the additional impervious cover.

(Ordinance 3500.11, § 19, adopted 2/20/07)

Sec. 22.05.013. Prohibitions.

(a) General prohibitions .

(1) Except as otherwise specifically authorized by this article, no person shall discharge, or cause, suffer or allow the discharge, of any wastes, substances or other materials into or adjacent to any water in the state which causes or will cause pollution of any water in the state, except where otherwise exempt or allowed through permit by the TCEQ.

(2) Except as otherwise specifically authorized by this article, no person shall introduce or cause to be introduced into a stormwater drainage system any pollutants or other discharge that is not composed entirely of stormwater, except where otherwise exempt or allowed through permit by the TCEQ.

(b) Specific prohibitions .

(1) No person shall introduce or cause to be introduced into a stormwater drainage system any discharge that causes or contributes to causing a violation of a water quality standard established by law.

(2) No person shall introduce, discharge, or cause, suffer or allow a release of any harmful quantity of the following substances into a stormwater drainage system:

(A) Used motor oil, antifreeze, or any other motor vehicle fluid;

(B) Industrial waste;

(C) Hazardous waste, including hazardous household waste;

(D) Domestic sewage or septic tank waste, grease trap waste, or grit trap waste;

(E) Garbage, rubbish, or yard waste beyond that which typically washes off a yard during by rain event;

(F) Wastewater from a commercial carwash facility; from any vehicle washing, cleaning, or maintenance operation at any new or used automobile or other vehicle dealership, rental agency, body shop, repair shop, or maintenance facility; or from any washing, cleaning, or maintenance of any business or commercial or public service vehicle, including a truck, bus, or heavy equipment, by a business or public entity that operates more than two such vehicles;

(G) Wastewater from the washing, cleaning, de-icing, or other maintenance of aircraft;

(H) Wastewater from a commercial mobile power washer or from the washing or other cleaning of a building exterior that contains any soap, detergent, degreaser, solvent, or any other harmful cleaning substance;

(I) Wastewater from commercial floor, rug, or carpet cleaning;

(J) Wastewater from the washdown or other cleaning of pavement that contains any harmful quantity of soap, detergent, solvent, degreaser, emulsifier, dispersant, or any other harmful cleaning substance as defined by the EPA or TCEQ; or any wastewater from the washdown or other cleaning of any pavement where any spill, leak, or other release of oil, motor fuel, or other

petroleum or hazardous substance has occurred, unless all harmful quantities of such released material have been previously removed;

(K) Effluent from a cooling tower, condenser, compressor, emissions scrubber, or emissions filter, or the blowdown from a boiler;

(L) Ready-mixed concrete, mortar, ceramic, or asphalt base material or hydromulch material, or from the cleaning of commercial vehicles or equipment containing, or used in transporting or applying, such material;

(M) Runoff or washdown water from any animal pen, kennel, or fowl or livestock containment area;

(N) Filter backwash from a swimming pool, or fountain, or spa;

(O) Swimming pool water containing any harmful quantity of chlorine, muriatic acid or other chemical used in the treatment or disinfection of the swimming pool water or in pool cleaning;

(P) Discharge from water line disinfection by superchlorination or other means if it contains any harmful quantity of chlorine or any other chemical used in line disinfection;

(Q) Fire protection water containing oil or hazardous substances or materials (except for discharges or flows from firefighting activities by a locally accredited fire department);

(R) Water from a water curtain in a spray room used for painting vehicles or equipment;

(S) Contaminated runoff from a vehicle wrecking yard;

(T) Substance or material that will damage, block, or clog the stormwater drainage system;

(U) Release from a petroleum storage tank (PST), or any leachate or runoff from soil contaminated by a leaking PST, or any discharge of pumped, confined, or treated wastewater from the remediation of any such PST release, unless the discharge satisfies all of the following criteria:

(i) The discharge complies with all state and federal standards and requirements;

(ii) The discharge does not contain a harmful quantity of any pollutant; and

(iii) The discharge does not contain more than 50 parts per billion of benzene; 500 parts per billion combined total quantities of benzene, toluene, ethylbenzene, and xylene (BTEX); or 15 mg/l of total petroleum hydrocarbons (TPH).

(3) No person shall introduce or cause to be introduced into a stormwater drainage system any harmful quantity of sediment, silt, dirt, soil, sand or other material associated with clearing, grading, excavation or other construction activities, or associated with landfilling or other placement or disposal of soil, rock, sand or other earth materials, in excess of what could be retained on-site or captured by employing sediment and erosion control measures to the minimum extent required by this article.

(4) No person shall connect a line conveying sanitary sewage, whether domestic or industrial, to a stormwater drainage system, nor allow such a connection to continue if discovered.

(5) No person shall cause or allow any pavement washwater from a service station to be discharged into a stormwater drainage system unless such washwater has first passed through a grease, oil, and sand interceptor which is properly functioning and maintained.

(Ordinance 3500.11, § 3, adopted 2/20/07)

Sec. 22.05.014. Restricted activities.

(a) Pesticides, herbicides and fertilizers .

(1) Any license, permit, registration, certification, or evidence of financial responsibility required by state or federal law for sale, distribution, application, manufacture, transportation, storage, or disposal of a pesticide, herbicide or fertilizer must be presented to an authorized city enforcement officer for examination upon request.

(2) No person shall use or cause to be used any pesticide or herbicide contrary to any directions for use on any labeling required by state or federal statute or regulation.

(3) No person shall use or cause to be used any pesticide, herbicide, or fertilizer in any manner that the person knows, or reasonably should know, is likely to cause, or does cause, a harmful quantity of the pesticide, herbicide, or fertilizer to enter a stormwater drainage system or waters of the United States.

(4) No person shall dispose of, discard, store, or transport a pesticide, herbicide, or fertilizer, or a pesticide, herbicide, or fertilizer container, in a manner that the person knows, or reasonably should know, is likely to cause, or does cause, a harmful quantity of the pesticide, herbicide, or fertilizer to enter a stormwater drainage system or waters in the state.

(b) Used oil .

(1) No person shall:

(A) Discharge used oil into a stormwater drainage system or a sewer, drainage system, septic tank, surface water, groundwater, or watercourse;

(B) Knowingly mix or commingle used oil with solid waste that is to be disposed of in a landfill or knowingly directly dispose of used oil on land or in a landfill.

The application of used oil shall be allowed for the uses of used oil as defined in 40 CFR 279.1.

(2) All businesses engaged in the changing of motor oil for the public, all municipal waste landfills, and all fire stations may serve as public used oil collection centers as provided by state law.

(3) A retail establishment which sells motor oil in containers directly to the public for use off-premises shall post in a prominent place a sign informing the public that improper disposal of used oil is prohibited by law. The sign shall prominently display the toll-free telephone number of the state used oil information center.

(c) Hazardous material traps (HMT) .

(1) Roadways capable of conveying at least 5,000 vehicles a day must include a hazardous material trap (HMT).

(A) These HMTs must be designed to retain a spill of 10,000 gallons of liquid hazardous material.

(B) These may be of a variety of designs, including that used previously by TxDOT.

(2) To eliminate the need for manual draining of a hazardous material trap after a rain event, the state department of transportation (TxDOT) has developed an automatic siphon system to drain the HMT when it fills with rainwater. See the city's TCSS for an illustration of a typical siphon detail from a set of TxDOT construction plans.

(A) The siphon device is designed to drain the trap after it becomes full from a rain event, but is installed at an elevation above the full capacity of the trap.

(B) Therefore, as long as a hazardous material spill does not occur during a rain event, the system should contain the spill.

(C) The siphon is provided with bypass and shutoff valves so that alert on-scene responders can shut off the automatic siphon and thereby maintain some containment even in the event of a concurrent rain/spill.

(D) Other options for spill containment are presented in the main section of TCEQ's Optional Enhanced Measures (OEM), RG-348.

(Ordinance 3500.11, § 4, adopted 2/20/07)

Sec. 22.05.015. Performance standards.

(a) Applicability .

(1) All development shall achieve the following pollutant removal standards through the design and implementation of structural and nonstructural BMPs and water quality controls.

(2) This article shall apply to an entire project for which a unified development scheme is intended by the applicant, without regard to whether the project is comprised of more than one lot. These regulations cannot be avoided by dividing a single project into several small lots.

(b) Performance standards within PGA . All development within the area defined as the PGA is subject to the following requirements:

(1) Five acres or less: Technical demonstration of pollutant load removal is not required; however, the applicant shall employ a combination of structural and nonstructural BMPs to remove the net increase in pollutants due to development to a level of not less than 80 percent TSS pollutant load removal and shall address the remaining pollutant loading constituents through nonstructural measures, in accordance with the TCSS.

(2) Greater than five acres: For each of the constituents below, the design shall demonstrate 85 percent removal of the net increase for the design storm event:

(A) Total suspended solids.

(B) Total phosphorus.

(C) Oil and grease.

(c) Performance standards outside PGA . All development that is not within the area defined as the PGA is subject to the following requirements:

(1) It is the desire of these regulations that there be no net increase of pollutant load.

(2) Plans shall be designed to achieve no net increase above base analysis.

(3) For each of the constituents below, the design shall demonstrate 90 percent removal of the net increase for the design storm event:

(A) Total suspended solids.

(B) Total phosphorus.

(C) Oil and grease.

(4) Background pollutant loads and pollution concentrations for developed sites:

(A) Background pollutant concentrations shall be as defined in the TCSS manual.

(B) Standard pollutant concentrations for developed sites shall be as defined in the TCSS manual.

(C) Calculation of annual pollutant loading shall comply with the criteria set forth in the TCSS manual.

(d) Incentive-based alternative standards . These standards shall apply throughout the city limits and the ETJ as they are to encourage the use of innovative strategies and opportunities for meeting water quality standards

and lessening demand on water for irrigation or other water uses that would otherwise use either surface water or groundwater resources.

(1) The gross impervious cover is 15 percent or less.

(2) The street and drainage network is designed to include the use of open roadway sections, ribbon curb, maintenance of sheet flow and vegetative buffer zones.

(3) Impervious cover credit by use of porous pavement, rainwater harvesting, and other methods can be used to gain compliance as they are demonstrated to the satisfaction of the city engineer to provide long-term water quality viability, and the long-term maintenance is ensured by the developer and subsequent owners through an approved method prescribed by the city council.

(e) Design storm event . The design storm event shall be the two-year, three-hour storm. The pollutant loadings for this storm event shall be calculated in accordance with the TCSS manual.

(Ordinance 3500.11, § 5, adopted 2/20/07)

Sec. 22.05.016. Impervious cover.

(a) Maximum limitations . Maximum limitations on impervious cover are established as follows on developments for which a site development plan is first filed after the effective date of this article:

(1) For areas within the Edwards Aquifer recharge zone: Ten percent.

(2) For areas within the Edwards Aquifer contributing zone in the ETJ: 35%.

(3) For areas within the city limits, refer to the zoning ordinance:

(A) Zoning . Impervious cover limits for tracts within PGAs are established in the city's zoning ordinance according to the particular zoning district the tract is designated.

(B) Reduction incentives . As an incentive to reduce impervious cover, all developments in the contributing zone with less than 15 fifteen percent impervious cover are not required to provide technical demonstration for removal of net increase in pollutants, but must still incorporate sufficient water quality control measures to comply with the other provisions of this section. Refer to section 22.05.015(b) and (c).

(C) Effective impervious cover . Through the incorporation of incentives (rainwater collection, pervious pavement, nonstructural BMPs), also known as "stormwater credits" for the purposes of water quality calculations, this allows for the reduction of impervious cover that is considered (taken into account) in the calculating of pollutant load removal for a specific site. (Refer to the LCRA or the city's TCSS manual for more explanation regarding the calculations and methods for attaining effective impervious cover.) There is a reduction in the impervious cover for purposes of calculation, and also a corresponding allowance for an increase in the physical impervious cover.

(b) Impervious cover limit calculations . Impervious cover limits in this section are expressed as a percentage of the gross site area of the subject tract. For purposes of calculation of impervious cover limits, the gross site area includes water quality buffer zone areas and critical environmental features setback areas.

