SCHLESINGER CONSULTING ENGINEERING, PLLC

Pima County Department of Transportation
Design Concept Report
Wilmot Road: North of Sahuarita Road

February 2015

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Executive Summary

The Pima County Department of Transportation (PCDOT) is designing and reconstructing 7.1 miles of Wilmot Road between Sahuarita Road and where the pavement begins, approximately 3 miles south Interstate-10. This is a Regional Transportation Authority (RTA) project that was approved by the voters in 2006.

This Design Concept Report documents the planning process and provides guidance for the final design of improvements for this project. Concept Plans for the recommended improvements are included in Appendix I. The improvements include:

- Construction of a two lane roadway with paved shoulders located along the east side of existing right of way, which will accommodate the Wilmot Road long range plan of a four lane divided roadway.
- Construction of drainage crossings sloping down at 2 % from east to west. This slope will facilitate "self-cleaning", minimizing the amount of sediment that may accumulate during runoff events. Cut-off-walls and or rip-rap will be placed downstream of the road at key locations to protect the road from scour and headcutting.
- Construction of a pavement structure that consists of cement treated subgrade and an asphaltic concrete riding surface.
- Avoidance of environmental impacts where possible and mitigation of the impacts where unavoidable.

This project is scheduled to begin construction in 2016 and will be completed in 9 months.
A summary of the project cost are presented in Exhibit 1. A detailed cost estimate is included in Appendix II.

Item	Cost
Construction	$6,173,744.00
Contingency (20% of Construction Cost)	$1,234,749.00
Engineering Design	$750,000.00
Utility Relocation	$100,000.00
Right of Way	$204,544.00
Post Design Services (1% of Construction Cost)	$61,737.00
Construction Administration (15% of Construction Cost)	$926,062.00
Total	$9,450,836.00

Exhibit 1 Project Cost

Project Location

The Wilmot Road project is located within Pima County, AZ, in the southeast part of metropolitan Tucson. It begins at Sahuarita Road and ends approximately 3 miles south of Interstate-10. The southern 2 miles of the project is in unincorporated Pima County. The majority of the northern 5.1 miles of the project are within City of Tucson jurisdictional limits. A location map is presented in Exhibit 2.

Exhibit 2 Location Plan

Project Description

Wilmot Road, between Sahuarita Road and where the pavement begins approximately 3 miles south of Interstae-10, is currently a dirt road that is bisected by a series of small washes. It is often impassable for long durations after rainstorms and requires frequent maintenance. The Wilmot Road project, as approved by the voters on May 16, 2006, is described as follows: "Wilmot Road, North of Sahuarita Rd.: New two-lane roadway connecting Sahuarita Rd. with existing paved facility (6 miles north)."

The actual length of this project is 7.1 miles. The goals of the project are to:

- Improve access to and from the southeastern part of metropolitan Tucson
- Design and build a project that is within budget
- Qualify for a Non-notification Clean Water Act permit
- Build a road that is passable after a rainstorm
- Develop a cross drainage system that conveys flows without significantly increasing the water surface elevations
- Lower long term maintenance costs
- Minimize utility and right of way impacts
- Minimize environmental impacts where possible and mitigate impacts where unavoidable

This project includes:

- A two lane roadway with paved shoulders
- Drainage facilities that convey storm water across the roadway
- A pavement structure that accommodates future traffic loading and minimizes maintenance

Project Area Characteristics

Land Use and Zoning

The Wilmot Road improvement project falls within the jurisdictions of the City of Tucson and Pima County. Much of this project is located within the City of Tucson's Rincon Southeast/Santa Rita and Upper Santa Cruz Comprehensive Plan sub regions. The jurisdictional limits are presented in Exhibit 3.

Within the project limits, land on the east side of Wilmot Road is primarily undeveloped. Some rural residential development is located along the east side of Wilmot Road, near Sahuarita Road. Land on the west side of Wilmot Road is almost entirely undeveloped. Federal and State Prisons and residential and commercial developments are located along Wilmot Road north of the project limits. A mixture of undeveloped land and rural residential developments are located south of the project limits. The existing zoning is presented in Exhibit 3.

The project limits fall within the Rural Homestead (RH) zoning within the City of Tucson and Pima County.

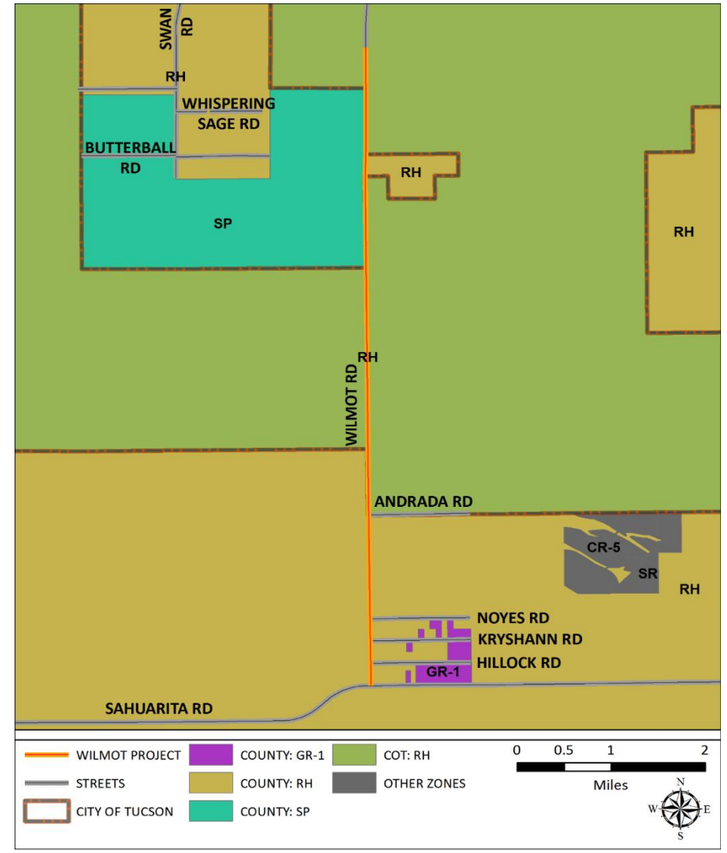


Exhibit 3 Jurisdictional Limits/Existing Zoning

Land Ownership

Adjacent land ownership includes privately owned, City of Tucson, State of Arizona, and Bureau of Land Management (BLM) parcels. The city owns several parcels on both sides of Wilmot Road. State land is present on both sides of the roadway throughout much of the project limits. The BLM parcel (about 39 acres) is located on the east side of Wilmot Road. The adjacent land ownership is presented in Exhibit 4.

Further coordination with BLM as to the disposition of the current right of way grant and renewal of the grant is pending. This renewal may require environmental clearance action through BLM National Environmental Policy (NEPA) process as a Categorical Exclusion or Environmental Assessment.

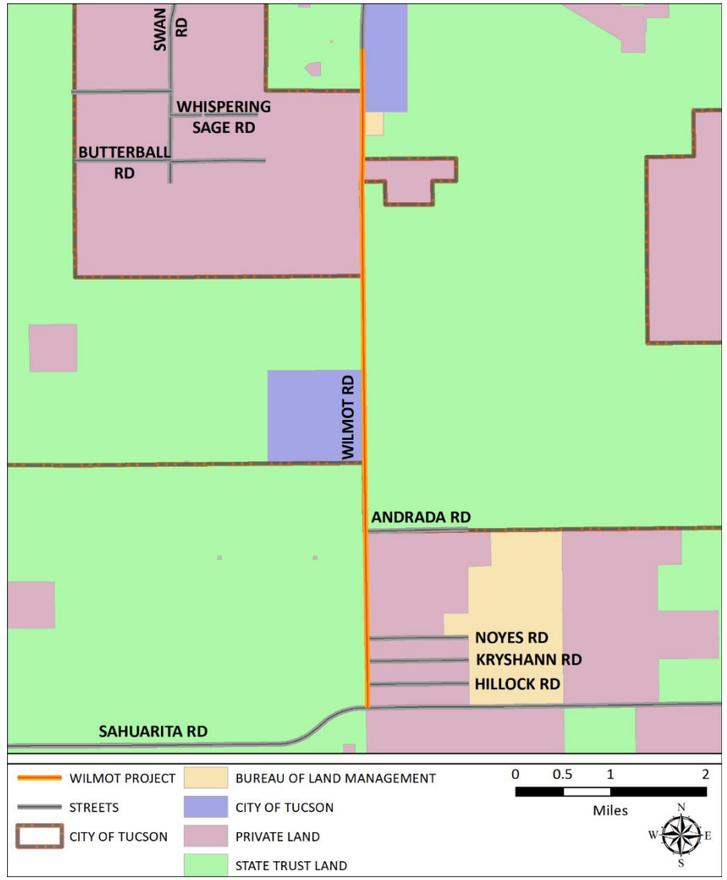


Exhibit 4 Land Ownership

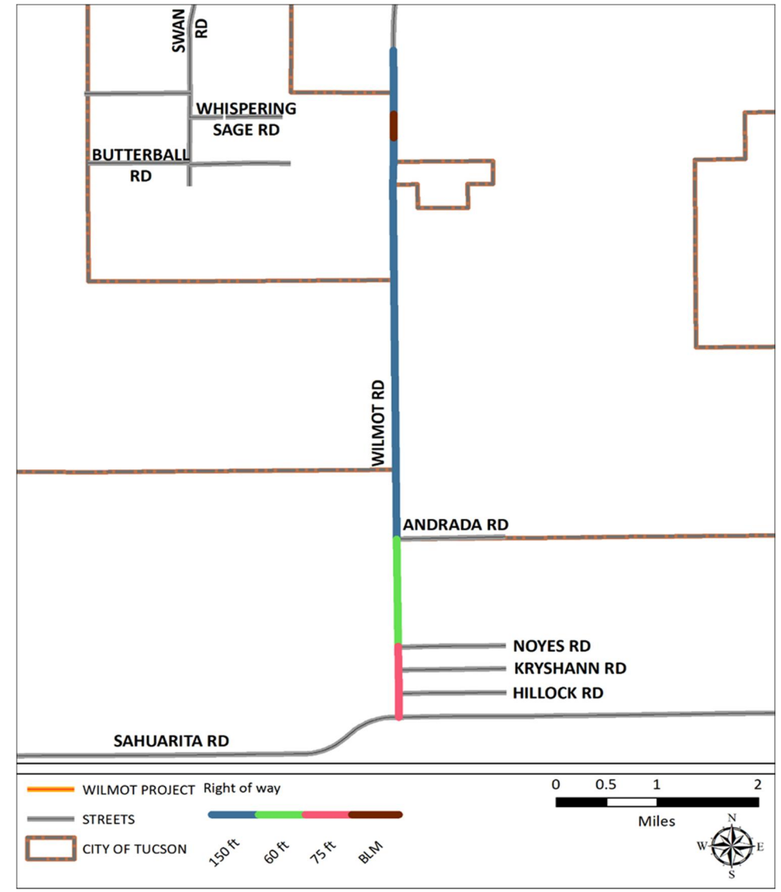


Exhibit 5 Existing Right of Way

Right of Way

Most of the existing roadway is located within the existing Wilmot Road right of way (ROW) which varies from 60 feet to 150 feet wide. There are however locations where the roadway grading extends outside the existing right of way. Approximately 1320 linear feet of the existing roadway falls within the Bureau of Land Management (BLM) parcel located 4 miles south of Inaterste-10. The existing right of way widths and BLM parcel are presented in Exhibit 5.

Habitat

The general ecology within the project area can be described as the Arizona Upland Subdivision of the Sonoran desert scrub biotic community. The upland plant community is dominated by creosote bush. Velvet mesquite is scattered within this community, with blue palo verde and whitethorn acacia common along xeroriparian drainages. Saguaro is widely scattered along most of the project length. A review of Pima County MapGuide (http://gis.pima.gov/maps/mapguide/mgmap.cfm?path=/maps/mapguide/dotmap65.mwf&scriptpath=mgmapinitnull

API.inc accessed 2/4/14) indicated that vegetation within some washes and drainages in the project area are considered Important Riparian Areas, which are considered Regulated Riparian Habitat as described in *Regulated Riparian Habitat Mitigation Standards and Implementation Guidelines. Supplement to Title 16 Chapter 16.30 of the Watercourse and Riparian Habitat Protection and Mitigation Requirements Ordinance No. 2010 FC5* (PCRFCD, 2011, http://rfcd.pima.gov/wrd/riparian/pdfs/onsite_mitigation_guidelines.pdf). These riparian areas are recognized in the Pima County Multi-Species Conservation Plan as important natural resources (http://www.pima.gov/cmo/sdcp/MSCP/MSCP.html). The Pima pineapple cactus, an Endangered Species Act protected plant, has been located within the project corridor and right of way. A Biological Evaluation of impacts to habitat and protected wildlife and plant resources will be conducted for the project.

Cultural/Historical

A number of cultural surveys have previously been completed along the Wilmot Road alignment, most of which have been related to utilities paralleling Wilmot Road. A review of previously completed cultural information within the area was conducted and showed that no major sites have been recorded within 0.5 miles of the project area; however, several small sites were documented in proximity to Wilmot Road. Because the previous cultural surveys were not complete for the Area of Potential Effect (APE) within the project area, a Cultural Resources Survey was conducted by EcoPlan Associates, Inc. on March 7, 11, and 21, 2014. Approximately 222 acres were surveyed, resulting in one site located adjacent to the project limits near Sahuarita Road. A cultural resources survey report has been prepared and is pending review by Pima County Office of Sustainability and Conservation.

Roadway

Wilmot Road is classified as a Rural Major Collector. The project extends north 7.1 miles from Sahuarita Road to the end of the paved section of Wilmot Road. The existing roadway features are as follows:

- The existing roadway is graded dirt that varies in width from 25 to 35 feet.
- The cross slope is approximately 2% from east to west.
- The existing horizontal alignment is north-south and consists of long tangents with angle breaks generally less than 1 degree.
- The existing profile generally rises from north to south, ranging in elevation from 2830 to 2900 feet, and typically has a gradient of less than 2%. The existing profile generally follows the topography while matching existing grades at driveways, side streets, and drainage crossings.
- The existing roadway avoids an electric substation, approximately 4 miles south of I-10.
- Drainage flows across the roadway at approximately 50 locations, approximately 25 of which are relatively well defined channels.
- There is no posted speed limit.
- Intersecting roadways, from north to south, are Old Vail Connection Road, Andrada Road, Noyes Street, Kryshann Street, Hillock Street, and Sahuarita Road.

Drainage

The north-south alignment of Wilmot Road is nearly perpendicular to several drainage paths. The project crosses through 6 primary watersheds: Franco Wash, Flato Wash, Petty Wash, Cuprite Wash, Fagan Wash, and Sycamore Canyon Wash. These watersheds drain long, distributary areas that begin south and east of Wilmot Road within the Santa Rita Mountains. Runoff drains west, where the landform changes from a distributary flow area to an incised, tributary system draining into the Lee Moore Wash and, ultimately, into the Santa Cruz River. While channel incision is found downstream of Wilmot Road, the maintenance activities performed on Wilmot Road allow it to act as a grade control, preventing the incision from extending upstream while also limiting lateral movement of the washes near the roadway.

The above mentioned watersheds have been the subject of numerous studies, including the Lee Moore Wash Basin Management Study (LMWBMS) conducted by the Pima County Regional Flood Control District (PCRFCD). The LMWBMS drainage analysis is the foundation of the existing drainage analysis for this project. The LMWBMS flood limits impact the majority of the project. These have been refined as a part of this project; however, the project has nearly 30 locations where the 100-year discharge crossing the road exceeds 100 cfs. Wilmot Road has no existing drainage structures within the project limits; therefore, flow currently crosses over the road during runoff events. Flow depths during the 100-year event exceed 1 foot across the road in many of these locations. The LMWBMS limits are presented in Exhibit 6.

The hydrologic and hydraulic modeling from the LMWBMS was expanded by refining the models near the project. Using this detailed model, design discharges were identified throughout the project, and flood limits were refined. The combined width of flow from these crossings is 3.0 miles, or 40% of the total project length. The peak discharges that impact the project and the 100-year width of flow across the existing road are presented in Exhibit 7.

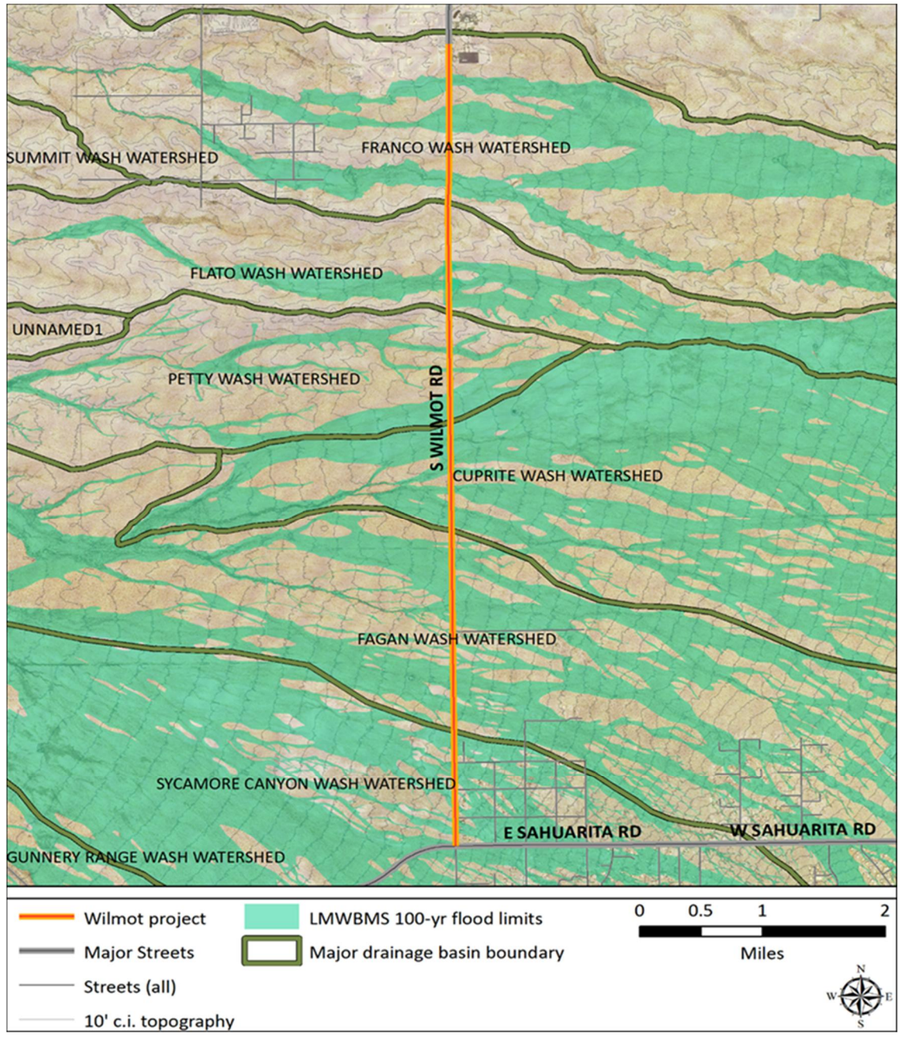


Exhibit 6 LMWBMS Limits

Project Station	Design Discharge (cfs)				100-year width of flow across road (ft)	100-year flow depth over road (ft)
	2-yr.	10-yr.	25-yr.	100-yr.		
117+00	80	260	460	930	400	2.7
135+00	70	210	380	765	1,100	1.0
163+00	230	780	1,410	2,870	800	4.3
182+00	40	120	220	430	400	1.3
188+00	20	40	80	145	400	1.3
204+00	80	250	460	920	400	3.7
212+00	140	480	860	1,750	650	3.4
231+00	10	20	30	60	250	1.3
242+00	20	60	110	210	370	1.7
252+00	10	20	30	60	320	1.3
265+00	90	310	550	1,120	840	2.2
273+00	120	410	740	1,500	810	1.8
285+00	270	900	1,620	3,300	1,050	2.3
294+00	180	580	1,060	2,150	430	4.2
300+00	10	40	60	120	550	4.2
307+00	80	260	470	950	260	4.0
317+00	40	120	220	430	240	2.4
322+00	60	190	330	670	440	2.6
340+00	90	310	560	1,130	520	3.5
352+00	70	210	380	770	380	2.5
365+00	150	510	920	1,870	660	3.2
370+00	20	60	100	200	330	1.2
375+00	5	40	75	150	200	1.3
393+00	20	60	100	200	380	3.8
400+00	110	350	630	1,270	670	3.8
407+00	50	170	300	600	410	2.3
412+00	80	250	450	900	400	2.2
421+00	80	250	460	920	650	2.6
428+00	30	80	140	270	360	1.7
435+00	160	520	940	1,900	480	2.6
454+00	70	210	380	770	360	3.4
463+00	10	30	50	85	230	1.5
466+00	10	10	20	35	250	0.6

Exhibit 7 Peak Discharges

Traffic

Wilmot Road, from Sahuarita Road to the north end of the project limits, is classified as a rural major collector. In this area, Wilmot Road serves as a north-south corridor, connecting residential developments from the southern part of the metropolitan area to Interstate-10. Based on traffic data gathered by the Pima Association of Governments (PAG) in 2011, the traffic volume on Wilmot Road between Sahuarita Road and Andrada Road is 500 vehicles per day. The AM peak hour morning is from 10:45 AM to 11:45 AM, and the PM peak hour is from 2:45 PM to 3:45PM. The K factor (percentage of daily traffic in the peak hour) is 0.08 in the AM peak hour and 0.09 in the PM peak hour. The D factor (percentage of the peak hour traffic in the peak direction) is 51% in the AM peak hour and 55% in PM peak hour.
The PAG travel demand model was utilized to obtained traffic volumes for the year 2025. According to the PAG model, 26,000 vehicles per day are expected in 2025.

Geotechnical

The soils within the project corridor are mostly native, coarse-grained soils. Coarse-grained soils are defined as soils with greater than 50% of the material by weight having particle sizes larger than 0.075 mm (No. 200 sieve). The remaining native soils are fine-grained soils. Fine-grained soils are defined as soils with greater than 50% of the material by weight having particle sizes smaller than 0.075 mm (No. 200 sieve). In descending order, with respect to the frequency of which they were encountered, the native soils within the limits of the project corridor may be characterized according to the Unified Soil Classification System (USCS) as clayey sand (SC), lean clay (CL), silty sand (SM), silty gravel (GM), poorly-graded sand with silt (SP-SM), well-graded sand with silt (SW-SM), silt (ML), and silty clayey sand (SC-SM). Within the sand fraction of most samples, there is roughly an equal portion of fine and medium sand with generally less coarse sand. Within the fine fraction of most samples, the plasticity ranged from low to medium. The density of the coarse-grained soils generally ranges from medium dense to very dense. However, at a few locations, low density (loose) coarse-grained soils were encountered. The consistency of the fine-grained soils varies from medium stiff to hard. Cobbles and or boulders should be anticipated in excavations based on the size of the drilling and sampling equipment, observations during drilling, and consideration of the general geologic formational processes within the project limits.

Design Criteria

Roadway

Exhibit 8 presents the design criteria elements used for design:

Description of Criteria	Values for Design
Design Year	2035
Design Speed	55 mph north of Andrada, 45 mph south of Andrada
Clear Zone	24 ft. north of Andrada, 19 ft. south of Andrada
Superelevation	0.06 ft/ft, maximum
Cross Slope	2%* (1% at cross drainage locations)
Travel Lane Width	11 ft.
Left and Right Turn Lane width	12 ft.
Paved Shoulder Width	6 ft.
Unpaved Shoulder Width	4 ft.
Horizontal and Vertical Control Location	Roadway Centerline
Maximum Horizontal Curve Radius	9425 ft.
Maximum Horizontal Angle Point	1 degree 08 minute maximum
Minimum Curve Length	500 ft.
Maximum Profile Gradient	3%
Minimum Profile Gradient	0.5%* (0.1% Min)
Maximum Grade Break	0.2%
Minimum Vertical Curve Length	3 x Design Speed
Minimum Stopping Sight Distance	495 ft.
Taper Rate	55:1 (Design Speed:1)
Cut Slope	4:1* (3:1)
Fill Slope	6:1
Driveways/Sidestreets Corner Radii	35 ft.
Design Vehicle	WB-62

* Design Exception Required

Exhibit 8 Design Criteria

Drainage

The requirements outlined within the Pima County Roadway Design Manual have been followed where possible. However, due to the budget and the project's rural setting and broad floodplain, design exceptions are required. These are discussed later in this document. The drainage crossings, which are all at-grade, will be designed to maintain current flow patterns and minimize disruption to the sediment balance in the watershed.

Alternative Analysis

Typical Sections

While various typical section alternatives were evaluated, no formal typical section alternatives analysis was performed.

The recommended typical section for this project is the PCDOT standard rural two lane road typical section. It consists of two 11-foot travel lanes, two 6-foot paved shoulders, two 4-foot unpaved shoulders and 6:1 side slopes. The recommend typical sections is presented in the plans in Appendix I. The roadway cross slope will be 2% down to the west to accommodate cross drainage. The paved shoulder will be widened as necessary to prevent cross drainage scour and head cutting from impacting the clear zone.

Horizontal Alignment

Two horizontal alignment concepts were analyzed. They are as follows:

- A horizontal alignment that follows the existing roadway was evaluated. In some locations the alignment would not meet the design speed requirements. This alignment will not accommodate a future four lane roadway. This alignment alternative will likely result in less earthwork and more right of way acquisition.
- A horizontal alignment that follows the existing right of way centerline and one that is offset from but parallel to the centerline were evaluated. An alignment that follows the existing right of way centerline will meet design speed requirements while requiring less right of way acquisition than the first alternative. This alignment will not accommodate a future four lane roadway. An alignment that is offset 24 feet to the east of the right of way centerline will meet design speed requirements, require less right of way acquisition and accommodate a future four lane roadway. It will also allow more room for drainage scour mitigation on the downstream (west side) of the roadway.

The recommended horizontal alignment for this project is offset 24 feet to the east of and parallel to the existing right of way centerline. The alignment will be adjusted to reduce right of way acquisition at the southern end of the project. Horizontal curves that meet design speed requirements will be utilized to match the existing roadway at the north and south ends of the project.

Drainage

Four alternatives to convey cross drainage were analyzed.

- Convey all flow under the road with large culverts.
- Use smaller culverts to convey frequent events under the road with the balance conveyed over the road.
- Convey all flow over the road with at-grade crossings with 100-year depths less than 1 foot.
- Convey all flow over the road with at-grade crossings and match existing conditions.

Conveying all flow under the road requires elevating the road 5 feet +/-, assuming a typical crossing would consist of a 3 foot culvert with 2 feet of cover. This would require a significant earthwork import and would have significant impacts upon the flow patterns in the watershed. The broad, distributary floodplains must be captured and contracted upstream of the culvert, then expanded and released downstream. This would require the acquisition of right of way and construction of channels and berms. This alternative does not fall within the project budget.

Like the first alternative, conveying some flow under the road still requires elevation of the road, drainage improvements, and right of way acquisition. A handful of crossings were examined to determine if some amount of flow could be conveyed under the road with the balance conveyed over the road following all-weather requirements. However, this alternative again required a significant investment in culverts and fill and the offsite impacts were substantial. Like the first alternative, this alternative was rejected because it had negative impacts upon the watershed and does not fall within the project budget.

The third alternative, at-grade crossings with all-weather access, was analyzed at several locations. In many of the locations, the existing flow depths approaching and flowing over the road are greater than 1 foot. In order to achieve a flow depth of 1 foot or less over the road, the profile of the road must be elevated. This results in increased flow depths upstream and diversion of flow downstream. This would cause adverse impacts to adjacent properties and would require offsite drainage improvements, necessitating right of way acquisition. This alternative was also rejected because it would not meet the project budget.

