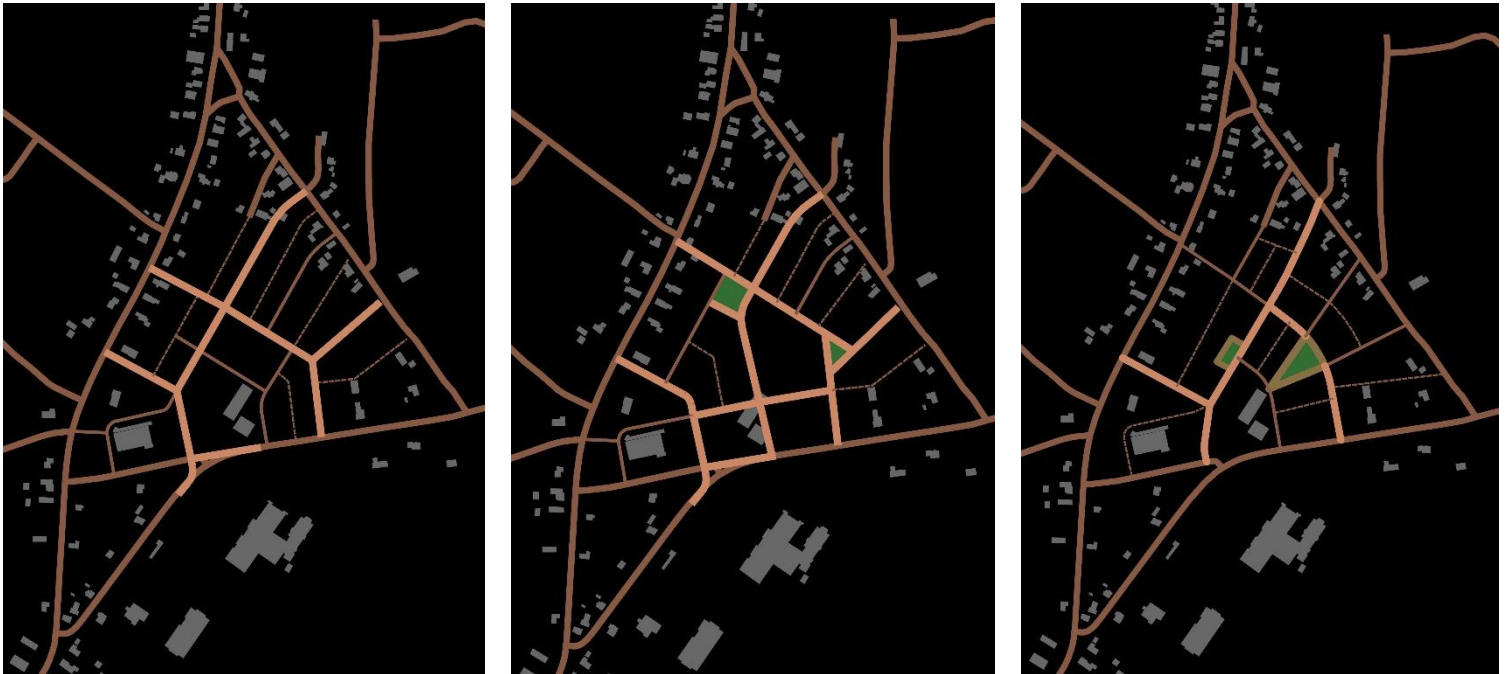


Riverside Neighborhood

A GUIDE FOR THE RIVERSIDE STREET NETWORK MASTER PLAN



Prepared for:

Town of Jericho, Vermont



CHITTENDEN COUNTY RPC
Communities Planning Together

Prepared by:



September, 2018

About This Report

The preparation of this report has been financed in part through grant[s] from the Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation, under the State Planning and Research Program, Section 505 [or Metropolitan Planning Program, Section 104(f)] of Title 23, U.S. Code. The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation.

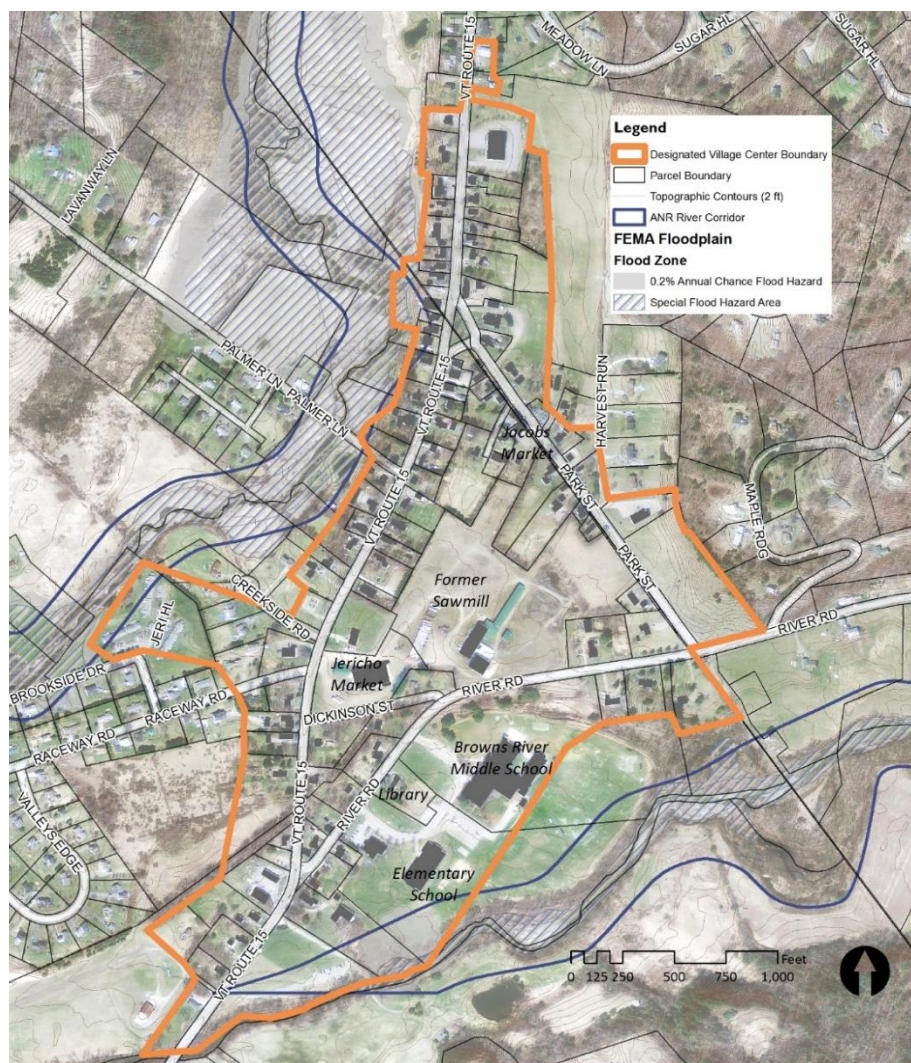
Riverside Neighborhood

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Introduction

CCRPC and Town of Jericho, with support from DuBois & King, have been engaged in the planning and design of a street network concept in the Riverside area to facilitate multimodal safety and circulation and encourage the redevelopment of the former sawmill property as a compact, walkable extension of the Riverside Village (also known as Jericho/Underhill Flats). This area is designated by the Agency of Commerce and Community Development (ACCD) as a Village Center, and is envisioned as a compact settlement that provides access by all modes of transportation, including Green Mountain Transit service.

Figure 1: Designated Village Boundary



Project Background

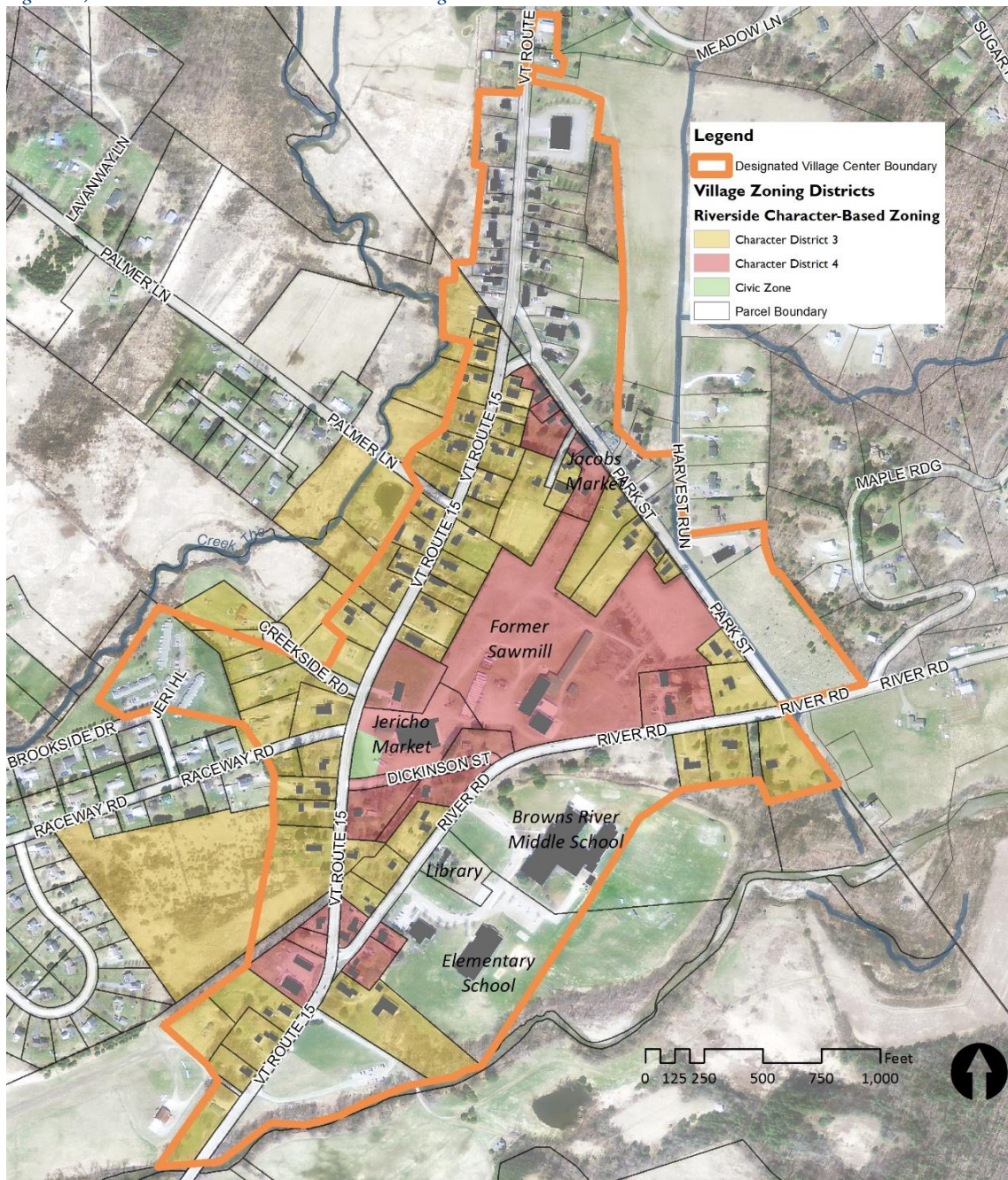
A number of planning projects have been undertaken over the past ten or more years that explore options for increasing the vitality of the village through growth and transportation investments. This led to the Town of Jericho adopting Character Based Zoning for the Riverside area. Below are images that illustrate a concept for the street network (left) and illustrations of the development patterns (right), which were the product of a charrette process that resulted in the zoning changes.

Figure 2: Character Based Code illustrations (concept plan view on left; character of C4, C3 and Civic districts on right)



The zoning districts are defined as a higher intensity C4 (illustration of character above, upper right) and moderate intensity C3 (above, middle right). Also included is a civic zone for public spaces (above, lower right). The resulting zoning district map is shown in Figure 3.

Figure 3: Jericho – Riverside Character Based Zoning Districts



The sawmill property, along with adjacent parcels with the same ownership, are considered highly developable due to the zoning, convenient location, lack of sensitive environmental or cultural resources, and favorable soils for septic and/or stormwater management. The development capacity of the sawmill site could be in the range 80-120 residential units, in a mix of single- and multi-family residential units, in addition to ground floor commercial and adaptive re-use of existing buildings. The location and requirements of a community wastewater system are key factors that will determine the ultimate capacity for development. Additional infill development could occur on surrounding properties over time.

Neighborhood Street Design

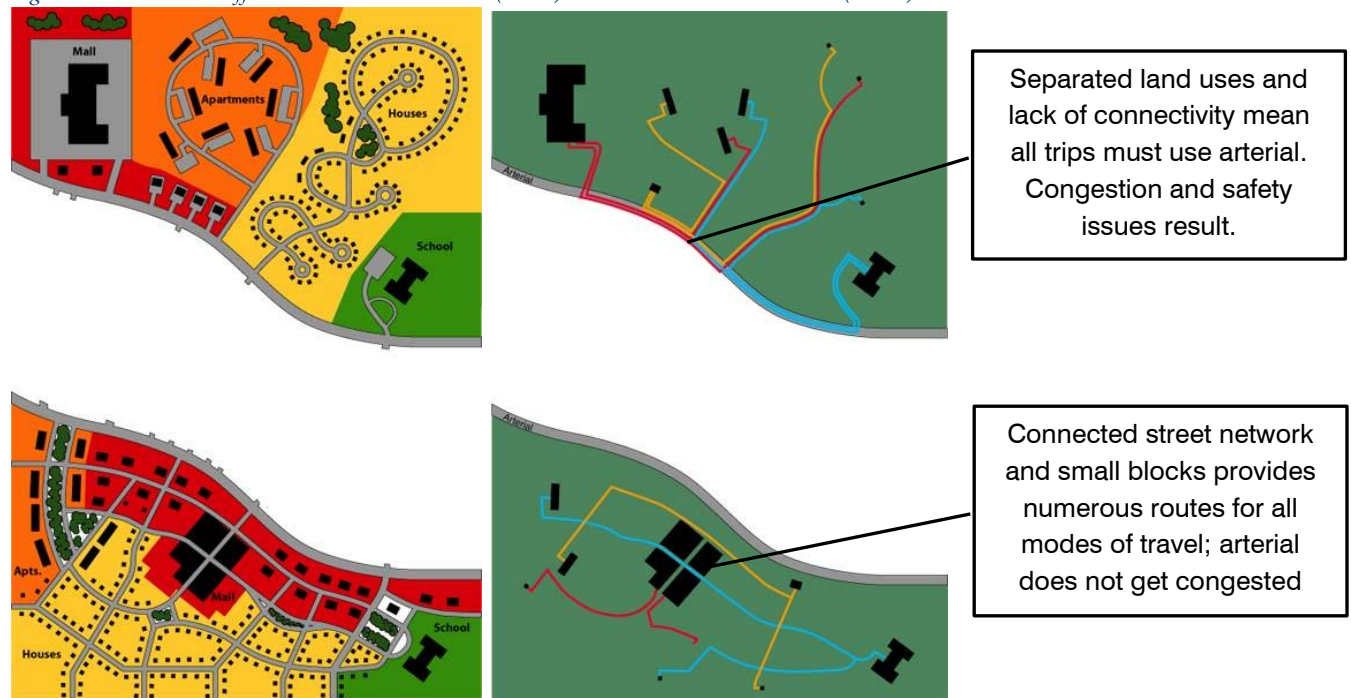
The layout of streets has perhaps the most enduring influence on the quality and character of a neighborhood. Roads and streets tend to be long lasting investments, when compared to buildings, land uses, and even lot sizes, all of which can change over time. Traditionally, cities and towns were laid out with a connected street network that crossed property boundaries, and established blocks and lotting plans. The actual development of the property is carried out by numerous different landowners or developers, but the pre-established street network, as well as building codes that emphasized harmony in the form and design of building facades and frontages resulted in attractive villages that remain vibrant, desirable places to live and do business. By contrast, conventional development practices from the past 50 years typically occur lot-by-lot, with each development accessing public roadways in separate driveways. Figure 4 compares two neighborhoods in Saratoga Springs NY; the neighborhood on the left has a traditional, highly connected street network, while the right has a network with much less connectivity, and evolved through lot-by-lot development without the benefit of a street network master plan.