(c) Items considered impervious cover . Impervious cover shall include all man-made improvements which prevent the infiltration of water into the natural soil, or prevent the migration of the infiltration as base flow. The following shall be considered as impervious cover, unless modified through the use of incentives (stormwater credit: rainwater collection, porous pavement, etc.):

(1) Roads, pavements, and driveways, except as provided in subsection (d) of this section;

(2) Parking areas;

(3) Buildings;

(4) Pedestrian walkways and sidewalks;

(5) Concrete, asphalt, masonry surfaced areas, and paving stone surfaced areas;

(6) Swimming pool water surface area;

(7) Densely compacted natural soils or fills which result in a coefficient of permeability less than 1×10^{-6} cm/sec;

(8) All existing man-made impervious surfaces prior to development;

(9) Water quality and stormwater detention basins lined with impermeable materials;

(10) Stormwater drainage conveyance structures lined with impermeable materials;

(11) Fifty percent of the horizontal surface area of an uncovered deck that has drainage spaces between the deck boards that is located over a pervious surface;

(12) Up to fifty percent of the horizontal surface of materials whose design has been prepared by a Texas licensed professional engineer and approved by the city to accommodate the capture and/or infiltration of stormwater, provided the design incorporates maintenance provisions sufficient to maintain the pervious nature of the material for its full service life.

(d) Items not considered impervious cover .

(1) Existing roads adjacent to the development and not constructed as part of the development at an earlier phase;

(2) Rock outcrops;

(3) Landscaped areas and areas remaining in their natural state;

(4) Water quality controls and stormwater detention basins not lined with impermeable materials;

(5) Stormwater drainage conveyance structures not lined with impermeable materials; and

(6) Interlocking or "permeable" pavers.

(e) Rainwater harvesting .

(1) Rainwater harvesting collection and containment structures functioning as a rainwater harvesting system are not considered impervious cover. Structures and/or improvements (e.g., building roofs, patios, awnings, etc.) from which stormwater is harvested are considered impervious cover. Only that portion of a structure covering a rainwater harvesting collection system may be credited with not being impervious cover.

(2) In order to qualify to receive credit for a rainwater system, the system must be designed to exceed normal draw (i.e., no credit will be given if the tank routinely stays full). Credit is not just for the tank cover, but for structures collected from. The applicant must demonstrate where water is going to qualify (how he is going to draw it down, e.g., use as nonpotable source rainwater, or irrigation).

(3) Credits can zero-out impervious cover for purposes of calculating runoff treatment. Applicants may also get 50 percent credit toward additional cover.

(f) Siting restrictions . Impervious cover shall not be constructed:

(1) Downstream of water quality controls;

(2) Within critical environmental feature setback areas; or

(3) Within the areas designated for on-site irrigation for treated wastewater effluent disposal.

(Ordinance 3500.11, § 6, adopted 2/20/07)

Sec. 22.05.017. Water quality buffer zones.

(a) Applicability . This section is applied at the time of platting (creation of newly subdivided lots). This section does not apply to legally platted lots that existed as of the effective date of this article.

(b) Water quality buffer zones (WQBZ) .

(1) Greater than 50 acres and up to 160 acres: The WQBZ shall extend a minimum of 50 feet from either side of the centerline of the stream (total of 100 feet of buffer zone).

(2) Greater than 160 acres and up to 320 acres: The WQBZ shall extend a minimum of 100 feet from either side of the centerline of the stream (total of 200 feet of buffer zone).

(3) Greater than 320 acres and up to 640 acres: The WQBZ shall extend a minimum of 200 feet from either side of the centerline of the stream (total of 400 feet of buffer zone).

(4) Greater than 640 acres and up to 1,280 acres: The WQBZ shall extend a minimum of 300 feet from either side of the centerline of the stream (total of 600 feet of buffer zone).

(5) Greater than 1,280 acres: The WQBZ shall extend a minimum of 400 feet from either side of the centerline of the stream (total of 800 feet of buffer zone).

(c) Special instructions regarding WQBZs .

(1) At the sole discretion of the city and based on special circumstances, minimum distances from the stream centerline may be adjusted if there are equivalent protection measures proposed that are found acceptable by the city engineer.

(2) Along steep slopes, as defined, the width of the WQBZ shall be 25 feet beyond the edge of the defined steep slope.

(3) Except as specifically provided for in this section, all development activities, including temporary construction activities, and landscaping activities, are prohibited in the buffer zone of a stream without the express written approval of the city engineer, who must be provided evidence of equivalent protection.

(d) Allowable development in WQBZ . The following development activities within a WQBZ may be allowed at the sole discretion of the city with the corresponding conditions:

(1) Critical utility crossings if the number of crossings of the WQBZ is limited to the maximum feasible extent;

(2) Critical roadway crossings if the number of crossings of the WQBZ is limited to the maximum feasible extent;

(3) Critical transportation crossings if the number of crossings of the WQBZ is limited to the maximum feasible extent;

(4) Hike-and-bike trails if provided for in an approved development plan;

(5) Maintenance and restoration of native, noninvasive vegetation;

(6) Water quality control monitoring devices;

(7) Removal of trash, debris, pollutants;

(8) Fences that do not obstruct flood flows;

(9) Public and private parks and open space, if human activities are limited to hiking, jogging, or walking trails, and excluding stables, corrals and other forms of animal housing;

(10) Typical private drives (acceptable to the city) to allow access to property not otherwise accessible; and/or

(11) The construction and use of BMPs for the express purpose of water quality and stormwater control provided that the natural drainage to the site is less than 128 acres.

(e) Limitations on allowed activities . Any development within a WQBZ allowed under subsection (d) of this section shall be designed and/or conducted in a manner which limits the alteration and pollution of the natural riparian corridor to the maximum extent feasible. In no case shall any wastewater line be located less than 100 feet from the centerline of a stream unless the applicant has demonstrated that installation of the wastewater line outside of this zone is physically prohibitive or environmentally unsound. Any wastewater lines located in a WQBZ shall meet design standards and construction specifications to ensure zero leakage.

(f) Requirements for discharges . All water quality control discharges and stormwater discharges into a WQBZ shall only be in the form of diffused, overland sheet flow and shall have peak velocities of less than five feet per second at the two-year, three-hour design rainfall event, unless demonstration is provided that this is not achievable with the proposed BMPs for managing stormwater runoff and quality, or that other means of diffusing the velocity of the runoff are provided that will protect the affected stream's morphology.

(Ordinance 3500.11, § 7, adopted 2/20/07)

Sec. 22.05.018. CEF setbacks.

(a) Minimum setback . A minimum setback area of 150 feet is established around the outside periphery of all CEFs.

(b) CEFs in Edwards Aquifer recharge zone . For a CEF which is in direct communication with the Edwards Aquifer, the upstream setback area shall extend out to the upper catchment divide of the CEF or 300 feet, whichever is less, but in no circumstances less than 150 feet.

(c) Restrictions . No site development activities are allowed within the setback area.

(d) Hilltop CEFs . For CEFs which are discovered to lie in an area which does not receive stormwater runoff (e.g., situated at the top of a hill), the setback area is 25 feet to prevent inadvertent pollution of the CEF.

(Ordinance 3500.11, § 8, adopted 2/20/07)

Sec. 22.05.019. Erosive flow control.

(a) Prohibition . No untreated stormwater runoff from developed land shall be allowed to flow over critical environmental features.

(b) Downspouts for certain roofs . All roof runoff from nonresidential buildings shall have downspouts disconnected from the site stormwater drainage system. Special circumstances may be reviewed and approved by the city without a waiver to this requirement.

(c) Grass-lined swales or vegetated buffers . To the maximum extent practical, stormwater drainage shall be treated using overland flow methods to a grass-lined swale or other vegetated buffer. The vegetated buffer shall be designed in accordance with the TCSS manual. Special circumstances may be reviewed and approved by the city without a waiver to this requirement.

(d) Drainage patterns . Drainage patterns shall be designed to the maximum extent practical to prevent erosion, maintain the recharge of local seeps and springs, and attenuate the harm of contaminants collected and transported by stormwater. All discharge points from stormwater retention and detention ponds or other accumulation areas shall provide for energy dissipation prior to exiting the site. Overland sheet flow and natural drainage features and patterns shall be maintained, rather than concentrating flows in storm sewers and drainage ditches. Stormwater drainage structures shall be sized to maintain flood flow velocities below the velocity associated with the 25-year, three-hour rainfall event.

(e) Stormwater discharge into waterway . For site designs that provide for discharge of stormwater into a waterway, adequate retention and/or detention shall be incorporated into the site design to limit flows into the receiving waterway to the level consistent with the flow rate of the two-year, three-hour rainfall event evenly distributed over a 24-hour period.

(f) Enclosed storm sewers and impervious channel linings . Enclosed storm sewers and impervious channel linings may be considered and approved by the city if such storm sewers or impervious linings are considered to be protective of water quality.

(g) Overland flow facilities . Overland flow facilities for a stormwater drainage system shall be designed in accordance with criteria set forth in the TCSS manual.

(Ordinance 3500.11, § 9, adopted 2/20/07)

Sec. 22.05.020. Infiltration.

(a) Restoration of infiltration capacity . To the maximum extent practical, water quality controls shall be designed to restore the infiltration capacity to pre-development conditions. Infiltration BMPs shall be designed in accordance with the TCSS manual.

(b) Impact avoidance . Infiltration systems shall be designed and located to avoid impacts to existing springs and recharge structures.

(Ordinance 3500.11, § 10, adopted 2/20/07)

Sec. 22.05.021. Steep slopes.

(a) Nonresidential construction . To the maximum extent practical, nonresidential construction shall be limited to those areas with pre-development natural grades of less than 25 percent.

(b) BMP standards . Erosion control, terracing and water quality control BMPs shall be designed in accordance with the TCSS manual.

(c) Cut and fill . A cut or fill with a finished gradient steeper than 33 percent shall be stabilized with a permanent structure.

(Ordinance 3500.11, § 11, adopted 2/20/07)

Sec. 22.05.022. Vegetation.

(a) Construction plans . Construction plans must demonstrate the following:

(1) Landscape shall be restored to the maximum extent practical to its natural state after construction on the site is concluded (i.e., restoration of landscaping and vegetation is done at the time of post-construction final inspection).

(2) Xeriscape and low maintenance vegetation shall be included in all nonresidential development in accordance with specifications in the TCSS manual.

(3) Guidance shall be provided for the use of herbicides, pesticides and fertilizers.

(b) Pesticide and fertilizer management plan . An applicant for a site development permit shall submit a pesticide and fertilizer management plan providing information regarding proper use, storage, and disposal of pesticides and fertilizers. The plan shall indicate likely pesticides and fertilizers to be used. The plan shall include two lists of pesticides and fertilizers:

(1) Those which, due to their chemical characteristics, potentially contribute significantly to water quality degradation;

(2) Those which, due to the chemical characteristics, potentially would result in minimal water quality degradation.

(c) Integrated pest management plan . An applicant for a site development permit shall submit an integrated pest management (IPM) plan in accordance with criteria set forth in the TCSS manual.

(d) Nonstructural BMPs . For the purposes of achieving compliance with this article, integrated pest management, pesticide, fertilizer, and parking lot management plans are considered a valid nonstructural BMP.

(e) Vegetative BMPs . Vegetative BMPs, such as vegetative filter strips, shall be designed in accordance with the TCSS manual.

(Ordinance 3500.11, § 12, adopted 2/20/07)

Sec. 22.05.023. Structural controls.

(a) Water quality control sizing . Structural water quality controls (WQCs) shall be sized for the entire contributing drainage area for the following types of developments:

(1) New multifamily residential development, new nonresidential development, and new subdivision development.

(2) Redeveloped multifamily residential development, redeveloped nonresidential development, and all redeveloped subdivision development that increases total impervious cover to a level greater than the impervious cover limits described in section 22.05.016.

(3) New single-family residential development which is not part of a subdivision development if such development has impervious cover greater than the impervious cover limits described in section 22.05.016.

(b) Runoff volume . The volume of runoff required to be captured, isolated, and treated by each structural WQC, or series of WQCs operating in sequence as a treatment train, shall be as required in section 22.05.015(e) and based on the contributing drainage area for the WQC or series of WQCs.

(c) Limited exclusions . Stormwater runoff from the following areas shall not require structural WQCs nor be included in the calculation of the volume of stormwater runoff required to be captured, isolated, and treated by a structural WQC:

(1) The full area of existing natural areas or restored natural areas from which stormwater runoff is routed around a WQC structure and which is restricted from development and from pesticide, herbicide, or fertilizer application through a plat note or restrictive covenant. The drainage areas from which stormwater is not routed around a WQC structure and which blends with runoff from developed areas shall be included in the water quality volume calculations.

(2) Fifty percent of the area using landscaping that requires no irrigation and no pesticide, herbicide, or fertilizer applications.

(3) The area on which a WQC structure is situated.

(4) Swimming pools that do not discharge the filter backwash into a stormwater drainage system.