The fourth alternative is to provide at-grade crossings which may not meet all-weather access requirements but minimize and/or eliminate impacts to adjacent properties. For this alternative, several profiles were examined within the drainage models to find one that minimized the offsite impacts while meeting the roadway driving safety requirements.

The recommended drainage conveyance for this project consist of providing at-grade crossings which may not meet all-weather access requirements but will minimize and or eliminate impacts to adjacent properties. The paved shoulder will be widened as necessary to prevent cross drainage scour and head cutting from impacting the clear zone. Concrete cut off walls will be placed at all drainage crossings. Dumped rip-rap will be placed at the downstream side of significant drainage crossings.

Pavement Structure

For evaluation purposes, the pavement structure was broken into the following components:

- *Grading*—Grading the roadway as necessary for the given pavement structure
- *Subgrade*—Removing and replacing subgrade to increase the R-value
- *Chemically Treated Subgrade*—Applying chemicals to the subgrade to increase the R-value
- *Mechanically Stabilized Base*—Applying materials to subgrade to increase the R-value
- *Surface and Base Treatment*—Applying materials on the subgrade to increase the R-value and or provide a driving surface

When all of the feasible pavement structure components were identified, the result was over 200 possible alternative combinations. These alternative combinations were qualitatively evaluated based on constructability, maintainability, suitability, and costs. Of the over 200 combinations, 14 were selected for further analysis.

The alternatives were evaluated based on the following:

- *Axel Load Capacity*—What is the capability of each pavement structure alternative to accept traffic loading? This was quantified by determining the amount of "Equivalent Single Axle Loads" the pavement structure could accommodate before failing

- *Cost*—What is the total cost of all the pavement structure components?
- *Environmental Impacts*—Will the pavement structure result in significant environmental impacts?
- *Constructability*—Will the pavement structure result in significant constructability impacts?
- *Maintainability*—Will the pavement structure result in significant maintainability impacts?

The results of the pavement structure alternatives analysis is presented in Appendix III.

The recommended pavement structure for this project consists of replacing the subgrade as needed to ensure a minimum R value of 20 and placing 2 inches of asphaltic concrete on 12 inches of cement treated subgrade. This alternative will provide the best cost per axel load capacity.

Major Design Features of Recommended Alternative

Roadway Alignment

The major design features of the recommended alignment include the following:

- Locates the roadway centerline 24-feet east of the existing right of way centerline. This positions the proposed two-lane roadway in the east half of the 150 foot right of way allowing for the future widening of Wilmot Road to a four-lane divided roadway.
- Matches the existing terrain and allows for all cross drainage to pass over the roadway.
- Varies the profile grade of the roadway from 0.25% to almost 3%.
- Provides a paved shoulder and concrete cutoff walls at cross drainage locations to protect the roadway from head cutting and erosion.
- Provides exclusive southbound left turn lane at the intersection of Sahuarita Road.

Earthwork

Earthwork represents a significant construction cost on the project. In order to minimize the haul of earthwork material, the roadway profile was set to follow the existing terrain as closely as possible while providing a design that is drivable, safe, and meets the drainage requirements. In areas between drainage crossings, the roadway profile was adjusted to help balance the earthwork on the project. Additionally, earthwork was balanced, to the extent possible, in 1 to 2-mile segments in order minimize haul costs.

Pavement Structure

The major design features of the recommended pavement structure include the following:

- Removal and replacement of the subgrade as needed to ensure a minimum R value of 20 and placing 2 inches of asphaltic concrete on 12 inches of cement treated subgrade
- Replacement of approximately 2,000 linear feet of roadway subgrade with on-site excavation to ensure a minimum R value of 20.

Drainage

All drainage crossings will be at grade and have been designed with a 2% slope from east to west. This slope will facilitate "self-cleaning", minimizing the amount of sediment that will accumulate during runoff events. Riprap will be placed upstream and downstream of the road to protect the road and cutoff walls from scour and headcutting.

The road design has gone through a number of iterations to minimize and eliminate impacts to adjacent properties. The intent of the design is to match the existing 100-year water surface elevation within the project right of way. This has been accomplished for all but one crossing, which will have a depth increase of 0.3 feet at the eastern right of way line. There are no habitable structures that will be impacted and the increase in flow depth quickly dissipates. The increase in flow depth does not extend beyond 100 feet from the roadway. The change in water surface elevation at east right of way line is presented in Exhibit 9.

Station	Design Q-100 (cfs)	Change in W.S.E. (ft)
117+00	930	0.1
135+00	765	-0.1
163+00	2,870	0.0
182+00	430	-0.1
188+00	145	-0.1
204+00	920	0.0
212+00	1,750	0.1
231+00	60	0.3
242+00	210	0.0
252+00	60	0.0
265+00	1,120	0.2
273+00	1,500	-0.2
285+00	3,300	0.0
294+00	2,150	-0.3
300+00	120	-0.3
307+00	950	0.0
317+00	430	0.1

Station	Design Q-100 (cfs)	Change in W.S.E. (ft)
322+00	670	0.0
340+00	1,130	-0.4
352+00	770	0.0
365+00	1,870	0.0
370+00	200	0.3
375+00	150	0.1
393+00	200	0.0
400+00	1,270	0.0
407+00	600	0.0
412+00	900	0.0
421+00	920	0.1
428+00	270	0.0
435+00	1,900	0.0
454+00	770	0.1
463+00	85	0.1
466+00	35	0.0

Exhibit 9 Change in Water Surface Elevation

Right of Way/Easements

Approximately 1,320 feet of the proposed improvements falls within the Bureau of Land Management (BLM) parcel located 4 miles south of Interstate-10. Pima County is coordinating with the BLM to renew the lease for this parcel. Additional rights of way will have to be acquired between Andrade Road and Sahuarita Road in order to accommodate the proposed improvements and clear zone.

Utilities
This proposed improvements will have minimal impact on existing utilities. There are only minor underground utility facilities and the proposed improvements avoid all significant at-grade utility facilities.

Cultural
The preliminary draft Cultural Resources Survey report suggests that nine isolated occurrences, two roadside memorials, and one small archaeological site were present. The report indicates the isolated occurrences (scattered throughout northern part of the project area) have been exhausted of their potential to provide further information and recommends that they are not eligible for the Arizona Register of Historic Places (ARHP) or the National Register of Historic Places (NRHP). The roadside memorials are located near the northern boundary of the project area, with one memorial on the east side of Wilmot Road and one memorial on the west side of the road. They are not eligible for listing on either register, but because they maintain importance to the individuals who place them, they should be avoided by project construction if possible. The single small archaeological site is located north of Sahuarita Road. Based on preliminary design, this site will be avoided. Additional survey may be required at the south end of the project due to design changes subsequent to completion of the cultural resources survey report.

Clean Water Act Permitting
Early evaluation of the Draft Preliminary Jurisdiction Determination (PJD) indicates that there are up to 38 washes that cross the Wilmot Road corridor, including 7 named washes (Franco Wash, Flato Wash, Pretty Ranch Wash, Cuprite Wash, Fagan Wash, Lee Moore Wash, and Sycamore Wash). The washes are typically low-gradient and highly braided channels that flow generally east to west and finally drain to the Santa Cruz River approximately 6.5 miles to the west. The U.S. Army Corps of Engineers (USACE) approved the Preliminary Jurisdictional Delineation (PJD) on September 11, 2014. Findings in this document suggest that washes within the Wilmot Road corridor may be considered Waters of the US. However, due to the relatively small size of the permanent impacts expected to these washes, it is likely that the project will qualify for Clean Water Act Section 404 authorization under Nationwide Permit 14. Because none of the anticipated impacts to the 38 washes exceeds 0.1 acre within the project footprint, Pre-Construction Notification is not anticipated to be required.

Habitat Preservation
The Pima pineapple cactus (*Coryphantha scheeri var. robustispina),* a USFWS protected species, exists within the Wilmot Road corridor. Consultation with USFWS regarding management of these plants during design is planned. Other protected or sensitive animals, such as lesser long-nosed bat and the de-listed Cactus ferruginous pygmy owl, may potentially occur within the project corridor. A Biological Evaluation report for the project will be prepared to address all federally protected species, as well as the 55 species identified in the Sonoran Desert Conservation Plan.

Social/Economic
This is an important roadway improvement for current and future residents of southeast Pima County. In addition to having a positive economic impact, paving an existing dirt road will also improve the air quality in the region. This project does not impact any disadvantaged communities and will have no adverse economic impacts. No relocations of residential or commercial property will be required.

Public Involvement
PCDOT is developing a website that will include all of the information pertinent to the project. There will be public meetings on completion of the DCR and prior to construction. The design team will meet with adjacent property owners.

Agency Coordination
The following agencies either consulted or participated in the development of the Wilmot Rd. project

- The United States Army Corps of Engineers
- The Bureau of Land Management
- The US Fish and Wildlife Service
- The State of Arizona
- Pima County Transportation
  - Real Property
  - Field Engineering
  - Survey
  - Cultural Resources
- Pima Flood Control District

Design Exceptions

Roadway

Roadway design exceptions include the following:

- The minimum profile grade is 0.5% as stated in Section 2.4 of the 2013 Pima County Roadway Design Manual. Since the intent of the design is to allow drainage flows to wash over the roadway at the dip crossing locations, the profile grade must match the existing topography which often results in profile grades of less than 0.5%.
- The current design standard for backslopes is 4:1 on rural roadways as stated in Section 2.3 of the 2013 Pima County Roadway Design Manual. In order to minimize right of way impacts, a 3:1 backslope was utilized. The backslope is located outside of the 24-foot clear zone of the roadway.
- The current design standard for roadway cross slope is 2% as stated in Table 2-2 of the 2013 Pima County Roadway Design Manual. In order to facilitate the cross drainage at the dip crossing locations, a minimum cross slope of 1% is required. This allows the roadway cross slope to more closely match the existing wash profile grade.

Drainage

Drainage design exceptions include the following:

- Flow crossing the road will exceed 1 foot in depth in certain locations. This matches the existing condition and cannot be avoided within the constraints set forth.
- Flow will not be conveyed under the road. Placement of culverts requires elevating the road to the height of the culvert plus 2 feet for cover over the culvert. Considering that the current roadway is at-grade, elevating the road the 4 to 5 feet or more necessary to place a culvert significantly and adversely impacts adjacent properties and the overall water and sediment balance in this watershed (unless substantial increases to right of way and construction budget are added).

SCHLESINGER CONSULTING ENGINEERING, PLLC

Appendix I
Concept Plans

February 2015

WILMOT ROAD IMPROVEMENTS

NORTH OF SAHUARITA ROAD

GENERAL DESCRIPTION OF PROJECT

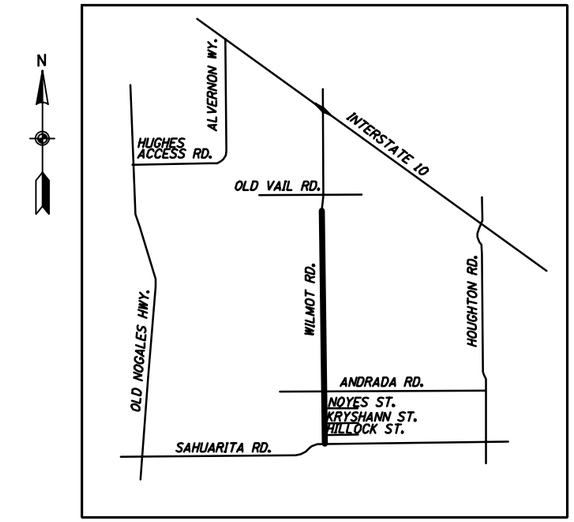
IMPROVEMENTS TO 7.1 MILES OF WILMOT ROAD, NORTH OF SAHUARITA ROAD. IMPROVEMENTS INCLUDE A PAVED TWO LANE ROADWAY WITH PAVED SHOULDERS, ROADSIDE DITCHES AND REINFORCED DIP CROSSINGS AT ALL CROSS DRAINAGE LOCATIONS.

PROJECT NUMBER

4RTWNS

PIMA COUNTY BOARD OF SUPERVISORS

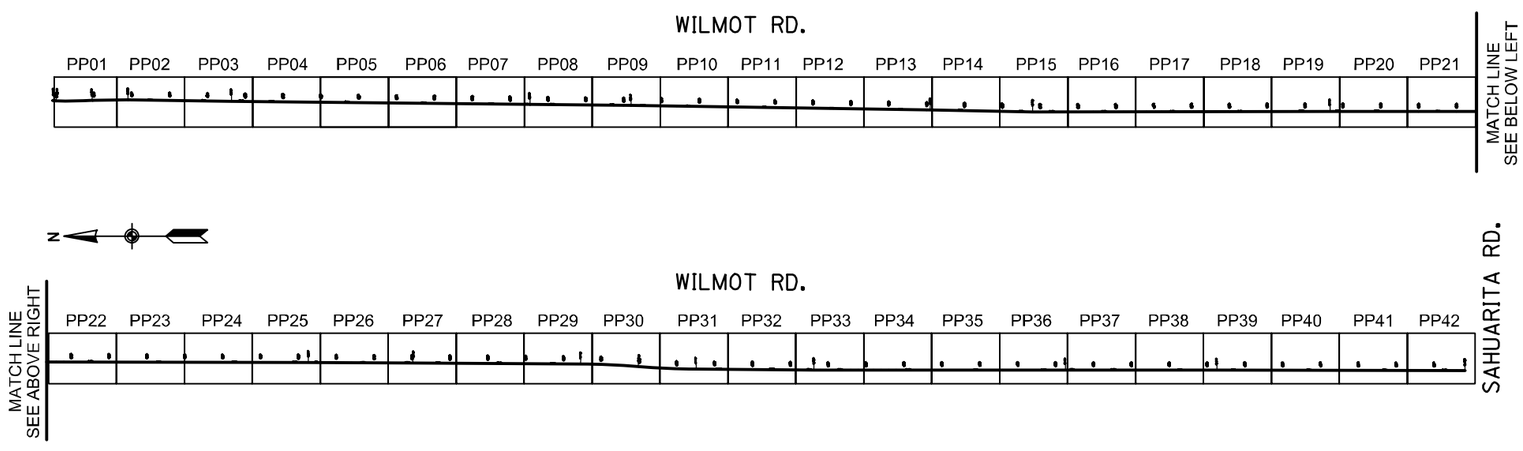
SHARON BRONSON, CHAIRMAN, DISTRICT 3
ALLY MILLER, DISTRICT 1 RAY CARROLL, DISTRICT 4
RAMON VALADEZ, DISTRICT 2 RICHARD ELIAS, DISTRICT 5
PROJECT IN SUPERVISOR DISTRICT 2



Location Map

NOT TO SCALE

Section 12, 13, 24, 25, 36
T - 16 - S, R - 14 - E,
Section 7, 18, 19, 30, 31
T - 16 - S, R - 15 - E
Section 1, 12
T - 17 - S, R 14 - E
Section 6, 7
T - 17 - S, R - 15 - E
G & S R & M
Pima County, Arizona



SHEET INDEX

SHEET NO.	PAGE NO.	DESCRIPTION
CS01	1	COVER SHEET
GN01	2	GENERAL NOTES
TYP01	3	TYPICAL SECTIONS & PAVEMENT STRUCTURAL SECTION SHEET
RD01	4	DETAIL SHEET
HC01 - HC04	5-8	HORIZONTAL CONTROL SHEETS
PP01 - PP42	9-50	ROADWAY PLAN & PROFILE SHEETS
PM01	51	PAVEMENT MARKING SHEET
LS01	52	LANDSCAPE SHEETS

Pima County Department of Transportation
201 N. Stone Ave. 4th floor Tucson, Arizona 85701
Phone Number: 740 - 6410
Priscilla S. Cornelio, P.E. Director

No.	Revisions	Engineer	Date

No.	As Built	Engineer	Date

30% SUBMITTAL
JANUARY 2015

Reviewed by	Engineer	Date
Mgr. Trans Engr.		
Mgr. Traffic Engr.		
Mgr. Field Engr.		
Mgr. WWM		

Approved: _____20__

Director

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Project No. 4RTWNS

Sheet No. CS01 of CS01

Page No. 1 of 52

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSFS.dgn DATE: 1/16/2015 TIME: 4:00:45 PM KershnerM

GENERAL NOTES

1. Construction shall conform to the Pima County Association of Governments (PAG) Standard Specifications and Details for Construction, 2012 Edition, except as modified by the Special Provisions or where noted on the plans. In addition, the construction shall conform to the Arizona Department of Transportation (ADOT) May 2012 Construction Drawings (C-series) plus current revisions.

2. Construction zone traffic control shall conform to the requirements of the "Manual on Uniform Traffic Control Devices" 2009 Edition, the project plans and the Special Provisions. Most elements of work will be included in a lump sum pay item. However, see Traffic Control Plans, bid schedule and Special Provisions for specific information.

3. Utility locations shown on plans were compiled based on the best information available to the department. Utility locations are not intended to be exact or complete. Prior to commencing construction, the contractor shall verify the location of all utilities with the appropriate organizations. Contact "Blue Stake" at 1-800-782-5348 two full working days prior to beginning construction (Saturdays and Sundays are not considered working days).

4. Right-of-way encroachments shall be removed only by order of Pima County, unless otherwise noted.

5. Removal of all cacti and native plants shall be in accordance with the provisions of the "Arizona Native Plant Law" A.R.S., Chapter 7.

6. Contractor shall comply with all applicable Occupational Safety and Health Administration regulations, in particular, shoring of trenches and excavations.

7. The design speed for Wilmot Road is 55 mph and the posted speed limit is 50 mph from Station 99+70.00 to Station 374+18.00. The design speed is 45 mph and the posted speed is 40 mph from Station 374+18.00 to Station 473+90.70.

8. Design vehicle is WB-62 for the project with the exception of U-turns; which were calculated using a standard passenger vehicle.

9. The basis of bearing for this project is a line between a found 2" brass capped monument stamped "T17S R14E T17S R15E 12,7,7" and a found 2 1/2" copper alloy disk stamped "US General Land Office Survey 1/4 S7 1930" bearing being North 0° 48' 31" West, as established from the Arizona Coordinate System, 1983 (HARN 92), Central Zone 0202.

10. Basis of Elevation: Pima County Benchmark Designation NN 174, elevation being 2845.77 feet NAVD88. Station mark is a 3 1/4" aluminum disk set in concrete stamped "NN-174 1992". Located 5.1 miles south of Interstate 10 on Wilmot Road, 58 feet west of roadway.

11. Basis of Coordinates: The horizontal control for this project is based on existing survey control points as provided by Pima County-City of Tucson geodetic control points. The published combined factor for "PG01" = 0.9998879600 was used to convert grid coordinates to surface. Surface northing coordinates are derived by dividing the grid coordinates by 0.9998879600 and then subtracting 300,000. Surface easting coordinates are derived by dividing the grid coordinate by 0.9998879600 and then subtracting 900,000.

12. Basis of stationing: Stations for Wilmot Road increase from north to south. The stationing for sidestreets increases from east to west. Stationing at the north end of Wilmot Road starts at Station 99+70.00.

13. All stationing shown on the plans and profiles is along the construction centerline, unless otherwise noted.

14. The contractor shall install all permanent pavement markings and all permanent traffic control devices.

15. Soils information will be made available to prospective bidders in the project Special Provisions. Soils information so provided shall be for information purposes only, and is not to be considered a part of the contract documents. This information was developed as accurately as possible by the methods used. Pima County accepts no responsibility for any conditions encountered which vary from the information provided.

16. The pavement structural sections are from the pavement design summary report dated _____, 2015.

17. The contractor shall maintain access to all driveways, alleys, and mailboxes during construction. The contractor will not restrict emergency vehicles, U.S. postal delivery, solid waste collections, and/or access to the adjacent properties, except as approved by the Engineer.

18. It shall be the contractor's responsibility to furnish, haul, and apply all water required for compaction, and for the control of dust from construction activity. The cost of water is to be incidental to those items of work using or requiring water.

19. The contractor shall be responsible for the care, maintenance, repair or replacement of existing improvements in the work area; which have been removed or damaged during the course of construction. All repair, replacement, or cleanup shall be done to the satisfaction of the owner.

20. Omissions or conflicts between various elements of the drawings, notes and details shall be brought to the attention of the Engineer and resolved before proceeding with the work.

21. Any revisions made to these plans must be approved by Pima County DOT prior to construction.

22. A copy of these plans shall be kept in an easily accessible location on the site at all times during construction.

23. Any excess excavated material shall become the property of the contractor, and shall be removed from the project site by the contractor at no additional cost to the Pima County DOT.

ABBREVIATIONS NOT INCLUDED IN PAG STD. DTL.

Asphalt Rubber Asphaltic Concrete	A.R.A.C.
Correction	Corr.
Edge of Pavement	E.P.
Point of Compound Curve	P.C.C.
Shoulder	Shld.
Stopping Sight Distance	SSDs
Vertical Curve	V.C.
Standard	Std.
Temporary Construction Easement	T.C.E.
Section Line	S.L.

PRELIMINARY EARTHWORK QUANTITIES

Item No.	Item Description	Total Volume (CY)
2030300	Roadway Excavation	102,096
2030401	Drainage Excavation	
	Total Excavation	102,096
	Total Shrinkage (X%)	
	NET EXCAVATION	102,096
	Roadway Embankment	41,323
	Ground Compaction (0.XX Ft.)	
	NET EMBANKMENT	41,323
	Waste	60,773

LENGTH OF PROJECT

Wilmot Rd. Sta. 99+70.00 to Sta. 473+90.70

Gross & Net Length = 37,420.70' (7.09 Miles)

DESIGN SPEED

ROADWAY	STATION RANGE	DESIGN	POSTED
Wilmot Rd.	Sta. 99+70 to Sta. 374+18	55 mph	50 mph
	Sta. 374+18 to Sta. 473+91	45 mph	40 mph

Priscilla S. Cornelio, P.E., Director

	Designed	MPK	01/15
	Drawn	MPK	01/15
	Checked	MDB	01/15
	Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE 1

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Pima County Department of Transportation

GENERAL NOTES SHEET
WILMOT ROAD
NORTH OF SAHUARITA ROAD
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: N.T.S. | Sheet GN01 of GN01 | Page 2 of 52

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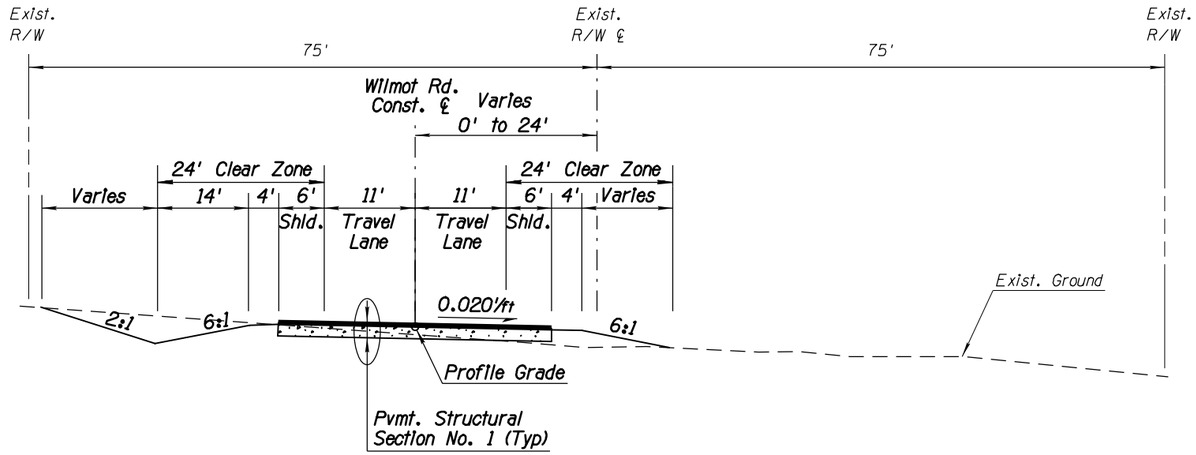
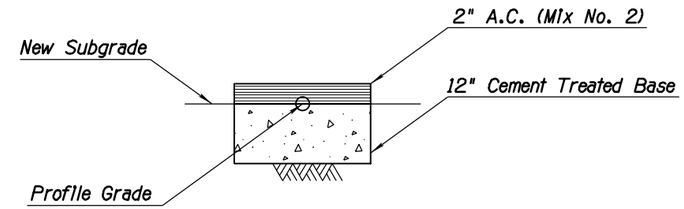


WILMOT ROAD

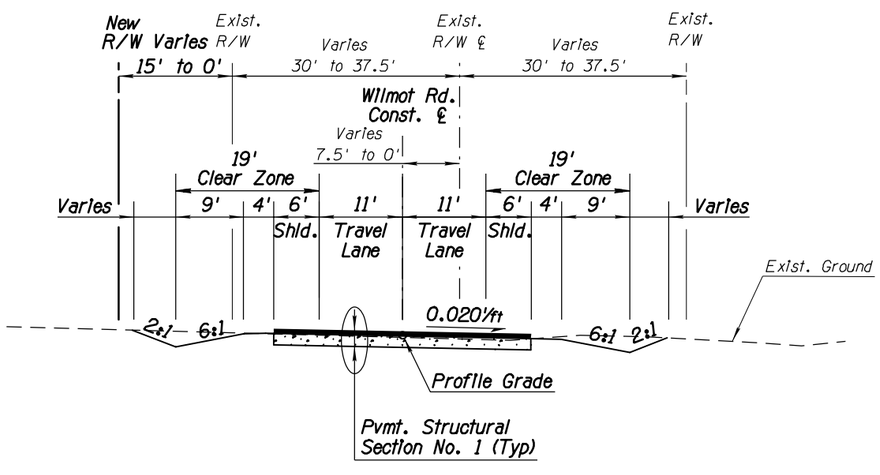
Sta 99+70.00 to Sta 374+18.00



Total Thickness = 14"

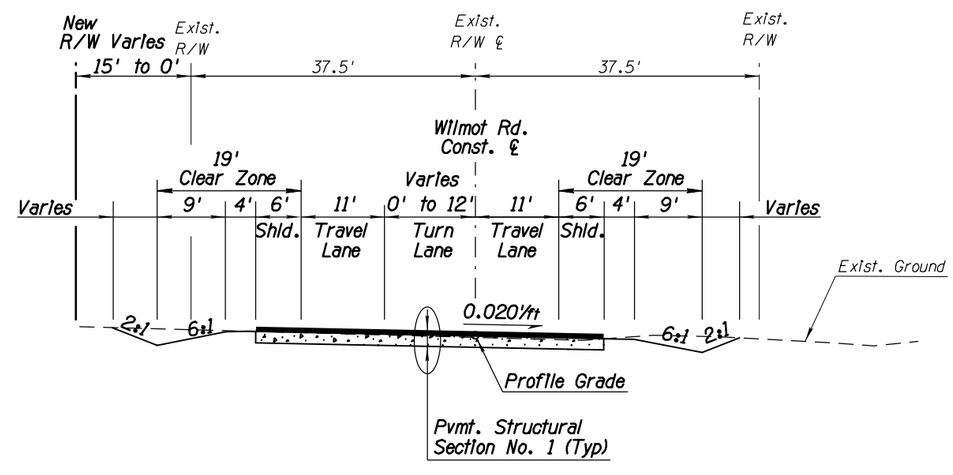
PAVEMENT STRUCTURAL SECTION NO. 1

Wilmot Road



WILMOT ROAD

Sta 374+18.00 to Sta 465+10.00



WILMOT ROAD

Sta 465+10.00 to Sta 473+90.70

Priscilla S. Cornelio, P.E., Director

Designed	WPK	01/15
Drawn	WPK	01/15
Checked	MDB	01/15
Proj. Engr.	WPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE I