Figure 4: Traditional Street Network (left) and Conventional Suburban Street Network (right), Saratoga Springs, NY



A traditional, highly connected street network has significant transportation benefits by providing many options for travel to or through the neighborhood. Figure 5 illustrates how a conventional development pattern (upper diagram) requires every trip to enter and leave the main arterial route, which now must serve a mix of through- and turning traffic, potentially resulting in safety and congestion problems, which can in turn require costly public investments. In a traditional street network (lower diagram), with its smaller blocks and closely spaced streets, all of the streets can serve a transportation function as well as providing access, which greatly relieves the traffic burden on the arterial corridor.

Figure 5: Street and Traffic Patterns in Traditional (lower) and Conventional Suburban (above) Street Networks



The transportation benefits of a connected street network extend to both walking and biking, as trips between destinations are often shorter as the street network provides more direct routes between destinations. Vehicle traffic is more dispersed in a traditional network and moves at lower speeds due to the frequent intersections, creating a safer environment for walking or biking.

From a land development perspective, a street network plan that connects to neighboring streets and properties can allow for more efficient use of land and increase development potential. Traditional street networks sometimes require more land area to be devoted to streets. However, this is offset by factors such as greater availability of shared, public on-street parking, and more efficient land development due to the greater accessibility provided by street networks.

Precedents

Through efforts of the Congress for New Urbanism and other allied organizations, traditional neighborhood design has been rediscovered, become far more prevalent in recent decades, also called neo-traditional design. Across the US, neo-traditional developments financially outperform neighborhoods with more conventional design due to the appeal of walkability and the efficiency of compact, mixed use development. Many municipalities are adopting enabling codes such as Jericho's Character Based Zoning, as conventional zoning may preclude neotraditional development. The following pages show some examples that provide useful models to consider for the Riverside neighborhood.

Information on other traditional neighborhoods can be found at the TND Town Paper,

<http://tndtownpaper.com/neighborhoods.htm>

South Main, Buena Vista, Colorado

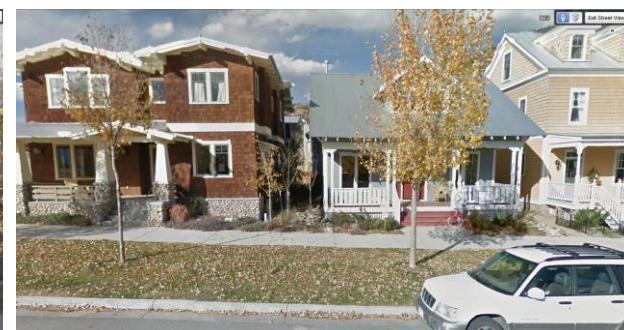
South Main is a mixed-use traditional neighborhood that adjoins the historic downtown district of Buena Vista, Colorado. The buildings and lots have a fine grain pattern, and block sizes that are slightly smaller than typical western small cities.



The South Main site plan includes a planned street network with several different typologies on a 41-acre site. Alleys provide rear access to single-family residential properties and access to parking for mixed uses. The smallest lot sizes are 0.10 acre for single-family residences, with over 200 lots for single-family, multi-family and mixed use.

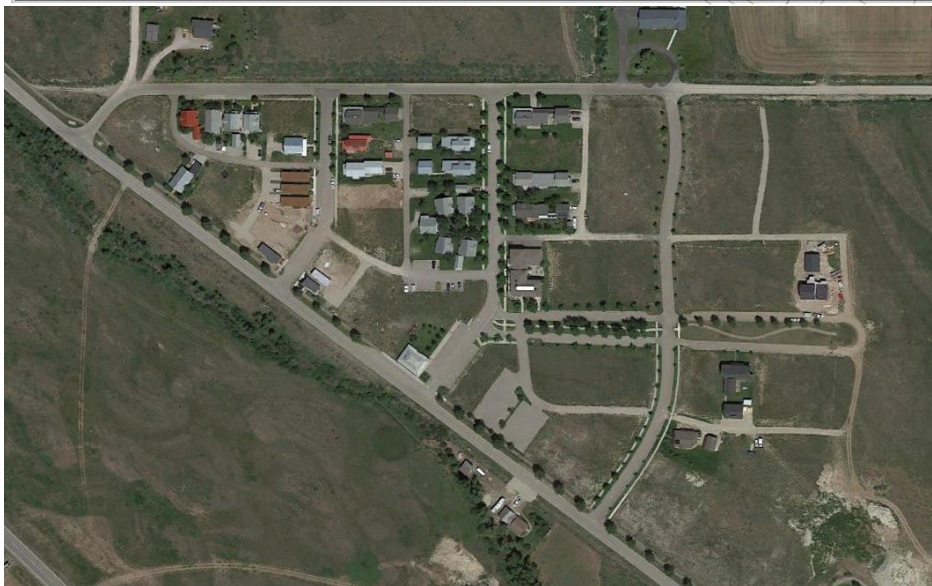


The development plan includes parks, common spaces, trails along the Arkansas River, and compact 2 and 3 story buildings set on an extensive street network. Most parking is provided by on-street shared spaces, and rear alleys serve residential buildings to increase the efficiency of the lot layout. The photos below show current conditions in South Main.



Mountainside Village, Victor, Idaho

Mountainside Village is a traditional neighborhood development in Idaho near Jackson Hole ski area with primarily residential with a mixed-use core area.



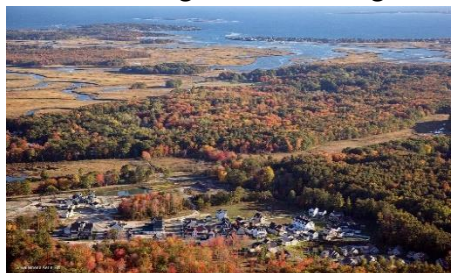
The overall development includes five phases, with the first two phases on about 15 acres, shown to the left. The site is not adjacent to any existing settlement, and will include a mixed-use village core around a public green. Lot sizes for single-family units are as small as 1/8 acre. The street network includes a boulevard with mountain views and alleys to provide rear access to parking. The aerial to the left shows current conditions at the site, with the street network for the first two phases established.

South Village, South Burlington

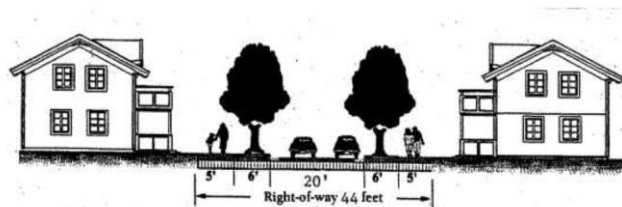
This is a traditional neighborhood that is primarily residential, agricultural, conservation and recreational. Unlike the Riverside area, this site is not near an existing village or downtown. The street network has been planned to extend a route to the east to connect with the Dorset Street corridor.



Eastern Village, Scarborough, Maine



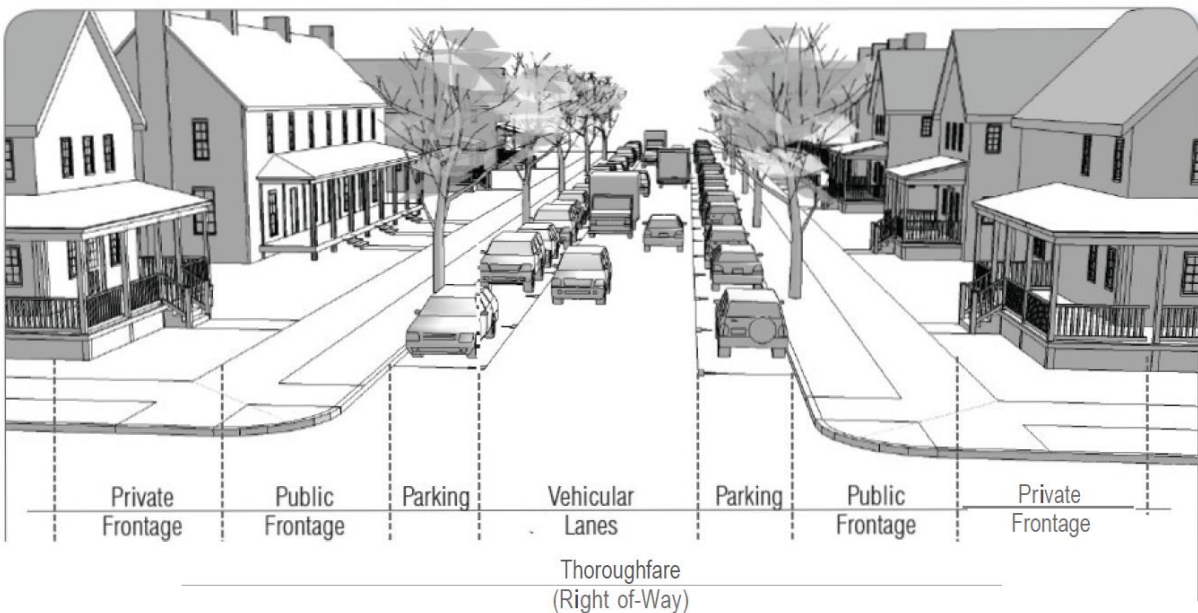
The project is primarily residential and conservation and will eventually have more than 150 units with the maximum development density of 5 units per acre. The street standards include 20 feet paved width, sidewalks and tree belts. Alleys provide rear access and parking.



Traditional Neighborhood Street Networks

Traditional neighborhood projects begin with a master plan that establishes a street network and block development pattern and public or civic spaces. Buildings are designed in conformance with a form based building code to ensure development quality, design harmony and efficient use of land. The code also defines a variety street typologies, including major streets designed to support more density and more traffic, and other types serving lower traffic areas. The character based code has specifications and dimensions for the street elements, illustrated below, for each street typology. The code also has standards for block sizes, with a maximum of 2,500 feet perimeter. On-street parking is an essential function of the streets, as it alleviates the need for on-site parking, and provides shared spaces for the mix of commercial and residential uses that are anticipated for this district.

Figure 6: Illustration of street and thoroughfare components in the Riverside Character Based Code



The benefits of a traditional neighborhood street network include:

- Improved safety and reduce traffic congestion in study area by providing more efficient circulation
- Support for all modes of transportation
- Promoting compact, mixed use development in the Riverside Character Based Zoning District
- Efficient development of land, allowing for a range of block and lot sizes to support a vibrant, walkable village center

Considerations in street network master planning are discussed further in the following sections.

Public and Civic Spaces

Incorporating public spaces for gathering and enjoying the outdoors is an essential part of a traditional street network. The Jericho zoning code provides different types of green spaces and parks, with the Green and Square in particular formed by the street network. These should be focal points in network, where adjacent mixed-use development will enhance the public spaces and economic vibrancy.



A Civic Space, available for unstructured recreation. A Green may be spatially defined by landscaping rather than building Frontages. Its landscape shall consist of lawn and trees, naturalistically disposed. The minimum size shall be 1/2 acre and the maximum shall be 8 acres.

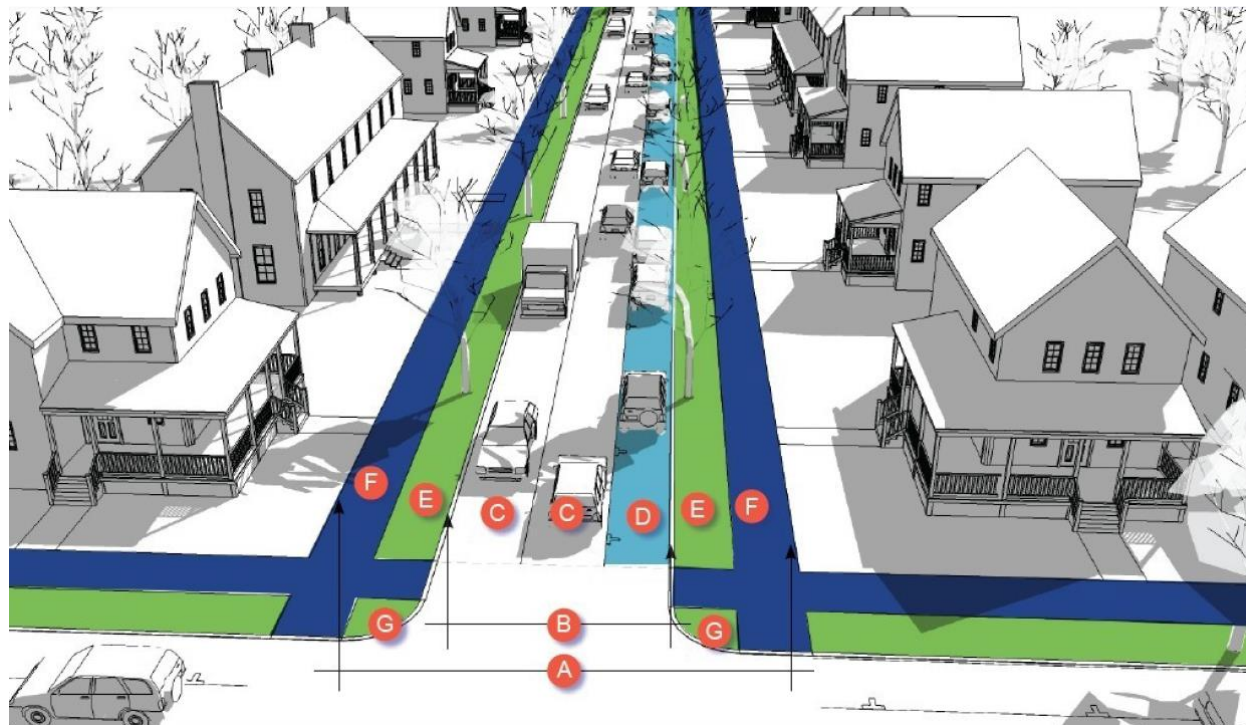


A Civic Space available for unstructured recreation and Civic purposes. A Square is spatially defined by building Frontages. Its landscape shall consist of paths, lawns and trees, formally disposed. Squares shall be located at the intersection of important Thoroughfares. The minimum size shall be 1/2 acre and the maximum shall be 5 acres.

Street Typology and Spacing

The proposed street network for the Riverside area includes several street types. The street dimensions are specified in the zoning code.

Neighborhood Street



This type is intended for the major accesses and circulation routes in the village area, with the following provisions:

- Dedicated travel lanes are provided, ensuring efficient traffic flow. (C)
- Sidewalks are required on at least one side, as these streets will be the primary traffic corridors in the neighborhood. (F)
- Parallel on-street parking is provided on at least one side. (D)
- Greenbelts for trees or other plantings buffer the sidewalk from the street. (E)
- Neighborhood Streets should be supported by alleys serving the rear of the property and providing access to rear lot parking. This eliminates the need for driveway curb cuts on the street, which increases its visual appeal and safety, especially for people walking or bicycling.

Neighborhood Drive



This type is intended for secondary access and circulation in the village area, with dimensional requirements and standards resulting the following intentions:

- Narrower travel lanes support slower speeds and yield movement, which may at times require one driver to pull to the edge of the street and let an oncoming vehicle pass. This will reduce speeds and make these streets less appealing for through traffic circulation. (C)
- Neighborhood Drives should be supported by alleys serving the rear of the property and providing access to rear lot parking. This eliminates the need for driveway curb cuts on the street, which increases its appeal and safety, especially for people walking or bicycling.
- Sidewalks are not required. Providing alleys and rear parking access essentially takes much of the local traffic off the streets, making it more possible to safely share the street with people walking and biking.
- Parallel on-street parking is provided on at least one side. On-street parking may require the “yield” movements if traffic approaches from both direction, which has a speed reducing effect, and increases safety. (D)
- Street trees can be placed in the parking lane area, with appropriate soils and protection from traffic such as curbing. (E)

Park Street



This is a street type specifically for streets that line a public park or green, and shares features of Neighborhood Streets and Neighborhood Drives.