(5) Impervious surface areas used for stormwater collection and on-site irrigation.

(6) Drainage from off-site areas which is routed around a WQC structure. The drainage areas from which stormwater is not routed around a WQC structure and which blends with runoff from developed areas shall be included in the water quality volume calculations.

(d) Nature and volume of pollutant loads . In determining the required level of treatment, the nature and volume of pollutant loads from all developed areas shall be considered, including but not limited to the following:

(1) Areas of impervious cover;

(2) The potential for pollutant impacts from industrial, commercial and other nonresidential types of development;

(3) Lawns, landscaping, and gardens using pesticides, herbicides or fertilizers;

(4) Golf courses, play fields and other recreational or greenspace areas using pesticides, herbicides or fertilizers; and

(5) Areas receiving wastewater effluent through surface spray irrigation or subsurface infiltration.

(e) Engineer required . All WQCs utilized for any development or redevelopment project shall be designed by a licensed Texas professional engineer in accordance with the removal efficiencies and other technical criteria set forth in the TCSS manual. Alternative WQC technical criteria may be approved if it is determined in the sole discretion of the city that the alternative technical criteria will result in equal or greater water quality control performance as that required under this article.

(f) Direct infiltration and recharge from WQC prohibited . All structural WQCs utilized in the recharge zone shall be modified or augmented to prevent direct infiltration and recharge from the WQC. To meet this requirement, such WQCs shall utilize artificial linings, evapotranspiration beds, or other methods designed and operated to prevent infiltration into the Edwards Aquifer even during periods of extended rainfall.

(g) Erosion control . The erosion control requirements of this article shall apply to all related areas for a development project, including but not limited to off-site borrow areas, off-site spoil areas and off-site construction staging areas which are owned or controlled by the developer.

(h) Peak runoff rate . The peak runoff rate for developed conditions shall not exceed the peak runoff rate for pre-development conditions for the two-year storm event. Peak runoff rate calculations shall comply with the criteria set forth in the TCSS manual.

(i) Dedicatory instrument . To provide necessary access for maintenance and monitoring, water quality controls shall be located within an area dedicated to the public by easement, deed restriction, or recorded plat notation. The dedicatory instrument shall note that water quality restrictions exist on the property and that any alternative use or alteration of the property must be approved in writing by the city.

(Ordinance 3500.11, § 13, adopted 2/20/07)

Sec. 22.05.024. Roof runoff capture systems.

A roof rainfall runoff capture system or rainwater harvesting system approved under this article shall comply with the following minimum requirements:

(1) The entire system, including rainwater collection, conveyance and storage, shall be isolated from the site stormwater system.

(2) The collected rainwater shall be used for on-site irrigation or other purposes as approved by the city.

(3) The system shall comply with the pollution control performance standards of section 22.05.015(b) and (c).

(4) The on-site irrigation system shall be designed in accordance with standard irrigation practices considering such factors as soil type, slope, and vegetative uptake rates.

(Ordinance 3500.11, § 14, adopted 2/20/07)

Sec. 22.05.025. Erosion hazard setbacks.

(a) Generally . The city may require preservation of an existing channel or waterway for use as a natural floodplain through the establishment of erosion hazard setbacks in accordance with the TCSS manual. No building, fence, wall, deck, swimming pool or other structure shall be located, constructed or maintained within the area encompassing the setback.

(b) Alternative . As an alternative to the establishment of an erosion hazard setback, an existing channel or waterway may be preserved and protected through a bank stabilization and protection plan as approved by the city.

(Ordinance 3500.11, § 15, adopted 2/20/07)

Sec. 22.05.026. Operation and maintenance of water quality controls.

(a) Maintenance plan required . An applicant for a site development permit shall submit a WQC maintenance plan describing the specific measures proposed for operating, monitoring, and maintaining each water quality control proposed for a development project as required by this article. The measures described in the WQC maintenance plan shall be consistent with the guidelines set forth in the TCSS manual and shall comply with the financial assurance requirements as may be defined by the TCSS and as required by the city council based upon design criteria and needs. City approval of the WQC maintenance plan is required prior to issuance of a site development permit.

(b) Recording of plan; deed restriction . Upon city approval of the WQC maintenance plan, the project applicant shall record in the county deed records and on any recorded plat(s) for the development a notation stating that the property is subject to a water quality control maintenance plan on file at the city's administrative offices. Upon transferring title to the property, or any subdivided portion thereof, the applicant shall establish a deed restriction stating that the property is subject to a water quality control maintenance plan on file at the city's administrative offices.

(c) Operation, monitoring and maintenance of controls . All applicants shall operate, monitor, and maintain each water quality control required by this article in accordance with the WQC maintenance plan and this article.

(d) Transfer of responsibility .

(1) The WQC maintenance plan may provide for transfer of responsibility for WQC operation and maintenance activities to:

(A) A groundwater district, a municipal utility district, a public utility district, or any other special district created under state law;

(B) A homeowners' or property owners' association;

(C) A natural resources conservation or other environmental interest group; or

(D) Any similar third party entity.

(2) Transfer of responsibility to any such entity requires the advance written consent of the city. Any entity assuming responsibility for WQC operation and maintenance shall also assume responsibility for the financial assurance as may be required by the TCSS or the city council.

(Ordinance 3500.11, § 16, adopted 2/20/07)

APPENDIX D FIRE APPARATUS ACCESS ROADS

SECTION D104
COMMERCIAL AND INDUSTRIAL DEVELOPMENTS

D104.1 Buildings exceeding three stories or 30 feet in height.

Buildings or facilities exceeding 30 feet (9144 mm) or three stories in height shall have not fewer than two means of fire apparatus access for each structure.

D104.2 Buildings exceeding 62,000 square feet in area.

Buildings or facilities having a gross *building area* of more than 62,000 square feet (5760 m^2) shall be provided with two separate and *approved* fire apparatus access roads.

Exception: Projects having a gross *building area* of up to 124,000 square feet (11 520 m^2) that have a single *approved* fire apparatus access road where all buildings are equipped throughout with *approved automatic sprinkler system*s.

D104.3 Remoteness.

Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses.

CITY OF DRIPPING SPRINGS

ORDINANCE No. 2021-40

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF DRIPPING SPRINGS, TEXAS AMENDING ARTICLE 22.04 TRANSPORTATION MASTER PLAN, SECTION 22.04.001 ADOPTION, ADOPTING THE 2021 CITY OF DRIPPING SPRINGS TRANSPORTATION MASTER PLAN AND ASSOCIATED POLICIES.

WHEREAS, Chapter 213 of the Texas Local Government Code authorizes the City to adopt a comprehensive plan for the long-range development of the City; and

WHEREAS, the Transportation Master Plan, represents a single plan organized by subject matter and geographic area to be used to coordinate and guide the establishment of development regulations; and

WHEREAS, the City Council approved a Professional Services Agreement with HDR to conduct transportation master planning services on May 18, 2018; and

WHEREAS, the primary purposes of the Transportation Master Plan are as follows:

1. Update the Thoroughfare Plan
2. Complete traffic analysis supporting routes identified on the Thoroughfare Plan
3. Develop recommended cross-sections
4. Identify cross-section and right-of-way needs on new and existing roads
5. Prepare a Transportation Master Plan documenting analysis, recommendations, and best practices

WHEREAS, the City Council of the City of Dripping Springs conducted a transportation master planning open house in January 2019; draft Thoroughfare Plan and Multimodal Plan was presented online for public comment in November/December 2020; and a virtual Town Hall in February 2021; and

WHEREAS, the City staff conducted stakeholder meetings with key representatives from local agencies that included Dripping Springs Independent School District, Hays County Commissioners Court, Texas Department of Transportation, and Hays County Transportation Department to address specific concerns related to local and regional mobility; and

WHEREAS, the Transportation Committee of the City of Dripping Springs received multiple presentations related to the Transportation Master Plan and provided input related to the proposed Plan; and

WHEREAS, the City Council and Planning and Zoning Commission were invited to participate in the transportation master planning open house in January 2019; and

WHEREAS, the Planning & Zoning Commission of the City of Dripping Springs conducted a public hearing on October 12, 2021, to consider the draft Transportation Master Plan report and provide recommendations for City Council consideration; and

WHEREAS, the City has conducted all necessary public hearings regarding the need and desirability of amendments, revisions, deletions, and modifications to the proposed 2021 Transportation Master Plan; and

WHEREAS, the City finds it has satisfied all legal prerequisites and has determined that the adoption of this Ordinance is in the interest of promoting the general health, safety, morals, and welfare of the community; and

WHEREAS, this Ordinance was passed and approved at a meeting of the City Council of the City of Dripping Springs held in compliance with the Texas Open Meetings Act at which a quorum of the City Council Members was present and voting.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF DRIPPING SPRINGS, TEXAS THAT:

SECTION 1: ADOPTION OF MASTER PLAN

That the City Council of the City of Dripping Springs does hereby adopt the attached 2021 Transportation Master Plan (the "Plan"), which supersedes previous existing Transportation Master Plans.

ARTICLE 22.04. TRANSPORTATION PLAN

Sec. 22.04.001. Adopted.

The transportation plan attached to Ordinance No. 2021-40 as exhibit A is adopted by reference.

SECTION 2: POLICIES STATEMENT

That the City Council of the City of Dripping Springs does hereby adopt the Plan subject to the following policies:

(a) It is the intent of the City Council to adopt a Plan that provides direction to enhance the development of a transportation network of roads, bicycle lanes, trails, sidewalks, and shared use paths that adequately supports existing and planned land uses, as well as to integrate and support interconnectivity among subdivisions, commercial areas, schools, and places of interest.

(b) It is the intent of the City Council that projects listed in the Plan will be constructed or developed within the general time frame outlined in the Plan.

(c) The City Council recognizes the need for annexation planning and transportation master planning to be coordinated activities.

(d) The Plan is designed to ensure compliance with applicable federal, state, and local regulatory programs. Projects identified within the Plan should be designed to ensure that transportation mobility within the City of Dripping Springs is managed in a comprehensive manner that minimizes project life-cycle costs and maximizes overall benefits for the citizens of Dripping Springs.

(e) The City Council acknowledges that circumstances may arise where adjustments or deviations from the Plan may be in the best interest of the City of Dripping Springs. If it is determined that an adjustment or deviation should be made, the Dripping Springs City Council may amend the Plan at any time to reflect the change.

SECTION 3. REPEALER

In the case of any conflict between other provisions of this Ordinance and any existing Ordinance of the City, the provisions of this Ordinance will control.

SECTION 4. SEVERABILITY

If any provision of this Ordinance or the application thereof to any person or circumstance is held invalid, that invalidity or the unenforceability will not affect any other provisions or applications of this Ordinance that can be given effect without the invalid provision.

SECTION 6. EFFECTIVE DATE

The Ordinance shall be effective immediately upon passage and publication.

SECTION 7. PROPER NOTICE & MEETING

It is hereby officially found and determined that the meeting at which this Ordinance was passed was open to the public, and that public notice of the time, place and purpose of said meeting was given as required by the Open Meetings Act, Texas Government Code, Chapter 551. Notice was also provided as required by Chapter 52 of the Texas Local Government Code.

PASSED & APPROVED this, the 19th day of October 2021, by a vote of 3 (ayes) to 0 (nays) to 0 (abstentions) of the City Council of Dripping Springs, Texas.