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TYPICAL SECTIONS & PAVEMENT STRUCTURAL SECTION SHEET
WILMOT ROAD
NORTH OF SAHUARITA ROAD

PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale:	N.T.S.	SheetTYP01ofTYP01	Page 3 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNStyp01.dgn DATE: 1/16/2015 TIME: 4:04:19 PM KershnerM

DETAILS TO BE ADDED FOR 60 PERCENT PLANS

Pima County Department of Transportation

Priscilla S. Cornelio, P.E., Director

No.	Revision Description	Engineer	Date

		Date
Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
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PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD - PROJECT NO. 4RTWNS

Scale:	N.T.S.	Sheet PM01 of PM01	Page 4 of 52

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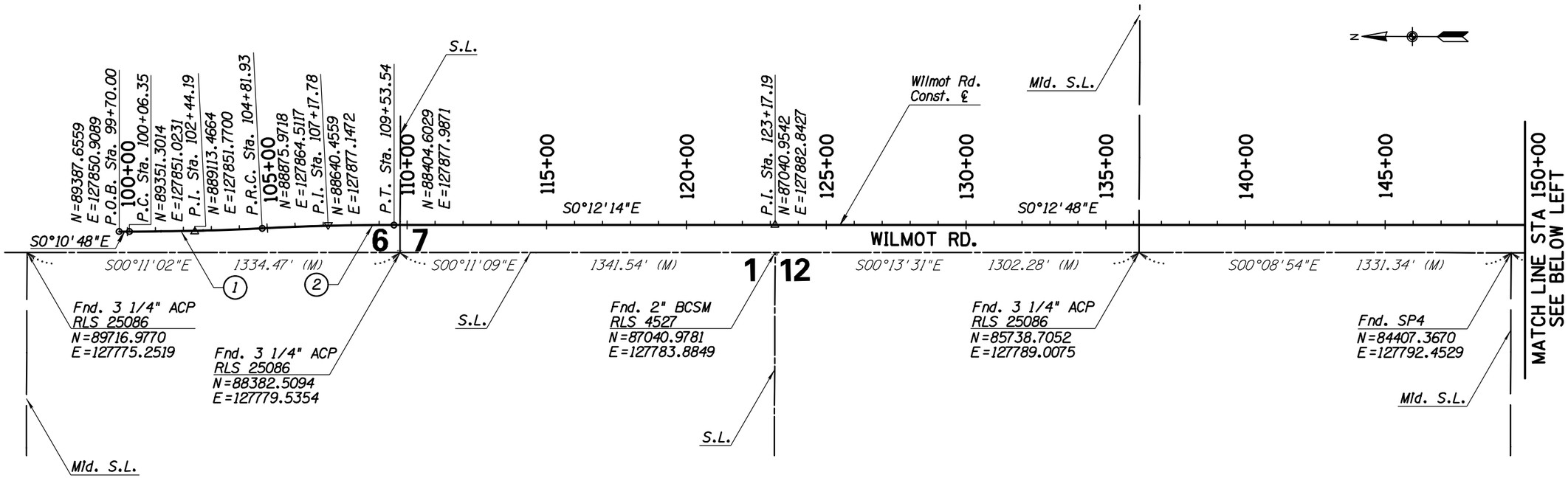

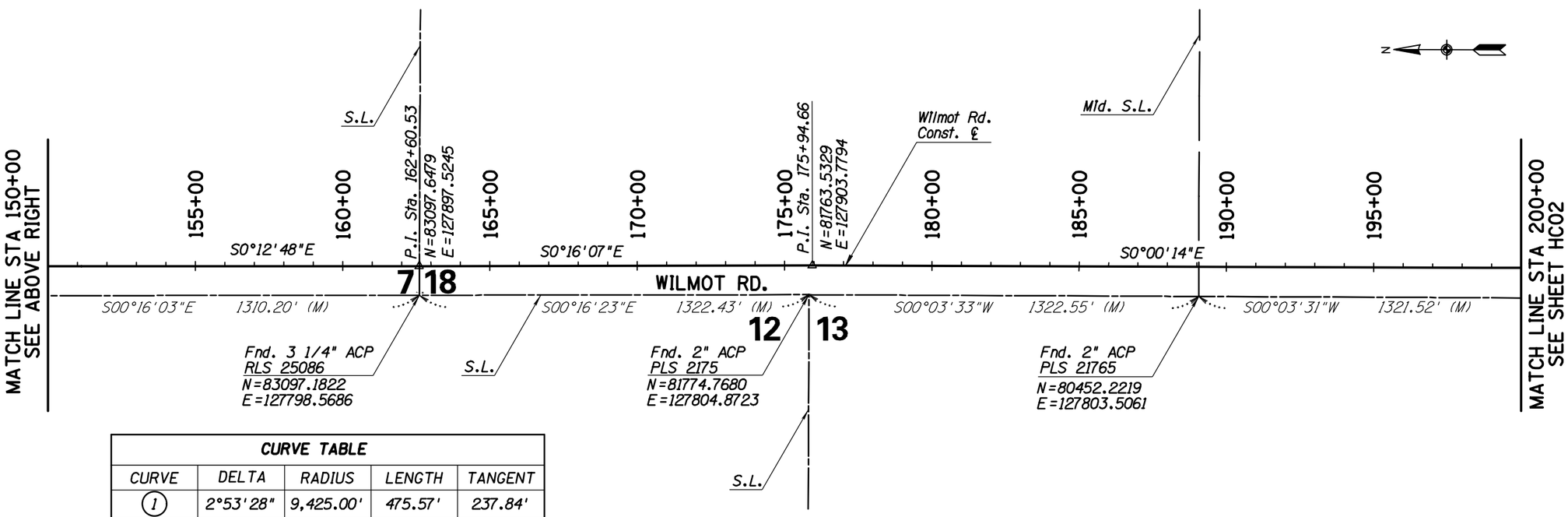

CURVE TABLE

CURVE	DELTA	RADIUS	LENGTH	TANGENT
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2	2°52'01"	9,425.00'	471.61'	235.85'

Priscilla S. Cornelio, P.E. Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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Pima County Department of Transportation

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STA. 99+70.00 TO STA. 200+00.00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale:	1"=200'	Sheet HC01 of HC04	Page 5 of 52

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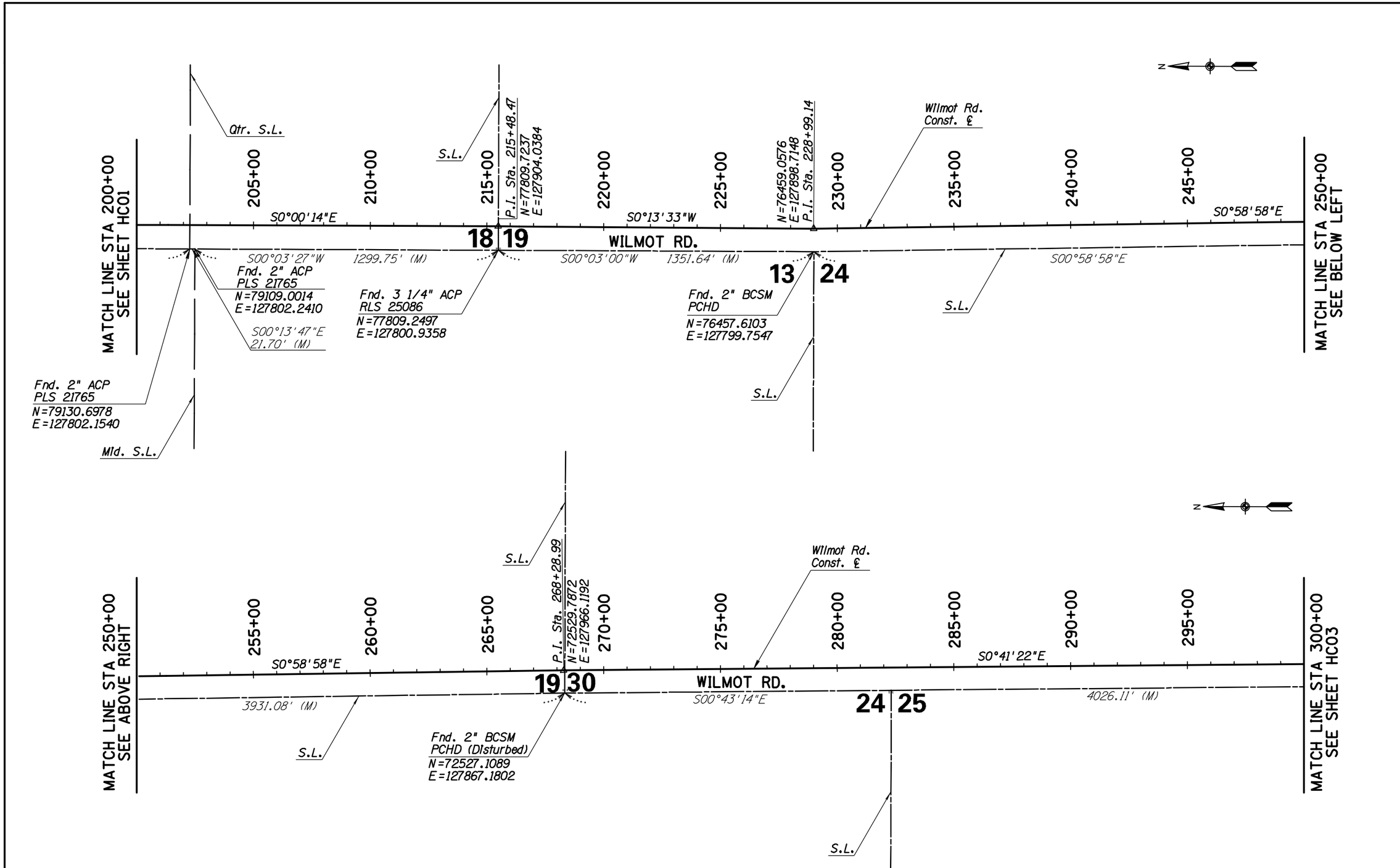

Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale:	1"=200'	Sheet HC02of HC04	Page 6 of 52

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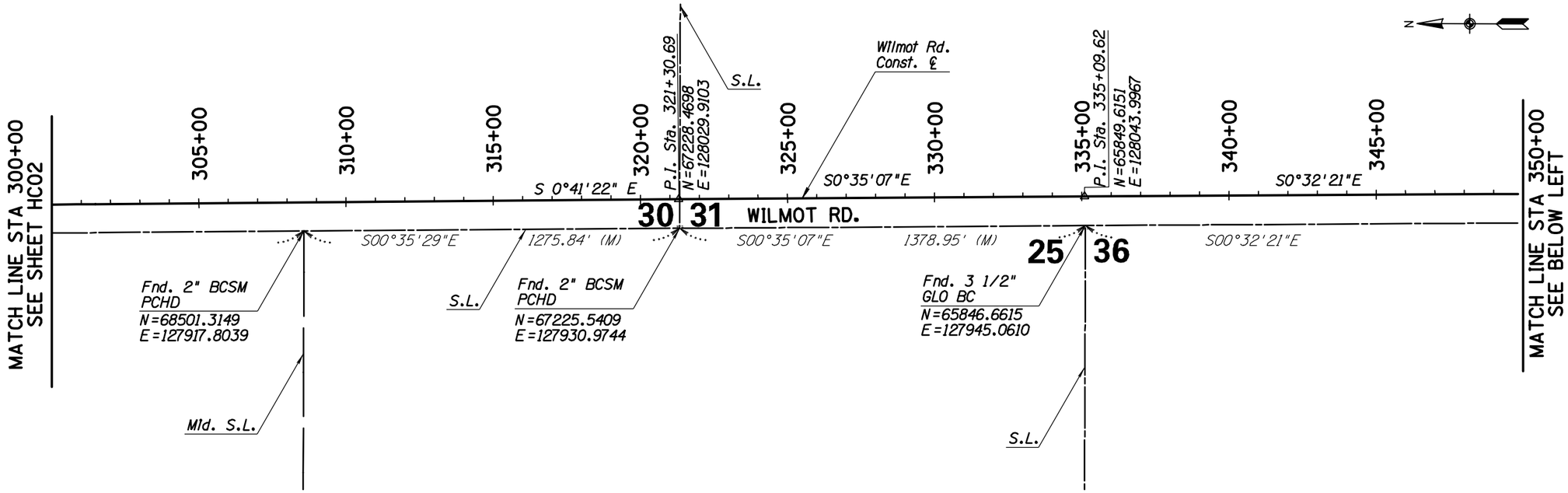

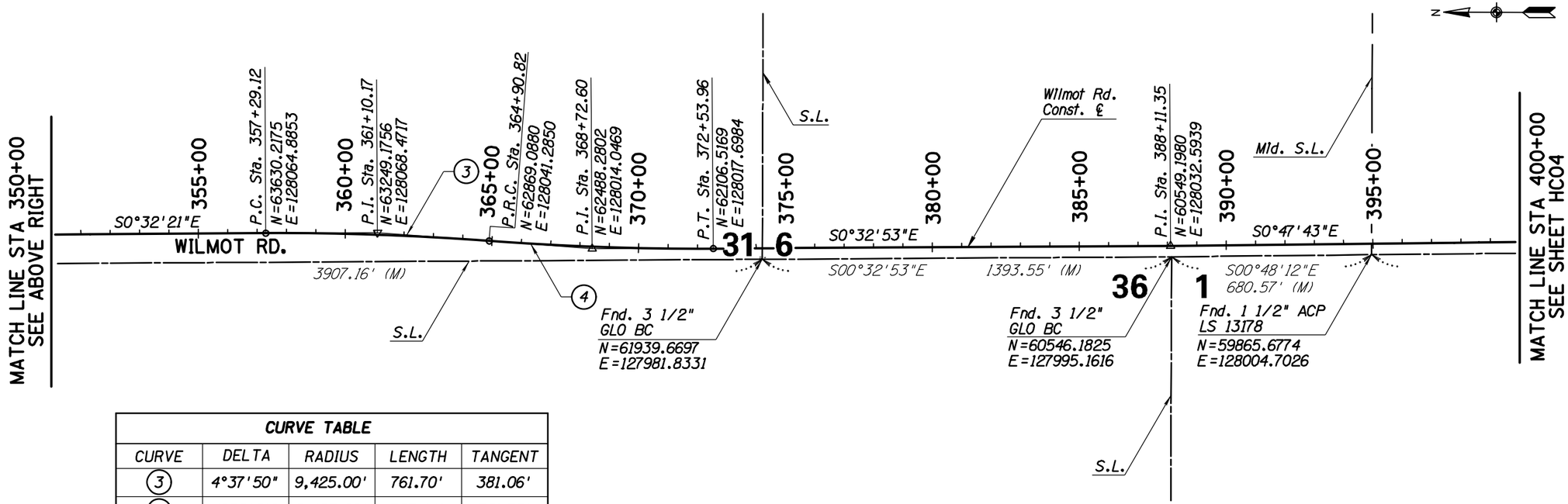

CURVE TABLE				
CURVE	DELTA	RADIUS	LENGTH	TANGENT
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4	4°38'21"	9,425.00'	763.14'	381.78'

Priscilla S. Cornello, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1"=200' | Sheet HC03of HC04 | Page 7 of 52

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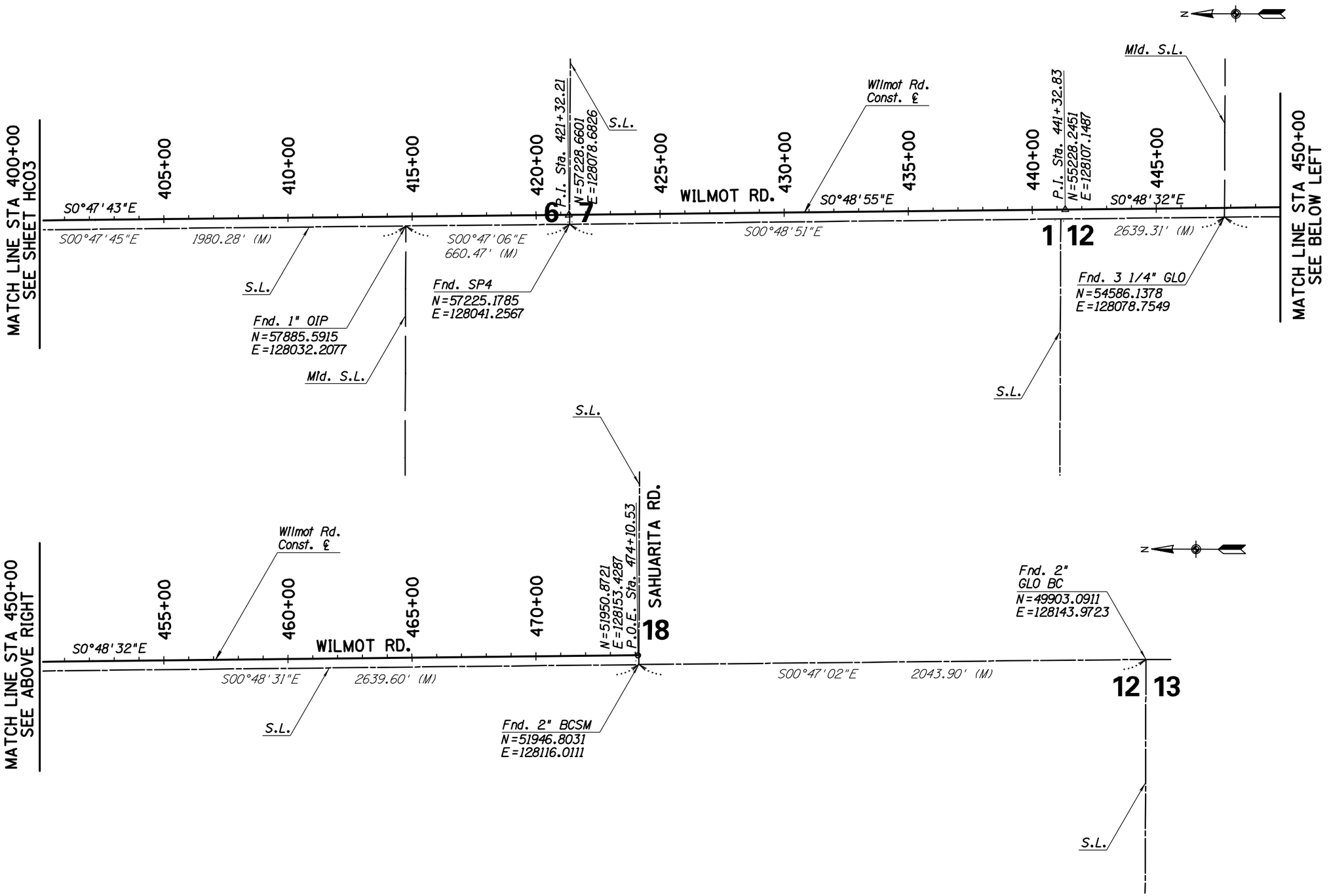

Priscilla S. Cornello, P.E. Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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CONSTRUCTION
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Pima County Department of Transportation

HORIZONTAL CONTROL SHEET
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NORTH OF SAHUARITA ROAD
STA. 400+00.00 TO STA. 474+10.53
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale:	1"=200'	Sheet HC04of HC04	Page 8 of 52

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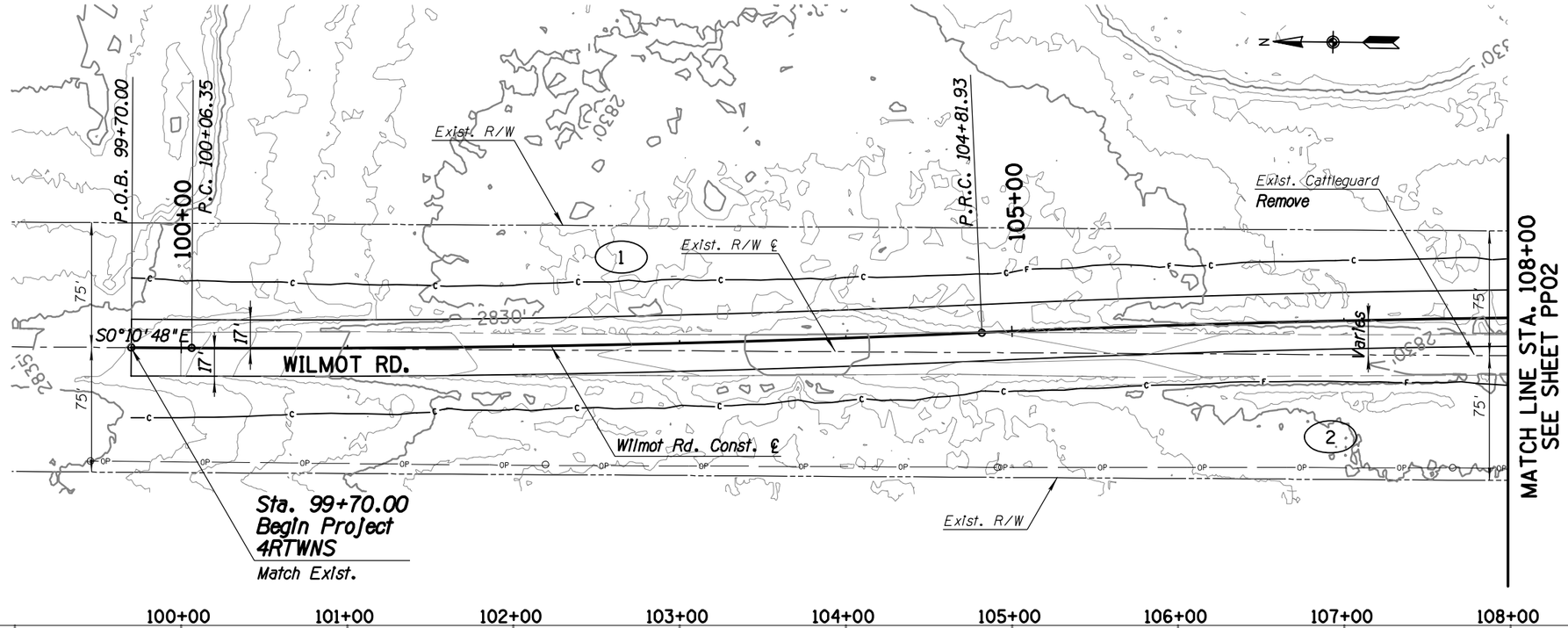

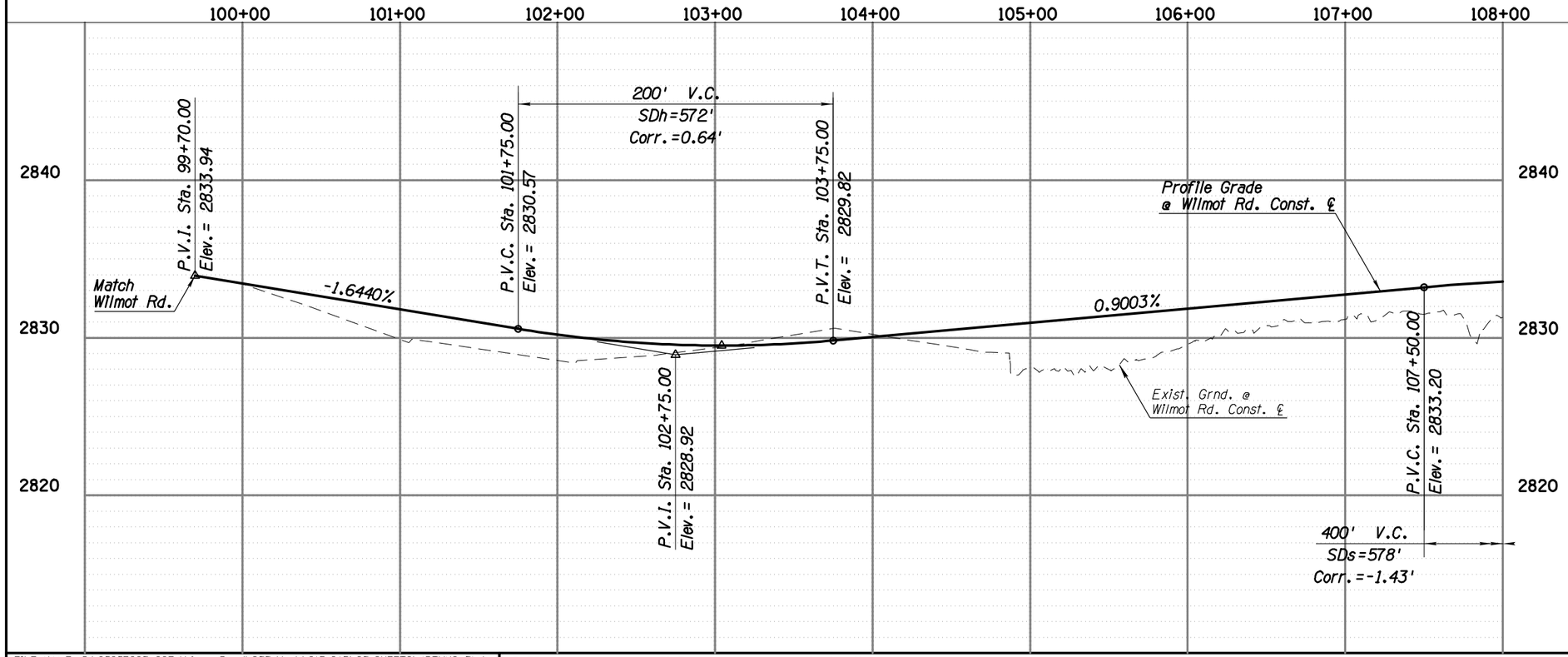

1 CURVE DATA

PI Station 102+44.19

Main Curve
Δ=2°53'28" Lt
D=0°36'28"
R=9,425.00'
L=475.57'
T=237.84'
E=3.00'

2 CURVE DATA

PI Station 107+17.78

Main Curve
Δ=2°52'01" Rt
D=0°36'28"
R=9,425.00'
L=471.61'
T=235.85'
E=2.95'