- They are designed for slow movement, and may be signed for one-way operation. (C)
- Parallel on-street parking is provided on one side. (D)
- A greenbelt for tree planting should separate the street from the sidewalk. (E)

Alleys



As can be seen in the precedent examples reviewed earlier in this document, alleys are an essential component of a traditional street network, with numerous benefits. Alleys provide access to rear parking, trash and recycling pick-up, and are corridors for utilities, such as overhead electric. Street networks that are supported with rear alleys have much more aesthetic appeal, as curb cuts are reduced or eliminated, overhead utilities don't impede street tree growth, and on-street parking space is not interrupted by driveways.

Stormwater Management Considerations

Traditional neighborhoods are well suited to a distributed approach to stormwater management, where stormwater is routed to rain gardens, vegetated swales and curb extensions, greatly reducing the need to collect and transport stormwater. The following are some design considerations for how effective stormwater management can be incorporated into the street design.

- Curbs are not required on any street type, allowing opportunities to use street edge swales or “green gutters” for stormwater management in appropriate locations.
- The greenbelts along the street frontages can be used to collect and manage stormwater, enhanced by stormwater tree wells and rain gardens.
- The character based code requires on-site parking to be in the rear of the lots, and providing rear alleys for access will reduce the length of the driveways. This can offset the additional impervious area created by the alleys.

- Parking spaces do not need to be paved, or can be surfaced with pervious asphalt on the parking bays, with the circulation areas surfaced with conventional asphalt.

A street network that includes alleys can result in an overall reduction in impervious area, despite the additional paved area from the alleys, due in part to the following factors:

- By using alleys, the streets at the front of the lot will have fewer curb cuts and lower traffic volumes. This allows the street to provide safe shared use between people walking and biking, and reduces the need for impervious surfaces for sidewalks or bike lanes.
- Alleys can provide a corridor for overhead utilities, so that the street trees can achieve a full canopy and provide greater retention and attenuation of stormwater. Mature street trees can also add value by providing a more appealing place to walk, and may reduce traffic speeds by providing a greater sense of enclosure.
- Because rear alleys can reduce or eliminate the need for curb cuts on the frontage streets, the greenbelt are uninterrupted by driveways, which greatly increases their ability to provide effective stormwater management.
- The code requires on-site parking and garages to be in the third layer (towards the rear) of the lot. Serving on-site residential parking, or a garage outbuilding, will require the driveway entering from the main street frontage to traverse across the lot to access parking. Alleys provide convenient rear access to parking, greatly reducing on-site impervious surfaces from on-site driveways.

Bikeway Network Considerations

The code provides several options for bikeway types that should be incorporated into the street network master plan. However, it is not essential to have a continuous network of off-street bicycle facilities. An advantage of a traditional street network is that many of the streets will have lower volumes and speeds, and can be safely shared by people driving, walking and biking. The following are considerations of incorporating bicycle use into the street network.

- Neighborhood Drives and Alleys serving primarily residential blocks can provide a backbone of a low stress bike network.
- For alleys that are providing access to significant parking for mixed uses, separated facilities for bicycle use may be warranted.
- Bicycle facilities may also be desirable along Neighborhood Streets if a rear alley is not present, as there would likely be frequent curb cuts.

Parking Considerations

The street typologies described above show the importance of providing on-street parallel parking in a traditional neighborhood street network. On-street parking is highly flexible and can be shared by residential and other uses successfully. A street network can absorb overflow parking on occasions when

demand is high. If spaces are unmarked, higher capacity utilization of the parking lanes is typical during periods of high demand. On-street parking will be maximized on streets with few or no curb cuts, which is achievable through the use of rear alleys for site access. In terms of stormwater, on-street parking requires 30% less impervious surface than a conventional parking lot, when the circulation space is considered.

Street Master Planning Process

The street network planning process first considered the form and density of the proposed development, and the site constraints.

Site Development Capacity

The development capacity of the Riverside area is an important consideration in the design of a street network. Desirable densities for traditional developments can range from 8 to 12 units per acre, representing a combination of single and multi-family units. Some of the multifamily units would be above ground floor commercial spaces. Considering past planning studies and concepts, and desirable development patterns, the following assumptions were used as a reasonable development capacity for the Riverside area within the “triangle” formed by Park St, River Road, Dickinson Road, and Route 15:

- 75 single family residential units (1/8 acre lots +/-)
- 40 multifamily residential units
- 30,000 square feet commercial/office/services (ground floor of multifamily buildings)

The above assumptions were used to determine both septic capacity, and to analyze future traffic operations at the surrounding intersections. Illustrative plans were also developed to show possible street and building layouts, which are included in the appendix.

An analysis of the area that would be required for on-site septic disposal was determined to require an areas of about 40,000 square feet, based on available data on the site soils. Ideally, the septic disposal area could be constructed on school property, adjacent to the site, reserving more area within the triangle for development. However, the septic can also be accommodated on site. The appendix includes septic area assumptions and calculations, as well as a map showing existing septic permits, and the area required for a community septic system.

Street Network Concept Design

The Character based code outlines the street typologies and design, civic spaces, and block sizes. The street network design process was iterative, and included the following steps:

- 1) Define constraints. The main sawmill building has reuse potential, and street network plans provided for its preservation.
- 2) Define external connection points. Primary connections included the intersection of Dickinson/River Road and at Jacobs Market along Park St.

- 3) Integrate with other project plans
 - Jericho market
 - GMT bus stop
 - Landowner preferences for connections using private property
- 4) Develop and review options

After developing and reviewing a number of options, a proposed street network is presented as an illustrative example, shown Figure 7, that could result in the transportation benefits and efficient land development envisioned in the Jericho code. The proposed street network allows for preservation and re-use of the former saw mill building.

Intersection design in a traditional street network can use many options, with the overall goal of maintaining slow traffic speeds, encouraging alert driving behavior, and using right-of-way priority to encourage traffic to use the desired routes. Intersections spaces at a walkable block size of 250 to 500 feet can provide opportunities to reinforce the desired target speed of 20 mph. The following intersection types can be considered:

- All-way stops
- Two-way stops, if the major route has traffic calming features within 200 feet from the intersection to maintain low speeds
- Mini-roundabouts (see example below, left)
- Neighborhood traffic circles (see example below, right)



Figure 7: Proposed Riverside Village Street Network



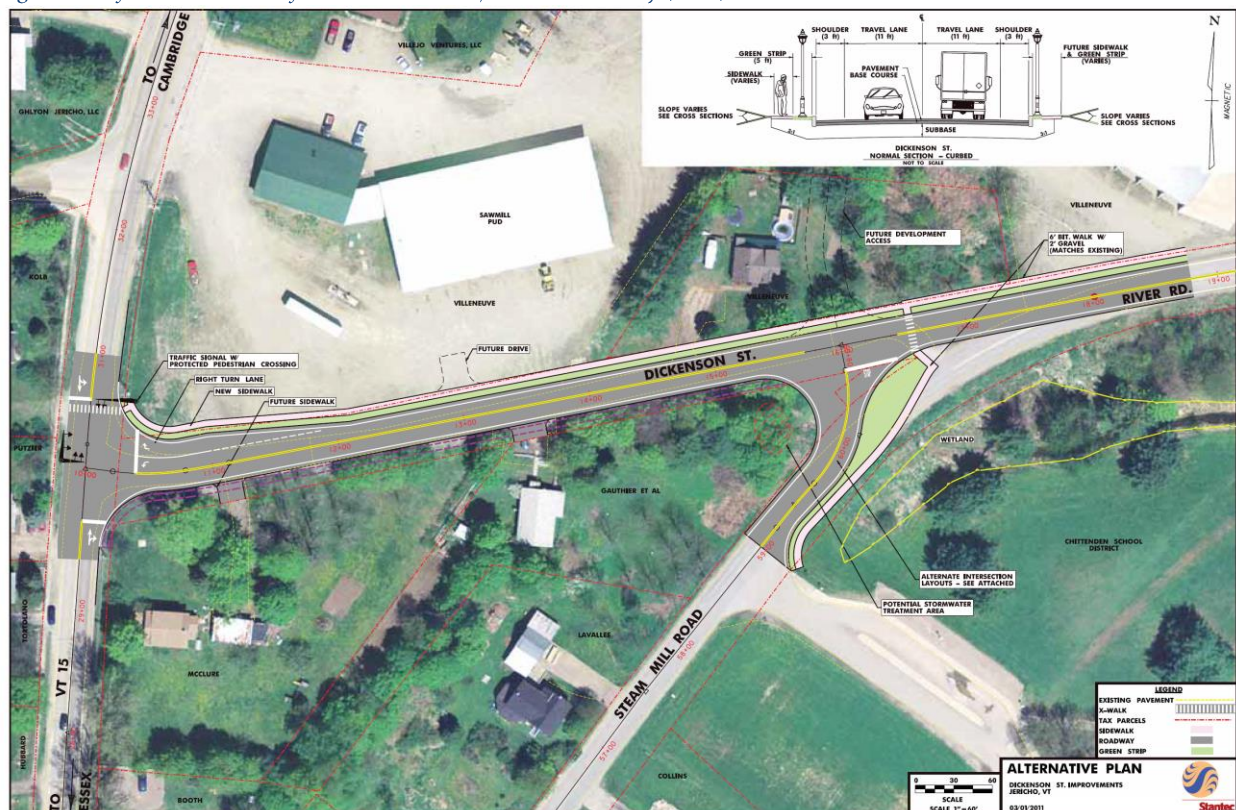
Public Road Improvements

In order to support the village development envisioned in the Character Based Code, public road improvements will be needed to provide safe and efficient access. Currently, the intersection of River Rd and Route 15 has failing level of service and meets signal warrants. A [2015 town wide transportation study](#) by RSG concluded that this intersection has the worst level of service in the town. Past scoping studies have laid the groundwork for the reconfiguration of the Dickinson St and River Rd in the study area, including [RSG's 2007 study](#) and [Stantec's 2011 study](#). The intent of these studies was that Dickinson Road would become the major connection to River Road to reduce traffic congestion near the schools and library, and provide better geometry for traffic control. The description of existing conditions in these reports largely still applies, although traffic volumes are higher, level of service at River Road/Route 15 is somewhat worse, and this section of Route 15 is now a High Crash Location.

Dickinson Road Improvements

The 2011 Stantec Project Scoping Study considered alternatives to improve Dickinson Road as a two-way street, and realign the intersection of Dickinson Road so that the dominant access to Route 15 is by Dickinson Road. The preferred option from the study is shown below, which includes the 2-way conversion, realignment of River Rd/Dickinson Rd, and an unsignalized T intersection at Dickinson/Route 15. The report notes that this could be converted to a signalized intersection once volumes reach the signal warrant thresholds.

Figure 8: Preferred Alternative for Dickinson Road from Stantec Study (2011)

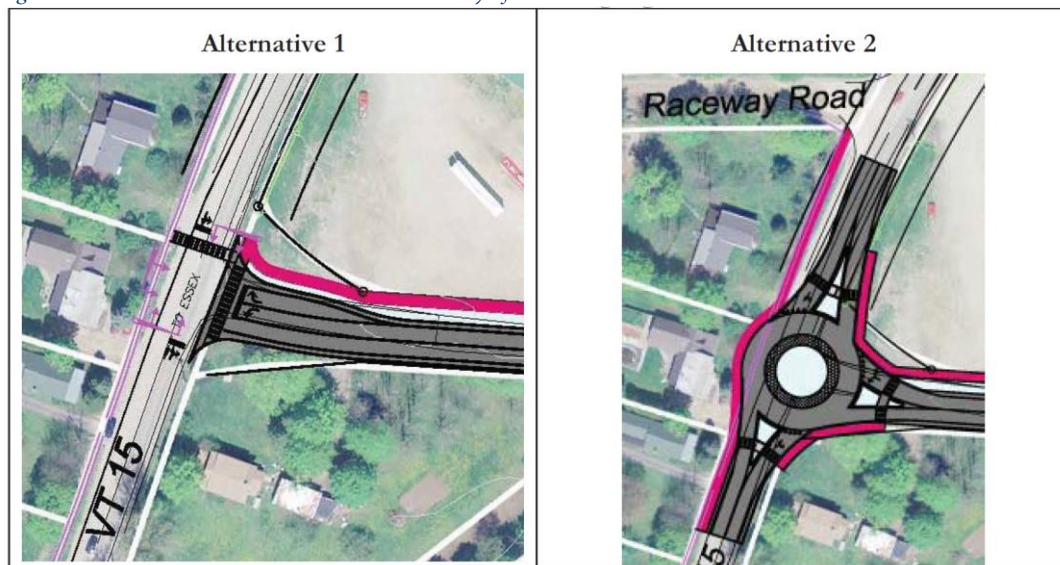


Route 15/Dickinson Road Intersection

A key element of developing the street network is to provide safe and efficient access points to Route 15. The intersection of Dickinson St and Route 15 will be a major gateway into the future Riverside Village area. This intersection is also planned to become the major connection to River Rd, to alleviate congestion at River Rd/Route 15 and reduce vehicular traffic in front of the elementary and middle schools. These changes will require the reconstruction and widening of Dickinson St so that it can serve two-way traffic, and traffic control (signal or roundabout) at the intersection with Route 15.

The following figure is from the 2007 RSG study, which considered both a roundabout and traffic signal alternatives at the Route 15/Dickinson Road intersection.

Figure 9: Alternatives considered in 2007 RSG study of Dickinson Road



The following were among the key findings of the RSG Study:

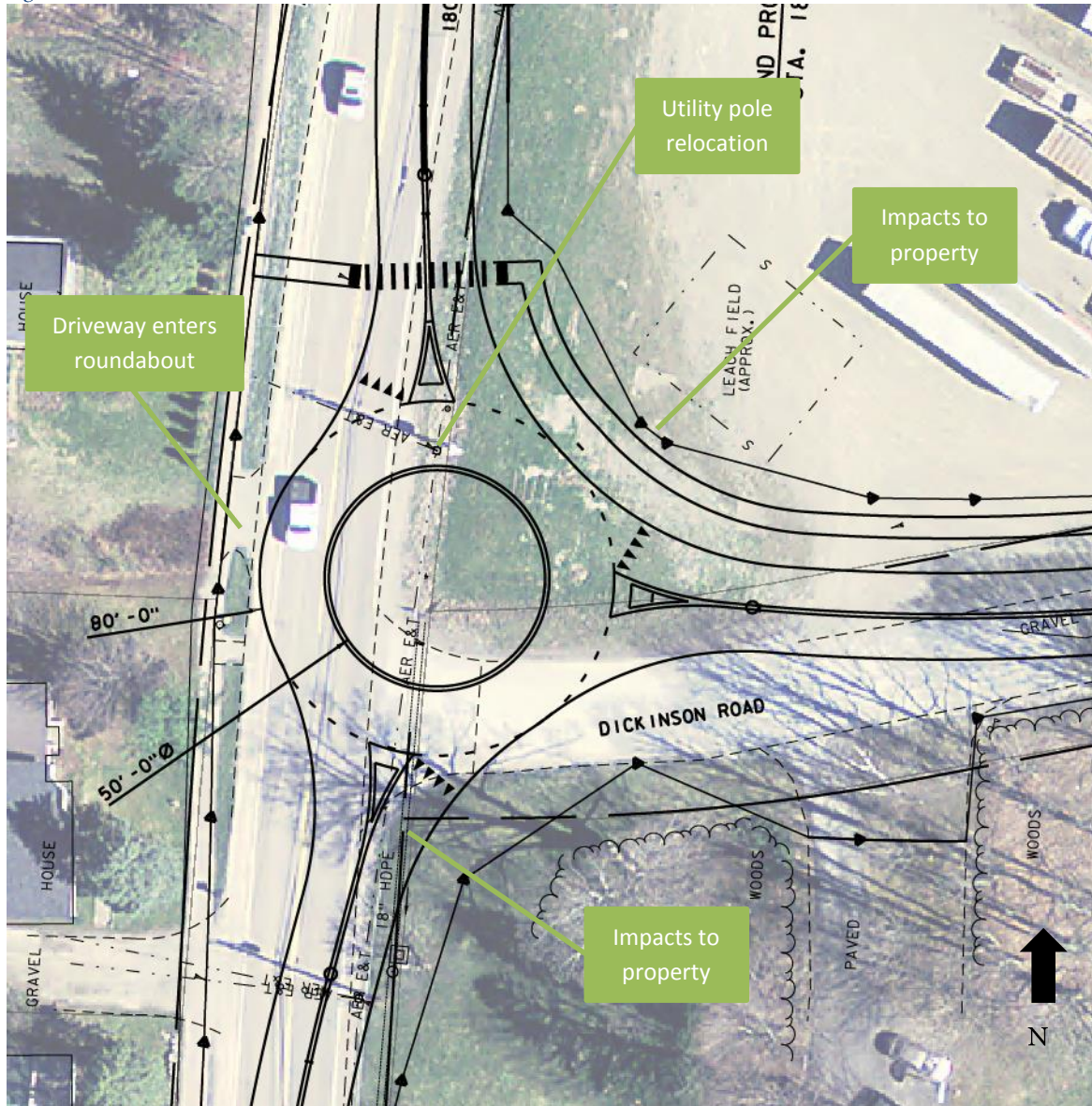
- The VT 15-Dickinson Street intersection should be controlled with a traffic signal or a roundabout by the analysis year 2021, assuming growth on the sawmill site. Traffic volumes should be monitored to determine when the intersection would meet applicable signal warrants.
- A traffic signal or a single lane roundabout would provide acceptable level of service for 2021 conditions at the VT 15-Dickinson Street intersection.