CITY OF DRIPPING SPRINGS:

Bill Foulds, Jr., Mayor

ATTEST:

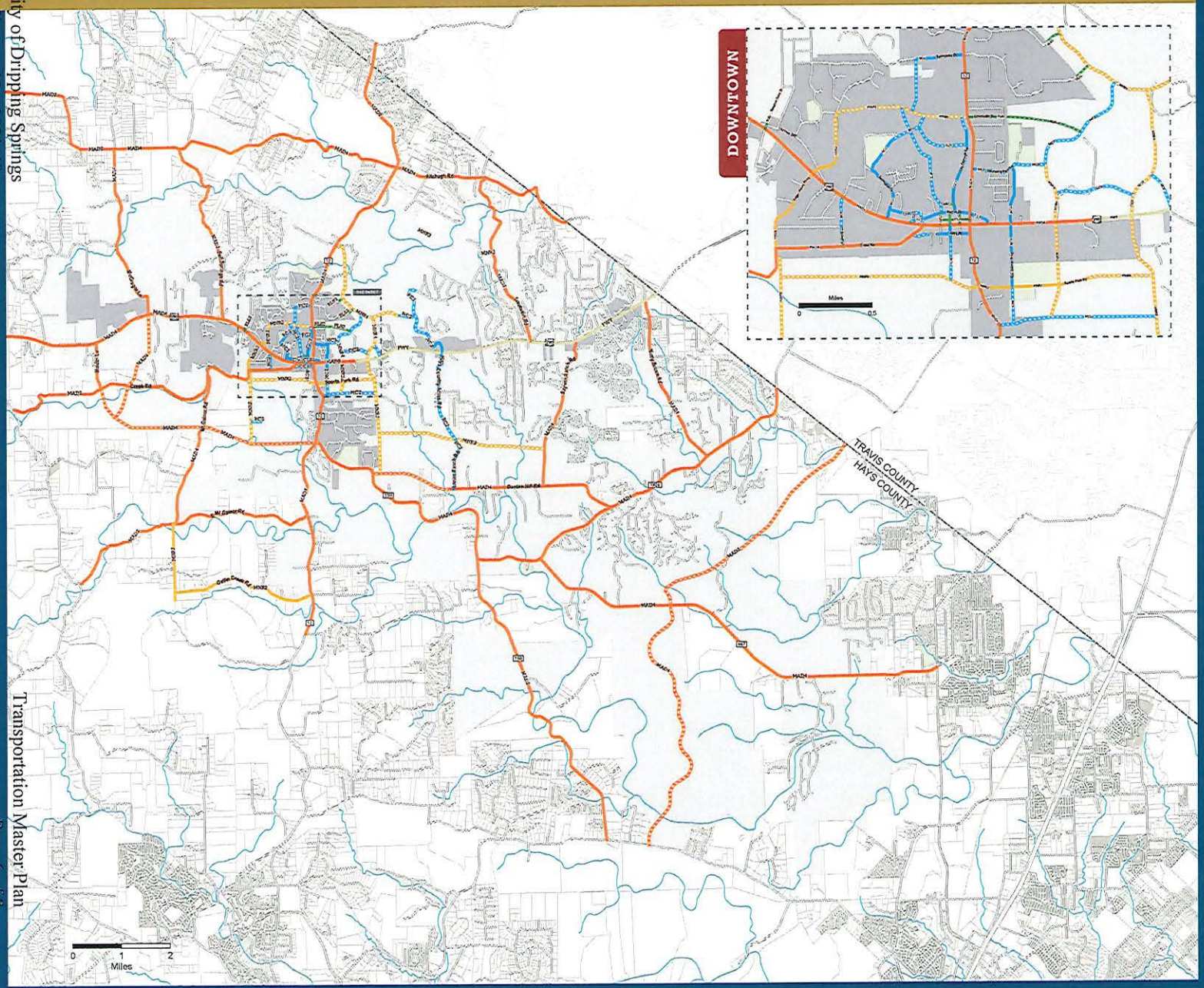
Andrea Cunningham

Andrea Cunningham, City Secretary

EXHIBIT "A"

Transportation Master Plan

THOROUGHFARE PLAN



DRIPPING SPRINGS
Texas

LEGEND

THOROUGHFARE PLAN

MAJOR ARTERIAL
- Enhanced
- Proposed

MINOR ARTERIAL
- Enhanced
- Proposed

COLLECTOR
- Enhanced
- Proposed

STREET
- Enhanced
- Proposed

FREEWAY
- Enhanced*

ROADWAY CLASSIFICATIONS

MAD6 - 6 Lane Major Divided Arterial
MAD4 - 4 Lane Major Divided Arterial
MAD2 - 2 Lane Major Divided Arterial

MNR4 -4 Lane Minor Divided Arterial
MNR2 -2 Lane Minor Divided Arterial

MIC2 - 2 Lane Major Collector
CC2 - 2 Lane Commercial Collector
NC2 - 2 Lane Neighborhood Collector
RC2 - 2 Lane Residential Collector

CLC2 - 2 Lane Commercial Local Street
RLC2 - 2 Lane Residential Local Street

OTHER

- CITY LIMITS
- EXTRATERRITORIAL JURISDICTION (ETJ)
- PARKS
- CREEKS & RIVERS
- COUNTY BOUNDARY

N

October 2021

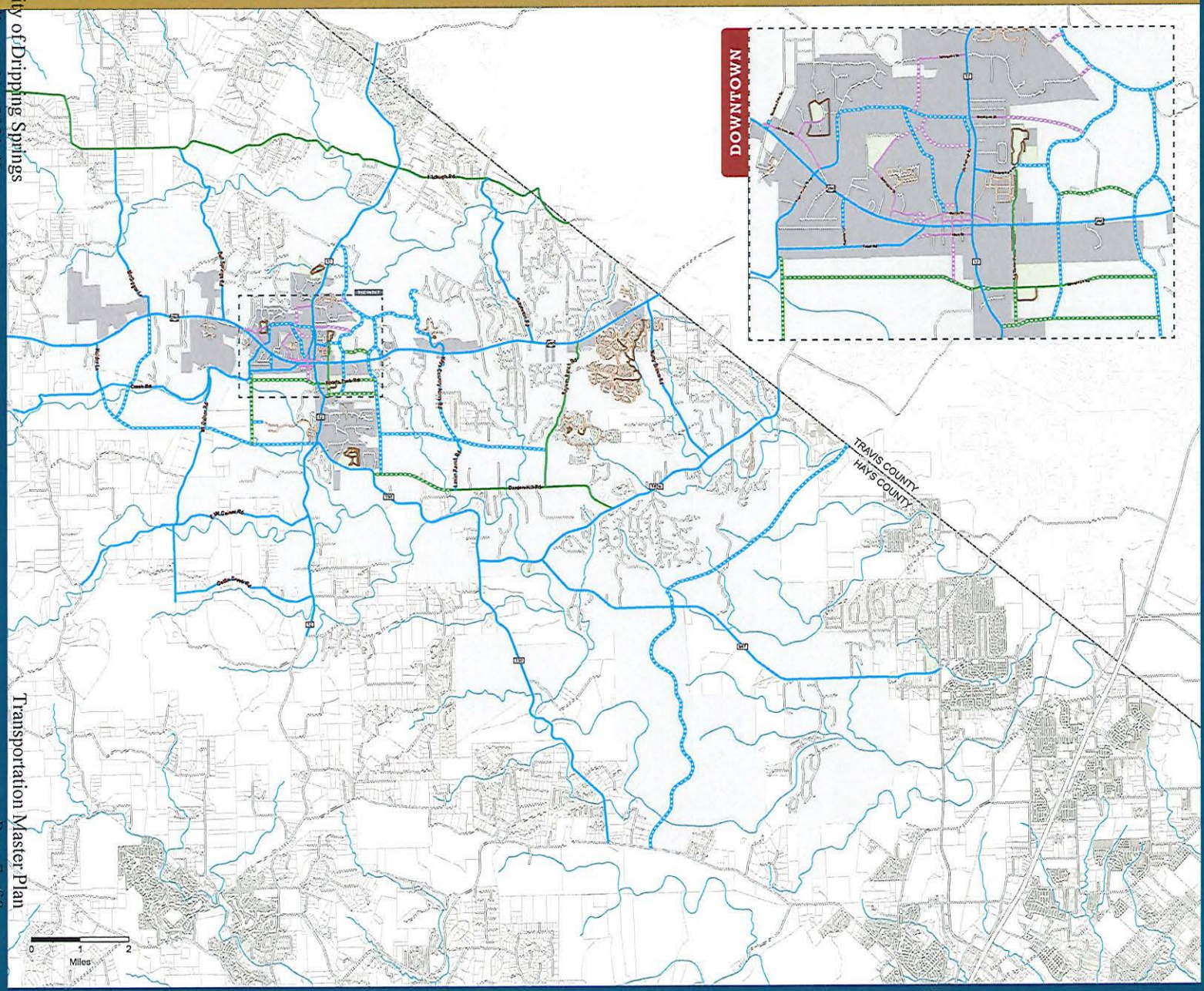
This Thoroughfare Plan depicts proposed enhancements to existing roadways and proposed roadways.

Final alignments of proposed roadways will be determined in cooperation with TxDOT, Hays County and its Long Range Transportation Plan, and the subdivision platting process.

* US 290 classification and roadway cross-section to be determined by TxDOT as part of US 290 Corridor Study.

HDR
504 Lavaca Street, Suite 900, Austin, TX 78701
512-904-3700 | www.hdrinc.com

MULTIMODAL PLAN



DRIPPING SPRINGS
Texas

LEGEND

MULTIMODAL PLAN

SHARED-USE PATH
- Enhanced
- Proposed

SIDEWALK
- Enhanced
- Proposed

SIDEWALK WITH RAISED BICYCLE LANE
- Enhanced
- Proposed

- EXISTING SIDEWALKS
- EXISTING TRAILS

OTHER
- CITY LIMITS
- EXTRATERRITORIAL JURISDICTION (ETJ)
- PARKS
- CREEKS & RIVERS
- COUNTY BOUNDARY

N

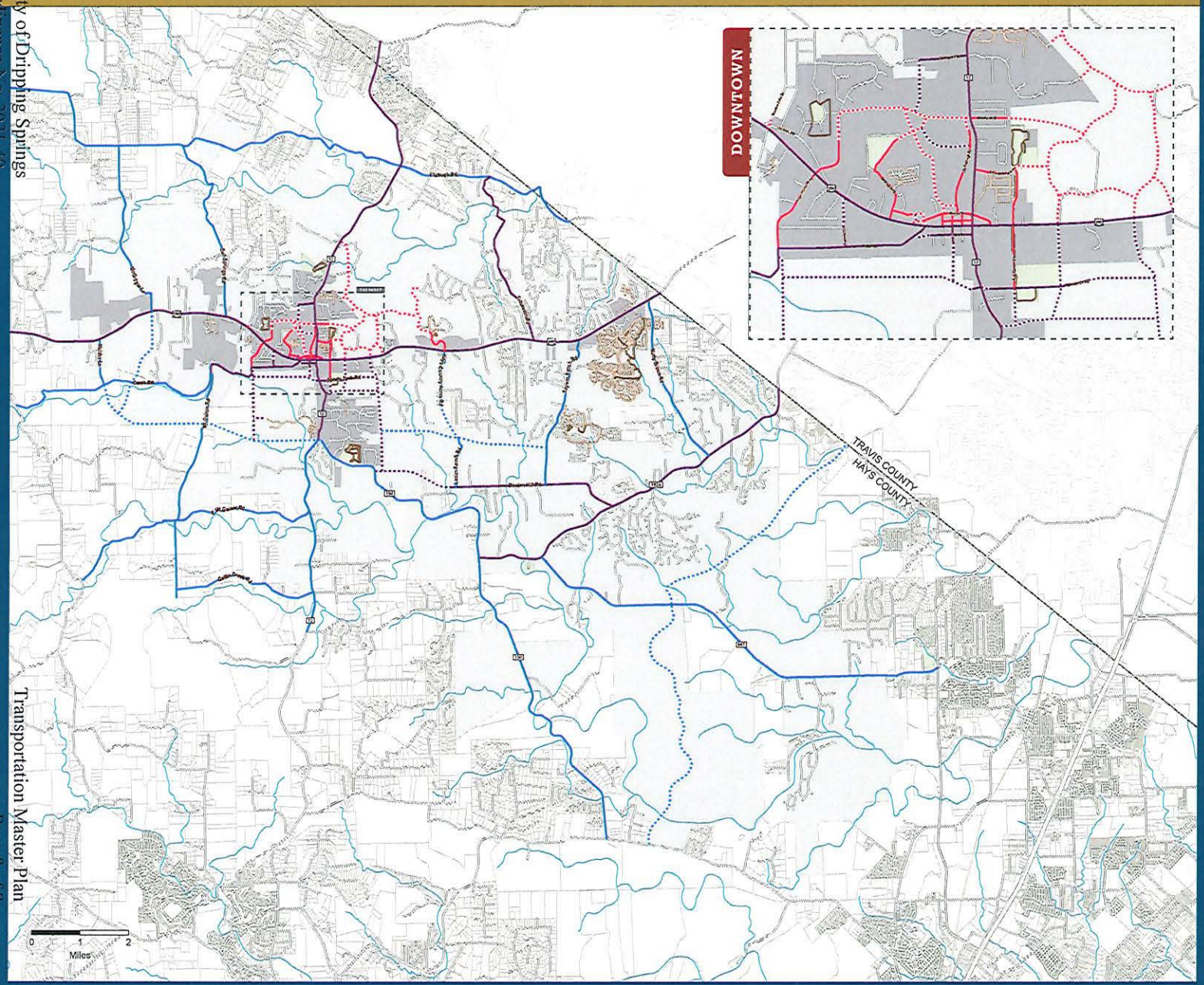
October 2021

This Multimodal Plan depicts proposed multimodal enhancements to existing roadways and proposed roadways. This Multimodal Plan does not preclude pedestrian and/or bicycle enhancements not indicated on this map.