Priscilla S. Cornelio, P.E. Director

		Date
Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE 1

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ROADWAY PLAN & PROFILE SHEET
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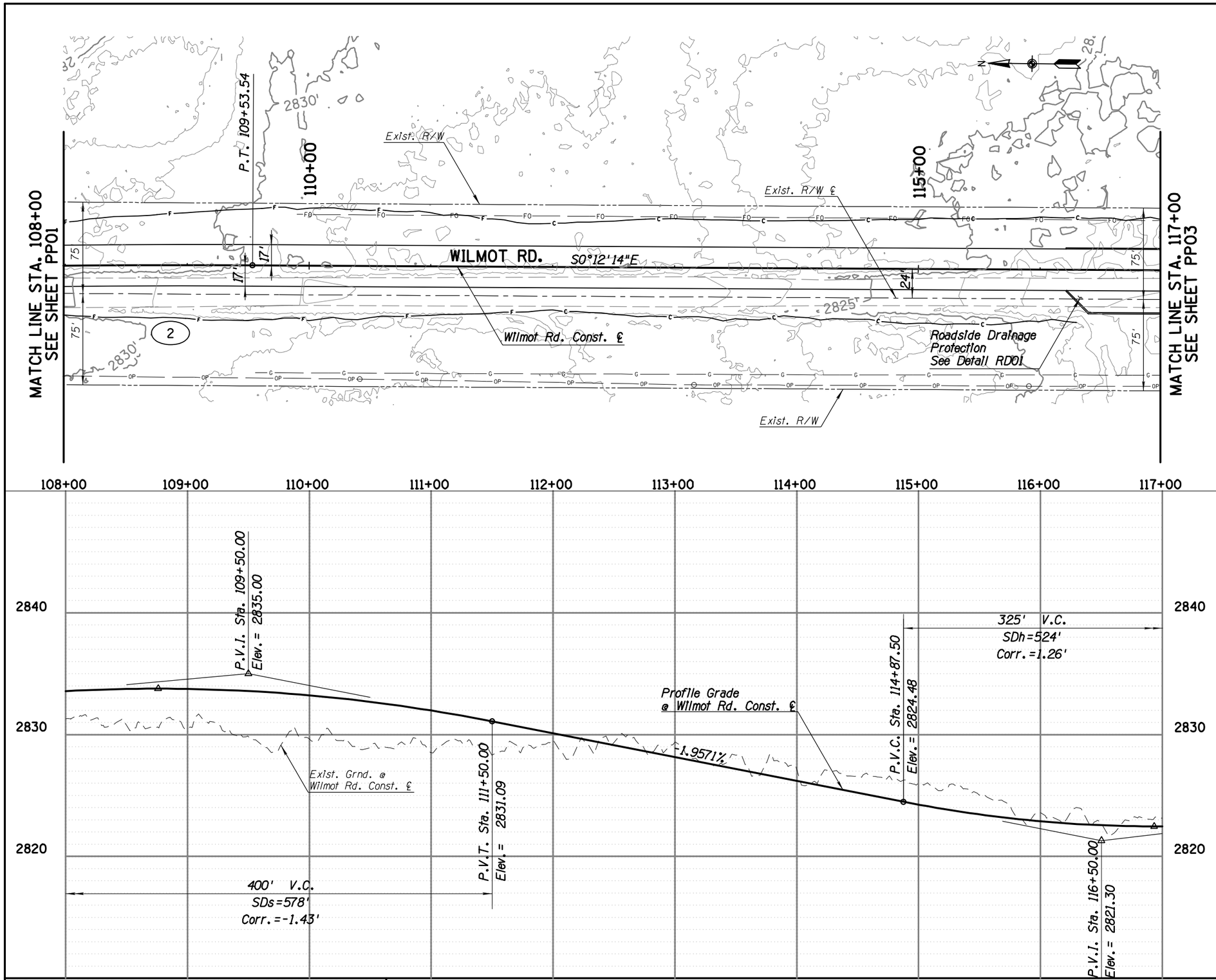
NORTH OF SAHUARITA ROAD
STA. 99+70 TO STA. 108+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP01 of PP42 | Page 9 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp01.dgn DATE: 1/16/2015 TIME: 4:10:27 PM KershnerM



2 CURVE DATA

PI Station 107+17.78

Main Curve
Δ=2°52'01" Rt
D=0°36'28"
R=9,425.00'
L=471.61'
T=235.85'
E=2.95'

Priscilla S. Cornelio, P.E. Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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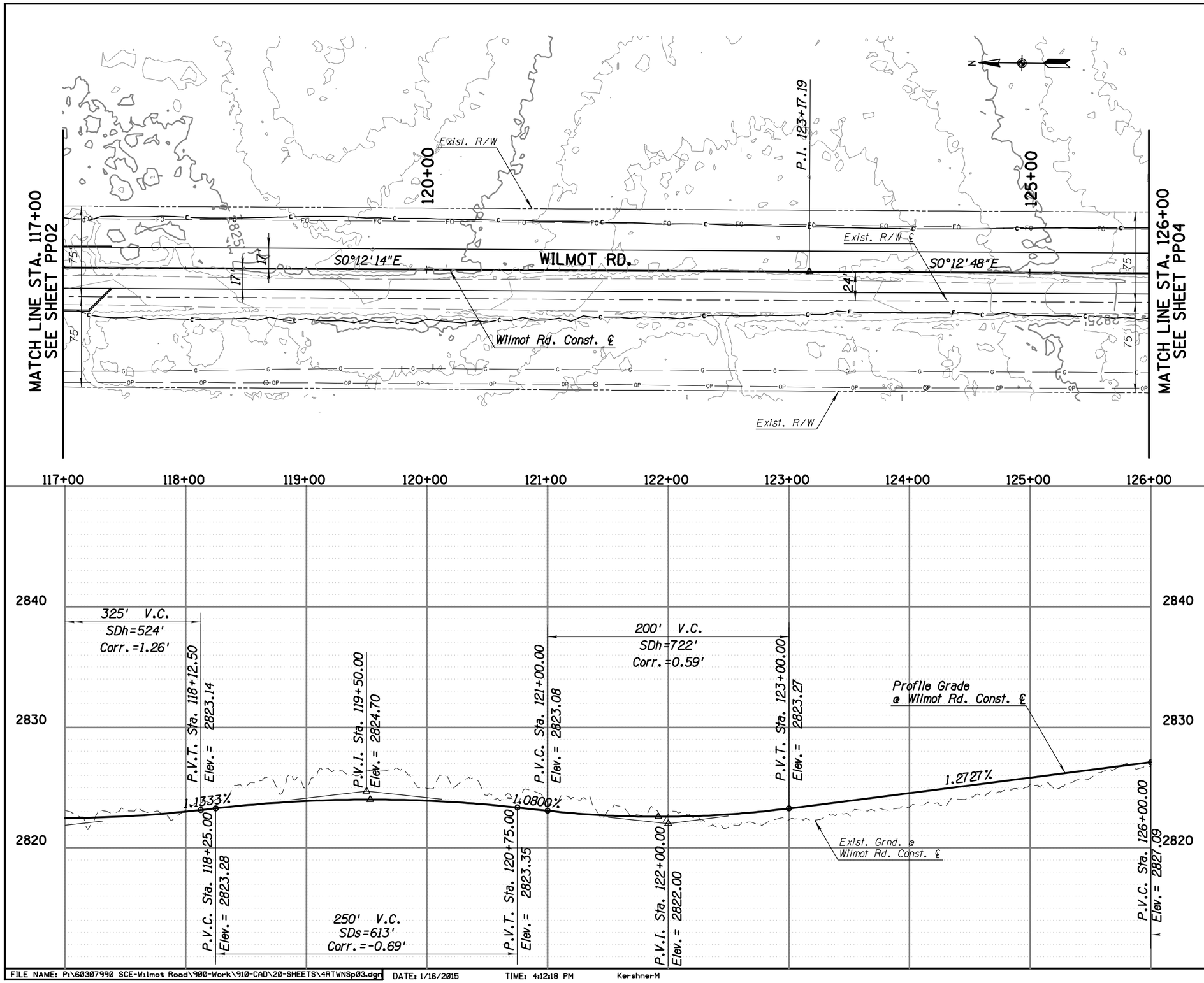
NORTH OF SAHUARITA ROAD
STA. 108+00 TO STA. 117+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP02 of PP42 | Page 10 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp02.dgn DATE: 1/16/2015 TIME: 4:11:32 PM KershnerM



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Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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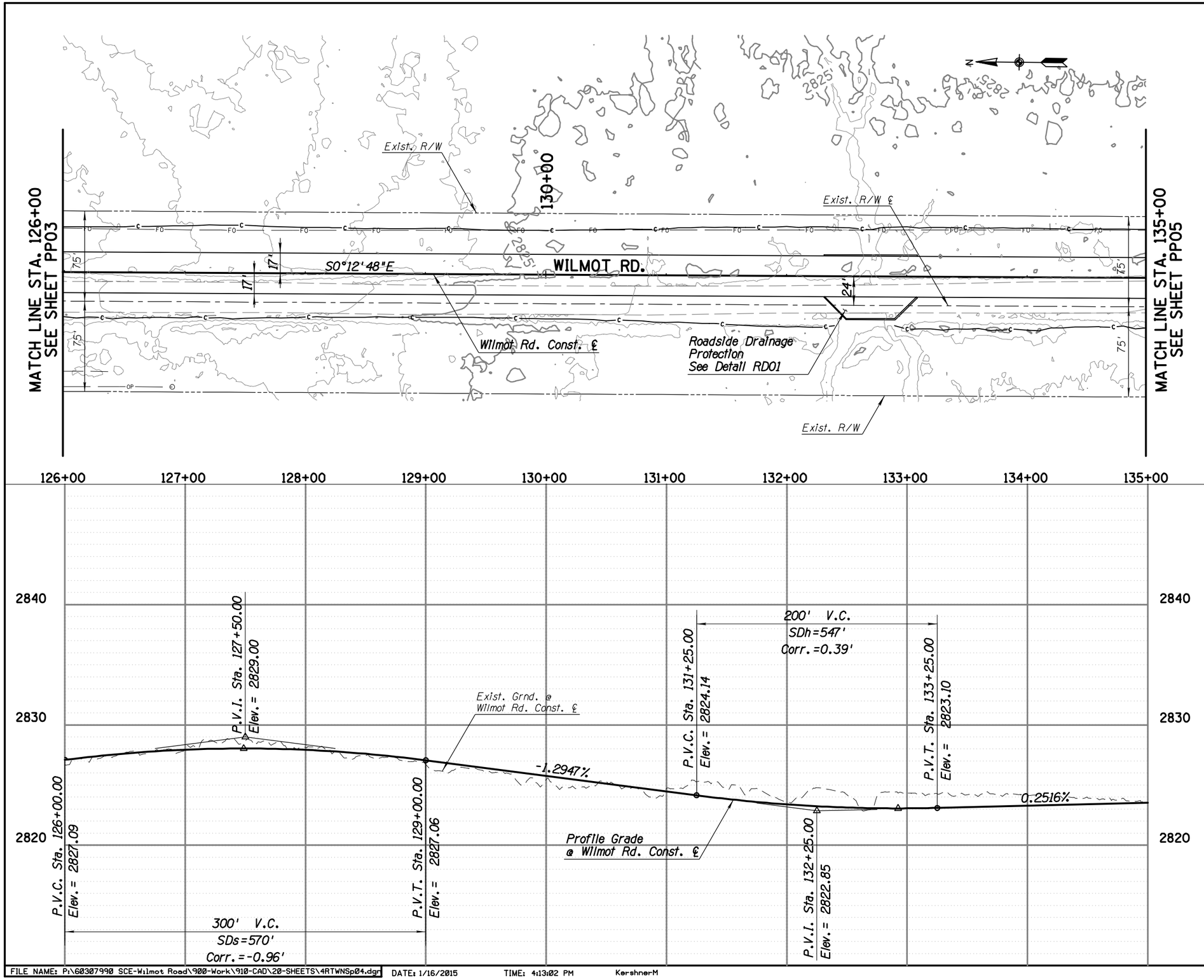
NORTH OF SAHUARITA ROAD
STA. 117+00 TO STA. 126+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP03 of PP42 | Page 11 of 52



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Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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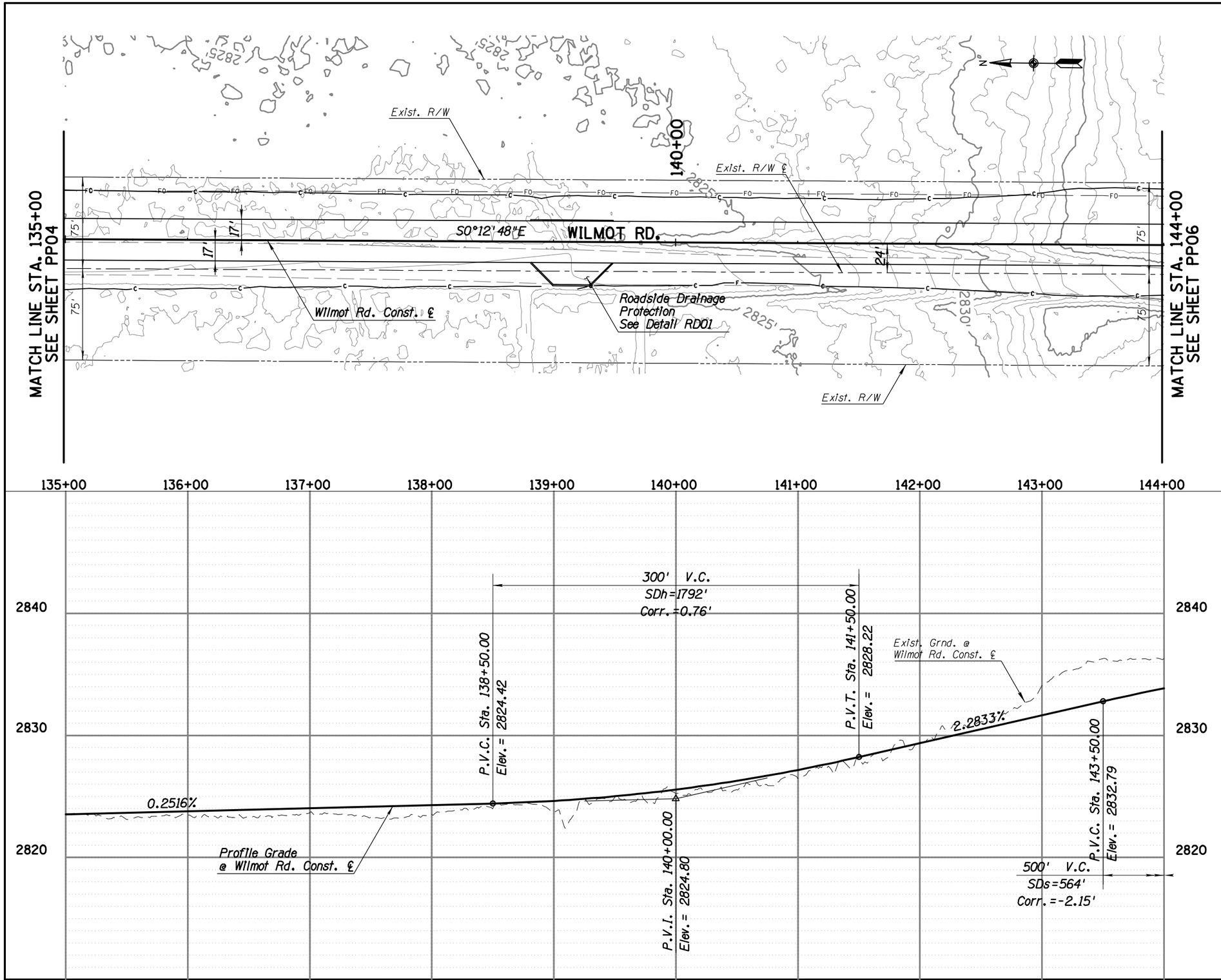
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP04 of PP42 | Page 12 of 52



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Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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AECOM
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1840 E. SOUTHERN AVE. SUITE 29
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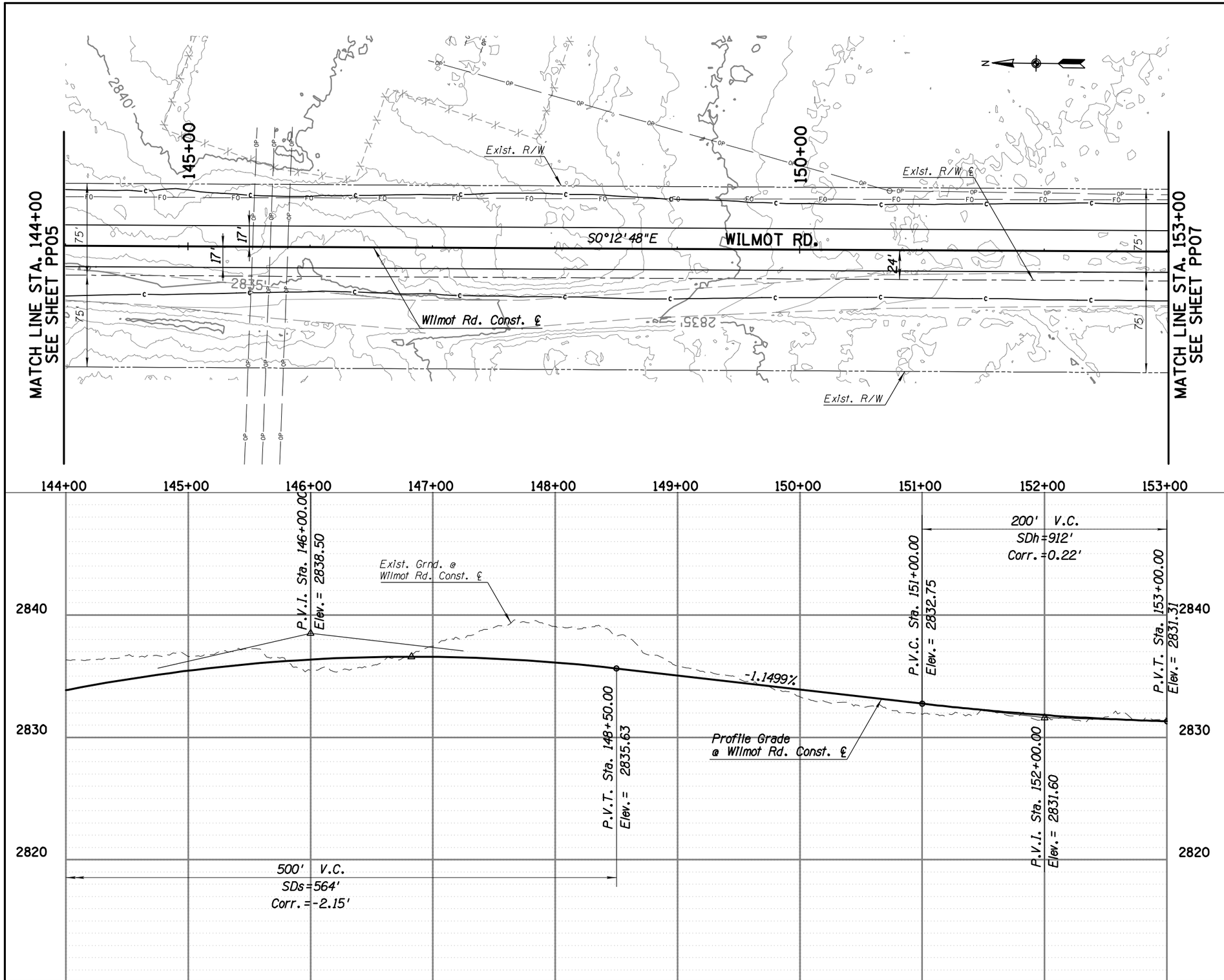
WILMOT ROAD
NORTH OF SAHUARITA ROAD
STA. 135+00 TO STA. 144+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP05 of PP42 | Page 13 of 52



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Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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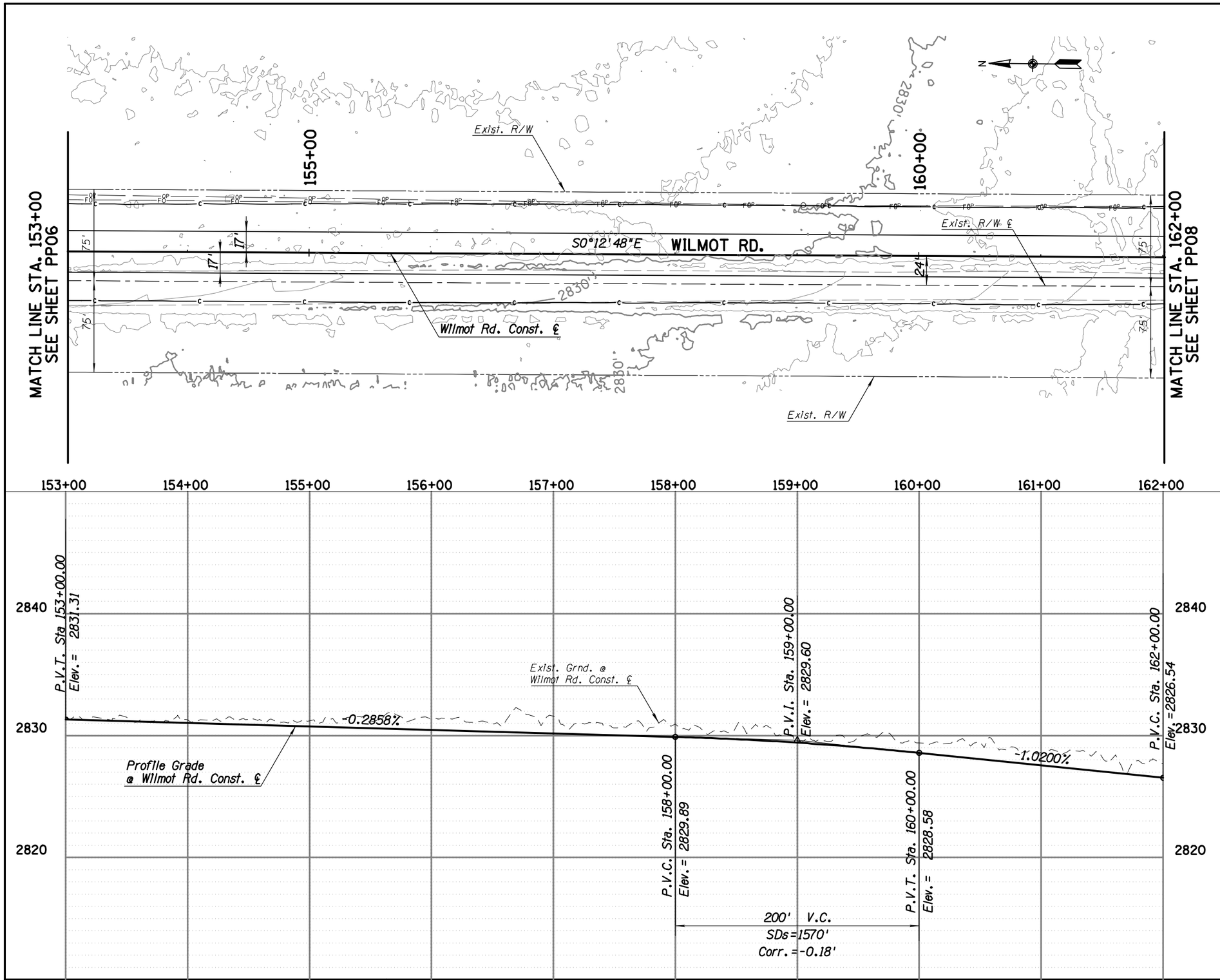
WILMOT ROAD
NORTH OF SAHUARITA ROAD
STA. 144+00 TO STA. 153+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP06 of PP42 | Page 14 of 52



Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE 1

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Pima County Department of Transportation

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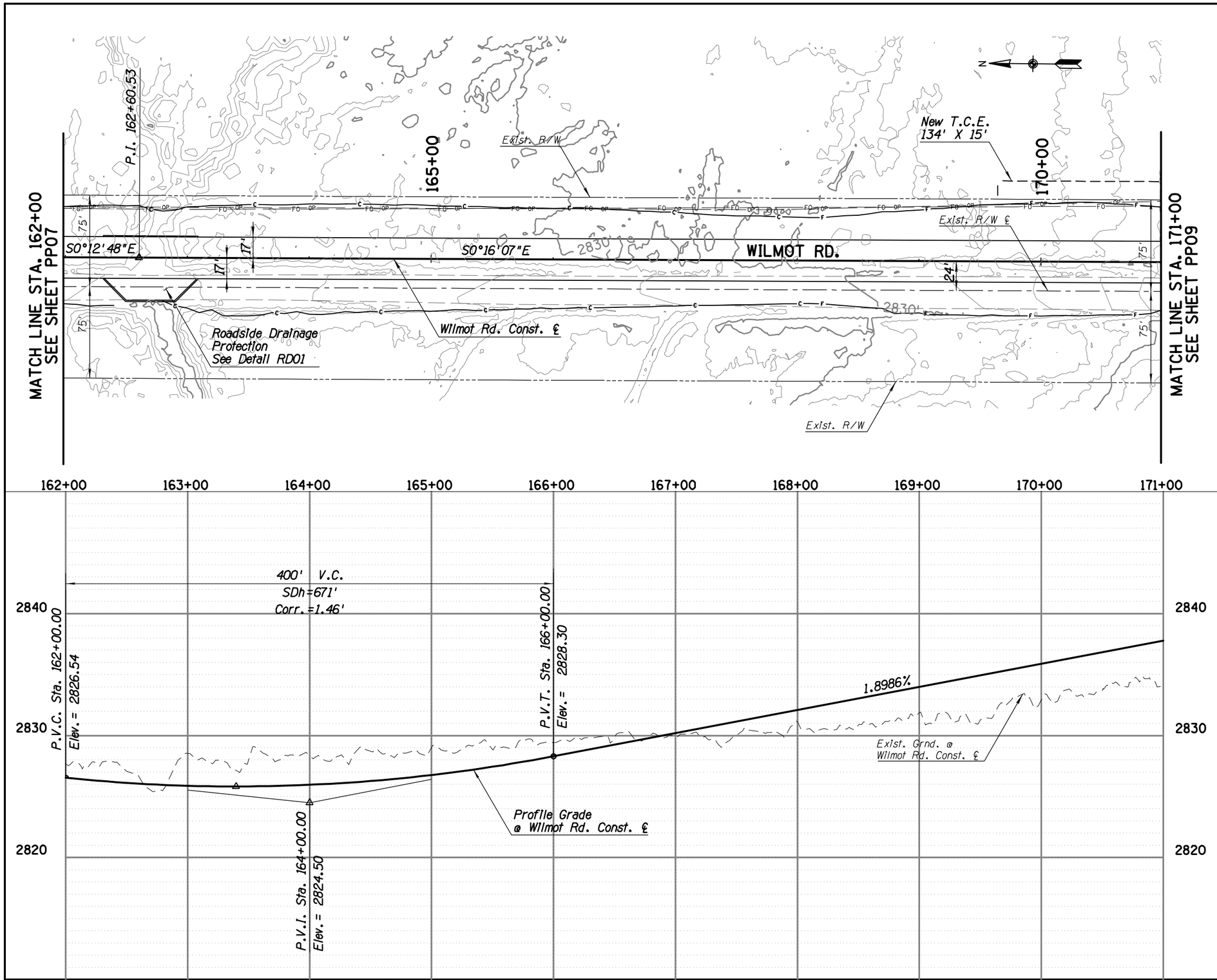
WILMOT ROAD
NORTH OF SAHUARITA ROAD
STA. 153+00 TO STA. 162+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP07 of PP42 | Page 15 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp07.dgn DATE: 1/16/2015 TIME: 4:15:45 PM KershnerM



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Priscilla S. Cornello, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE 1