At the present time, with better understanding of the safety benefits of roundabouts, and more experience with mini-roundabouts, a mini-roundabout can be considered as an option for the Dickinson St/Route 15 intersection.

Mini-Roundabout Alternative

Based on safety benefits of roundabouts and potential of mini-roundabouts to provide many of these benefits at lower cost and impact, the locally preferred option is for a mini-roundabout at Dickinson/Route 15 rather than a signal. The figure below shows the layout of a mini-roundabout at Dickinson/Route 15 with a diameter of 80 feet. The roundabout would have mountable islands for circulation of larger trucks. Truck turning paths for a WB 67 are also attached to this report. A set of conceptual plans for the reconstruction and realignment of Dickinson St are attached to this report.

Figure 10: Mini-Roundabout at Route 15/Dickinson



The mini-roundabout was placed to minimize impacts to historic residential structures to the west of the intersection, and to avoid impacts to the Jericho Market septic leachfield. It will require the relocation of two utility poles, and right-of-way acquisition from two adjacent properties.

Traffic Signal Alternative

The traffic signal option has been analyzed with all single lane approaches (see diagram to the right), which will provide adequate vehicular level of service C or better during morning and afternoon peak hours. Additional benefits of the single lane approaches will be to reduce project costs and impacts, reduce pedestrian crossing distances, and reinforce lower speeds through the village. While more detailed scoping and analysis would need to be completed and approved by VTrans, the intersection geometry to the right is recommended as most consistent with the goals in the village.



Traffic Analysis

A level of service analysis was conducted for future traffic conditions with a signal and a roundabout. The following assumptions were incorporated into this analysis:

- Traffic counts conducted at River Rd/Route 15 by VTrans in 2016 were used, which were conducted just before the opening of Jericho Market. A traffic signal warrant analysis indicates that the volumes at this intersection meet several warrants for signalization.
- Traffic volumes from the Jericho Market Traffic Impact Study were added to the 2016 counts to account for development traffic from the market.
- Traffic was redistributed from River Rd onto Dickinson St as follows: 100% of westbound left turns used Dickinson St; 40% of northbound right turns use Dickinson St.
- Development traffic was estimated at levels to be consistent with PUD concepts under consideration as a placeholder for future traffic. It is anticipated that the future growth in the Riverside area will be primarily residential, but contain other mixed uses that provide local services and employment. The following development program has been assumed for traffic planning purposes:
 - 75 single family dwelling units
 - 40 multi family dwelling units
 - 6,000 square ft restaurant
 - 13,400 square ft hardware store
 - 23,400 square ft Fitness Center
- Background traffic growth from CCRPC were added to develop a future 2035 scenario.

Cost Estimates

The following table presents cost estimates for a mini roundabout or new traffic signal at Route 15/Dickinson Road, and the widening and improvements to Dickinson Road. Detailed cost estimate are attached to this report

Roundabout Cost Summary			
CONSTRUCTION		\$	634,000
CONTINGENCY:	25%	\$	158,500
ROW ALLOWANCE:		\$	100,000
Roundabout SUBTOTAL =		\$	892,500
Traffic Signal Cost Summary			
CONSTRUCTION		\$	240,000
CONTINGENCY:	25%	\$	60,000
Traffic Signal SUBTOTAL =		\$	300,000
Dickinson Rd Cost Summary			
CONSTRUCTION		\$	616,000
CONTINGENCY:	25%	\$	154,000
Dickinson Rd SUBTOTAL =		\$	770,000

Recommendations

The Town of Jericho should consider options to advance the Dickinson Road improvements, including both the realignment of River Road/Dickinson Rd and a roundabout or signal at Route 15/Dickinson Road. These improvements will address existing traffic and safety issues and also facilitate the development of the Riverside village.

The traffic signal has significantly lower cost and impacts than the traffic signal. The mini-roundabout has the advantage of safety, which should be a consideration as options are developed further for this intersection. The intersection is within a high crash location, which may make it eligible for federal transportation funding. A meeting was held with VTrans to review the options, with the results that neither option appeared to have insurmountable problems, and funding options could include impact fees through Act 145, or state and federal safety funds. Funding options are presented in the following section.

The realignment and widening of Dickinson Road should give consideration to pedestrian safety and circulation given its proximity to the school, and avoid additional traffic lanes, such as right- or left-turn lanes that are not necessary, as they can degrade safety for pedestrians.

Conceptual plans and cost estimates are attached to this report.

Implementation Funding

The development of the Riverside Street Network has multiple components: Transportation, Land Use and Public Spaces. While proposed design alternatives focus on transportation, the overarching purpose of this analysis is to look ahead to make sure future opportunities are maximized for development and public space creation. Funding for necessary infrastructure, such as the new street network or water and wastewater, will be required to implement any future development. Significant public infrastructure investment projects often utilize a conglomeration of funding from multiple sources, including state, federal and municipal funds. This can include a mix of grants, loans and bonds as well. In addition to borrowing the funding, communities are enabled to generate revenue for infrastructure investments in several ways.

VTrans

VTrans does not typically provide assistance for local road projects such as the widening and realignment of Dickinson Road, but there are possible avenues for funding the improvements at Route 15/Dickinson Road, as it is on the state highway system, and currently has the status of a high crash location.

CCRPC-MPO TIP

The Town of Jericho, as a member of the Chittenden County Regional Planning Commission, can request and advocate for the public road improvements to be included for funding in the region's Transportation Improvement Program (TIP). The High Crash Location on Route 15 at Dickinson Road, as well as the importance of this project for the planned village growth and development could advance its priority among competing regional project needs.

Impact Fees

Since the passage of Act 145 in 2014, VTrans has enabled the collection of impact fees from developers to contribute their fair share to transportation projects that increase capacity to accommodate development generated traffic. The assessment of an impact can be enacted if a project is in the VTrans Capital Plan (which is not the case for the Route 15/Dickinson Road intersection), or it can also serve as a vehicle for a developer-funded project to be able to recoup their costs from future developments. The following website provides more information on Act 145.

<http://vtrans.vermont.gov/planning/development-review-services>

Municipal Funding Programs

Impact Fees

Impact fees are authorized under state law (24 V.S.A. §§5200, et. Seq.), for the purposes of enabling “municipalities to require the beneficiaries of new development to pay their proportionate share of the cost of municipal and school capital projects which benefit them and to require them to pay for or mitigate the negative effects of construction.”

Typically, Impact Fees are instituted in response to very rapid growth. The process for developing impact fees begins with identifying the facilities and services affected by the sudden growth. This is followed by the identification of capital projects that are needed to bring the level of service to “acceptable standards.” These standards could be determined from existing levels of service, accepted state or federal standards, or a standard that is part of an adopted municipal plan or capital budget and program. Capital projects that are needed to support anticipated development are candidates for impact fees. It is important to note that impact fees cannot be used to cover operation or maintenance costs, or to address any existing deficiencies with infrastructure. Communities develop an impact fee formula that connects the capital costs of new facilities or facility capacity to the demand for that capacity generated by new growth. This formula must rely on a “rational nexus” to serve as the logical and legal foundation for the impact fee. Typically, studies are utilized to develop and document impact fee formulae and to support adopted fee schedules. Once the formulae and fee schedules are developed, communities must adopt them via an ordinance or as part of a bylaw.

Communities with impact fees are required to account for revenues collected through impact fees on a yearly basis. State law requires that impact fee revenues must be expended for designated capital projects within six years of the date they are collected or be refunded at the request of the property owner.

The pros and cons of impact fees are varied. Proponents often argue that impact fees are a way to have “developers pay” for the impacts of their development. However, in strong property markets, the developer will typically pass on the cost of the fee to the new occupant in the form of a higher purchase price or increased rent. Or, the developer may be less willing to pay top dollar for a property due to the added cost of impact fees. And yet, with impact fees in place, developers can be fairly certain that necessary infrastructure and facilities that are needed by their development will be provided.

Impact Fees are commonly a reaction to significant development growth. While the housing market in Jericho is strong, it is debatable that there is enough projected growth in the near future to justify Impact Fees.

Tax Increment Financing

24 V.S.A. §§1891 et. seq., enables communities to utilize Tax Increment Financing (TIF) as a tool to finance public infrastructure improvements that are necessary to ensure development of an area. Using the “build it and they will come” theory of development and growth, communities are able to borrow funds against future tax revenue within a designated TIF District. This assumes that with infrastructure investments, additional development will occur and more tax revenue will be developed. As part of the TIF development process, the municipality designates the area which requires redevelopment as the TIF district and freezes the base tax of the District. Property taxes increase with new development and a portion of that increment is utilized to help retire the debt incurred to fund the infrastructure

improvements. The TIF is particularly useful when there are parties interested in developing the real property within the District if necessary infrastructure is built.

Unlike the Impact Fee, a TIF District must be approved by the State. Prior to filing an application with the Vermont Economic Progress Council (VEPC), communities must undergo a process of local planning (including an appropriate level of public process) to develop and adopt a TIF District Plan and Finance Plan. Communities pledge a minimum of 85% of the municipal incremental property tax revenue within the TIF District will go toward TIF District debt. State Statute outlines the criteria under which VEPC can approve an application for a TIF district. This includes a close look at the public process utilized at the municipal level including an assessment of the District's compatibility with local and regional plans.

There are a number of criteria that communities must meet, at least in part, in order to be approved. Based on our review of the criteria against our understanding of the project area, we believe that Jericho should be able to make a strong application. The following criteria appear to fit in Jericho:

- The project area is compact and high density.
- The project area is within a State-designated Village Center
- If implemented, transportation would be enhanced through improved traffic patterns and flow.
- The project area is a logical location for affordable housing, a key criteria that could be met.
- Development of a new road network and/or wastewater system would require substantial public investment over and above normal municipal operating or bonded debt.
- Any new infrastructure financed by the TIF, will serve the TIF District and will be directly linked to real property development.

In addition to the above criteria, an application for a TIF District will need to include an analysis of infrastructure cost and debt assumptions, real property development and property tax revenue generation assumptions. Also necessary, is an analysis of revenues including property taxes, grants and other sources of funding, and the ability to service debt.

The laws the govern TIF districts had previously set a limit of no more than two districts per county. Chittenden County already has six active TIF districts. In 2017, legislation was passed that grandfathered existing TIF districts, allowing for two additional TIFs in Chittenden County. If there is interest in creating a TIF district in the Jericho Riverside project area, Jericho should be engaged in discussions about the process with VEPC and the Regional Planning Commission in the near term.

Loans, Grants and Bonds

Loans and/or bonding are common components of a major infrastructure investments at the municipal level. While loans and bonds can be the primary source of funding for a project, they are often utilized in addition to state or federal grants. In Vermont, there are far more diverse funding opportunities for Water and Wastewater projects than Transportation projects.

Vermont Municipal Bond Bank

The Vermont Municipal Bond Bank (VMBB) provides low-interest, tax exempt, taxable and tax credit bonds for municipal projects. General obligation bonds are generally considered relatively safe, as municipalities can utilize any source of revenue available to them, such as tax revenues, fees, etc. Projects VMBB will finance using general obligation bonds include “infrastructure installation and repairs,” and “water supply systems and wastewater systems.” Revenue bonds are backed by the revenue generated by the specific project being financed. As such, VMBB limits the types of projects that can be implemented using revenue bonds to those that will generate income through fees, such as water supply and wastewater systems and TIF districts.

Vermont State Infrastructure Bank

The Vermont Economic Development Authority (VEDA) works with VTrans and the Federal Highway Administration to provide funding assistance with construction of highways, roads, bridges and pedestrian facilities. Like bonds, interest rates are generally very low. Borrowers are required to provide an equity contribution of 1-20%.

Clean Water State Revolving Loan Fund

The Clean Water State Revolving Loan Fund is administered by the Vermont Department of Environmental conservation and funded by the EPA. Its purpose is to assist communities with the planning, design and construction of public drinking water improvements to comply with drinking water standards and protect public health. Loans from this program can be used for public water system, wastewater collection system and treatment facility construction, as well as the development of community decentralized wastewater disposal systems. There are separate pools of funding for planning and construction, and it is likely that requests for funding would be competitive with other communities. If there is interest in creating a decentralized wastewater system to serve new development the Jericho Riverside area, this fund should be considered.

Community Development Block Grants

Jericho Riverside is one of Vermont’s Designated Village Centers. One of the benefits of this designation is priority consideration for some grant programs including Vermont Community Development Program (VCDP) grants. VCDP assists communities on a competitive basis by providing financial and technical assistance to identify and address local needs, including the development of public facilities and services. The program’s Planning and Implementation Grants could be applicable to the development of a decentralized wastewater system in Jericho Riverside, however infrastructure projects of this nature typically fall under the Low-Moderate Income (LMI) Area Wide benefit criteria. In order to meet the LMI criteria a projected funded through VCDP at least 51% of the service area residents would need to be LMI. According to HUD, area wide LMI date for the Town of Jericho is at approximately 23%, which is well below the 51% that is required under VCDP. If the new infrastructure was going to directly benefit a

business by creating jobs available to LMI persons or housing units that will meet the required 51% LMI area benefit, then it would be worth contacting VCDP staff for further discussion.

USDA Water & Waste Disposal Loan and Grant Program

USDA provides low-interest, long-term loans for the acquisition, construction and improvement of drinking water sourcing, treatment, storage and distribution; and sewer collection, disposal and treatment. The facilities that receive federal financing must be used for public purposes and must be financially sustainable. Interest rates vary based on the need for the project and the median household income of the area to be served. Jericho's high median income (as compared to Chittenden County), would result in a higher interest rate.

Funding Strategy Recommendations

Jericho should refine future plans for the Jericho Riverside by working with landowners to determine their willingness to invest in new development and engage with community members to determine support for potential projects in this area. With a strong public process, and a clear plan for future investments, Jericho will have the components needed to seek funding. Given the mix of potential infrastructure investments that could take place in the Jericho Riverside Project area, multiple funding sources will need to be pursued.