Final alignments of proposed roadways will be determined in cooperation with TxDOT, Hays County and its Long Range Transportation Plan, and the subdivision platting process.

HDR
504 Lavaca Street, Suite 900, Austin, TX 78701
512-904-3700 | www.hdrinc.com

PRIORITIZATION PLAN



DRIPPING SPRINGS
Texas

LEGEND

PRIORITIZATION PLAN

SHORT-TERM
- Enhanced
- Proposed

MID-TERM
- Enhanced
- Proposed

LONG-TERM
- Enhanced
- Proposed

- EXISTING SIDEWALKS
- EXISTING TRAILS

OTHER
- CITY LIMITS
- EXTRATERRITORIAL JURISDICTION (ETJ)
- PARKS
- CREEKS & RIVERS
- COUNTY BOUNDARY

N

October 2021

This Prioritization Plan depicts the recommended project priority for enhancements to existing roadways and proposed roadways.

Final alignments of proposed roadways will be determined in cooperation with TxDOT, Hays County and its Long Range Transportation Plan, and the subdivision platting process.

HDR
504 Lavaca Street, Suite 900, Austin, TX 78701
512-904-3700 | www.hdrinc.com

2021-40

San Marcos Publishing, LP
Wimberley View • Century News

P.O. Box 49, Wimberley, Texas 78676
(512) 847-2202

Received
OCT 28 2021
City of Dripping Springs

State of Texas
County of Hays

Before me, the undersigned authority, on this day personally appeared Dalton Sweat, who being by me here and now duly sworn, upon oath says:

My name is Dalton Sweat, and I am the General Manager, of the The Wimberley View & The Dripping Springs Century News, a newspaper of general circulation in Hays County, Texas, and a newspaper which has been regularly and continuously published in Wimberley, Hays County, Texas, for a period of more than one year immediately preceding the date of publications of the following, and that the said notice, a copy of which follows, was published in the regular edition of said newspaper for a period of 1 week on the following dates:

October 28, 2021

---------- 2021

----------_2021

---------- 2021

The said General Manager, Dalton Sweat further states that the rate charged for this publication is the lowest rate charged to commercial advertisers for the same class as advertising for a like amount of space.

Signature of Affiant

Subscribed and Sworn to me, by the said General Manager Dalton Sweat this 27th day of October, 2021 to certify which witness my hand and seal of office.

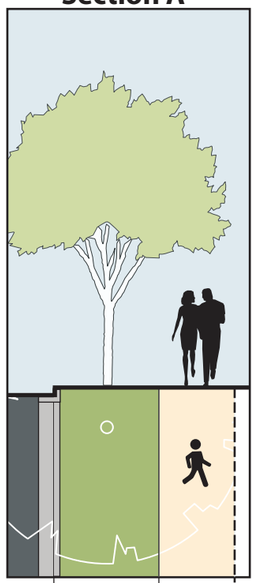
Mattatha Barker
NOTARY PUBLIC in and for Hays County, Texas

MATTATHA MARIE BARKER
Notary Public, State of Texas
Comm. Expires 11-04-2022
Notary ID 128436511

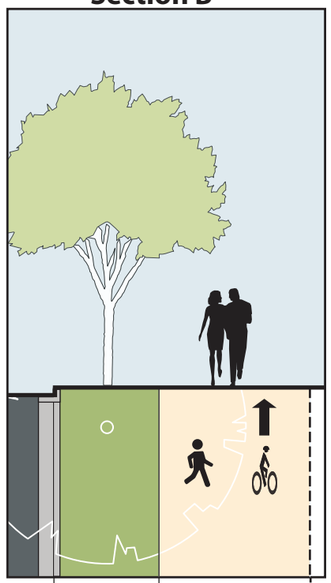
City of Dripping Springs
Public Notice of Ordinance 2021-40
Transportation Master Plan
Effective Date: October 28, 2021

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF DRIPPING SPRINGS, TEXAS AMENDING ARTICLE 22.04 TRANSPORTATION MASTER PLAN, SECTION 22.04.001 ADOPTION, ADOPTING THE 2021 CITY OF DRIPPING SPRINGS TRANSPORTATION MASTER PLAN AND ASSOCIATED POLICIES.

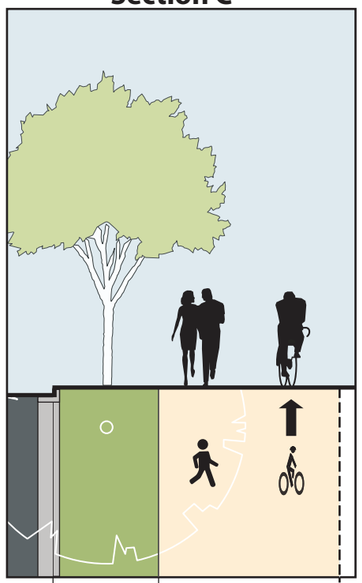
Section A



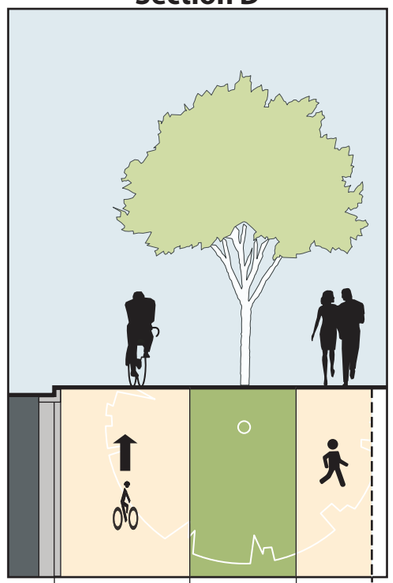
Section B



Section C

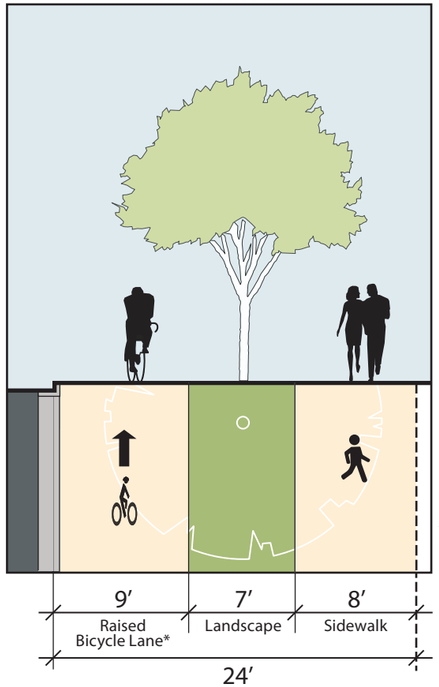


Section D



*Raised Bicycle Lane is dimensioned from the face-of-curb and includes a 2-foot buffer adjacent to the roadway.

Section E

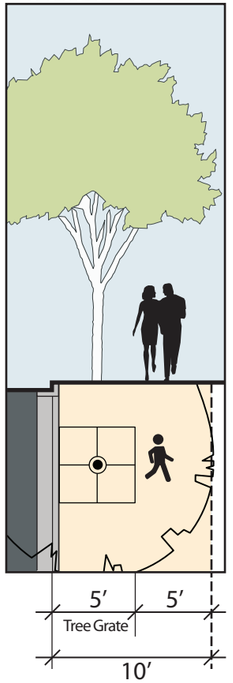


*Raised Bicycle Lane is dimensioned from the face-of-curb and includes a 2-foot buffer adjacent to the roadway.

Section DT 1*

*Back-of-curb section and dimensions are applicable in Downtown Dripping Springs only and may only be used in street sections, as specified in the Transportation Master Plan.

Section DT 2*



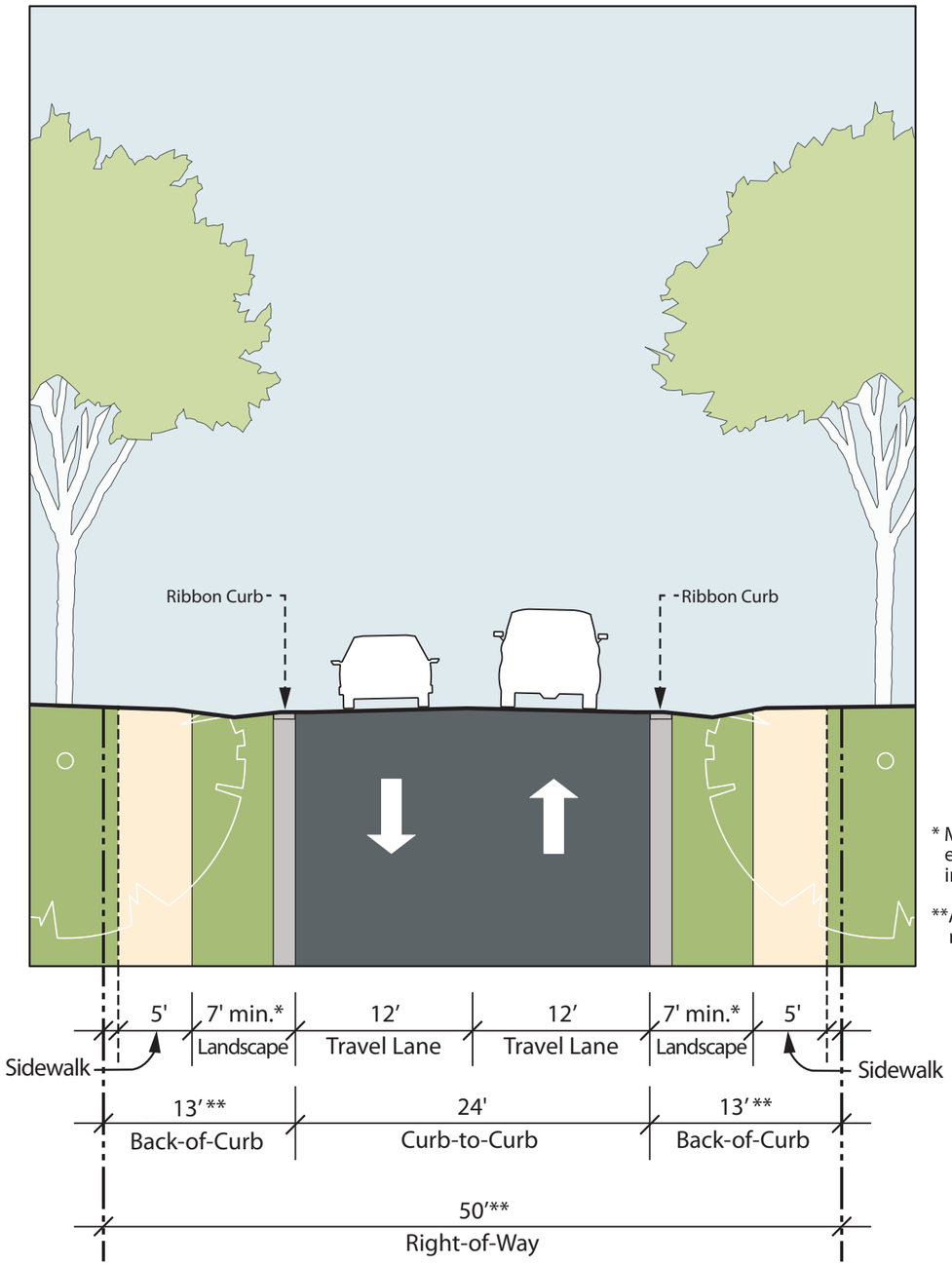
*Back-of-curb section and dimensions are applicable in Downtown Dripping Springs only and may only be used in street sections, as specified in the Transportation Master Plan.

0′ 5′ 10 ft.

Back-of-Curb Options

City of Dripping Springs - Transportation Master Plan

October 19, 2021



* Minimum landscape clear space width between edge of pavement and sidewalk to be determined in coordination with the City of Dripping Springs.

**Accommodations for drainage may impact required Right-of-Way width.

0' 5' 10 ft.