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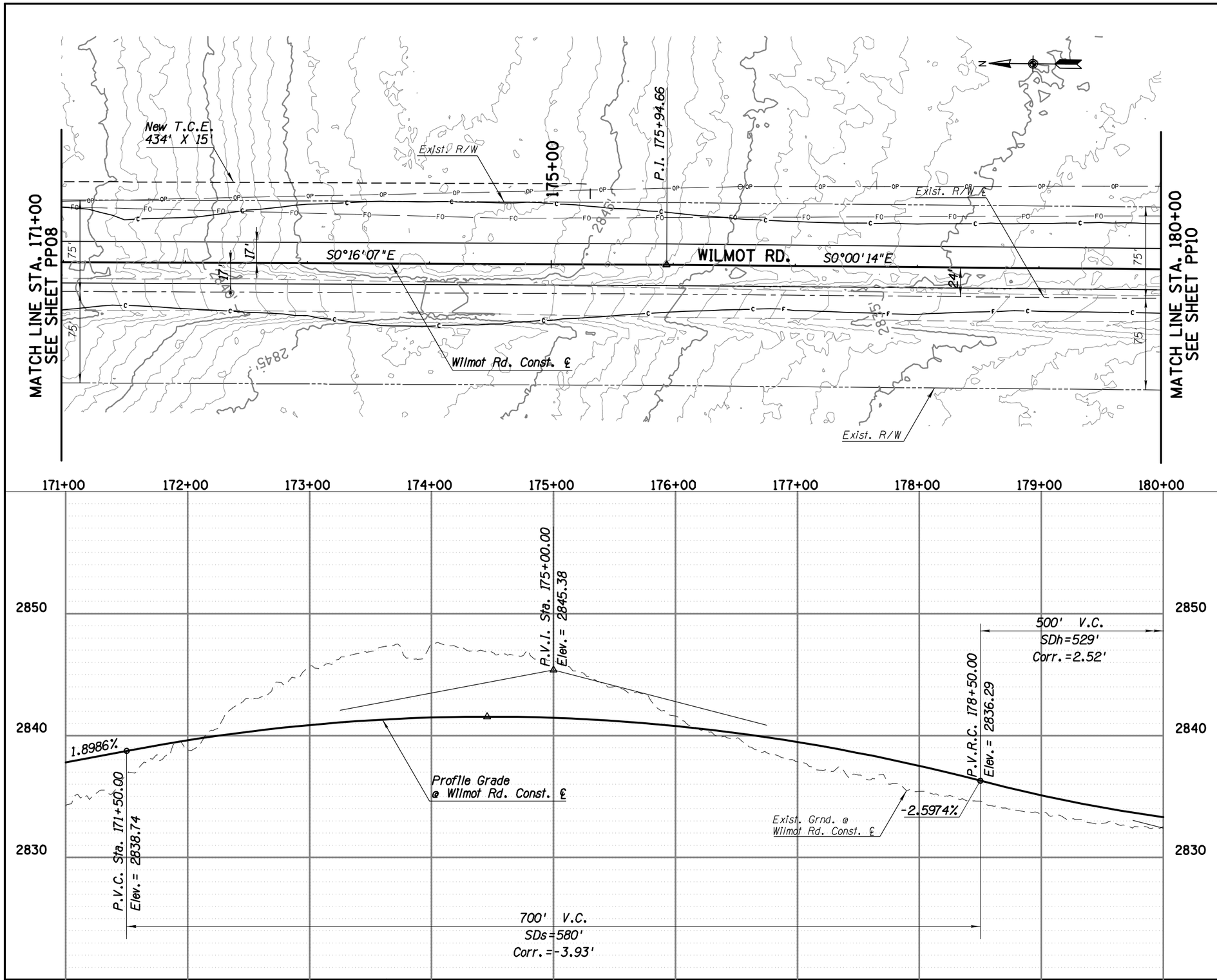
WILMOT ROAD
NORTH OF SAHUARITA ROAD
STA. 162+00 TO STA. 171+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP08 of PP42 | Page 16 of 52



Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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Pima County Department of Transportation

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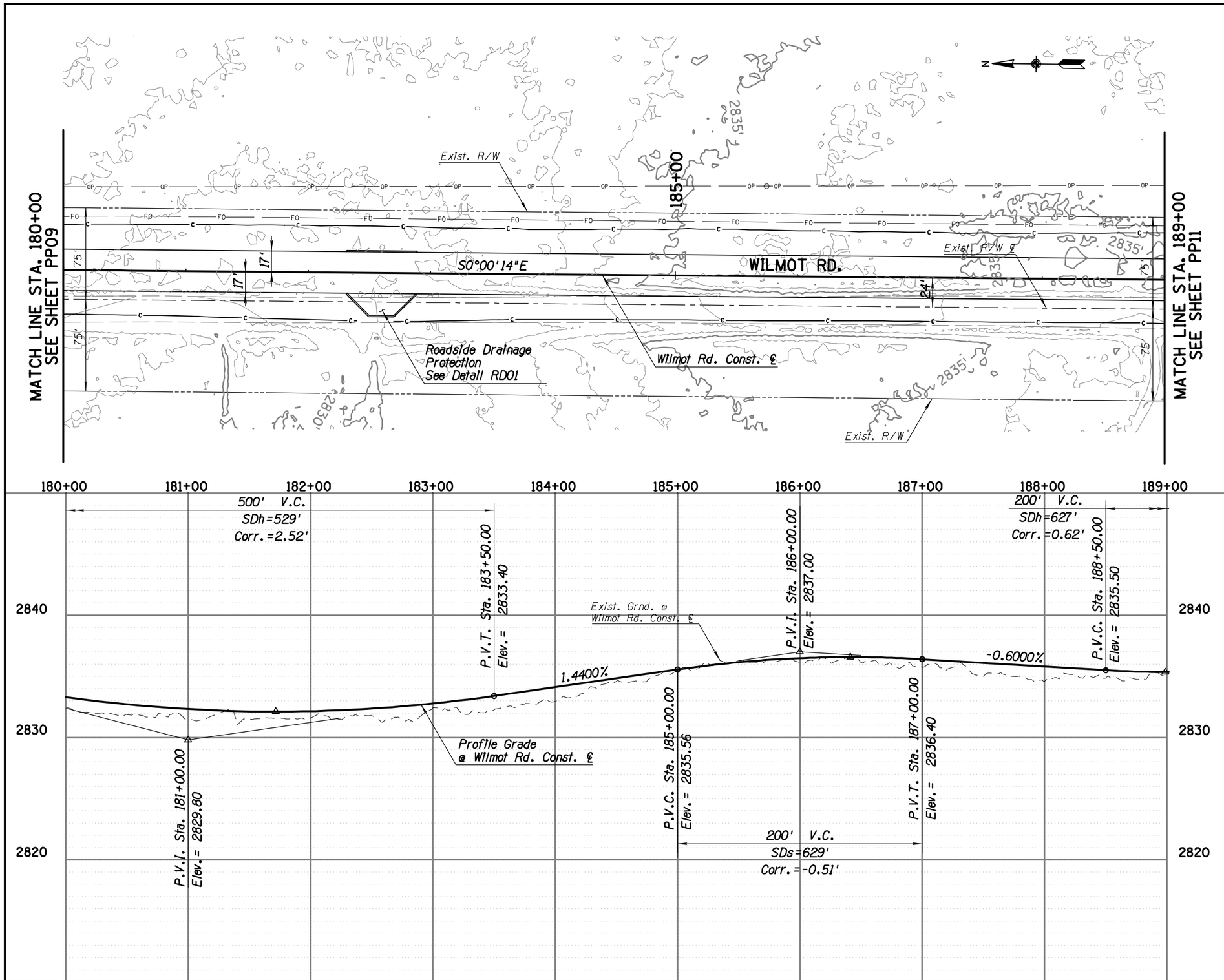
WILMOT ROAD
NORTH OF SAHUARITA ROAD
STA. 171+00 TO STA. 180+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP09 of PP42 | Page 17 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp09.dgn DATE: 1/16/2015 TIME: 4:17:14 PM KershnerM



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Priscilla S. Cornelio, P.E., Director

		Date
Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE 1

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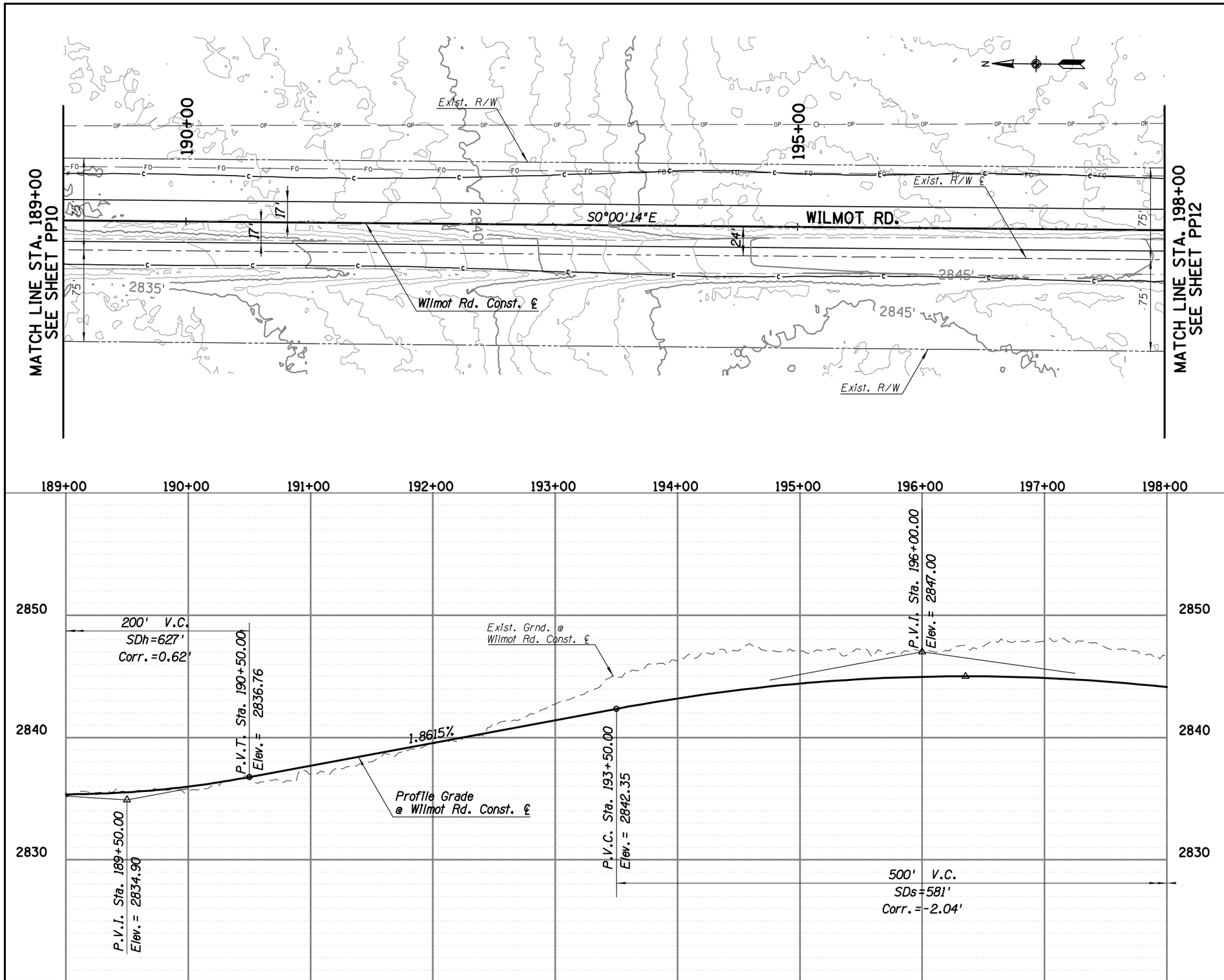
NORTH OF SAHUARITA ROAD
STA. 180+00 TO STA. 189+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP10 of PP42 | Page 18 of 52



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Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE 1

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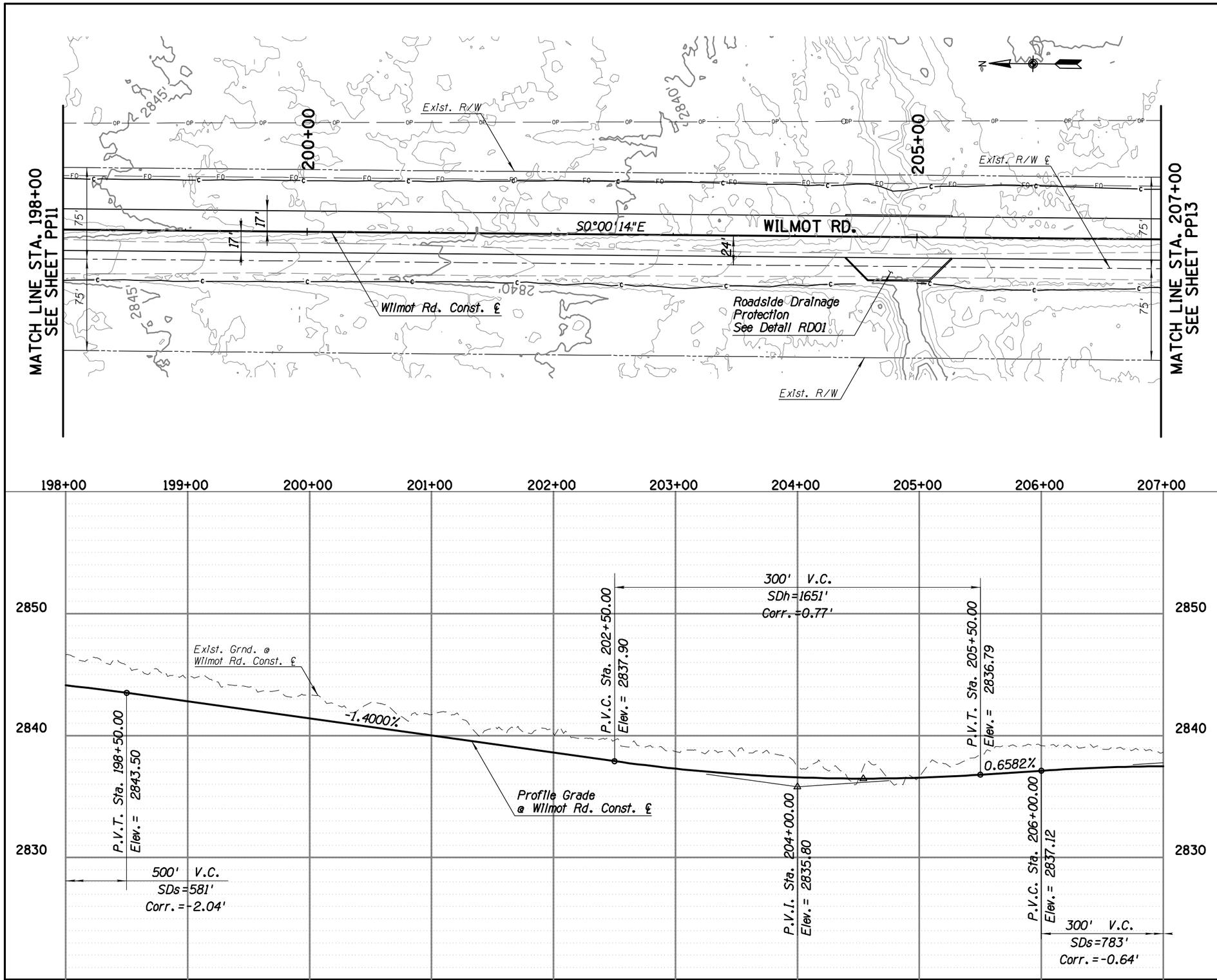
STA. 189+00 TO STA. 198+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP11 of PP42 | Page 19 of 52



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Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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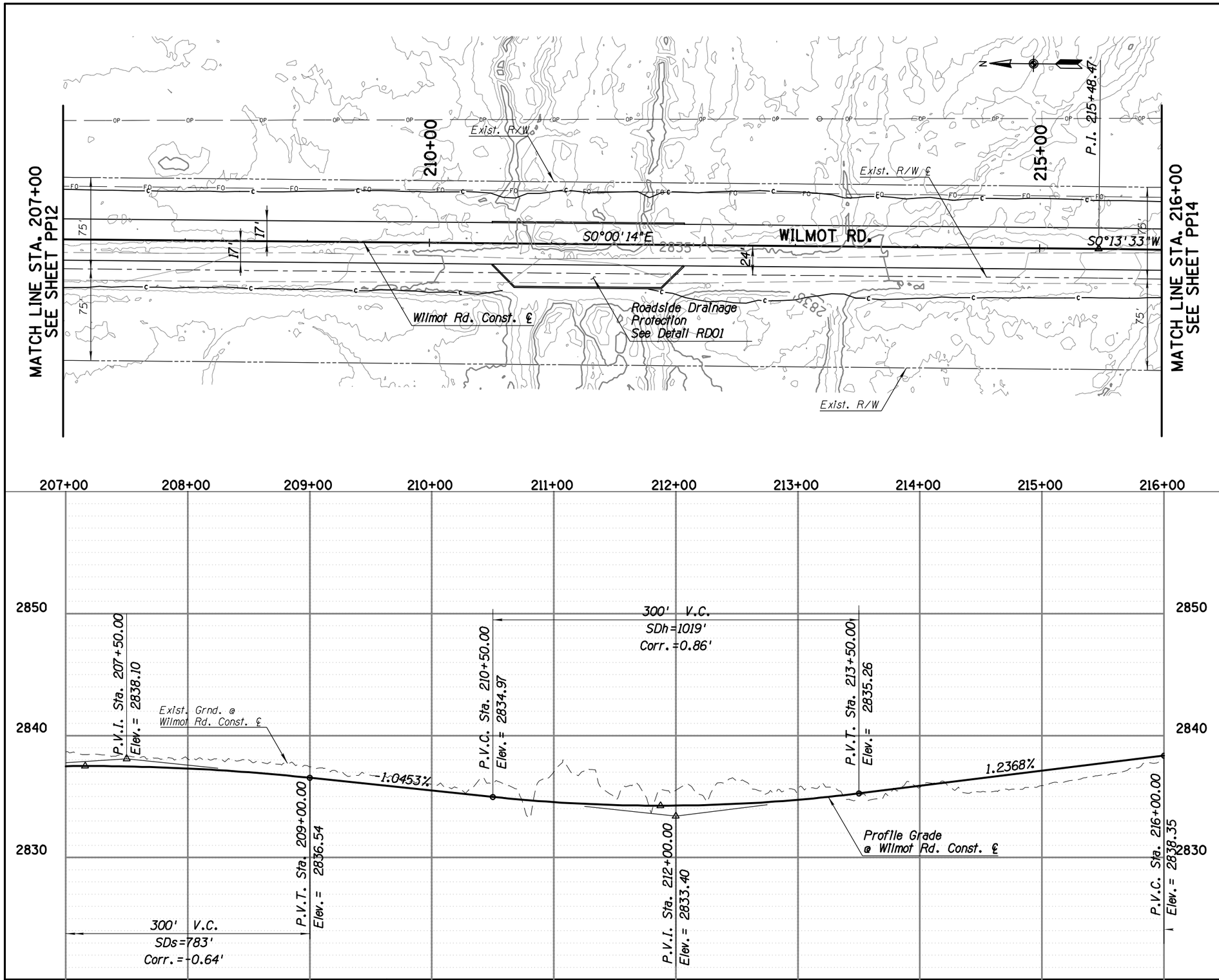
NORTH OF SAHUARITA ROAD
STA. 198+00 TO STA. 207+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert.

Sheet PP12 of PP42



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Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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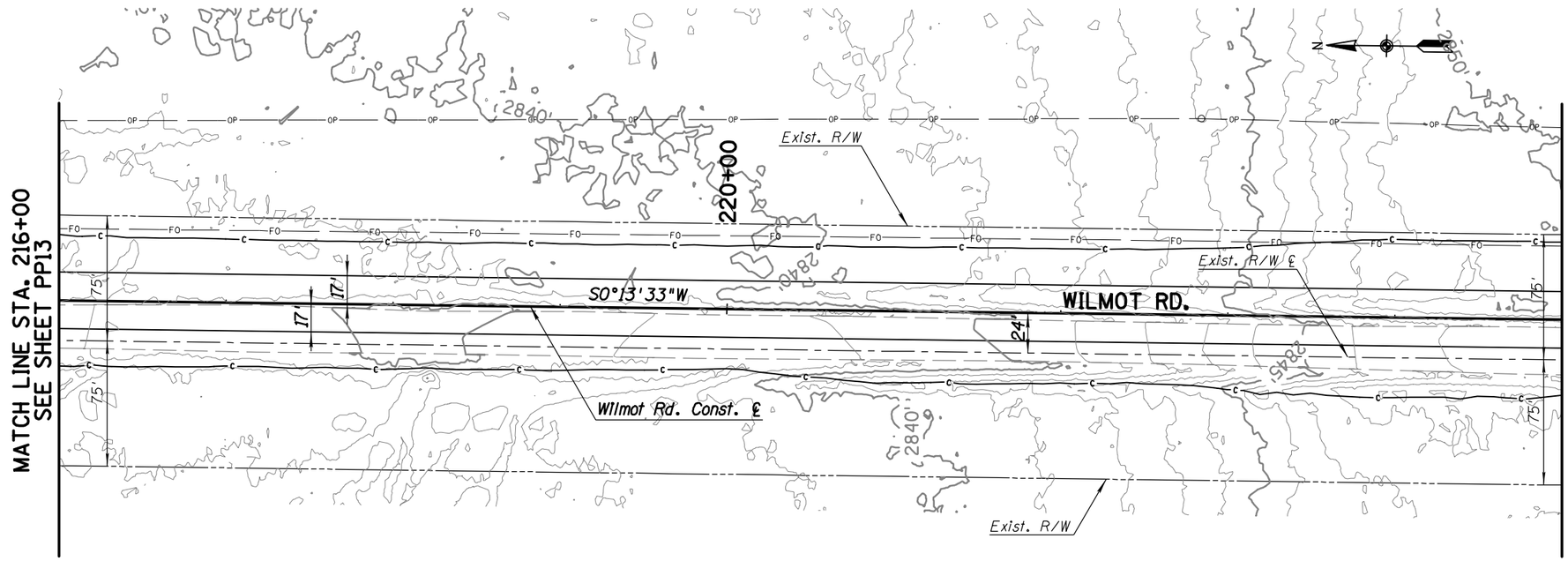
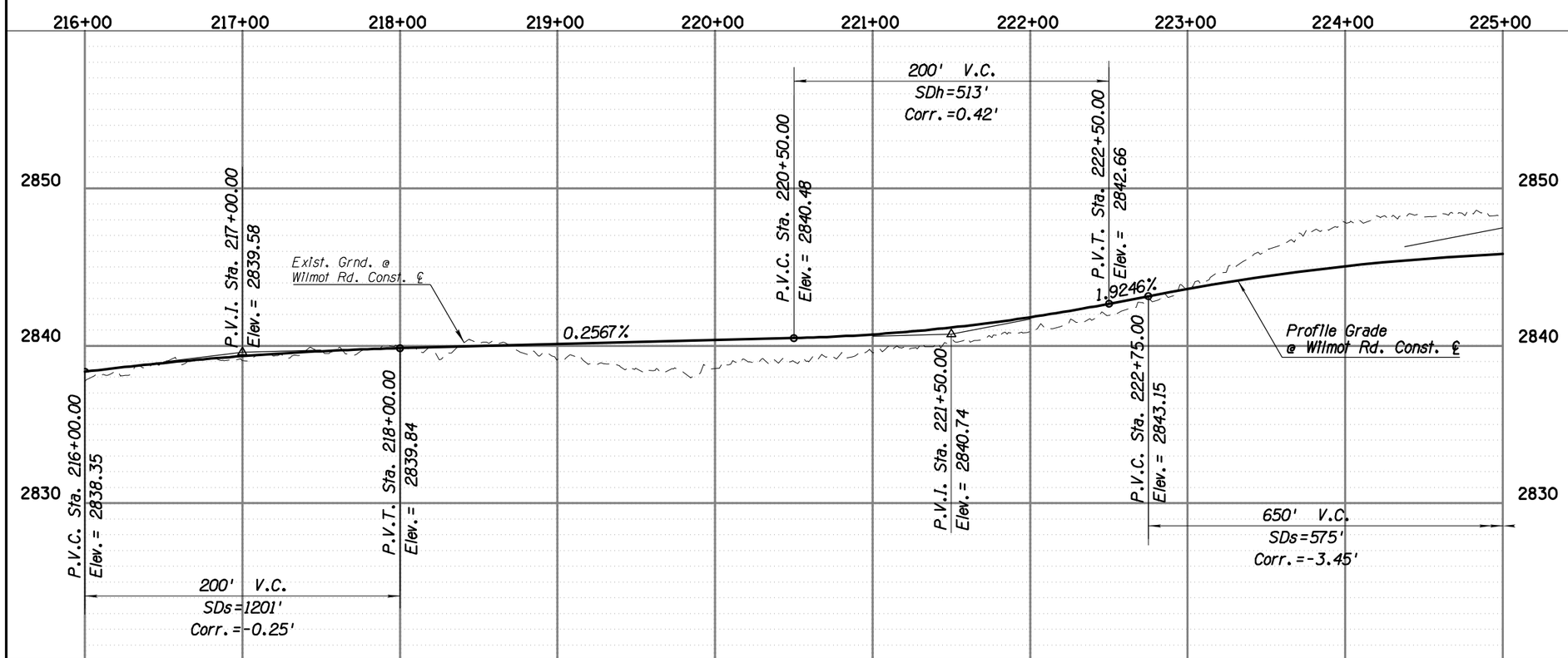
STA. 207+00 TO STA. 216+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP13 of PP42 | Page 21 of 52





Priscilla S. Cornelio, P.E., Director

	Designed	MPK	01/15
	Drawn	MPK	01/15
	Checked	MDB	01/15
	Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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1840 W. DRAKE DRIVE, SUITE 21
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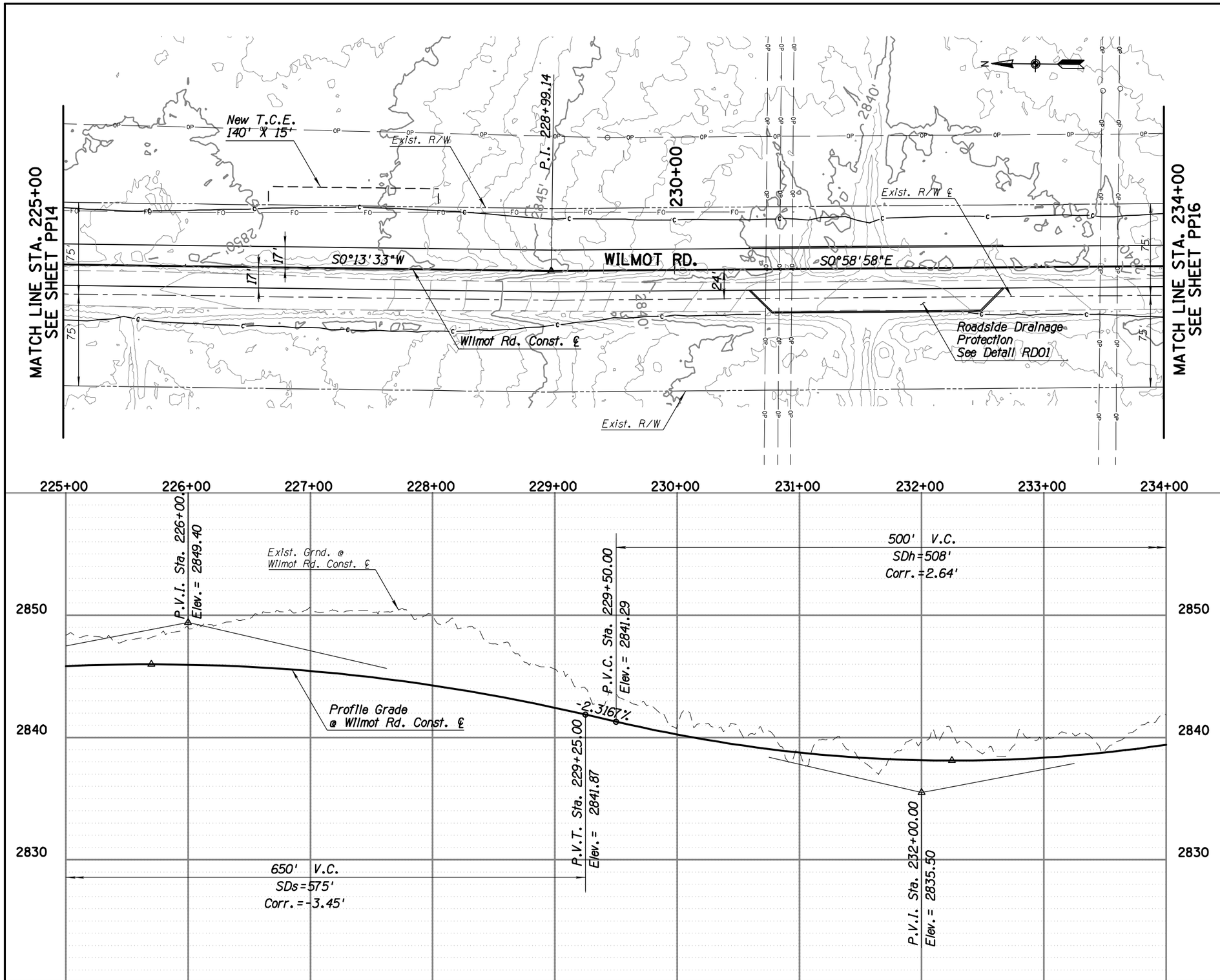
ROADWAY PLAN & PROFILE SHEET
WILMOT ROAD
NORTH OF SAHUARITA ROAD
STA. 216+00 TO STA. 225+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP14 of PP42 | Page 22 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp14.dgn DATE: 1/16/2015 TIME: 4:26:05 PM KershnerM