Initially, Jericho should strongly consider creating a TIF district. Given the value of property in the community and the high likelihood that a mix of housing would be marketable and would ultimately lead to increased tax revenue, a TIF district would be a logical part of a total financing package that could fund a new street network, transportation safety improvements and a decentralized wastewater system. The Vermont Economic Progress Council and Chittenden County RPC should be able to assist Jericho with the process.

Concurrently, the Town should reach out to state agencies to determine what funding sources are appropriate based on the community's plan for infrastructure investments. In particular, the Vermont Department of Environmental Conservation should be contacted about the Clean Water State Revolving Loan Fund and whether or not the program can be utilized as part of a complete funding package for Jericho's planned water and wastewater investments in the project area.

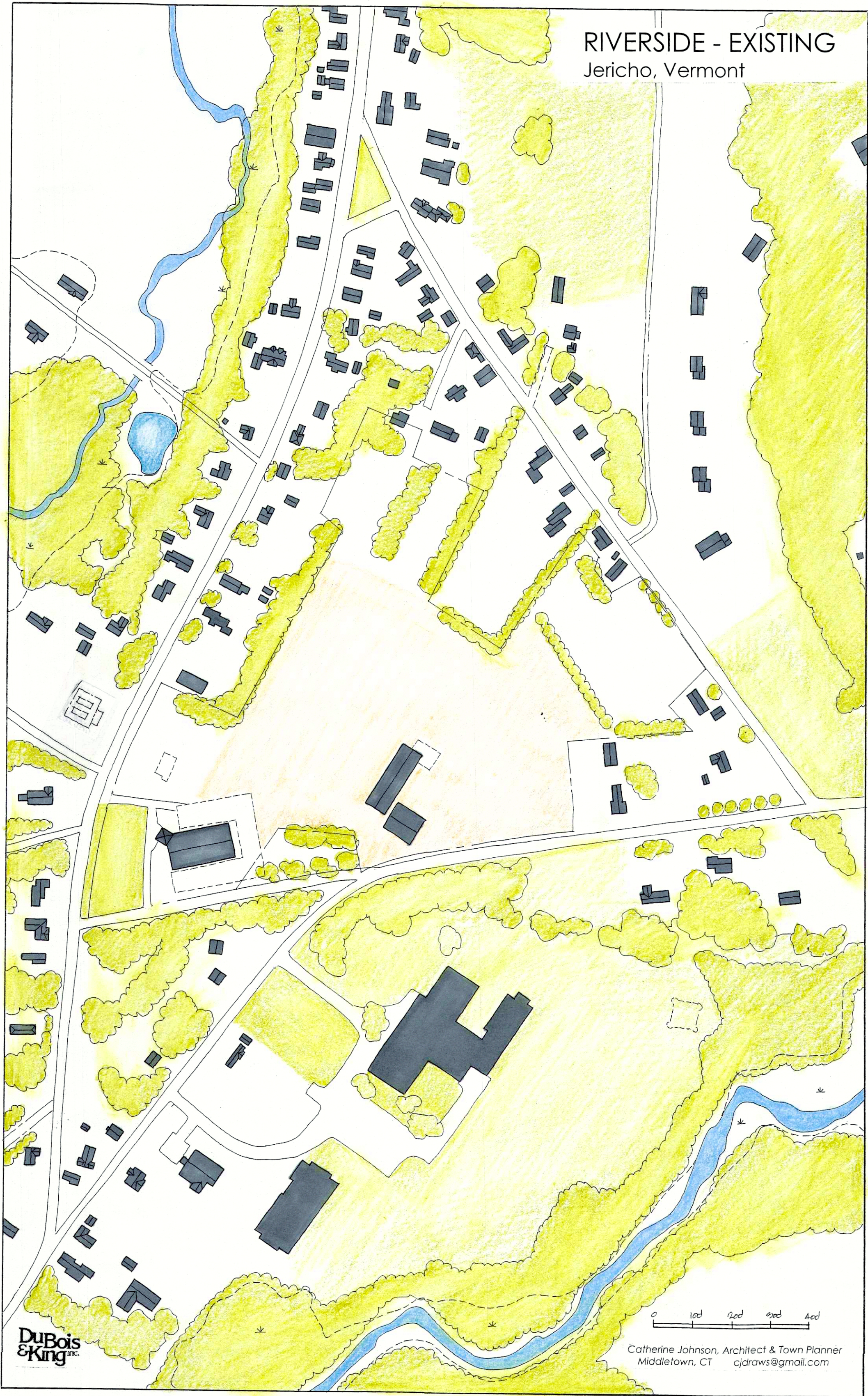
Appendix

Initial street network and village development concepts

Wastewater analysis and basis of design for community septic system

Conceptual Plans and Cost Estimates for Route 15 and Dickinson Road Project

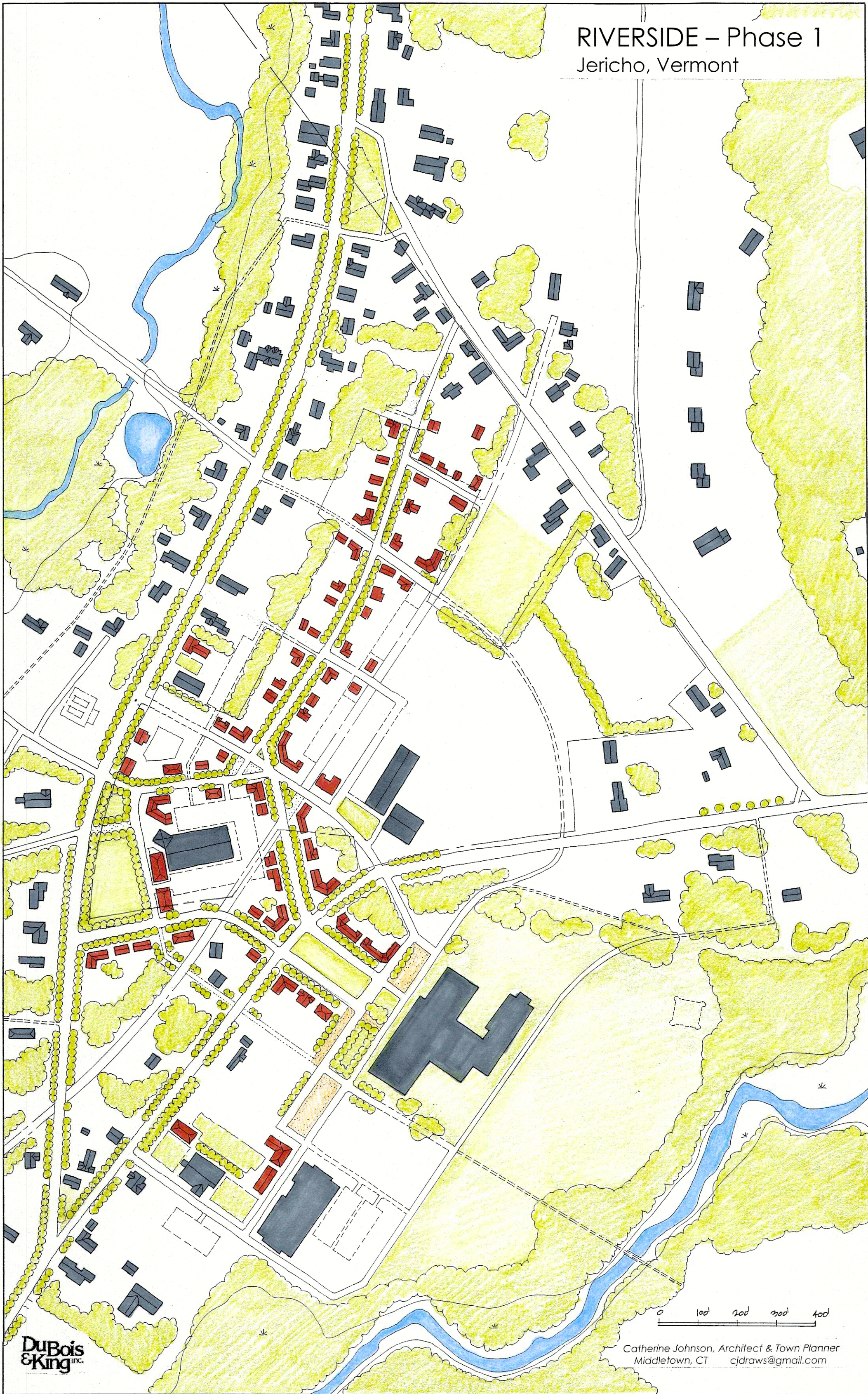
RIVERSIDE - EXISTING
Jericho, Vermont



DuBois
& King
INC.

Catherine Johnson, Architect & Town Planner
Middletown, CT cjdrows@gmail.com

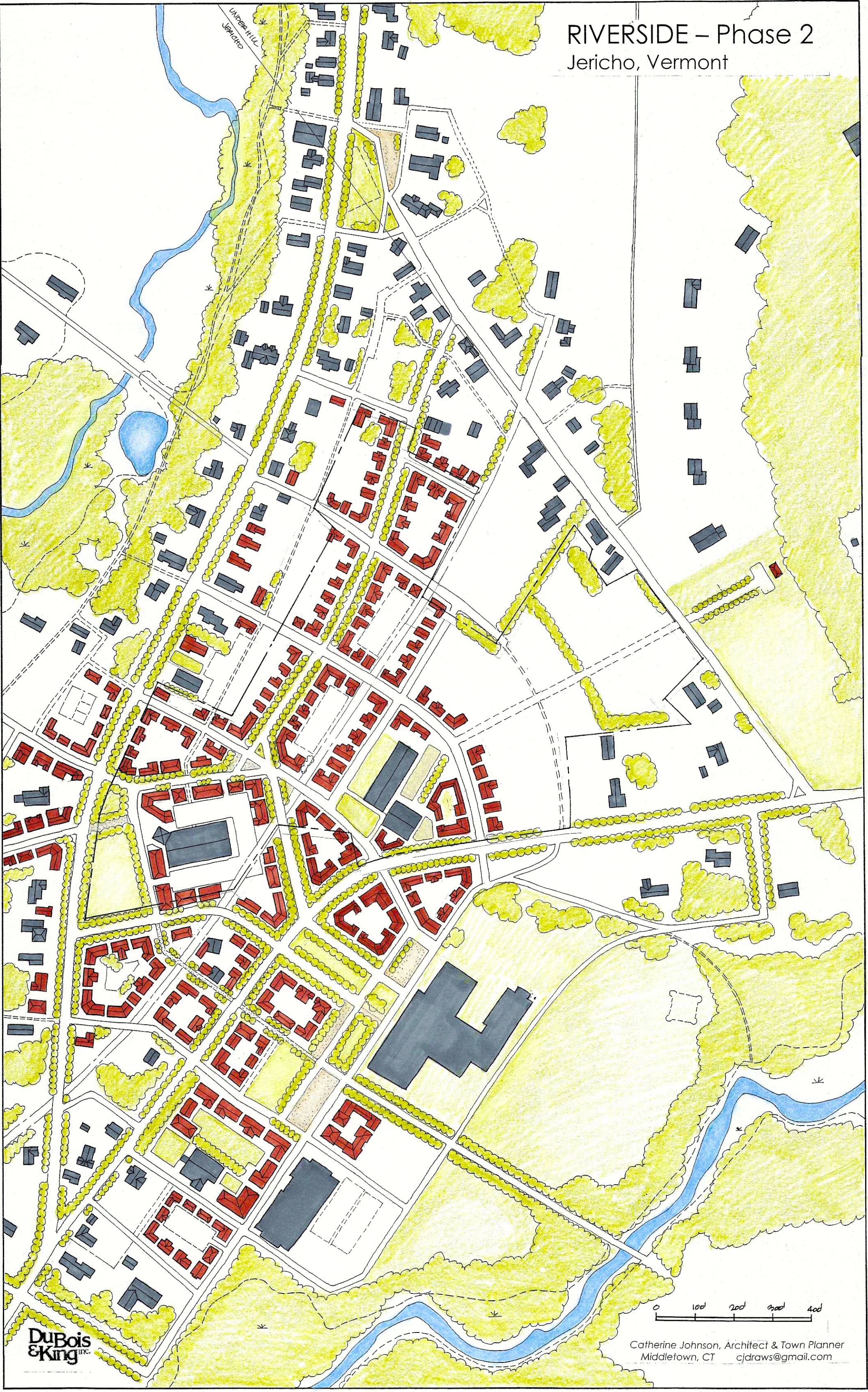
RIVERSIDE – Phase 1
Jericho, Vermont



DuBois
& King
INC.

Catherine Johnson, Architect & Town Planner
Middletown, CT cjdrows@gmail.com

RIVERSIDE – Phase 2
Jericho, Vermont



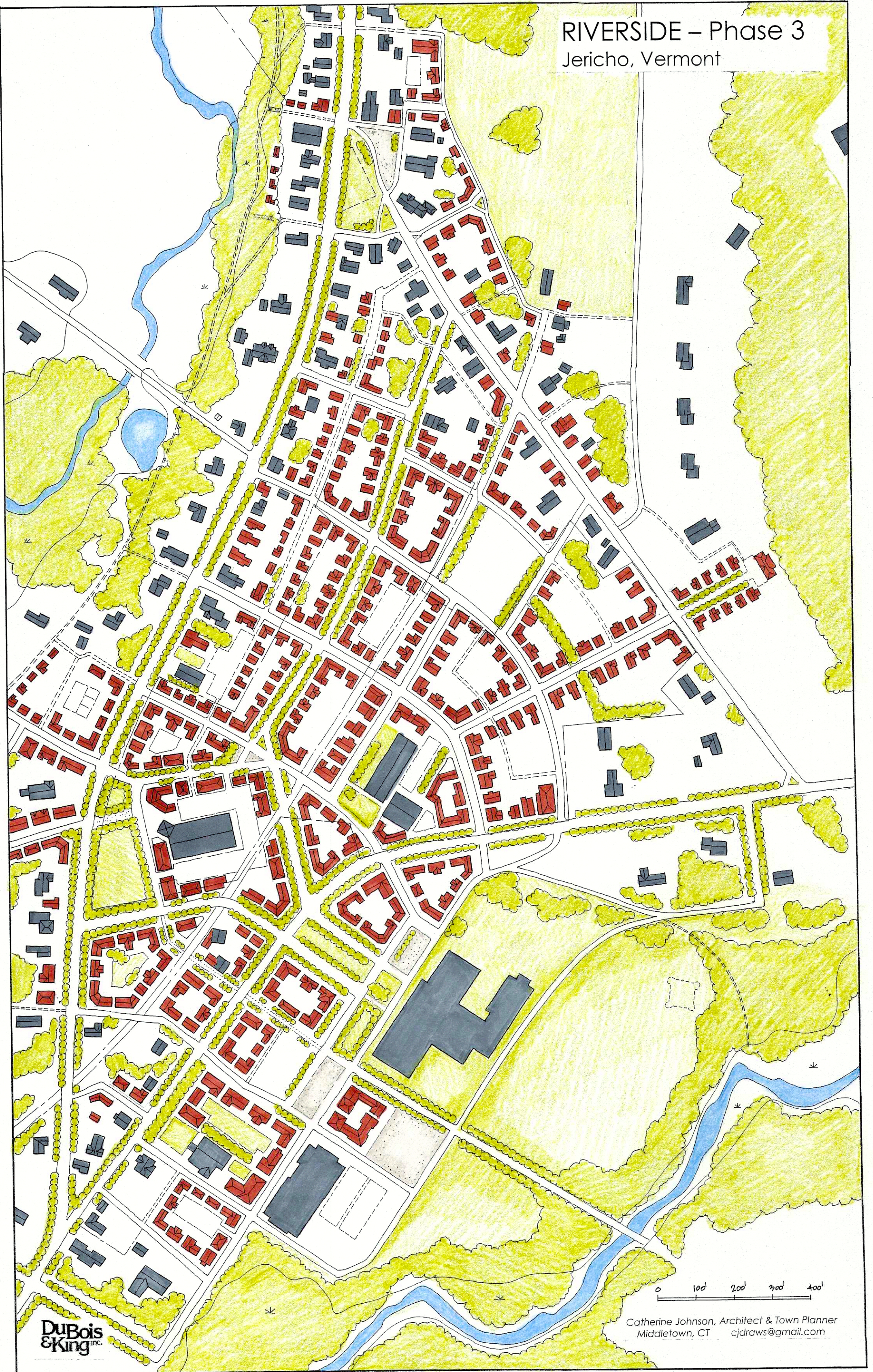
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Catherine Johnson, Architect & Town Planner
Middletown, CT
cjdrows@gmail.com

DuBois
& King
INC.