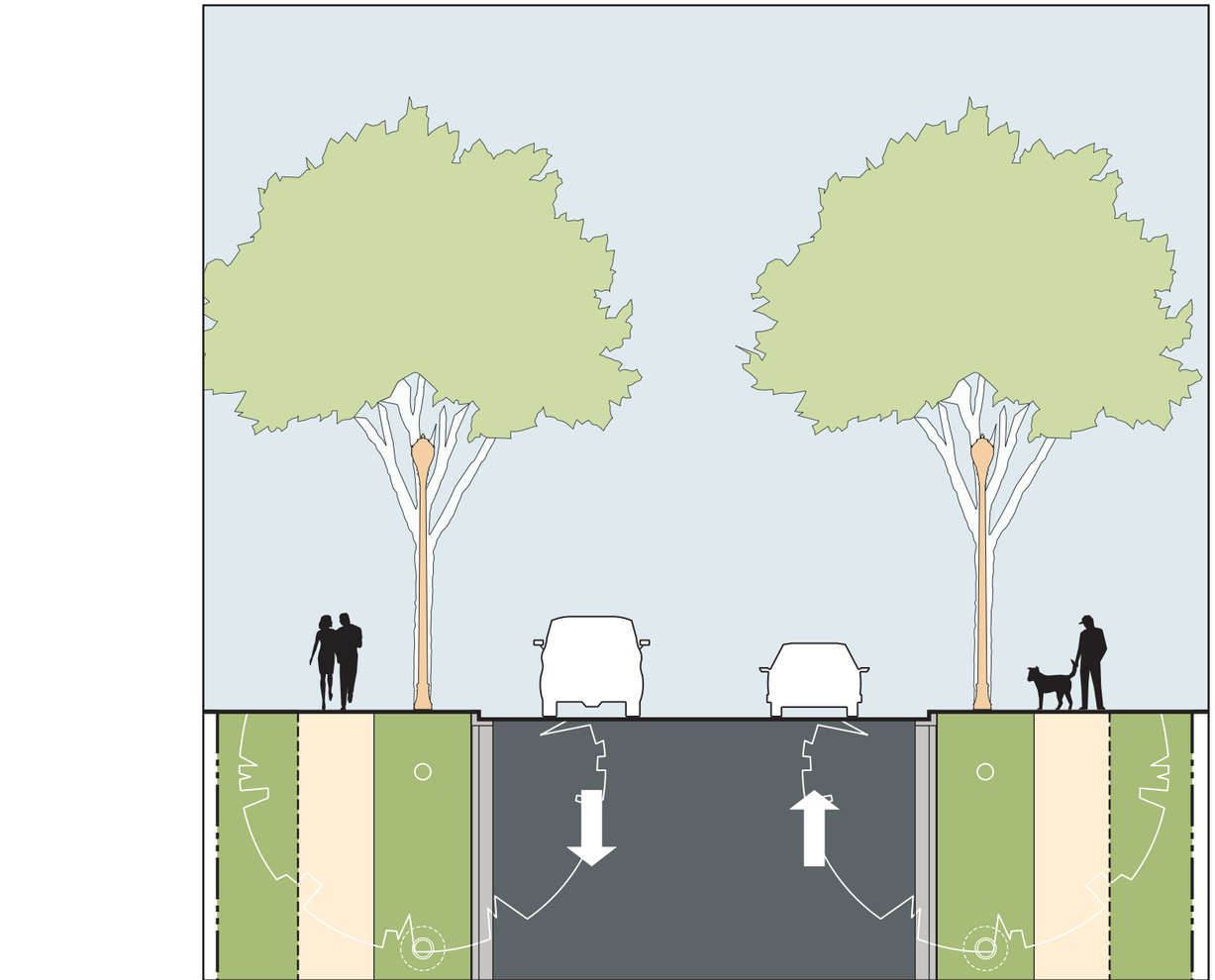
2 Lane Rural Roadway

City of Dripping Springs - Transportation Master Plan

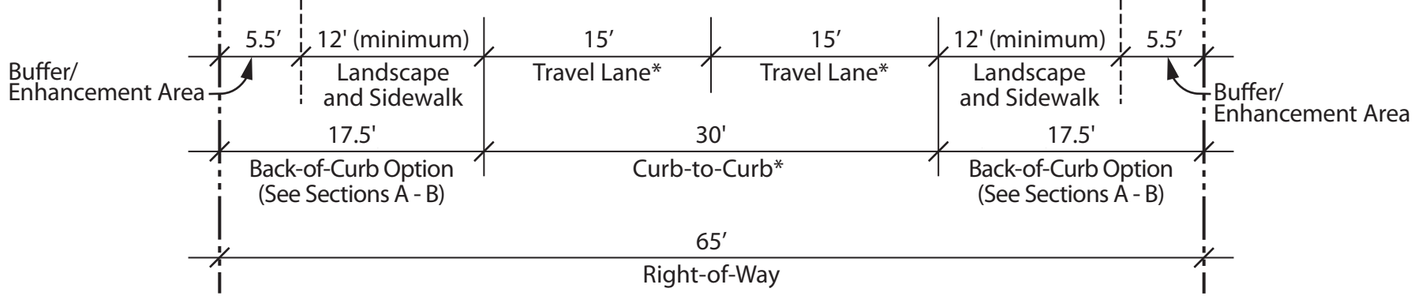
October 19, 2021

NOTES

- Curb-to-curb dimensions are to face-of-curb.
- For Back-of-Curb Options refer to the Sections supplement for alternate configurations and dimensions. Use of an alternate Section may encroach into the Buffer/Enhancement Area.



* *The travel lanes may be used for parallel parking with a single, queuing lane of traffic, as approved by the City of Dripping Springs. Additional off-street parking requirements are determined by the Zoning Code.*



0′ 5′ 10 ft.

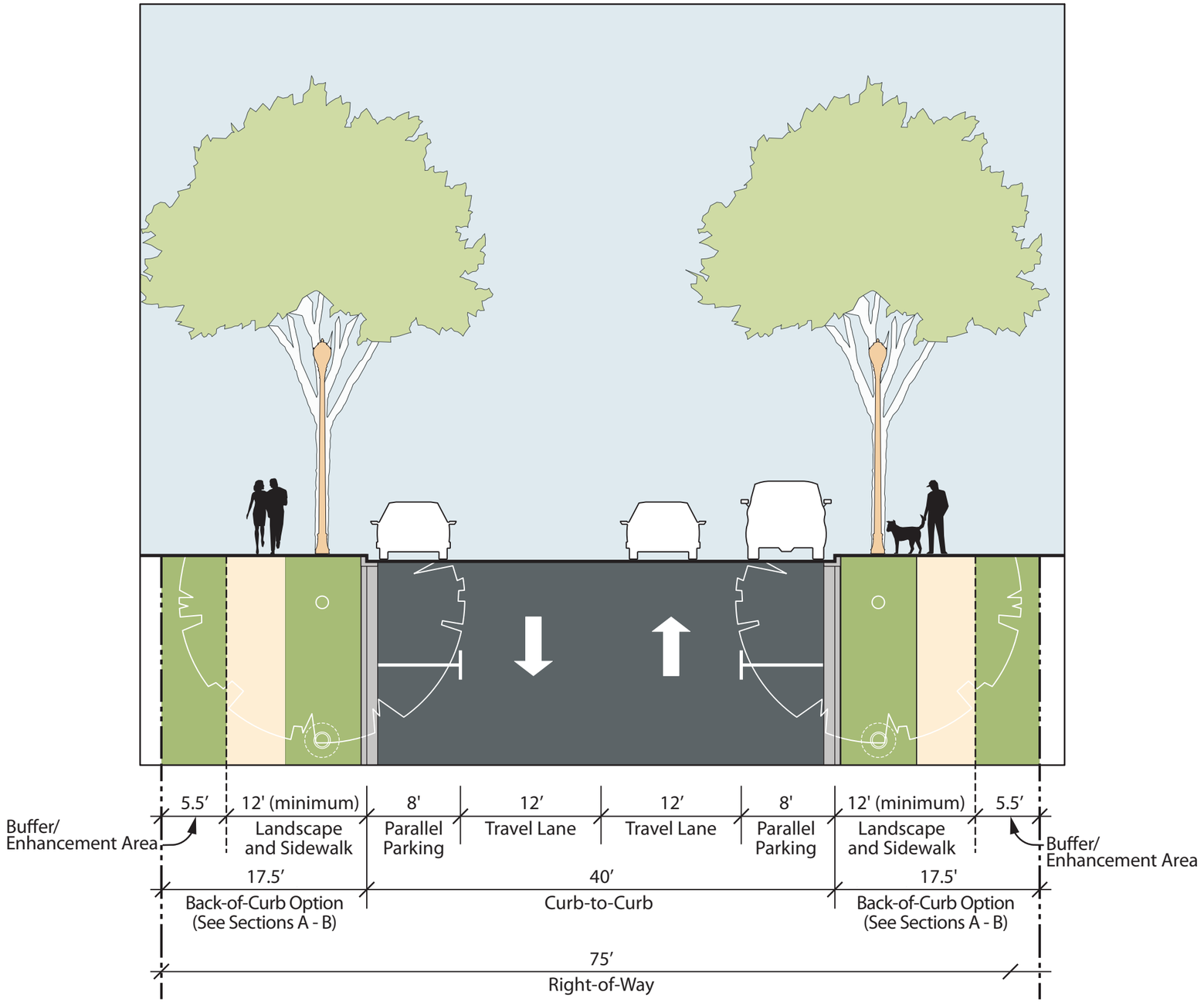
2 Lane Residential Local Street

City of Dripping Springs - Transportation Master Plan

October 19, 2021

NOTES

- Curb-to-curb dimensions are to face-of-curb.
- For Back-of-Curb Options refer to the Sections supplement for alternate configurations and dimensions. Use of an alternate Section may encroach into the Buffer/Enhancement Area.



0′ 5′ 10 ft.

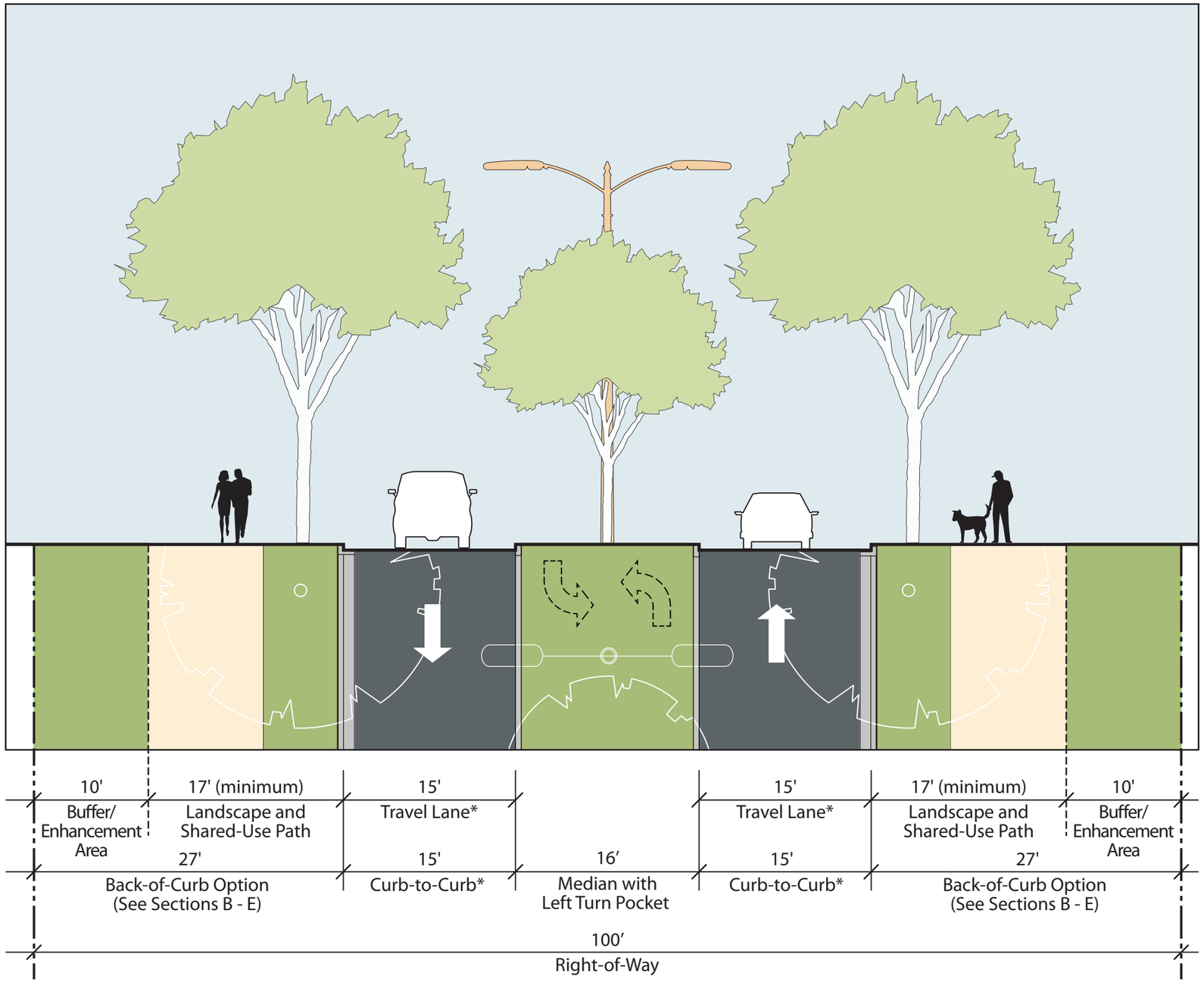
2 Lane Residential Collector/Local Street

City of Dripping Springs - Transportation Master Plan

October 19, 2021

NOTES

- Curb-to-curb dimensions are to face-of-curb.
- For Back-of-Curb Options refer to the Sections supplement for alternate configurations and dimensions. Use of an alternate Section may encroach into the Buffer/Enhancement Area.