Priscilla S. Cornello, P.E., Director

Designed	MPK		01/15
Drawn	MPK		01/15
Checked	MDB		01/15
Proj. Engr.	MPK		01/15

No.	Revision Description	Engineer	Date

PRELIMINARY
NOT FOR
CONSTRUCTION
STAGE 1

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TRANSPORTATION
AECOM USA, INC.
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Pima County Department of Transportation

ROADWAY PLAN & PROFILE SHEET
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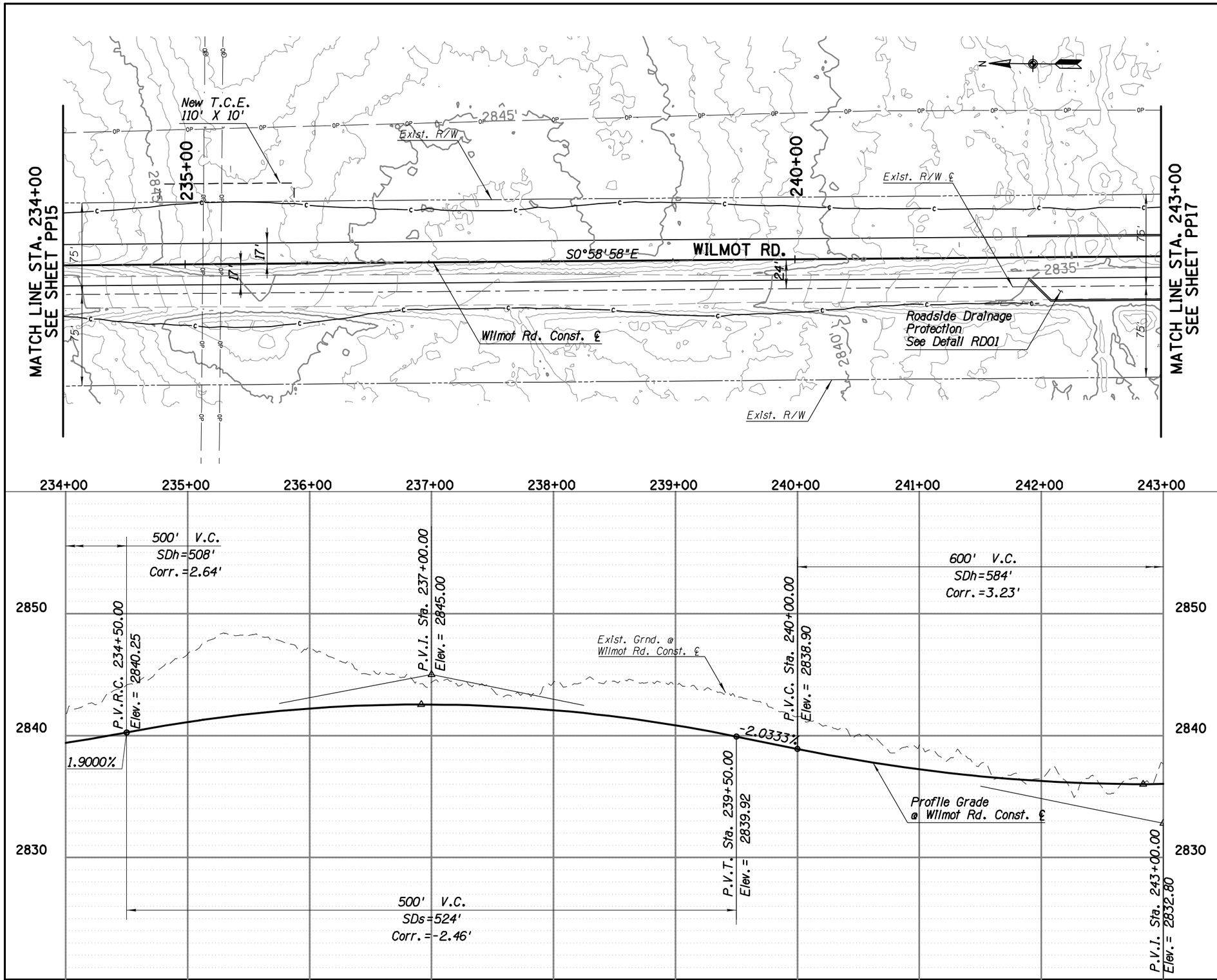
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales:	1" = 40' Horiz. 1" = 4' Vert.	Sheet PP15 of PP42	Page 23 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp15.dgn DATE: 1/16/2015 TIME: 4:32:51 PM KershnerM



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Priscilla S. Cornello, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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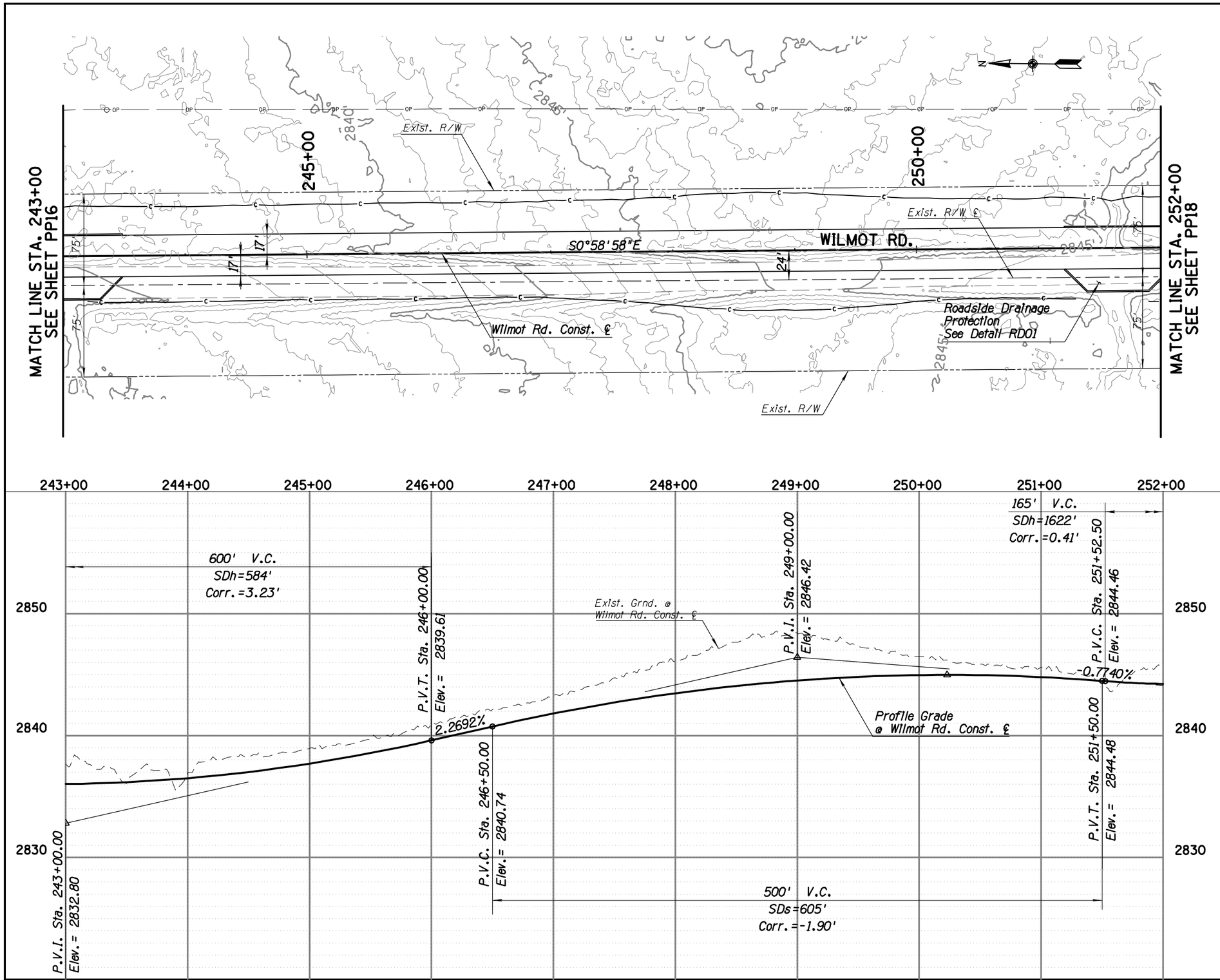
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP16 of PP42 | Page 24 of 52



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Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE 1

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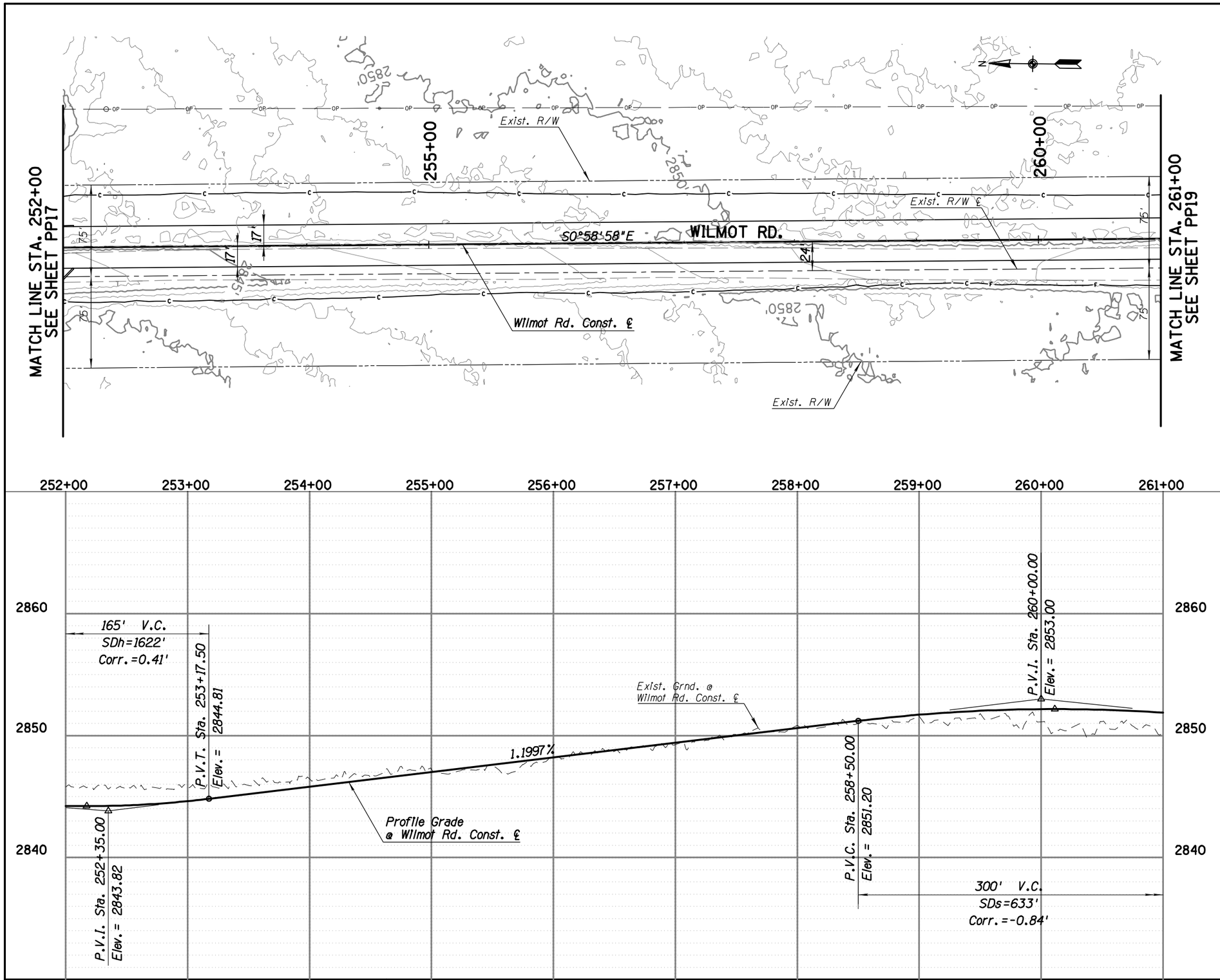
STA. 243+00 TO STA. 252+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP17 of PP42 | Page 25 of 52



Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE 1

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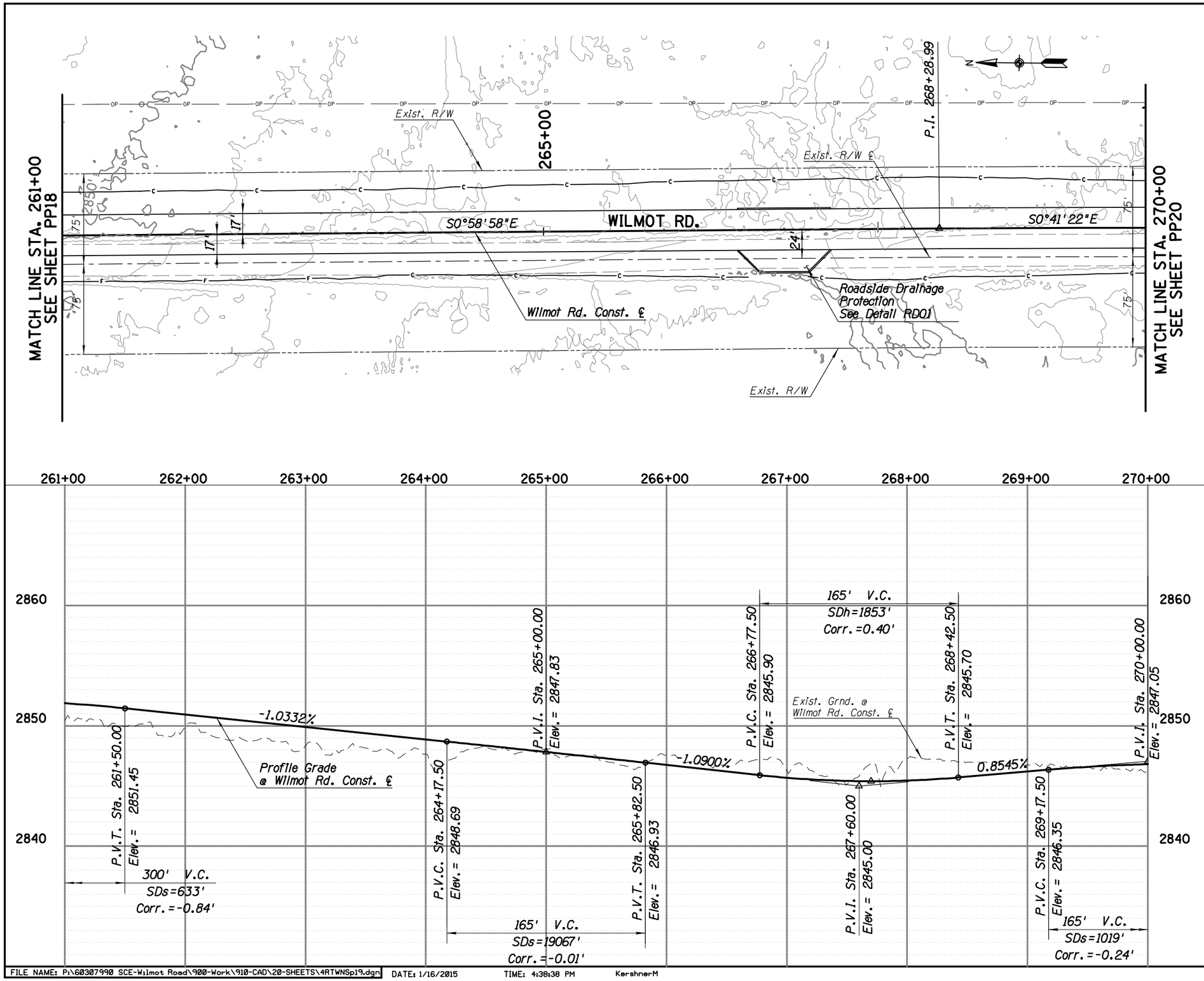
STA. 252+00 TO STA. 261+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP18 of PP42 | Page 26 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp18.dgn DATE: 1/16/2015 TIME: 4:37:22 PM KershnerM



Priscilla S. Cornelio, P.E., Director

	Designed	Drawn	Checked	Proj. Engr.
	MPK	MPK	MDB	MPK
Date	01/15	01/15	01/15	01/15

No.	Revision Description	Engineer	Date

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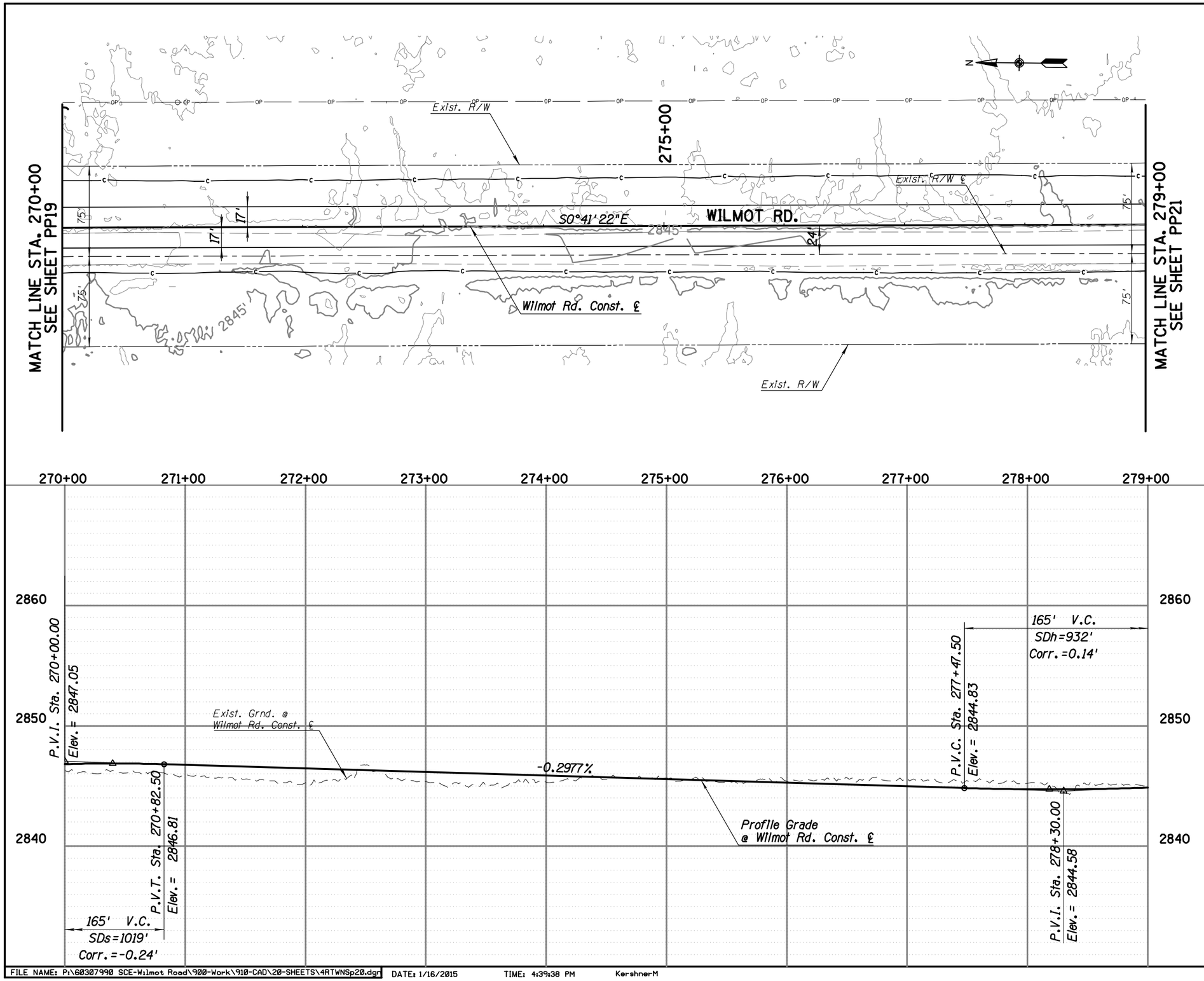
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP19 of PP42 | Page 27 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp19.dgn DATE: 1/16/2015 TIME: 4:38:38 PM KershnerM



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Priscilla S. Cornelio, P.E., Director

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Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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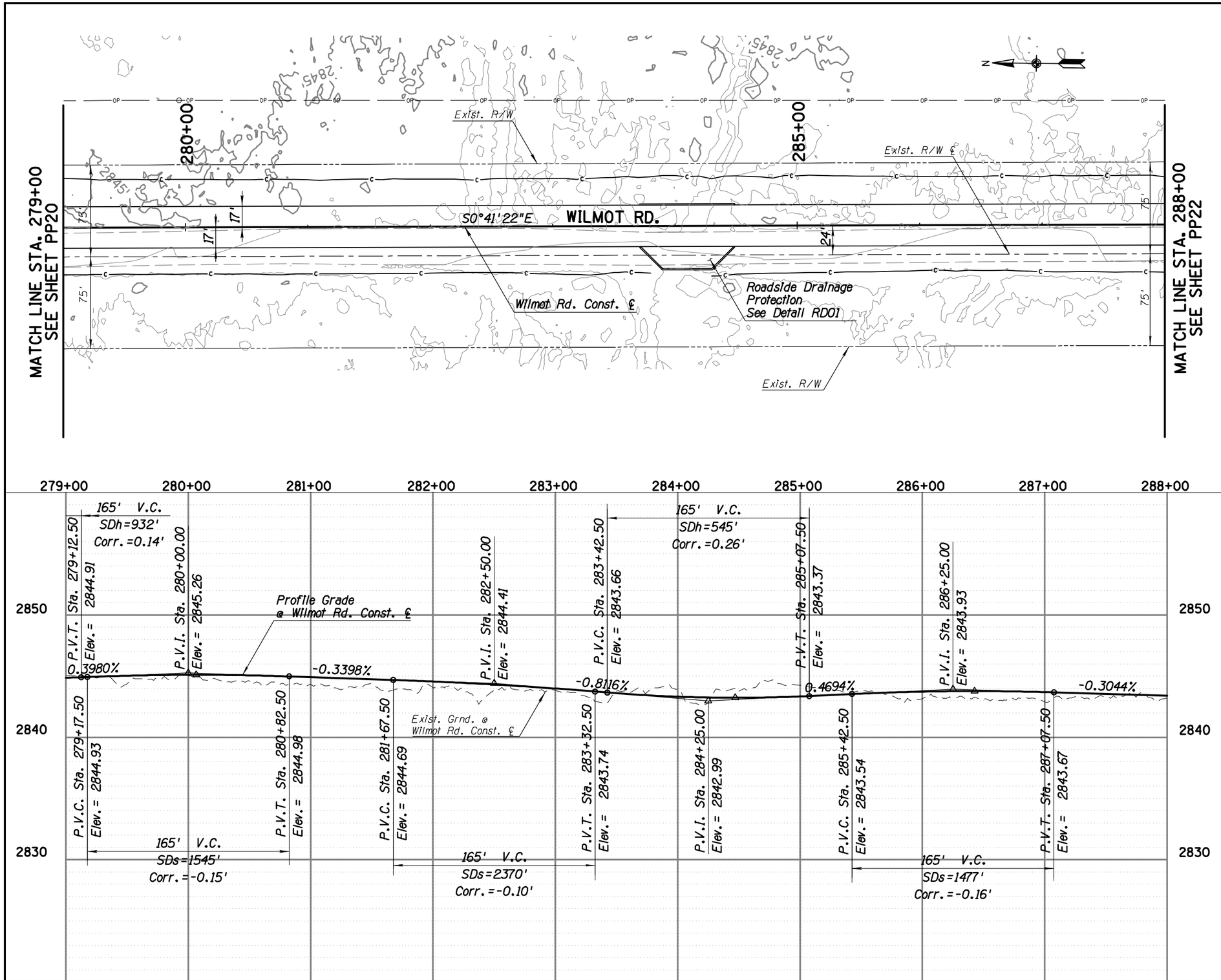
STA. 270+00 TO STA. 279+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP20 of PP42 | Page 28 of 52



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Priscilla S. Cornelio, P.E. Director

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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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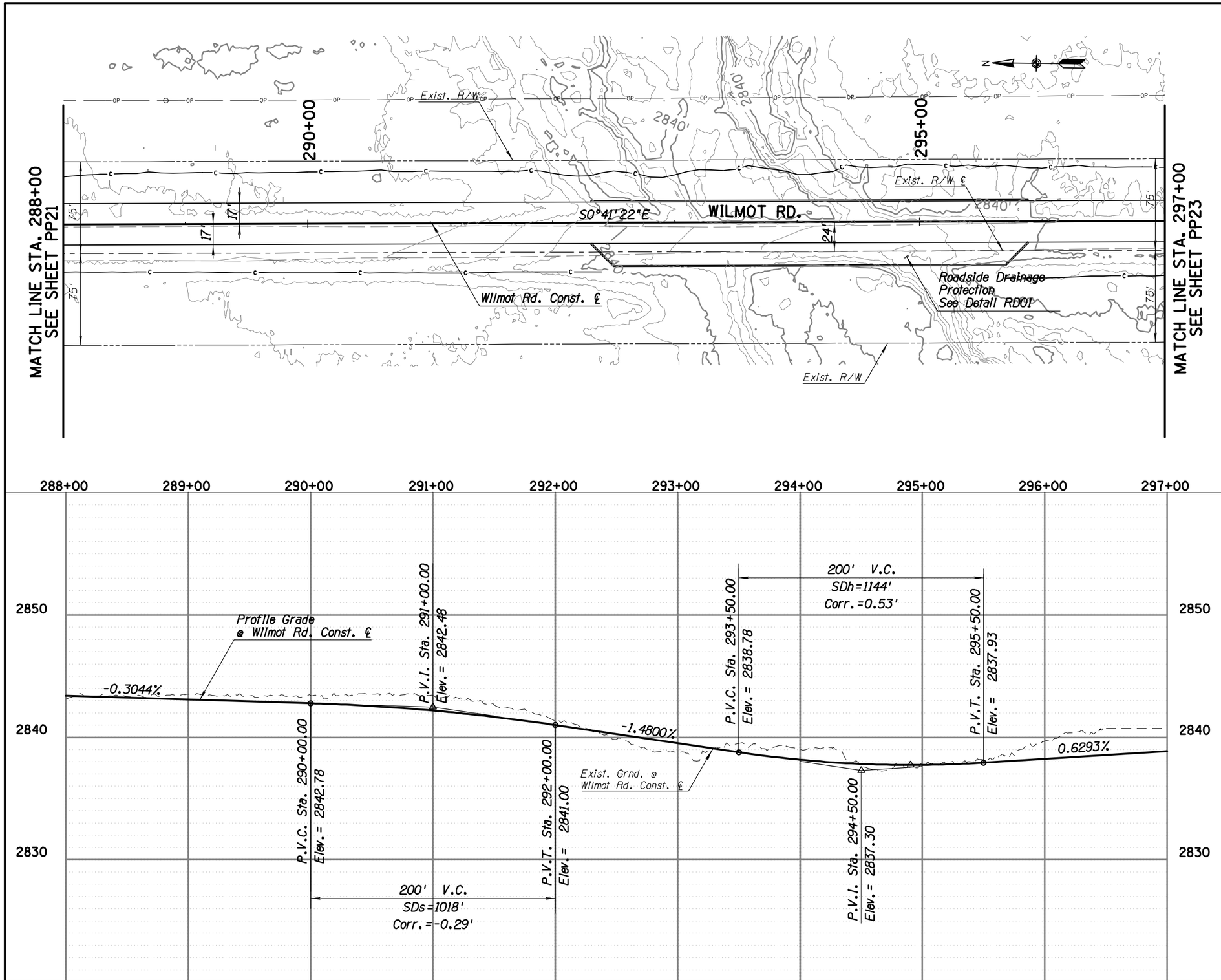
NORTH OF SAHUARITA ROAD
STA. 279+00 TO STA. 288+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP21 of PP42 | Page 29 of 52