RIVERSIDE – Phase 3

Jericho, Vermont



DuBois
& King
inc.

Catherine Johnson, Architect & Town Planner
Middletown, CT cjdrows@gmail.com

CCRPC/Riverside Future St Study Basis for Design 12/8/2016	
Wastewater	
Demand	<p>From Interpretation of PUD Map: 73 Single Family Residential Homes, assumed half 2 bedroom and half 3 bedroom $73 * 2.5 * 140 \text{ GPD} = 25,550 \text{ GPD}$</p> <p>19 Commercial/Residential buildings, assumed small dry goods store on ground floor, and 2 bedroom on top floor $19 * (100 \text{ GPD} + (2 * 140 \text{ GPD})) = 7,220 \text{ GPD}$</p> <p>2 apartment buildings assumed 3 two bedroom apartments each $2 * (3 * (2 * 140 \text{ GPD})) = 1,680 \text{ GPD}$</p> <p>3 condo buildings with assumed 6 two bedroom units each $3 * (6 * (2 * 140 \text{ GPD})) = 5,040 \text{ GPD}$</p> <p>2 commercial buildings of unknown use, assumed 2 15,000 Sq. ft. markets $2 * \frac{15,000 \text{ sq. ft.}}{100 \text{ sq. ft.}} * 11 \text{ GPD} = 3,300 \text{ GPD}$</p> <p>Existing Jericho Market 1,350 GPD</p> <p>Permitted Rehab Gym 1,875 GPD</p> <p>Permitted Restaurant 6,494 GPD</p> <p>→ Total Demand For Proposed Development = 52,509 GPD 52,509 GPD > 6,500 GPD → demand falls under indirect discharge category</p>
Approach	<p>One large subsurface leachfield area with two alternating leachfields to meet indirect discharge requirements:</p> <ul style="list-style-type: none"> • Simplified Design • Easier to manage a one opposed to many • Works with existing land availability • Suitable soil types • Hidden from sight • Allows land to be used for additional purposes
Leachfield Design	<p>From researching existing waste water permits, and mapping existing soil types in the area the max loading rate for the two proposed leach field areas was determined to be 0.9 GPD/sq. ft. from the indirect discharge manual</p> <p>Based on the total demand of the system a recirculating sand filter design is required which multiplies the loading rate by 3.</p> <p>The required bottom of trench area for one of the two alternating leachfields was calculated to be</p>

$$\frac{52,509 \text{ GPD}}{(0.9 \frac{\text{GPD}}{\text{ft}^2} * 3)} = 19,448 \text{ sq. ft.}$$

→ total bottom of trench area required for system

$$2 * 19,448 \text{ sq. ft.} = \mathbf{38,896 \text{ sq. ft.}}$$

If 18" of crushed stone is placed under the trenches then the required area is reduced by 25%

$$19,448 \text{ sq. ft.} * 0.75 = 14,586 \text{ sq. ft.}$$

→ total bottom of trench area required for system

$$2 * 14,586 \text{ sq. ft.} = \mathbf{29,172 \text{ sq. ft.}}$$

If 24" of crushed stone is placed under the trenches then the required area is reduced by 34%

$$19,448 \text{ sq. ft.} * 0.66 = 12,836 \text{ sq. ft.}$$

→ total bottom of trench area required for system

$$2 * 12,836 \text{ sq. ft.} = \mathbf{25,672 \text{ sq. ft.}}$$

If optional tertiary treatment is used then the loading rate is multiplied by 5

The required bottom of trench area for one of the two alternating leachfields would be

$$\frac{52,509 \text{ GPD}}{(0.9 \frac{\text{GPD}}{\text{ft}^2} * 5)} = 11,669 \text{ sq. ft.}$$

→ total bottom of trench area required for system

$$2 * 11,669 \text{ sq. ft.} = \mathbf{23,338 \text{ sq. ft.}}$$

Using 18" of crushed stone

$$11,669 \text{ sq. ft.} * 0.75 = 8,752 \text{ sq. ft.}$$

→ total bottom of trench area required for system

$$2 * 8,752 \text{ sq. ft.} = \mathbf{17,504 \text{ sq. ft.}}$$

Using 24" of crushed stone

$$11,669 \text{ sq. ft.} * 0.66 = 7,702 \text{ sq. ft.}$$

→ total bottom of trench area required for system

$$2 * 7,702 \text{ sq. ft.} = \mathbf{15,404 \text{ sq. ft.}}$$

Assuming the largest area was required (38,896 sq. ft.) three plausible options were developed using ArcMap. See attached Wastewater Planning Exhibit.

Note:

Max bottom width of a trench is 4 ft.

4 ft. of spacing is required between individual trenches

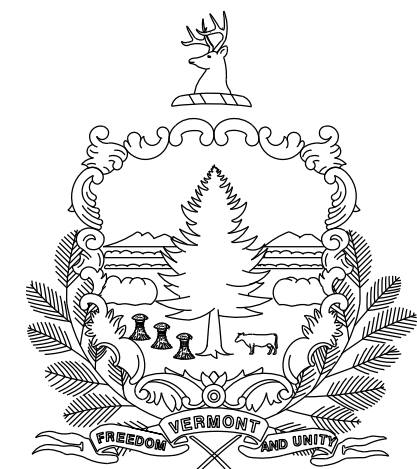
10ft. of spacing is required between alternating leachfields

Trenches must be laid parallel to elevation contours

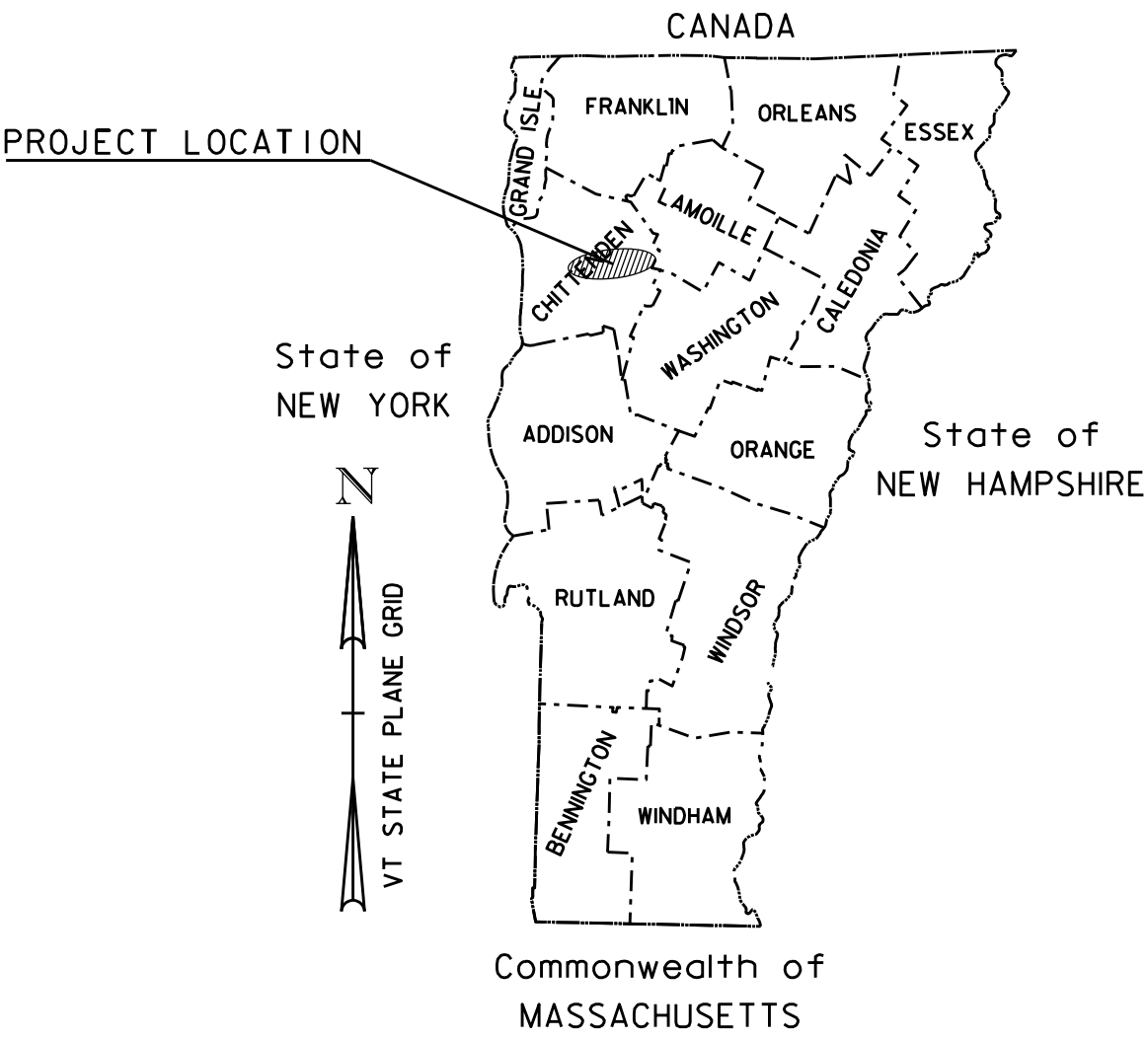
INDEX OF SHEETS

1	TITLE SHEET
2-4	PROJECT TYPICAL SECTIONS SHEETS 1-3
5-7	PLAN SHEETS 1-3

STATE OF VERMONT



PROPOSED IMPROVEMENT
TOWN OF JERICHO
COUNTY OF CHITTENDEN
DICKINSON STREET (LOCAL ROAD)



APPROXIMATE END PROJECT
VT ROUTE 15
STA. 181+25.00

BEGINNING ON VT ROUTE 15 IN THE TOWN OF JERICHO AT STA. 176+75.00 AND EXTENDING EASTERLY
ALONG VT ROUTE 15 A DISTANCE OF 450 FEET TO STA. 181+25.00
BEGINNING ON DICKINSON ROAD AT STATION 0+00.00 AND EXTENDING EASTERLY ALONG DICKINSON
ROAD A DISTANCE OF 975 FEET TO STA. 9+75.00
BEGINNING ON RIVER ROAD AT STA. 30+00.00 AND EXTENDING NORTHERLY ALONG RIVER ROAD A
DISTANCE OF 100.17 FEET TO STA. 31+10.17

STATION TO STATION DATA

VT ROUTE 15	STA. 176+75.00 TO STA. 181+25.00	TOTAL ROADWAY LENGTH = 450
DICKINSON ROAD	STA. 0+00.00 TO STA. 9+75.00	TOTAL ROADWAY LENGTH = 975
RIVER ROAD	STA. 30+00.00 TO STA. 31+10.17	TOTAL ROADWAY LENGTH = 110.17
		TOTAL PROJECT LENGTH = 1535.17

WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES CONSTRUCTION OF A ROUNDABOUT, FULL DEPTH
RECONSTRUCTION, REALIGNMENTS OF ROADWAYS, COLD PLANING, RESURFACING WITH BASE, INTERMEDIATE
AND WEARING COURSE, PAVEMENT MARKINGS, GUARDRAIL, SIGNAGE AND OTHER RELATED HIGHWAY ITEMS.

APPROXIMATE END PROJECT
DICKINSON RD
STA. 9+75.00

APPROXIMATE BEGIN PROJECT
DICKINSON RD
STA. 0+00.00

APPROXIMATE END PROJECT
RIVER RD
STA. 31+10.17

APPROXIMATE BEGIN PROJECT
RIVER RD
STA. 30+00.00

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE
WITH THESE PLANS AND THE STANDARD SPECIFICATIONS
FOR CONSTRUCTION DATED 2011, AS APPROVED BY THE
FEDERAL HIGHWAY ADMINISTRATION ON JULY 20, 2011
FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT
REVISIONS AND SUCH REVISED SPECIFICATIONS AND
SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE
PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 3

SURVEYED BY : DUBOIS & KING
SURVEYED DATE : N/A

DATUM
VERTICAL N/A
HORIZONTAL N/A

APPROXIMATE BEGIN PROJECT
VT ROUTE 15
STA. 176+75.00

DuBois
& King inc.

PLOTTED:

CONCEPTUAL PLANS
NOVEMBER 2017

DIRECTOR OF PROJECT DELIVERY

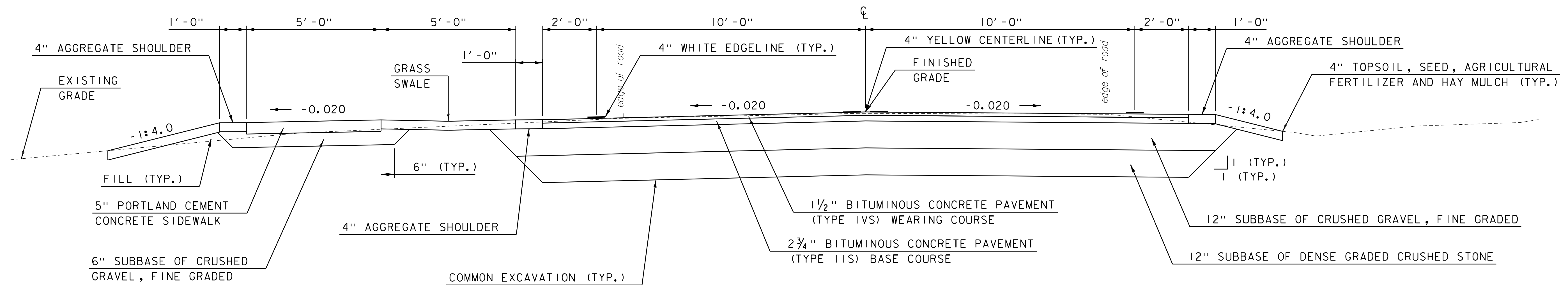
APPROVED _____ DATE _____

PROJECT MANAGER : XXXXXX

PROJECT NAME : JERICHO RIVERSIDE

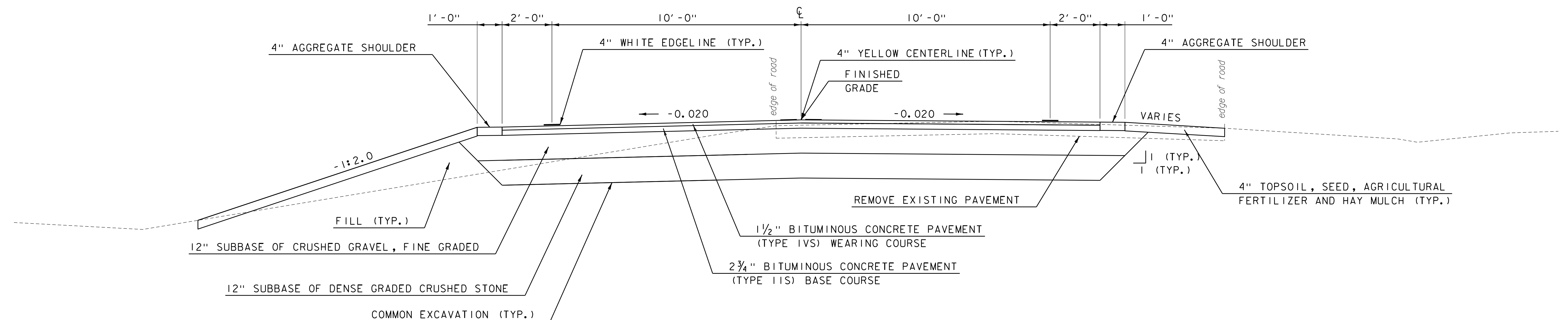
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SHEET 1 OF 7 SHEETS