* *Parking is prohibited to allow for fire truck access.*

0' 5' 10 ft.

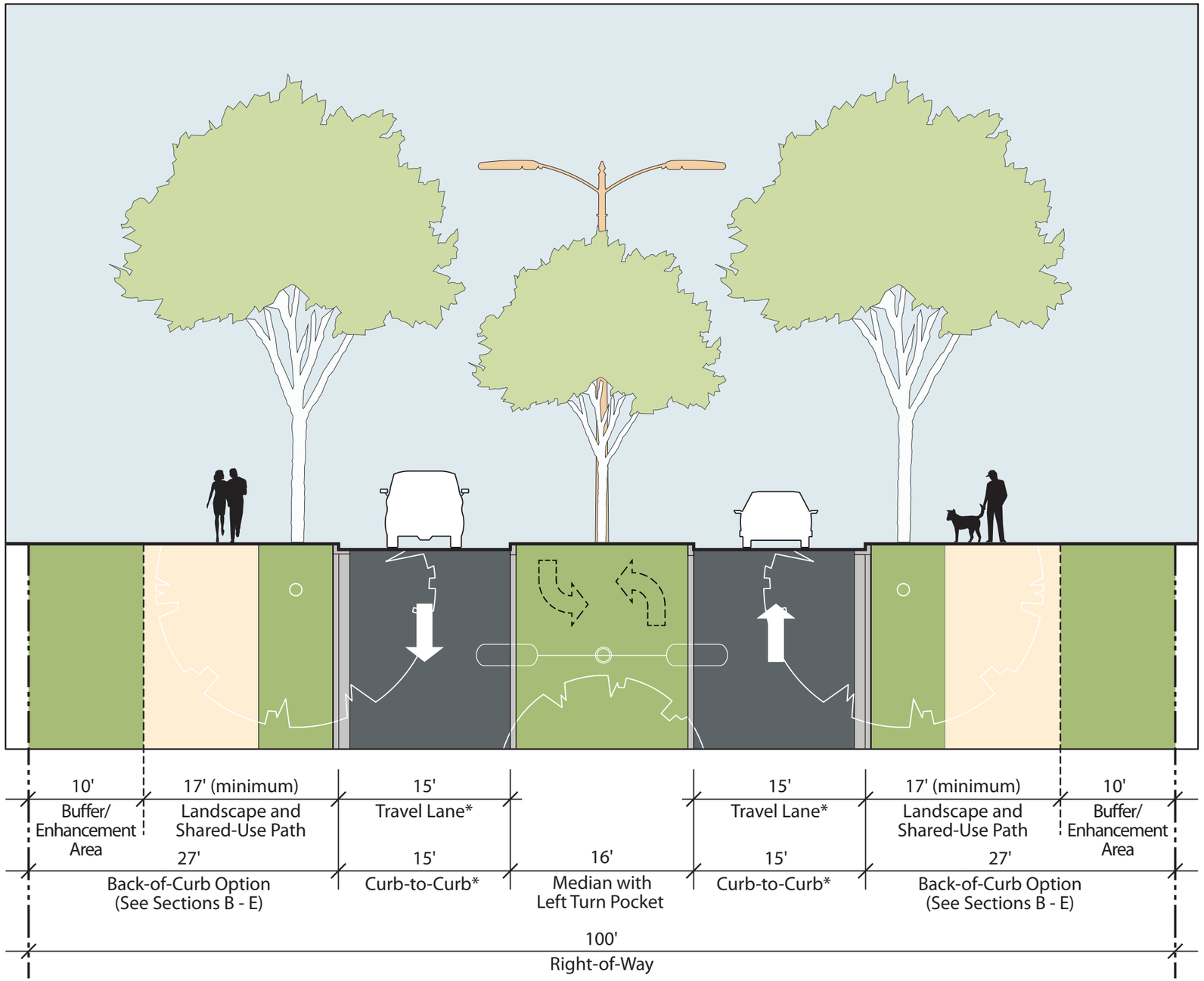
2 Lane Neighborhood Collector Divided

City of Dripping Springs - Transportation Master Plan

October 19, 2021

NOTES

- Curb-to-curb dimensions are to face-of-curb.
- For Back-of-Curb Options refer to the Sections supplement for alternate configurations and dimensions. Use of an alternate Section may encroach into the Buffer/Enhancement Area.



* *Parking is prohibited to allow for fire truck access.*

0' 5' 10 ft.

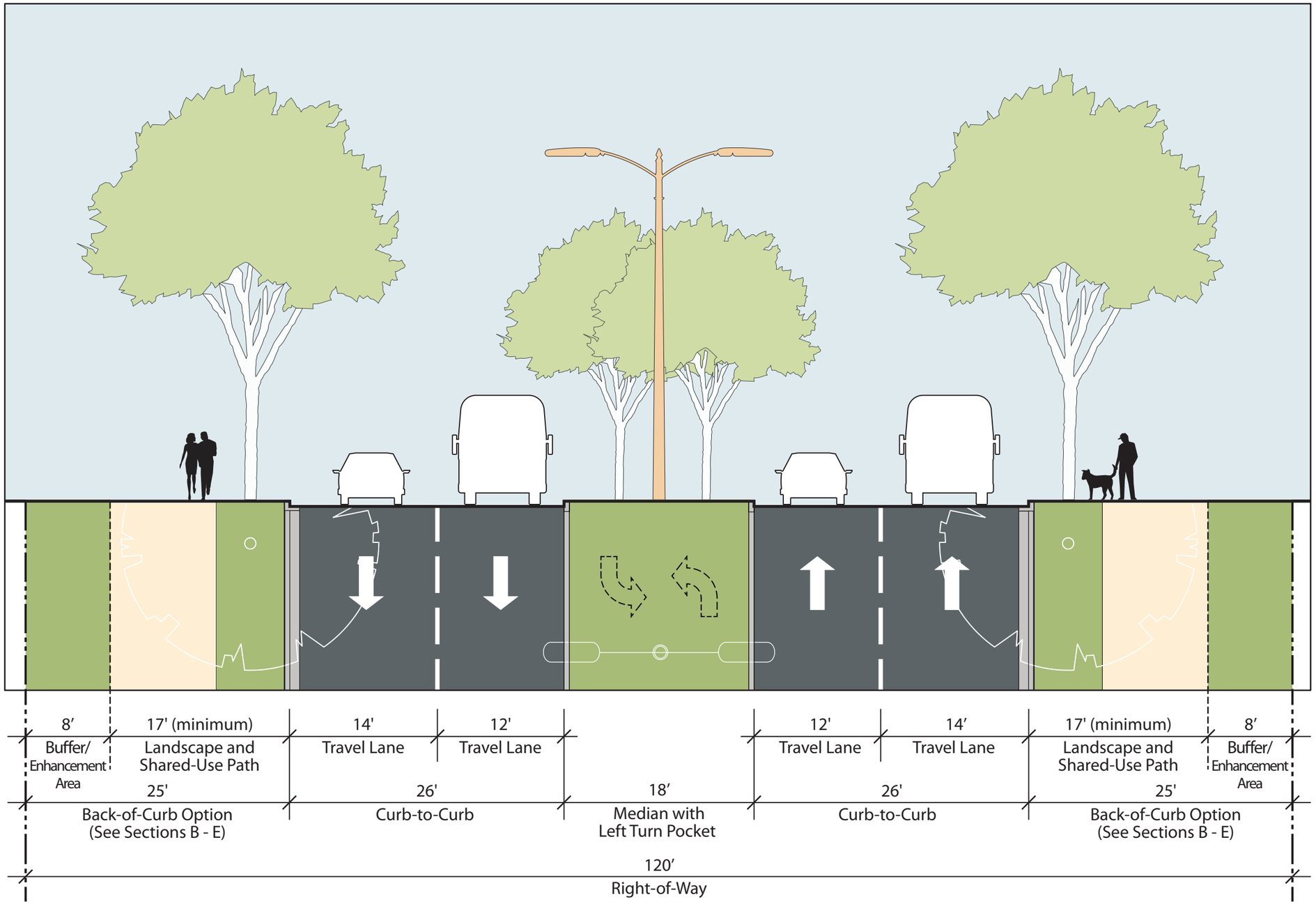
2 Lane Minor/Major Arterial Divided

City of Dripping Springs - Transportation Master Plan

October 19, 2021

NOTES

- Curb-to-curb dimensions are to face-of-curb.
- For Back-of-Curb Options refer to the Sections supplement for alternate configurations and dimensions. Use of an alternate Section may encroach into the Buffer/Enhancement Area.



0′ 5′ 10 ft.

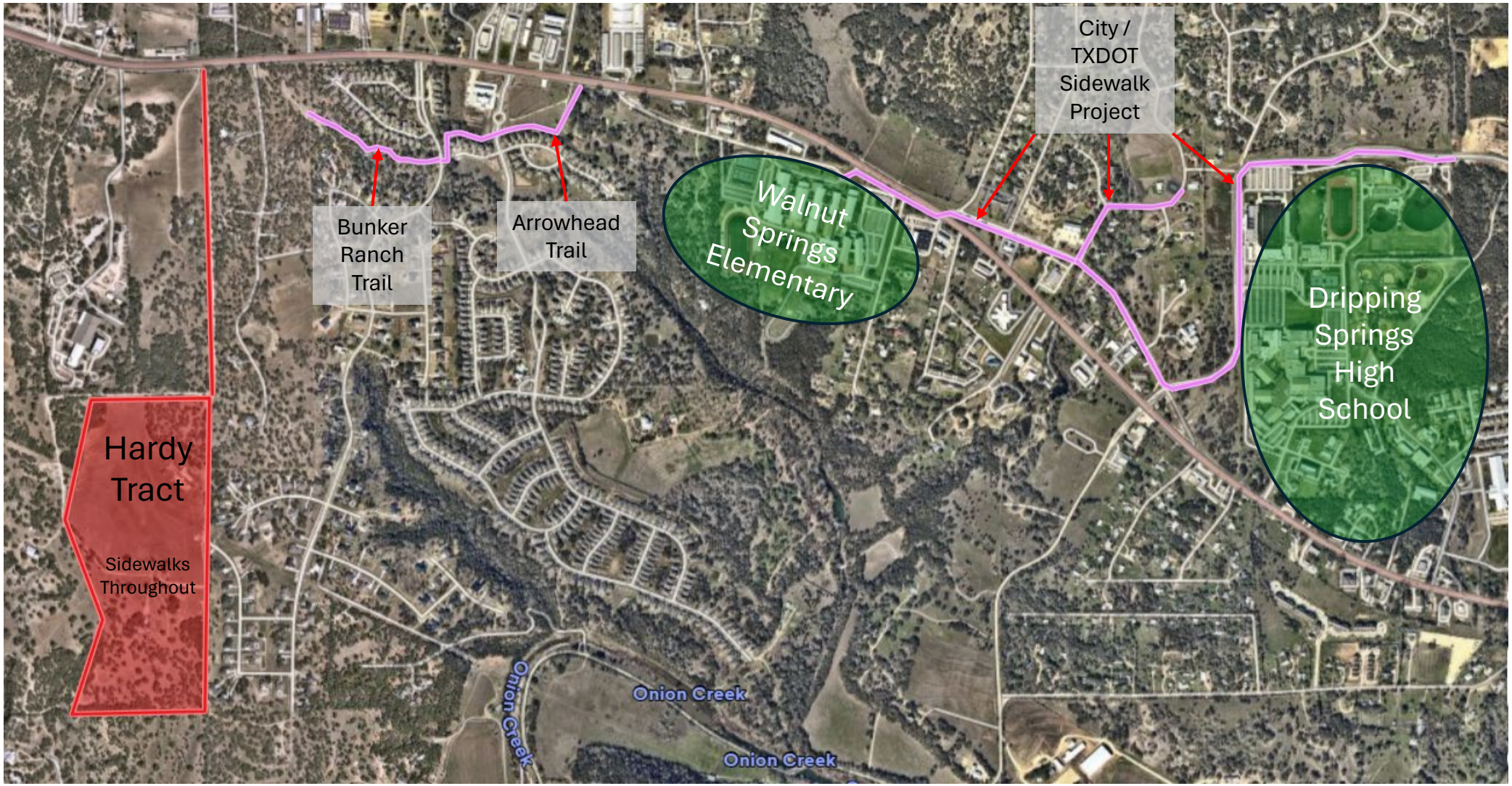
4 Lane Major Arterial Divided

City of Dripping Springs - Transportation Master Plan

October 19, 2021

NOTES

- Curb-to-curb dimensions are to face-of-curb.
- For Back-of-Curb Options refer to the Sections supplement for alternate configurations and dimensions. Use of an alternate Section may encroach into the Buffer/Enhancement Area.