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Priscilla S. Cornello, P.E., Director

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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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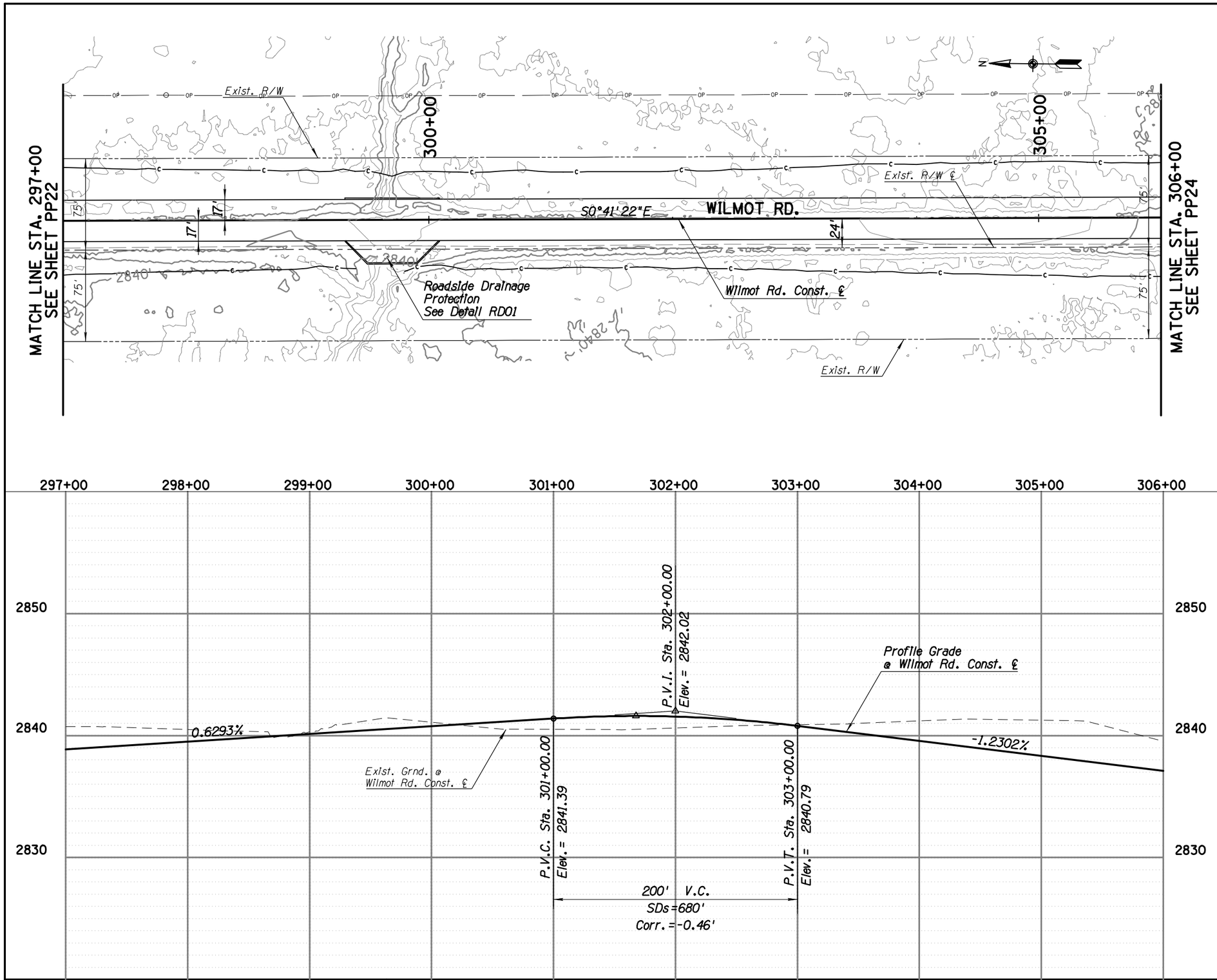
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP22 of PP42 | Page 30 of 52



Priscilla S. Cornelio, P.E., Director

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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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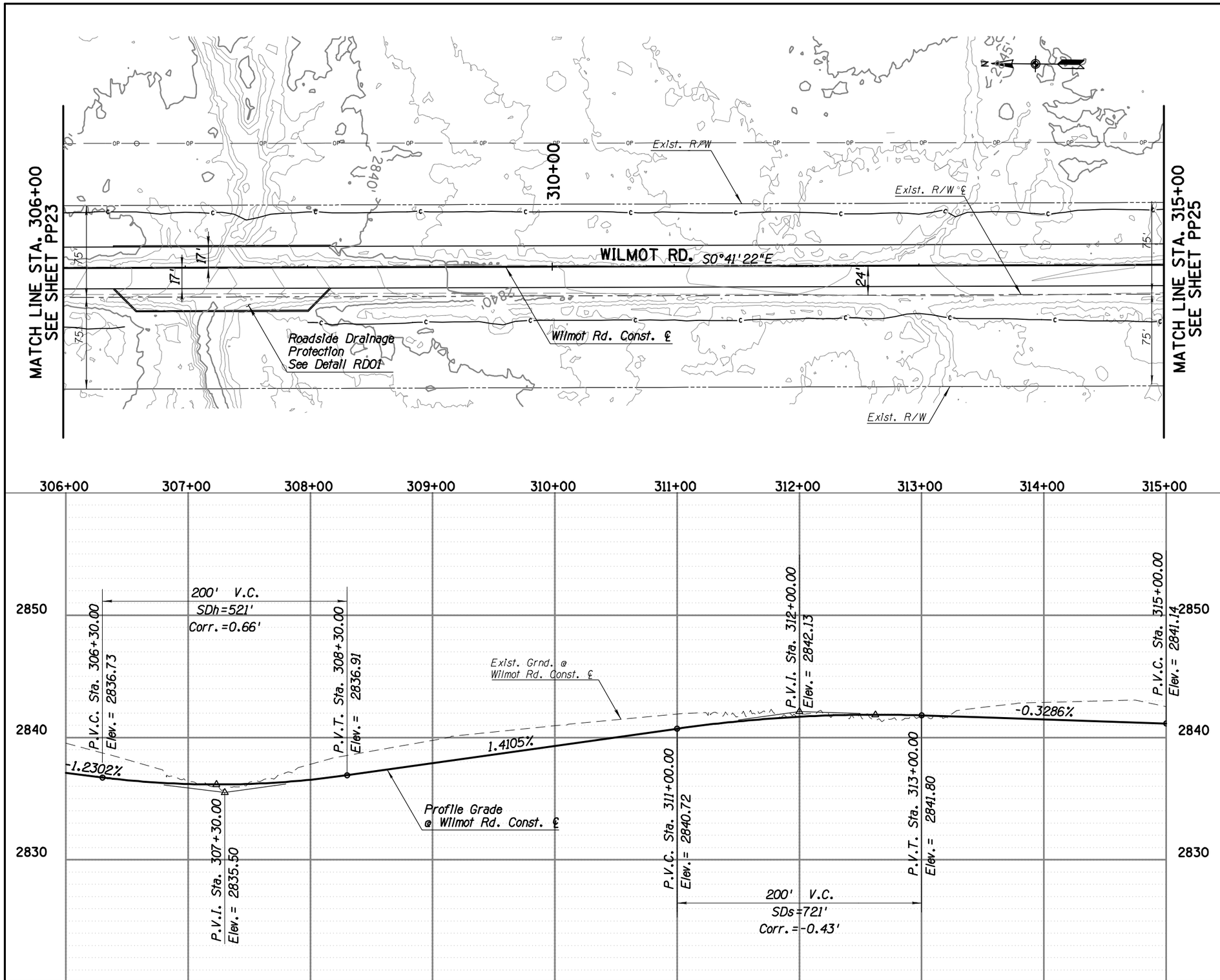
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP23 of PP42 | Page 31 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp23.dgn DATE: 1/16/2015 TIME: 4:42:51 PM KershnerM



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Priscilla S. Cornelio, P.E., Director

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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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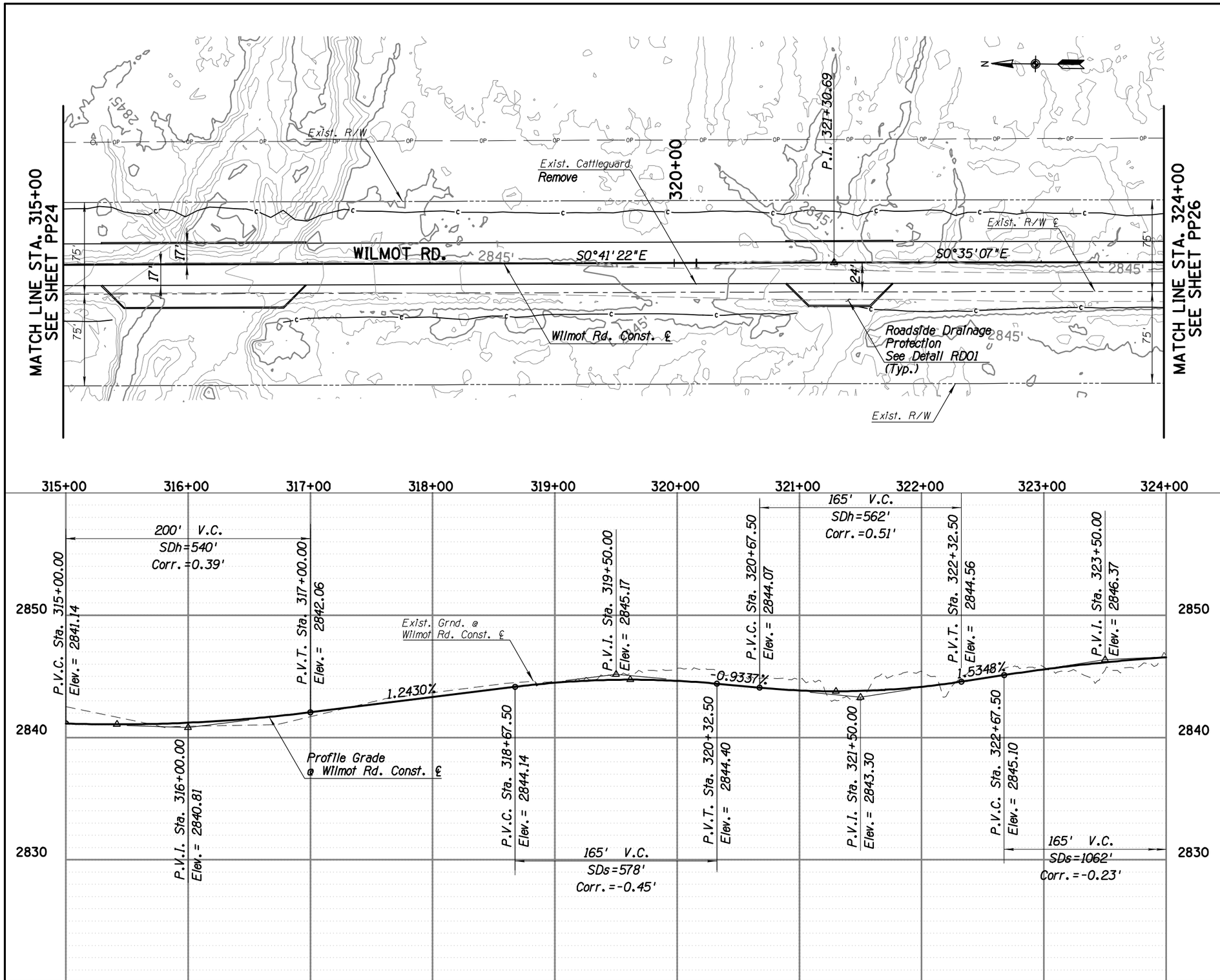
NORTH OF SAHUARITA ROAD
STA. 306+00 TO STA. 315+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP24 of PP42 | Page 32 of 52



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Priscilla S. Cornelio, P.E., Director

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No.	Revision Description	Engineer	Date

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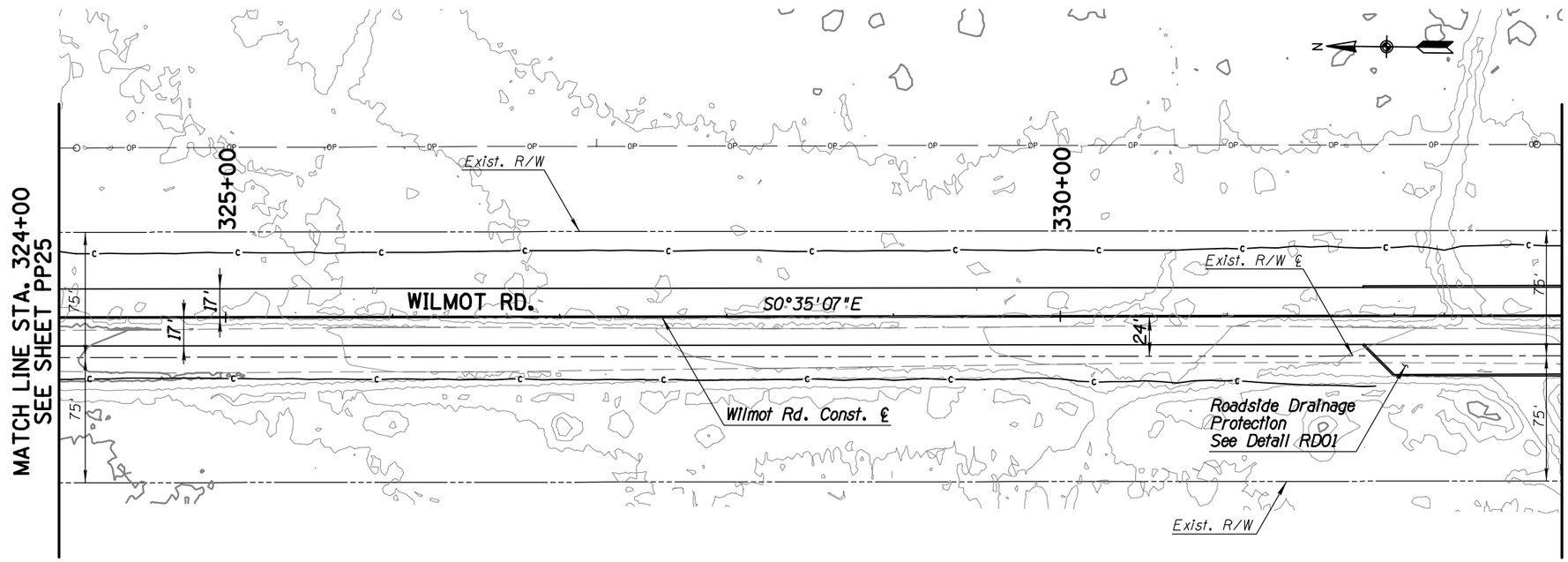
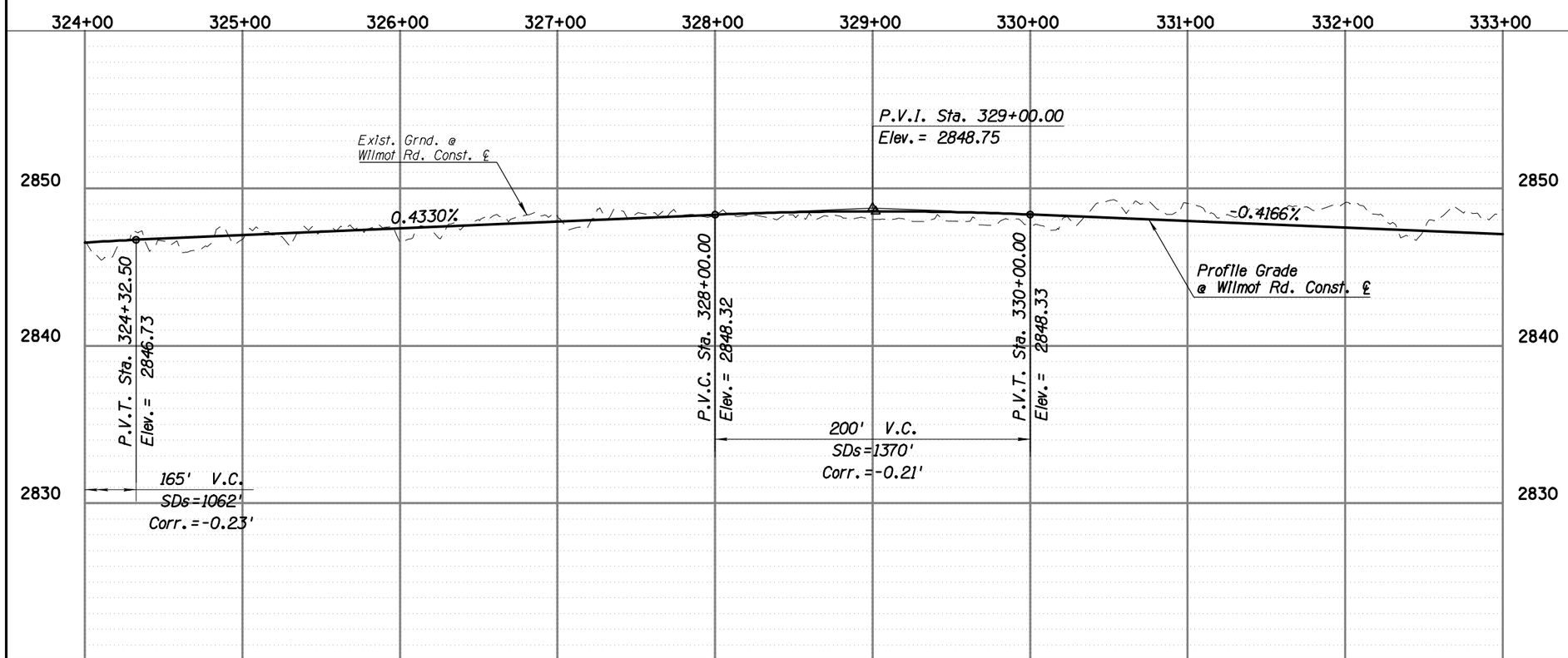
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP25 of PP42 | Page 33 of 52





Priscilla S. Cornelio, P.E., Director

		Date
Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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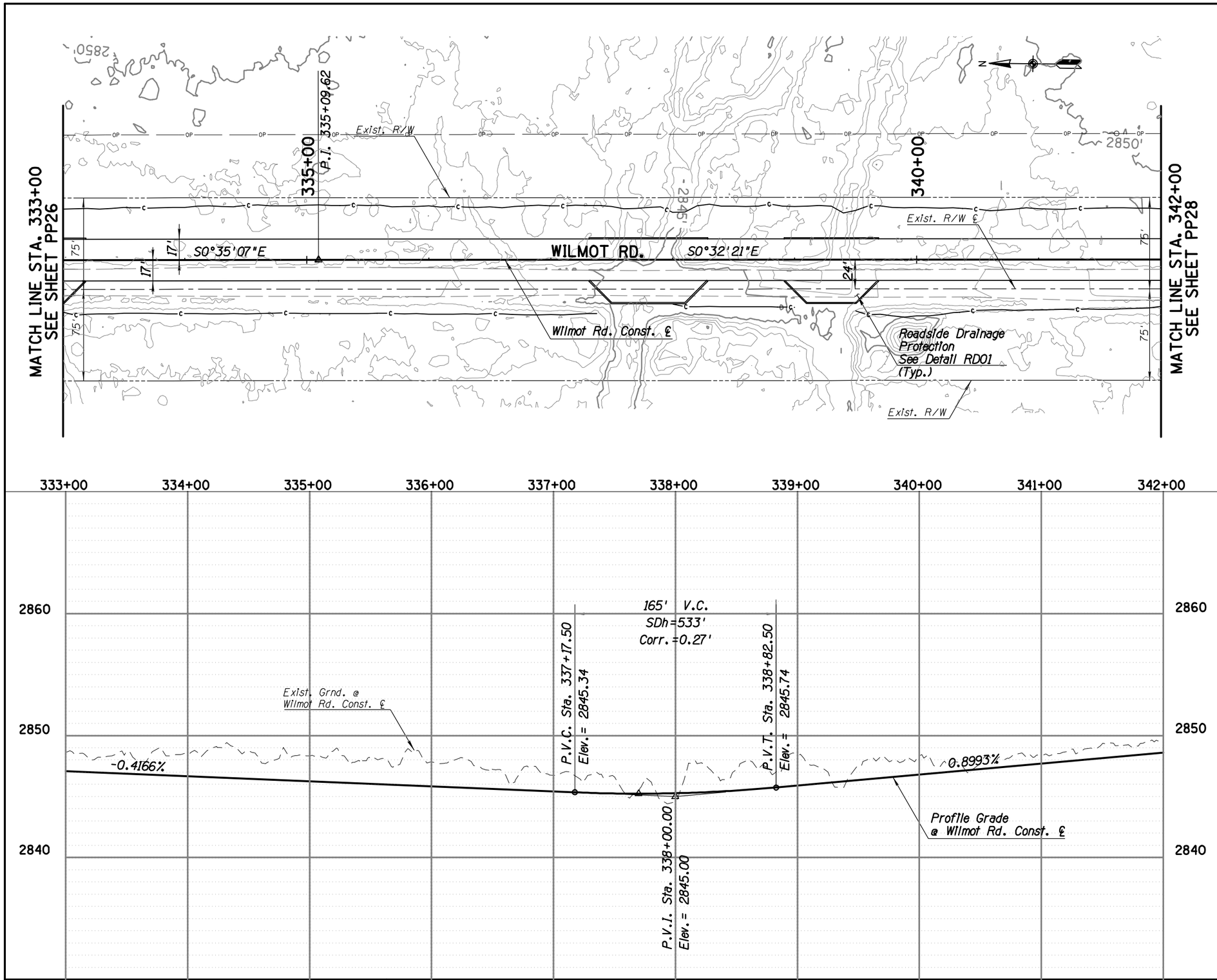
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP26 of PP42 | Page 34 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp26.dgn DATE: 1/16/2015 TIME: 5:13:51 PM KershnerM



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Priscilla S. Cornelio, P.E. Director

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No.	Revision Description	Engineer	Date

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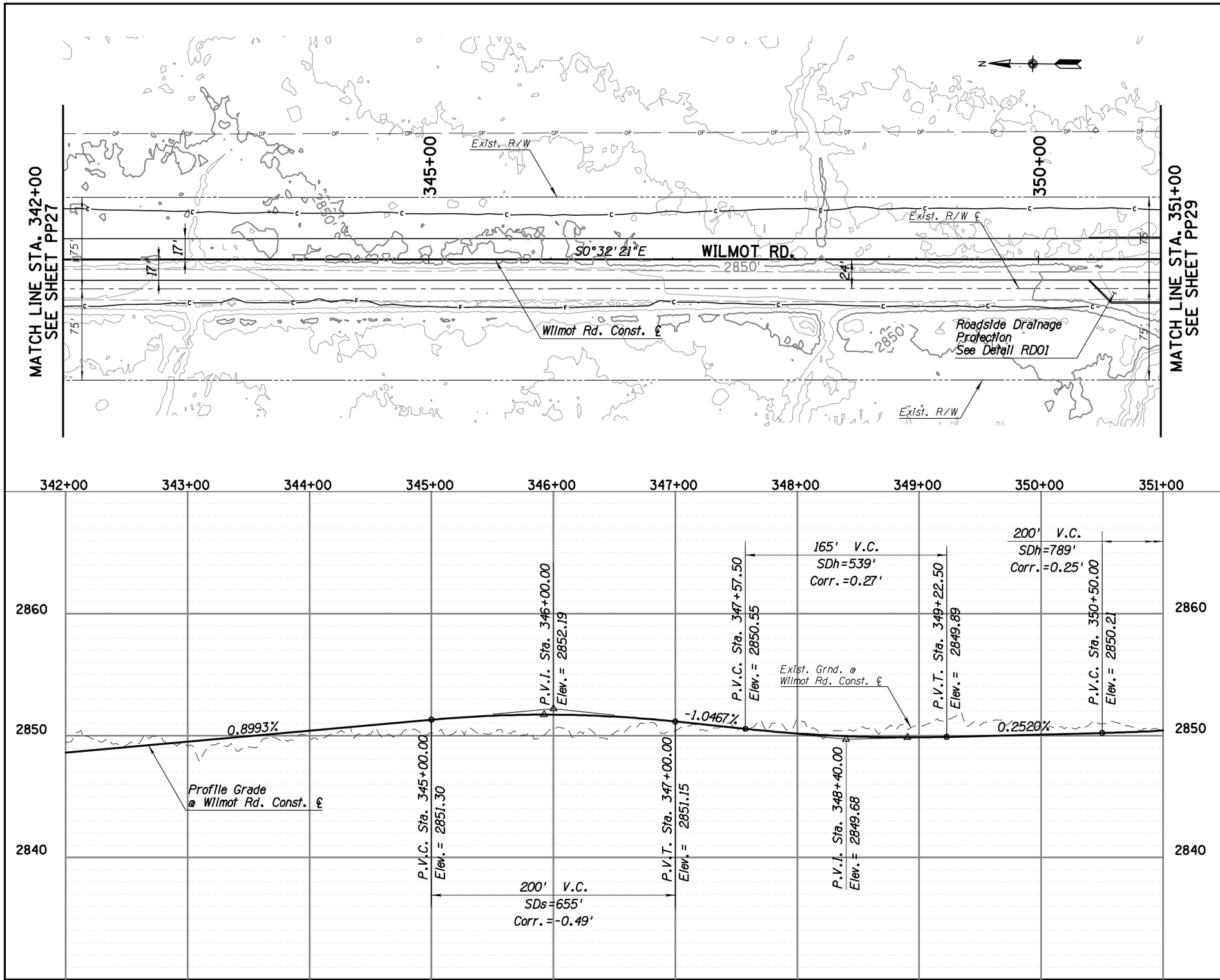
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP27 of PP42 | Page 35 of 52



Priscilla S. Cornello, P.E., Director

	Designed	Drawn	Checked	Proj. Engr.
	MPK	MPK	MDB	MPK
Date	01/15	01/15	01/15	01/15

No.	Revision Description	Engineer	Date

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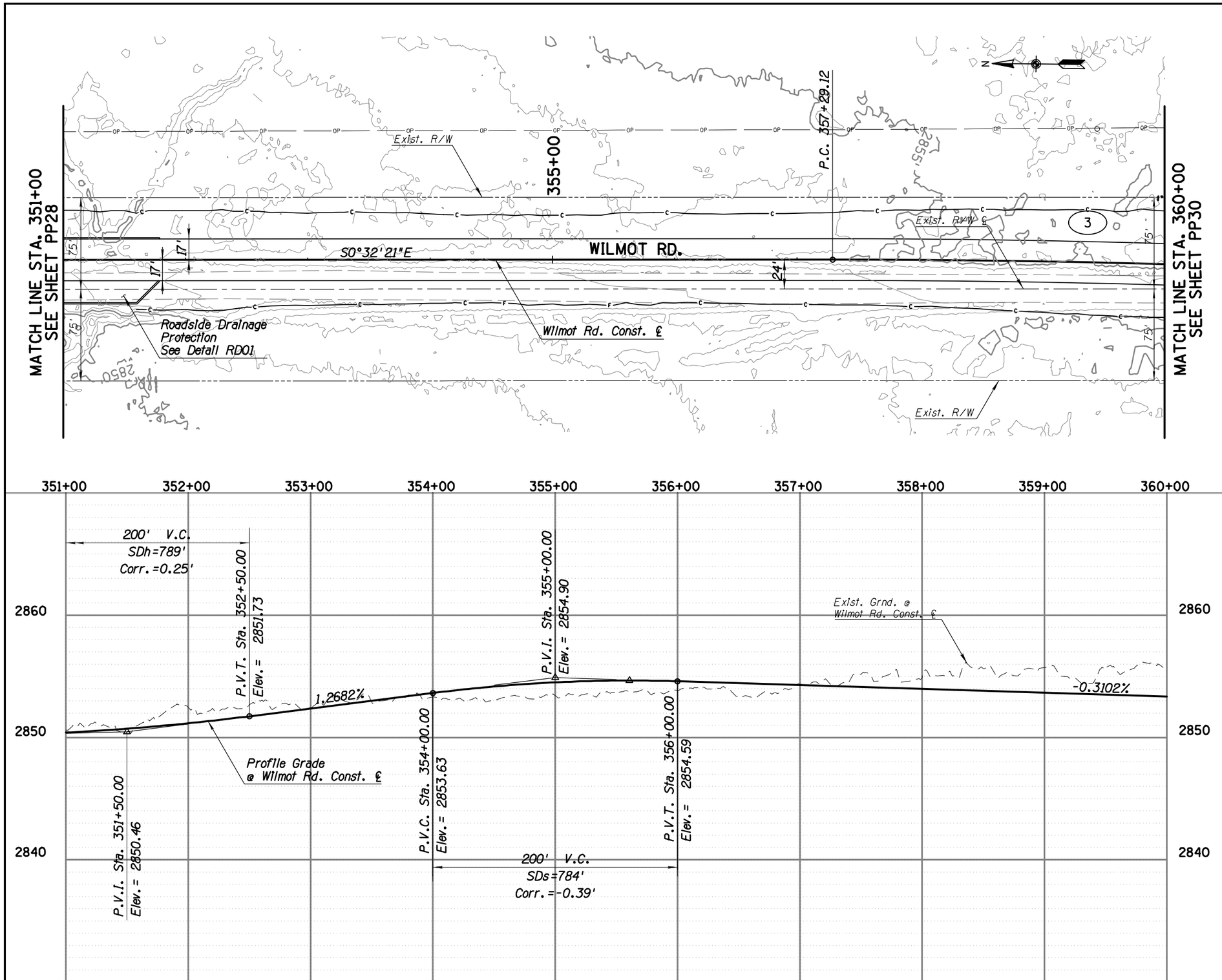
STA. 342+00 TO STA. 351+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP28 of PP42 | Page 36 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp28.dgn DATE: 1/16/2015 TIME: 5:16:17 PM KershnerM



3 CURVE DATA

PI Station 361+10.17

Main Curve
Δ=4°37'50" Rt
D=0°36'28"
R=9,425.00'
L=761.70'
T=381.06'
E=7.70'

Scale: 1" = 40' Horiz. 1" = 4' Vert.