DICKINSON ROAD
FULL DEPTH RECONSTRUCTION

STA. 0+00.00 - STA. 9+75.00

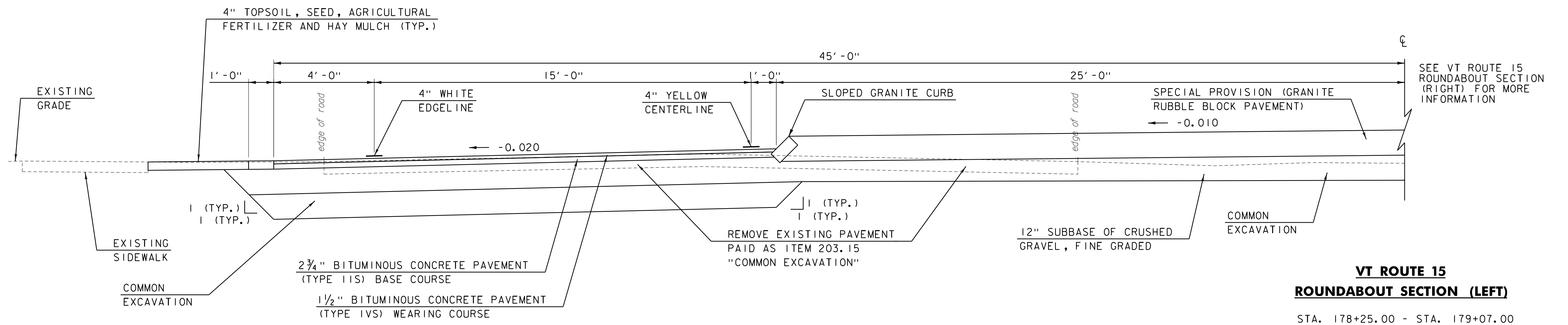
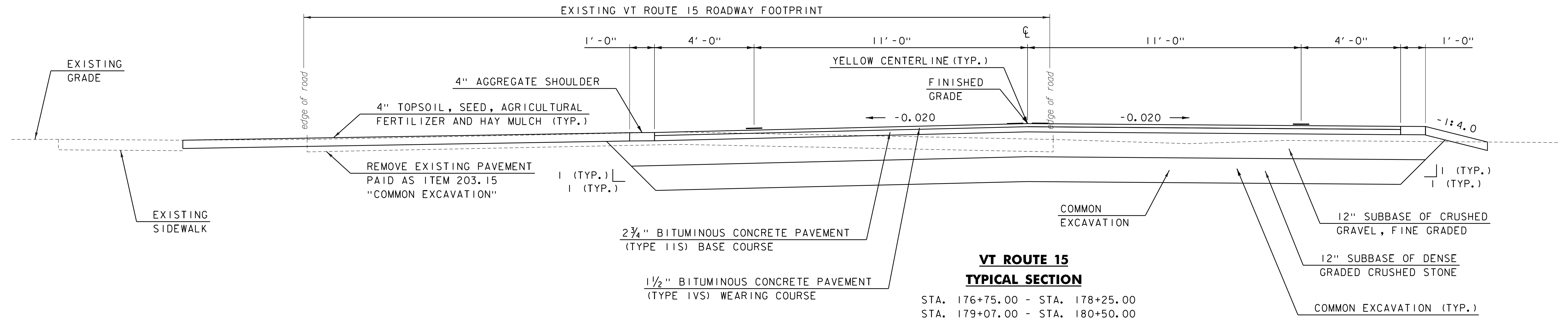


RIVER ROAD
FULL DEPTH RECONSTRUCTION

STA. 30+00.00 - STA. 31+01.17

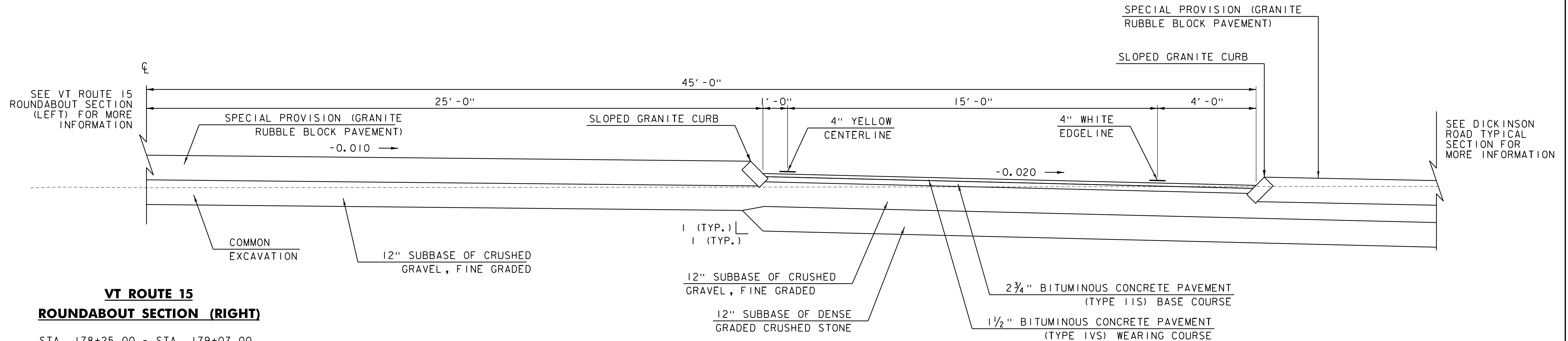
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PROJECT NUMBER:	
FILE NAME: 622386P7-tyt.dgn	PLOT DATE: 11/14/2017
PROJECT LEADER: L. GIBSON	DRAWN BY: O. DALMER
DESIGNED BY: B. BRESLEND	CHECKED BY: C. LATHROP
PROJECT TYPICAL SECTIONS SHEET 1	SHEET 2 OF 7



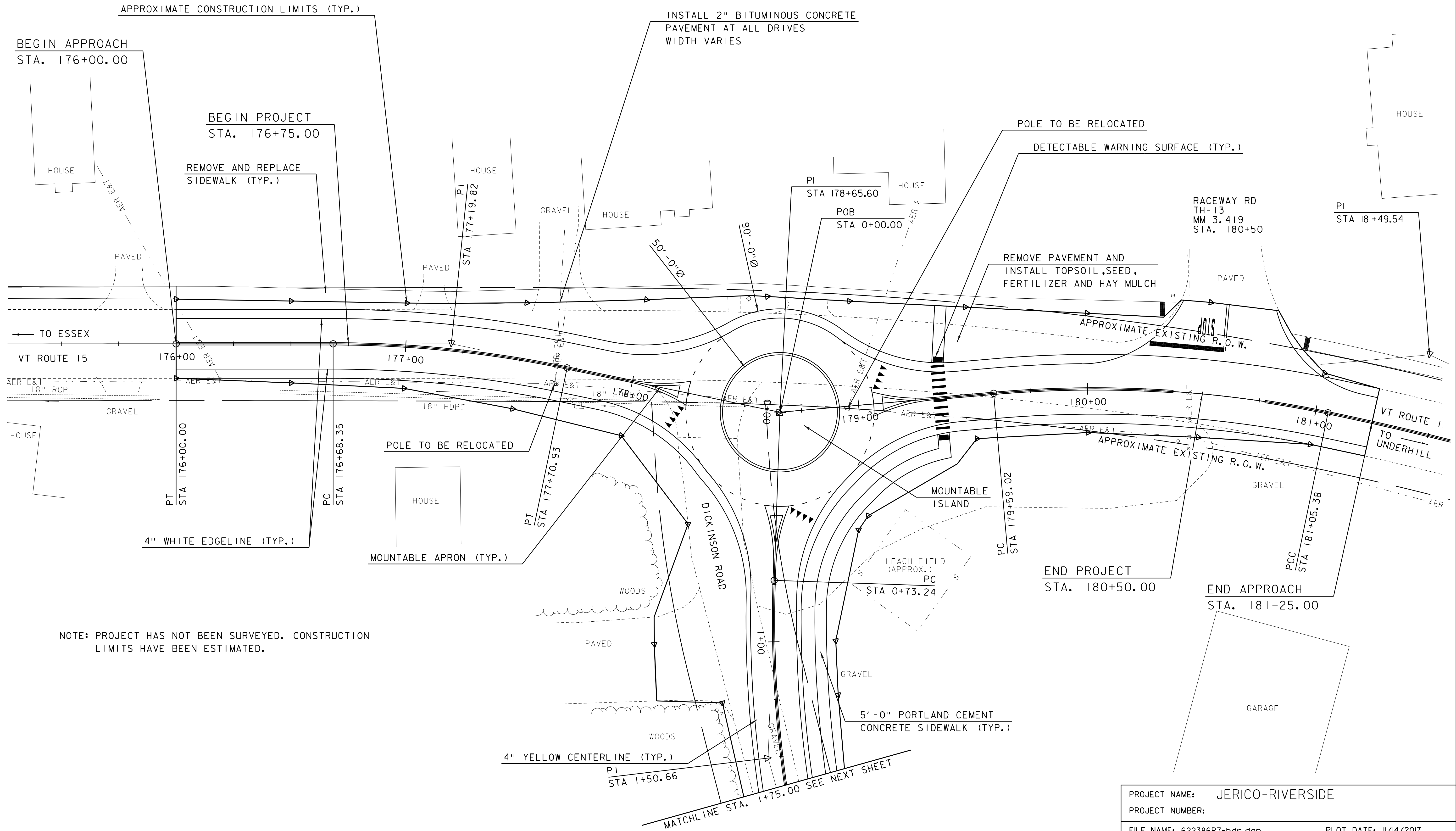
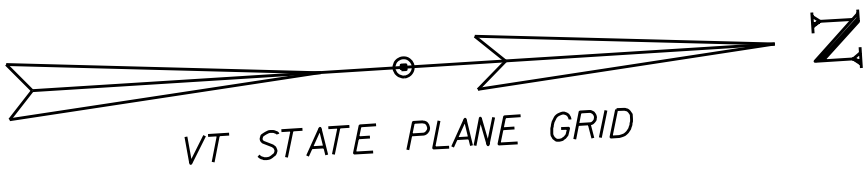
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PROJECT NUMBER:	
FILE NAME: 622386P7-tyt.dgn	PLOT DATE: 11/14/2017
PROJECT LEADER: L. GIBSON	DRAWN BY: O. DALMER
DESIGNED BY: B. BRESLEND	CHECKED BY: C. LATHROP
PROJECT TYPICAL SECTIONS SHEET 2	SHEET 3 OF 7

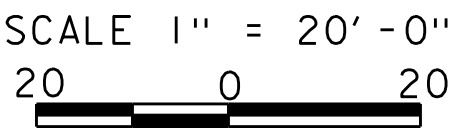


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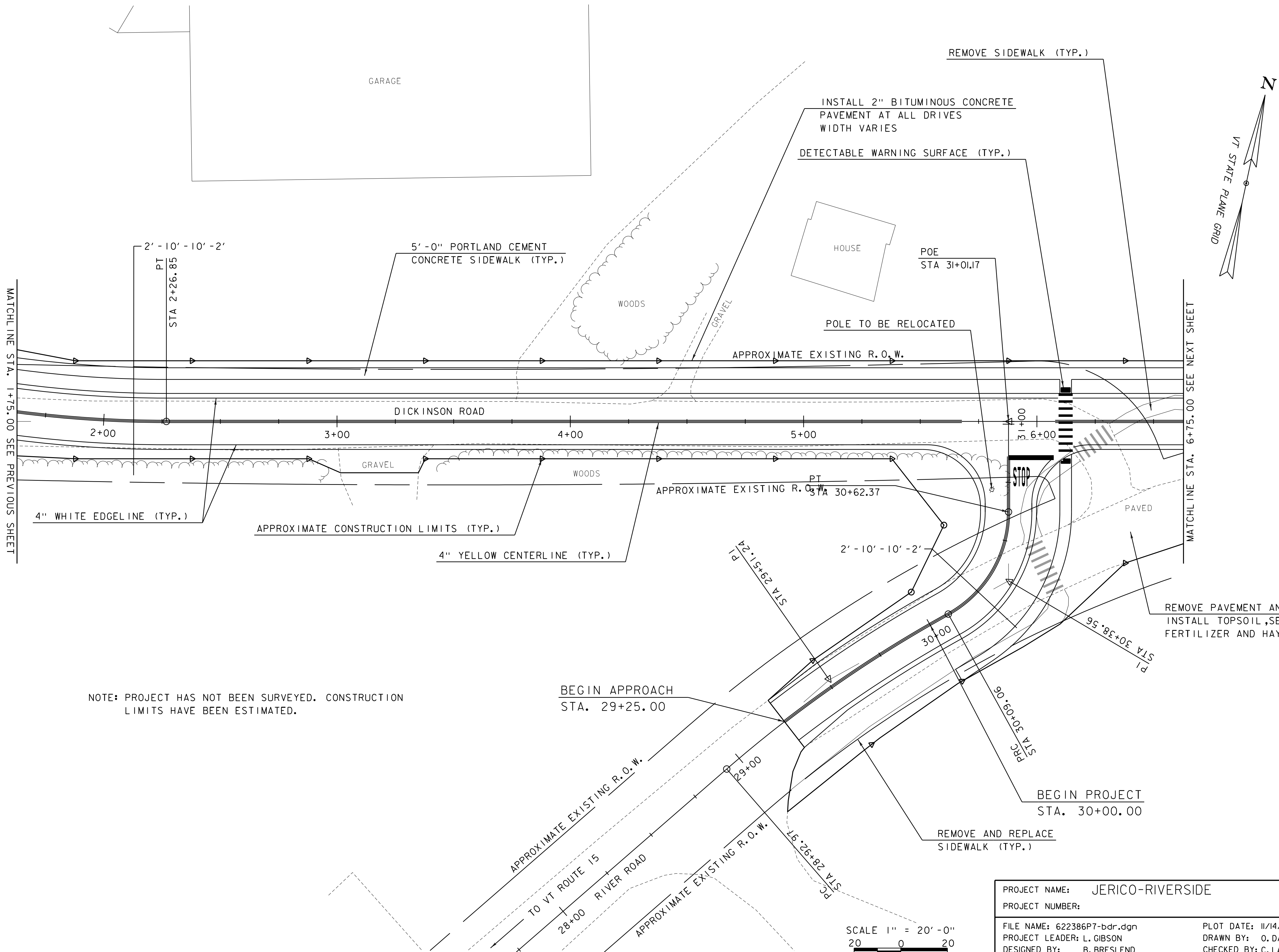
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PROJECT NUMBER:	
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PROJECT LEADER: L. GIBSON	DRAWN BY: O. DALMER
DESIGNED BY: B. BRESLEND	CHECKED BY: C. LATHROP
PROJECT TYPICAL SECTIONS SHEET 3	SHEET 4 OF 7



NOTE: PROJECT HAS NOT BEEN SURVEYED. CONSTRUCTION LIMITS HAVE BEEN ESTIMATED.