City / TXDOT Sidewalk Project
Bunker Ranch Trail
Arrowhead Trail
Walnut Springs Elementary
Dripping Springs High School
Hardy Tract
Sidewalks Throughout
Onion Creek
Onion Creek
Onion Creek

From: Luisa Leon
To: Planning
Subject: Re: Hardy development concern
Date: Saturday, January 18, 2025 11:02:25 AM

Hello City of Dripping Springs,

I hope this message finds you well. My name is Luisa Alberto and I live in the Bunker Ranch community here in Dripping Springs. I am reaching out to make a public statement on the appeal happening Tuesday 1/21/2025 for the proposed Hardy development. I would like to voice my family's concern as we live on the main Bunker Ranch Blvd road in our community and cannot fathom why construction traffic would be allowed through our community for this project! We have young families that use these roads and I fear for our safety. I've almost been hit by a car walking in my own community and cannot imagine the legal consequences this could impart by allowing these big construction trucks to go through our private community; day in and day out. Another notable mention, we had a personal incident of a construction truck going through our backyard when a home was being built on our block. They could have hit our little one! We do not trust that these construction crews will be safe and we fear for our safety in allowing strangers have that close of proximity to our homes. Considering the dangers, lack of regulation, safety concerns, and disruption to our community we hope that the city will put its residents first and deny the developer using our community to access the project. The last thing we want is to add legal affairs to an already burdened city that we recognize you all juggling at the moment. Sincerely, we know you are dealing with a plethora of issues that come with growth and you are appreciated in our community; we simply pray you will value our concerns.

A concerned citizen,

Luisa Alberto

From: Marcia Opsata Sparks
To: Tory Carpenter
Subject: Bunker Ranch #9
Date: Sunday, January 19, 2025 12:58:19 PM

Mr Carpenter,
I am a resident of Bunker Ranch. I have been living here since April 2019.

This neighborhood has grown and changed every single day since our move here. What hasn't changed are the degradation of our streets, the racing through our neighborhood by construction vehicles and the inability to walk safely along the street.
I used to stand in the middle of the road, waving my arms to get the drivers to slow down. It rarely worked and of course it wasn't safe for me to do that. I just wanted them to slow down. We have old people, we have little people, all of which might not be able to quickly jump out of the way of a speeding vehicle.
One of our diligent parents was able to get some speed bumps and stop signs installed. They help but the honest to goodness truth is that people still race through the neighborhood AND they run the stop signs.

We do have a security gate at our entrance. The gate initially was suppose to be open during the day and closed at night, (per the developer). The hours for construction people to be in the neighborhood varied between 6 and 7 am and then to be out by 6 or 7 pm. The gates were then closed for the night. What we experienced was construction personnel, wanting to come in earlier then allowed. They would push our gate open, tie the gate open, block the sensors once they got in and of course any additional means to essentially break our gate opening and closing. Early on, I reached out to our HOA and asked how much money had been spent to repair the gates. At that time I was quoted $6300+. WOW! The sad thing is that we have probably spent twice that much since my inquiry. We recently were able to get our security gates to be closed full time. This has helped keep out unauthorized vehicles. However, with the possibility of increased construction trafficking through our neighborhood our gates will again be subjected to increased vandalism thus eroding our personal and property safety. When we had little control over our gates, we were subjected to construction traffic at all times of the day and night. The cement trucks often entered in the middle of the night to pour cement. If you have never witnessed or been abused by the noise of construction at 1 am, you simply cannot understand how horrendously loud it is. Forget about going back to sleep.

Have I mentioned the condition of our Bunker Ranch roads? Well, the first phase roads were built with a side strip of cement and then the main driving road being blacktop. These roads which carry ALL of the Bunker Ranch traffic currently have large cracks, crumbling blacktop/cement and of course they were built too narrow for safe driving! When the "powers that be" approved building in the newer areas, they mandated full cement roads which are a decent width for two passing vehicles. They are infact, awesome. The roads in the first phase were not built to handle such heavy duty equipment on a regular basis If access is allowed to the desired building area via Bunker Ranch, our first phase roads will need to be replaced and potentially the second phase will also need repair or replacement..

It is my understanding that the gravel road two gates to our west is a direct road to the area that is wanting to be developed. Why can that road not be used for the entrance and exit to the building area? It makes sense to use it and not impact so many families. It seems logical.

Mr. Carpenter, I apologize for the length of this long missive. It's just that I am tired of being abused by the developer and his wants. What we, the residents of Bunker Ranch want, is a safe, quiet neighborhood where we can build a community that will benefit Dripping Springs and the surrounding areas

Hopefully you can help us build a better Bunker Ranch and thus a better Dripping Springs.
Thank you
Marcia Opsata-Sparks.

From:	Rodney Sparks
To:	Planning
Cc:	Bill Foulds; Taline Manassian; Wade King; Geoffrey Tahuahua; Travis Crow; Sherrie Parks
Subject:	Opposition to Takings Assessment Appeal, Case TA2025-001, Hardy Tract
Date:	Tuesday, January 21, 2025 8:18:20 AM

All,

As long-time residents of Bunker Ranch my wife and I vehemently oppose approval of the Appeal. We were one of the first three families to buy here back in 2018. We chose to move from out of state back to Texas and to settle in Dripping Springs and Bunker Ranch as we retired. You may be surprised that our HOA has not opposed this, but that is because it is still under the control of the developer seeking a variance. The residents do not seem to be of much concern to them.

We have witnessed heavy construction traffic with large and small trucks, speeding and running of stop signs by these trucks and contractor employees, and damage to our entrance road by the large trucks has yet to be addressed by the developer/HOA. I should also point out that these same contractors do not comply with the supposed 12-hour day time limits (which change from time to time and are not really in writing) and I have seen and have been rousted from sleep by large trucks and even caravans of trucks anywhere from 1 in the morning to 5 in the morning. The HOA claims they have no real control over the contractors or builders.

It has only been in the last few months that the developer has allowed the gates to be closed during the day, and with new construction being requested the gates may remain open again. All of the wear and tear caused by large trucks has also caused problems with the gates and their operations, including being broken, disarmed, or dismantled by construction crews who forgot codes when they arrived in the hours outside their approved time. Broken and open gates in the middle of the night have allowed unwanted visitors and thefts to occur. Furthermore, HOA funds paid by the residents have paid for the repairs, not the developer.

I am a signatory of the petition being submitted by our fellow concerned Bunker Ranch neighbors and urge you to consider the main points outlined there: 1. Destruction of Infrastructure; 2. Traffic Congestion and Thru Traffic; 3. Safety Concerns; 4. Traffic Hazards; 5. Violation of HOA bylaws; 6. Property Value Impacts.

We also request that the City Council honor the requests in our petition regarding upholding the previous rejection of the sidewalk issue, deny any future appeals or requests not compliant with the subdivision ordinances, requiring the construction traffic to utilize a new road from 290 into the Hardy Tract, and to protect the interests of the residents of Bunker Ranch and our community.

Thank you for your consideration.

Rodney Sparks
132 Dally Court, Bunker Ranch, Dripping Springs, Texas 78620
434-806-8198
Rsparks64@gmail.com

--

Rodney Sparks

From: lchen108
To: Tory Carpenter
Cc: lauralindsey6212@gmail.com
Subject: Public Comment for Takings Assessment Appeal (TA2025-001)
Date: Sunday, January 19, 2025 8:14:18 AM

To Whom This May Concern:

Please consider the following public comment with respect to the Takings Assessment Appeal (TA2025-001) as it pertains to the public hearing currently scheduled for January 21, 2025:

I, Laura Lindsey and Lindsey Chen, jointly submit these comments, as current residents of the existing Bunker Ranch Estates neighborhood.

ACCESS ROAD -

- We are respectfully requesting that any and all contractors, sub-contractors, and construction related vehicles/individuals involved in the future development of the Hardy Subdivision be forced to either create a separate access road outside of the existing Bunker Ranch Estates neighborhood front entrance gate and/or use ONLY the new exit road linking the Hardy Subdivision to HWY 290. **Specifically, we are requesting that the Hardy Subdivision be prohibited from using the existing main entrance gate of Bunker Ranch Estates under all circumstances during the construction of the proposed subdivision.**
    - As the developer of the Hardy Subdivision is well aware, we have specific bylaws in place which were in part created by the developer himself, that were intended to protect the current homeowners from being forced to endure "unusual construction practices." Moreover, the contract (our bylaws) in which the developer created understands that enduring years of loud construction vehicles, unauthorized individuals/vehicles from accessing our private property during all hours of the day/night, the speeding of vehicles, as well as, the danger of large construction trucks, when children are present and at

play, as well as the destruction of our current roads, qualifies as "unusual construction practices" and is a direct violation of our bylaws pursuant to Article 5, paragraph 5.25 - "Construction Activities."

- Furthermore, it is our understanding that if such activities do constitute "unusual construction practices" we have the right as members of the community, to potentially seek an injunction via the ACC. We believe by addressing this ingress and egress issue now, all parties involved will avoid potential future litigation.

- In addition to the aforementioned, as a result of the developer allowing our front gate to remain open during the day for many years, there have been numerous occurrences of theft on private properties under construction, as unauthorized vehicles have been known to case the various lots during active construction, and we have had numerous encounters where both children and adults are almost hit by construction workers (because we don't have sidewalks which should never have been approved by the City.) Please note that the front gate at the main entrance to Bunker Ranch is now closed after years of residents requesting to the HOA that it be closed during the daytime. The HOA took action to close the gate for the full 24 hour day period following an incident where an unwelcomed non-resident and potentially illegal adult male took pictures and engaged in inappropriate conversation with several children out for early trick or treating on Halloween this past October. Re-opening the main entrance of Bunker Ranch for construction traffic for 78 additional tracts would put the residents and especially the children of Bunker Ranch Estates at risk.

- Finally, please understand that there are some residents of Bunker Ranch Estates who have already been forced to live through nearly 5 years of constant construction activities; with no end date in sight within the current plots of Bunker Ranch Estates; it's time for this to come to an end.

Thank you for taking the time to listen to our comments, concerns, and requests. We can both be reached for additional comments/questions by

phone and/or email as noted below.

Sincerely,

Laura Lindsey, Esq. and Lindsey Chen

Contact Info:

Laura Lindsey: LauraLindsey6212@gmail.com / (858) 335-4619

Lindsey Chen: lchen108@protonmail.com / (541) 272-2026

From: Mike Wright
To: Planning
Subject: Hardy Tract Appeal
Date: Saturday, January 18, 2025 9:09:49 AM

I am responding to the Public Notice below:

CITY OF DRIPPING SPRINGS
NOTICE OF PUBLIC HEARING
FOR A TAKINGS ASSESSMENT APPEAL
CASE #: TA2025-001
HARDY TRACT

I am a resident of Bunker Ranch and I believe that a second entry/exit for Hardy Tract is critical for the safety of Bunker Ranch residents. There are now many children in our neighborhood and plenty of traffic from residents, delivery trucks and contractors that are causing concerns and safety issues and adding to it threatens our residents even further.

A second entry/exit for Hardy Tract, would also be essential for the residents there should they build at some point.

Thank you for your consideration.

Sincerely,

Michael S. Wright
250 Reataway
630-258-8790