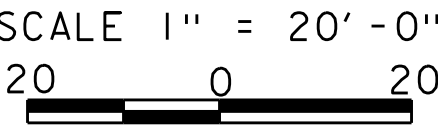
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PROJECT LEADER: L. GIBSON	DRAWN BY: O. DALMER
DESIGNED BY: B. BRESLEND	CHECKED BY: C. LATHROP
PLAN SHEET 1	SHEET 5 OF 7



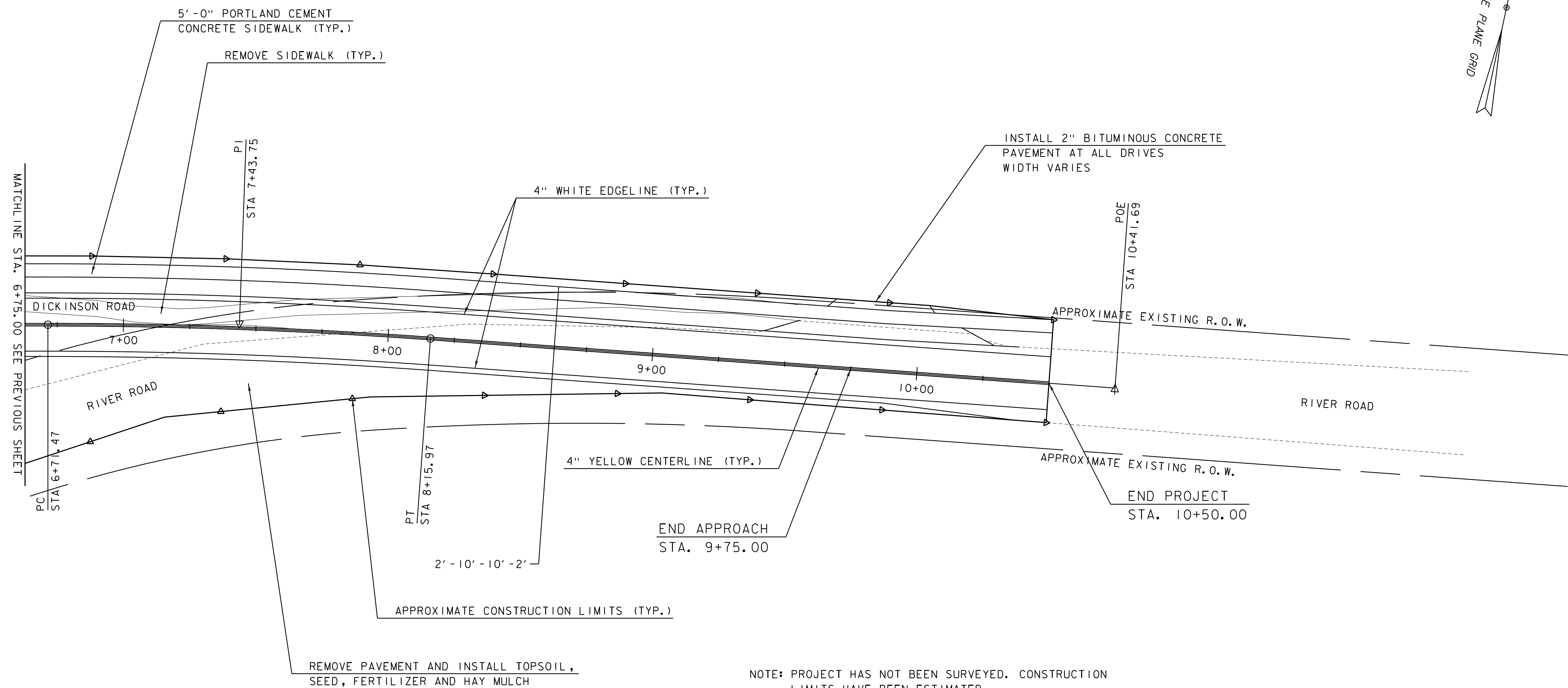
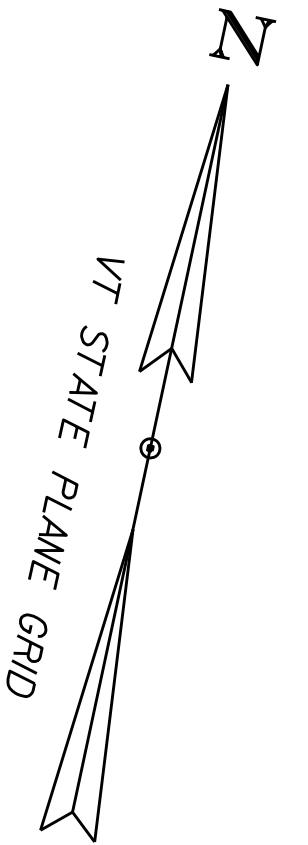
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BEGIN APPROACH
STA. 29+25.00

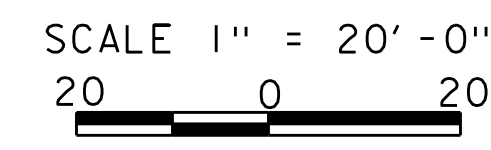
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STA. 30+00.00



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PROJECT NUMBER:	
FILE NAME: 622386P7-bdr.dgn	PLOT DATE: 11/14/2017
PROJECT LEADER: L. GIBSON	DRAWN BY: O. DALMER
DESIGNED BY: B. BRESLEND	CHECKED BY: C. LATHROP
PLAN SHEET 2	SHEET 6 OF 7



NOTE: PROJECT HAS NOT BEEN SURVEYED. CONSTRUCTION LIMITS HAVE BEEN ESTIMATED.



PROJECT NAME: JERICO-RIVERSIDE	
PROJECT NUMBER:	
FILE NAME: 622386P7-bdr.dgn	PLOT DATE: 11/14/2017
PROJECT LEADER: L. GIBSON	DRAWN BY: O. DALMER
DESIGNED BY: B. BRESLEND	CHECKED BY: C. LATHROP
PLAN SHEET 3	SHEET 7 OF 7

Estimate 622386P7

Estimated Cost:\$1,180,499.77

Contingency: 25.00%

Estimated Total: \$1,475,624.71

Base Date: 11/13/17

Spec Year: 11

Unit System: E

Work Type: ROADS & HIGHWAY CONSTRUCTION

Highway Type: LOCAL

Urban/Rural Type: URBAN

Season: CONSTRUCTION (APRIL 15th - OCTOBER 15th)

County: JERICO

Midpoint of Latitude:

Midpoint of Longitude:

District: NW

Federal/State Project Number:

Estimate Type: CONCEPTUAL

Prepared by P. DAY, E.I. on 11/14/17

Checked by B. BRESLEND, P.E. on 11/14/17

Approved by L. GIBSON on 11/14/17

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					

Group 1011: ROADWAY

0007	201.10	1.000	LS	\$10,000.00000	\$10,000.00
CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS					
0008	203.15	4,500.000	CY	\$12.12448	\$54,560.16
COMMON EXCAVATION					
0009	203.16	200.000	CY	\$64.75447	\$12,950.89
SOLID ROCK EXCAVATION					
0010	210.10	1,000.000	SY	\$5.69767	\$5,697.67
COLD PLANING, BITUMINOUS PAVEMENT					
0011	204.20	900.000	CY	\$17.73268	\$15,959.41
TRENCH EXCAVATION OF EARTH					
0012	204.21	100.000	CY	\$163.94655	\$16,394.66
TRENCH EXCAVATION OF ROCK					
0013	204.22	1.000	CY	\$75.00000	\$75.00
TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)					
0014	204.30	900.000	CY	\$37.52627	\$33,773.64
GRANULAR BACKFILL FOR STRUCTURES					
0015	210.10	1,500.000	SY	\$5.69767	\$8,546.50
COLD PLANING, BITUMINOUS PAVEMENT					
0016	301.26	3,000.000	CY	\$40.00000	\$120,000.00
SUBBASE OF CRUSHED GRAVEL, FINE GRADED					
0017	301.35	4,000.000	CY	\$37.45311	\$149,812.44
SUBBASE OF DENSE GRADED CRUSHED STONE					
0018	402.12	100.000	TON	\$47.85693	\$4,785.69
AGGREGATE SHOULDERS					
0019	404.65	200.000	CWT	\$35.22372	\$7,044.74
EMULSIFIED ASPHALT					
0020	490.30	1,500.000	TON	\$76.29594	\$114,443.91
SUPERPAVE BITUMINOUS CONCRETE PAVEMENT					
0021	601.2615	1,000.000	LF	\$25.27816	\$25,278.16
18" CPEP(SL)					
0022	604.10	5.000	EACH	\$3,500.00000	\$17,500.00
CONCRETE CATCH BASIN WITH CAST IRON GRATE					
0023	604.412	1.000	EACH	\$1,247.69063	\$1,247.69
REHAB. DROP INLETS, CATCH BASINS, OR MANHOLES, CLASS I					
0024	604.415	2.000	EACH	\$1,450.73389	\$2,901.47
REHAB. DROP INLETS, CATCH BASINS, OR MANHOLES, CLASS II					
0025	604.418	2.000	EACH	\$1,720.17400	\$3,440.35
REHAB. DROP INLETS, CATCH BASINS, OR MANHOLES, CLASS III					
0026	608.15	10.000	HR	\$103.13690	\$1,031.37
POWER GRADER RENTAL					
0027	608.25	40.000	HR	\$100.54043	\$4,021.62
ALL PURPOSE EXCAVATOR RENTAL, TYPE I					

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					
0028	608.26	10.000	HR	\$200.00000	\$2,000.00
ALL PURPOSE EXCAVATOR RENTAL, TYPE II					
0029	608.30	10.000	HR	\$65.26173	\$652.62
POWER BROOM RENTAL, TYPE I					
0030	608.37	80.000	HR	\$81.20140	\$6,496.11
TRUCK RENTAL					
0031	608.40	10.000	HR	\$93.24484	\$932.45
LOADER RENTAL, TYPE I					
0032	613.10	100.000	CY	\$52.16267	\$5,216.27
STONE FILL, TYPE I					
0033	616.20	200.000	LF	\$36.23847	\$7,247.69
GRANITE SLOPE EDGING					
0034	616.41	100.000	LF	\$13.98640	\$1,398.64
REMOVAL OF EXISTING CURB					
0035	618.10	700.000	SY	\$104.93667	\$73,455.67
PORTLAND CEMENT CONCRETE SIDEWALK, 5 INCH					
0036	618.30	40.000	SF	\$49.92897	\$1,997.16
DETECTABLE WARNING SURFACE					
0037	619.17	10.000	EACH	\$56.45219	\$564.52
YIELDING MARKER POSTS					
0038	629.20	5.000	EACH	\$90.62702	\$453.14
ADJUST ELEVATION OF VALVE BOX					
0039	630.10	200.000	HR	\$57.68554	\$11,537.11
UNIFORMED TRAFFIC OFFICERS					
0040	630.15	900.000	HR	\$27.90995	\$25,118.96
FLAGGERS					
0041	634.10	520.000	HR	\$11.01783	\$5,729.27
EMPLOYEE TRAINEESHIP					
0043	635.11	1.000	LS	\$107,318.16100	\$107,318.16
MOBILIZATION/DEMOBILIZATION					
0044	641.10	1.000	LS	\$100,000.00000	\$100,000.00
TRAFFIC CONTROL					
0045	641.15	3.000	EACH	\$3,437.22061	\$10,311.66
PORTABLE CHANGEABLE MESSAGE SIGN					
0046	646.402	4,000.000	LF	\$1.25704	\$5,028.16
DURABLE 4 INCH WHITE LINE, THERMOPLASTIC					
0047	646.414	4,000.000	LF	\$1.14829	\$4,593.16
DURABLE 4 INCH YELLOW LINE, POLYUREA					
0048	646.482	60.000	LF	\$6.44603	\$386.76
DURABLE 24 INCH STOP BAR, THERMOPLASTIC					
0049	646.492	20.000	EACH	\$68.64757	\$1,372.95
DURABLE LETTER OR SYMBOL, THERMOPLASTIC					
0050	646.502	60.000	LF	\$11.43359	\$686.02
DURABLE CROSSWALK MARKING, THERMOPLASTIC					

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					
0051	646.602	7,000.000	LF	\$0.23170	\$1,621.90
TEMPORARY 4 INCH WHITE LINE, PAINT					
0052	646.612	7,000.000	LF	\$0.20612	\$1,442.84
TEMPORARY 4 INCH YELLOW LINE, PAINT					
0053	646.682	110.000	LF	\$5.31168	\$584.28
TEMPORARY 24 INCH STOP BAR, PAINT					
0054	646.692	40.000	EACH	\$29.53084	\$1,181.23
TEMPORARY LETTER OR SYMBOL, PAINT					
0055	646.76	400.000	EACH	\$1.67144	\$668.58
LINE STRIPING TARGETS					
0056	675.20	500.000	SF	\$14.95985	\$7,479.92
TRAFFIC SIGNS, TYPE A					
0057	675.341	500.000	LF	\$11.64456	\$5,822.28
SQUARE TUBE SIGN POST AND ANCHOR					
0058	675.50	20.000	EACH	\$15.33239	\$306.65
REMOVING SIGNS					
0059	675.60	10.000	EACH	\$29.40819	\$294.08
ERECTING SALVAGED SIGNS					
0060	900.620	5.000	EACH	\$500.00000	\$2,500.00
SPECIAL PROVISION (CPM SCHEDULE)					
0061	900.645	1.000	LS	\$25,000.00000	\$25,000.00
SPECIAL PROVISION (LANDSCAPING CONTINGENCY)					
0062	900.645	1.000	LS	\$25,000.00000	\$25,000.00
SPECIAL PROVISION (UTILITY CONTINGENCY)					
0063	900.675	100.000	SY	\$300.00000	\$30,000.00
SPECIAL PROVISION (GRANITE RUBBLE BLOCK PAVEMENT)					
0080	900.675	550.000	SY	\$40.00000	\$22,000.00
SPECIAL PROVISION (HAND PLACED BITUMINOUS CONCRETE MATERIAL, DRIVES)					
0081	900.680	10.000	TON	\$300.00000	\$3,000.00
SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT SURFACE PREPARATION, TYPE I)					

Total for Group 1011:\$1,108,863.61

Group 1051:

0064	649.51	500.000	SY	\$5.80945	\$2,904.73
GEOTEXTILE FOR SILT FENCE					
0065	651.15	200.000	LB	\$7.80513	\$1,561.03
SEED					
0066	651.18	350.000	LB	\$3.26752	\$1,143.63
FERTILIZER					
0067	651.20	2.000	TON	\$667.41595	\$1,334.83
AGRICULTURAL LIMESTONE					
0068	651.25	2.000	TON	\$779.30489	\$1,558.61
HAY MULCH					

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u> <u>Supplemental Description</u>					
0069	651.35 TOPSOIL	400.000	CY	\$37.86327	\$15,145.31
0074	652.10 EPSC PLAN	1.000	LS	\$5,000.00000	\$5,000.00
0075	652.20 MONITORING EPSC PLAN	200.000	HR	\$33.81017	\$6,762.03
0076	652.30 MAINTENANCE OF EPSC PLAN (N.A.B.I.)	1.000	LU	\$7,500.00000	\$7,500.00
0077	653.20 TEMPORARY EROSION MATTING	500.000	SY	\$2.92120	\$1,460.60
0078	653.35 VEHICLE TRACKING PAD	50.000	CY	\$55.65921	\$2,782.96
0079	653.50 BARRIER FENCE	2,500.000	LF	\$1.79297	\$4,482.43

Total for Group 1051:\$51,636.16

Group 1999: FULL C.E. ITEMS

0070	631.10 FIELD OFFICE, ENGINEERS	1.000	LS	\$15,000.00000	\$15,000.00
0071	631.16 TESTING EQUIPMENT, CONCRETE	1.000	LS	\$1,000.00000	\$1,000.00
0072	631.17 TESTING EQUIPMENT, BITUMINOUS	1.000	LS	\$1,000.00000	\$1,000.00
0073	631.26 FIELD OFFICE TELEPHONE (N.A.B.I.)	3,000.000	DL	\$1.00000	\$3,000.00

Total for Group 1999:\$20,000.00