Sheet PP29 of PP42

Page 37 of 52

Priscilla S. Cornelio, P.E. Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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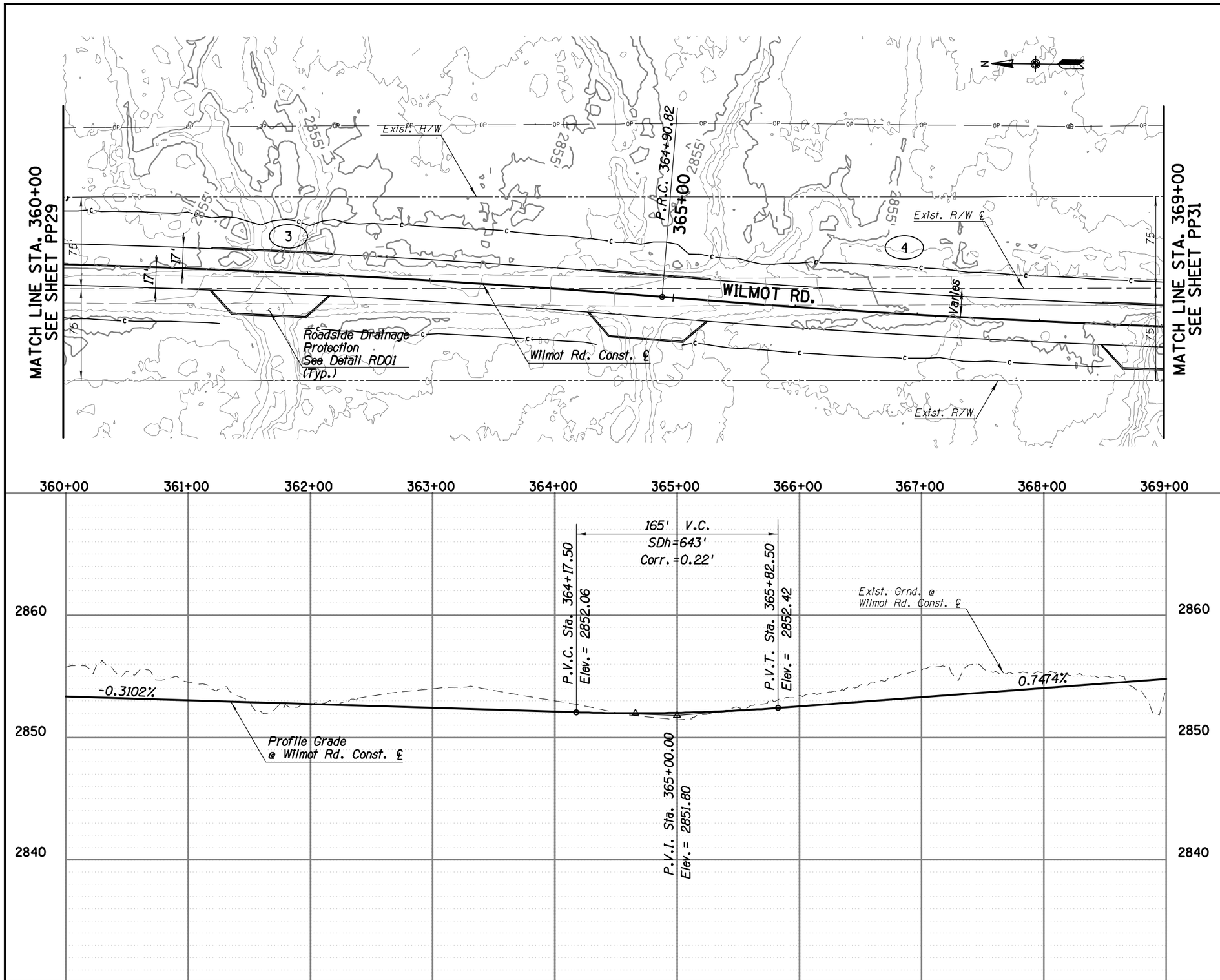
WILMOT ROAD
NORTH OF SAHUARITA ROAD
STA. 351+00 TO STA. 360+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp29.dgn DATE: 1/16/2015 TIME: 5:17:01 PM KershnerM



3 CURVE DATA

PI Station 361+10.17

Main Curve
Δ=4°37'50" Rt
D=0°36'28"
R=9,425.00'
L=761.70'
T=381.06'
E=7.70'

4 CURVE DATA

PI Station 368+72.60

Main Curve
Δ=4°38'21" Lt
D=0°36'28"
R=9,425.00'
L=763.14'
T=381.78'
E=7.73'

Priscilla S. Cornelio, P.E. Director

		Date
Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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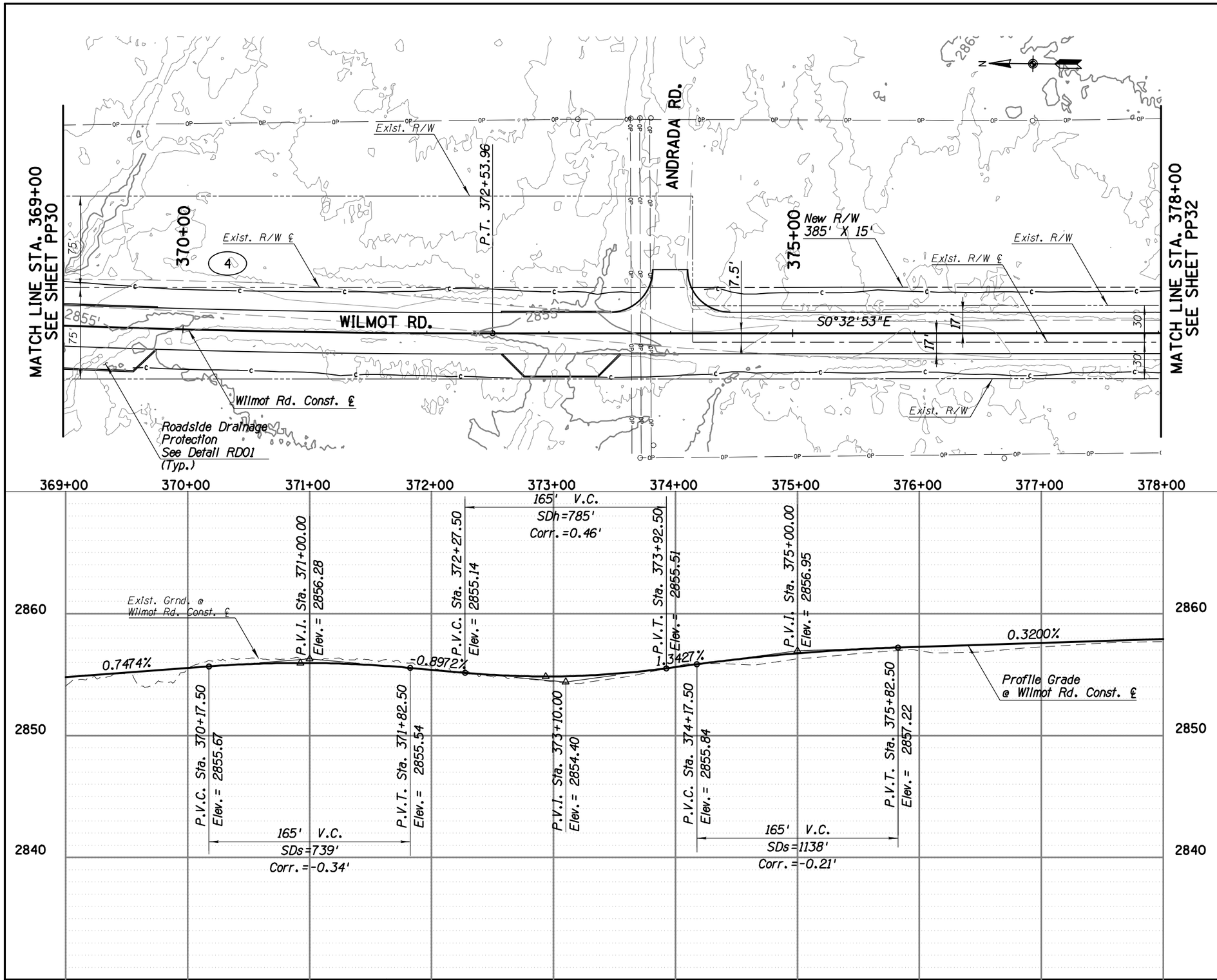
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP30 of PP42 | Page 38 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp30.dgn DATE: 1/16/2015 TIME: 5:17:44 PM KershnerM



(4) CURVE DATA

PI Station 368+72.60

Main Curve
Δ=4°38'21" Lt
D=0°36'28"
R=9,425.00'
L=763.14'
T=381.78'
E=7.73'

Priscilla S. Cornelio, P.E. Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE 1

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Pima County Department of Transportation

ROADWAY PLAN & PROFILE SHEET
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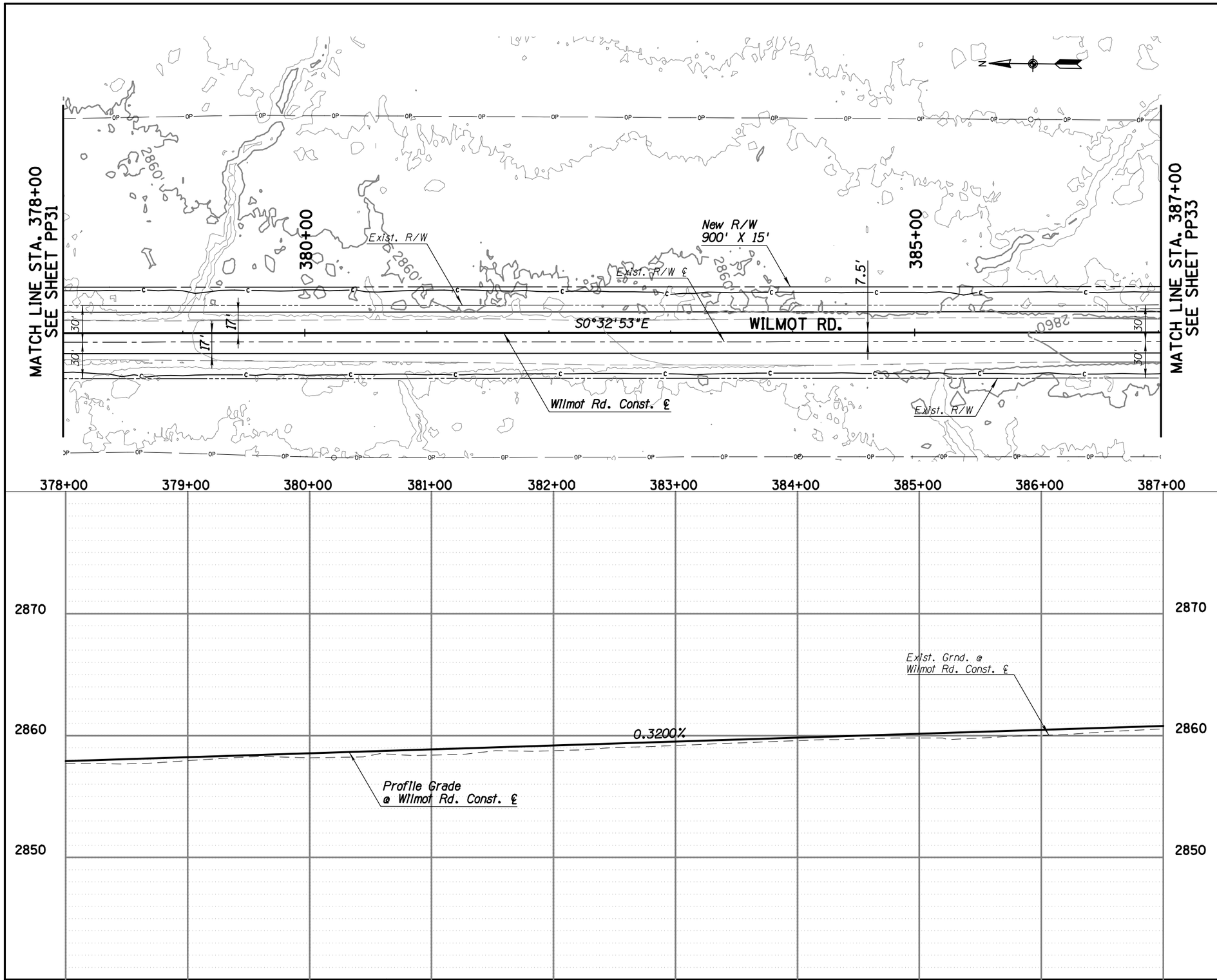
NORTH OF SAHUARITA ROAD
STA. 369+00 TO STA. 378+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP31 of PP42 | Page 39 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp31.dgn DATE: 1/16/2015 TIME: 5:18:30 PM KershnerM



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Priscilla S. Cornello, P.E., Director

Designed	MPK	01/15
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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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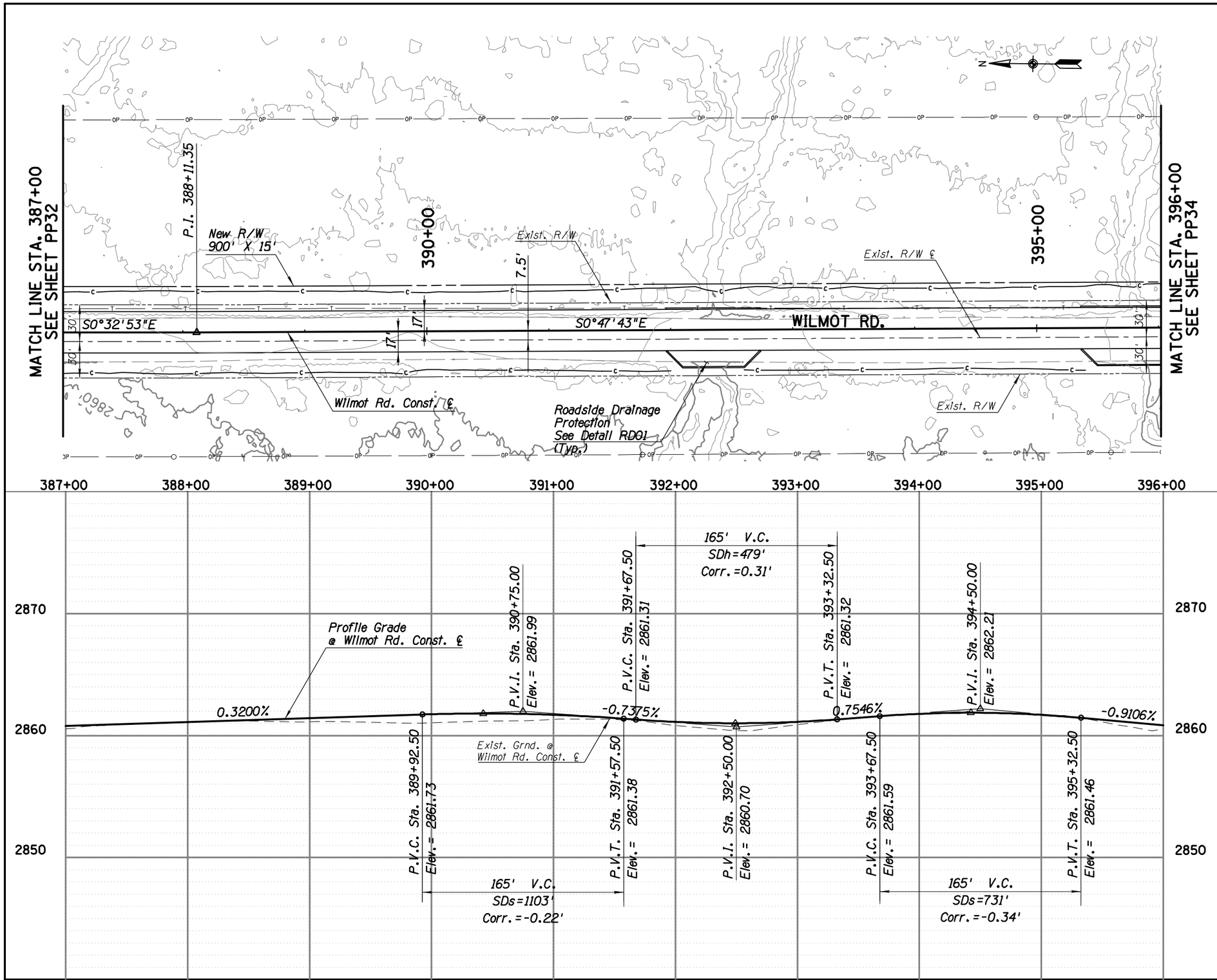
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP32 of PP42 | Page 40 of 52



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Priscilla S. Cornelio, P.E., Director

		Date
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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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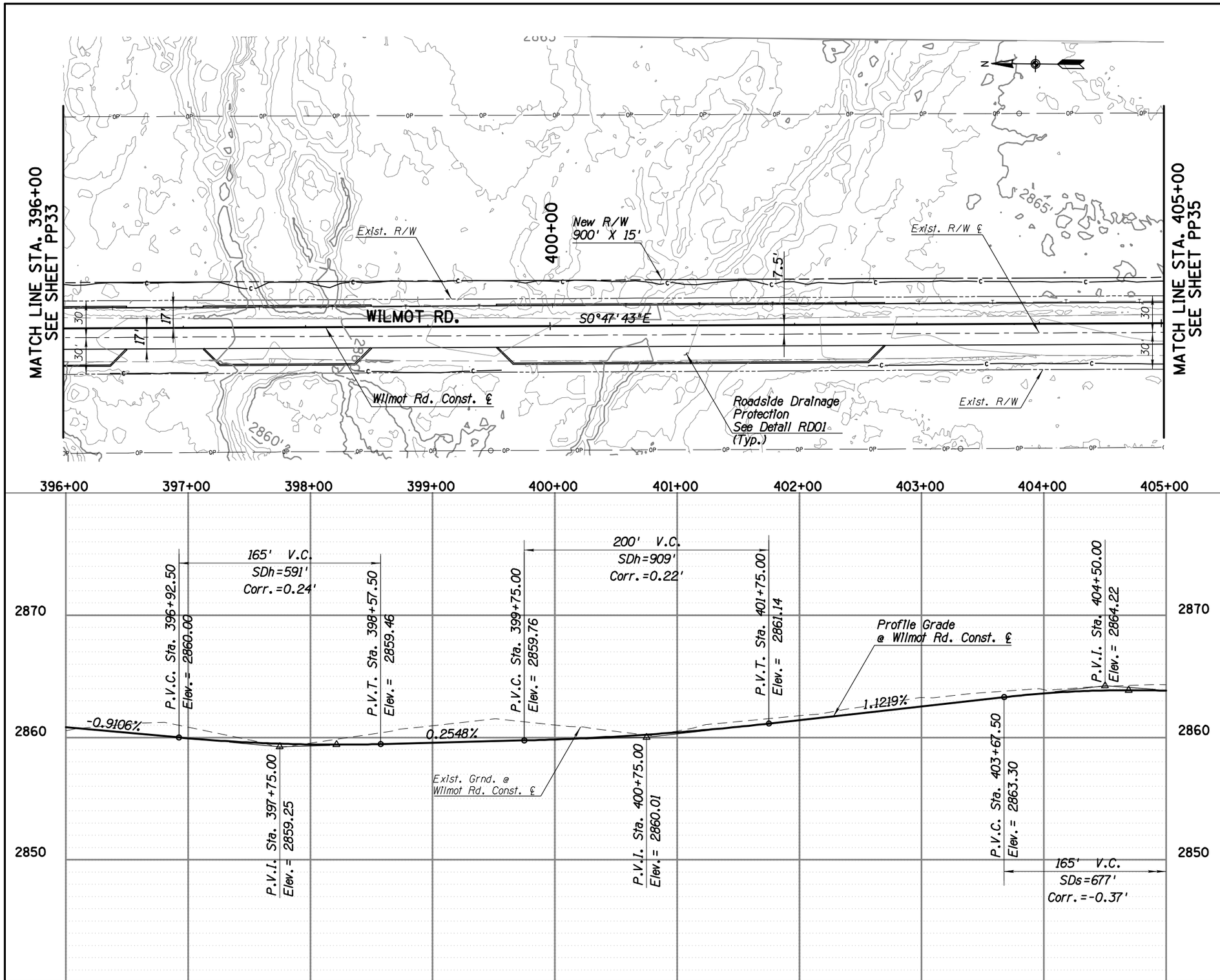
STA. 387+00 TO STA. 396+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP33 of PP42 | Page 41 of 52



Priscilla S. Cornelio, P.E., Director

		Date
Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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Pima County Department of Transportation

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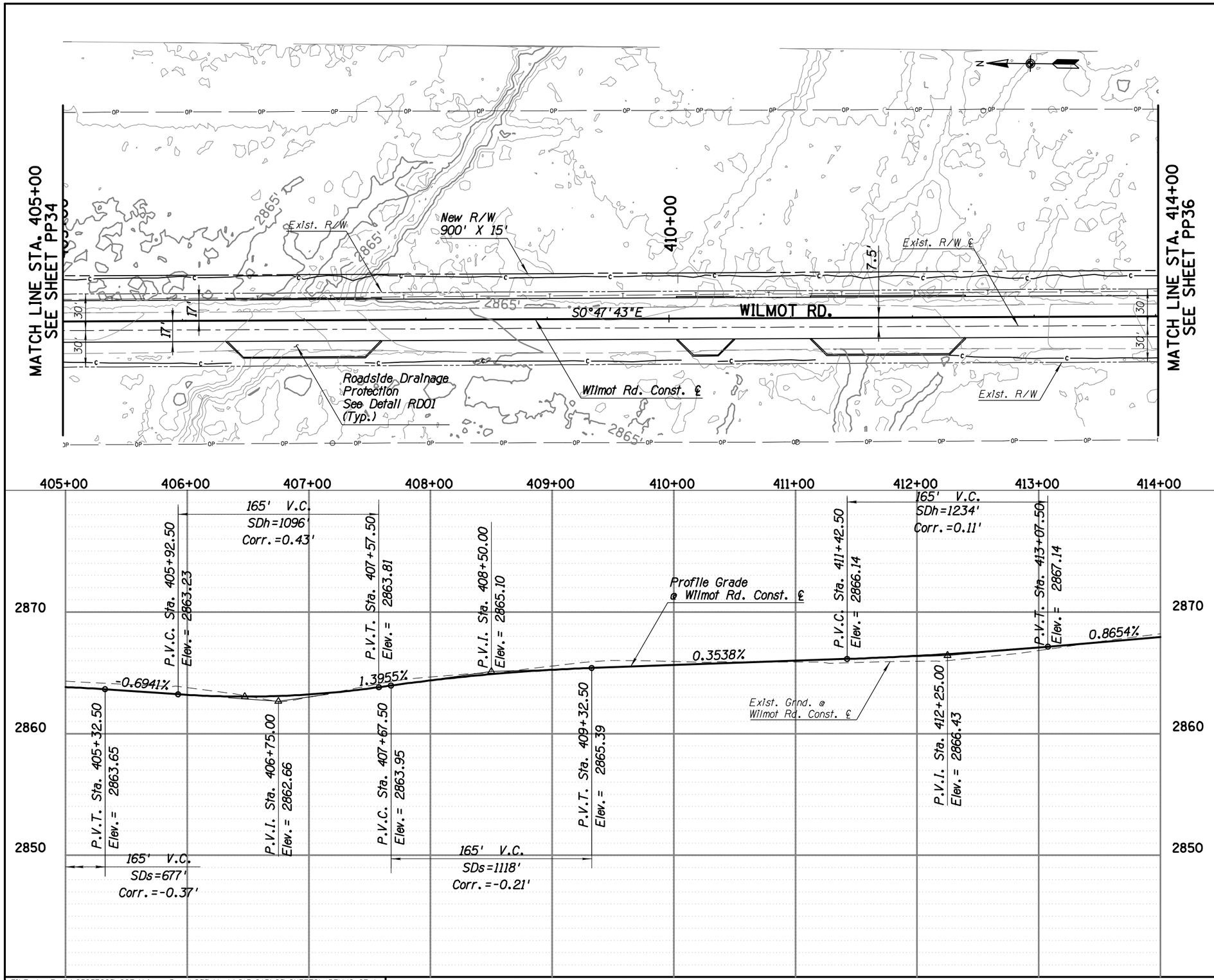
STA. 396+00 TO STA. 405+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP34 of PP42 | Page 42 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp34.dgn DATE: 1/16/2015 TIME: 5:21:23 PM KershnerM



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Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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Pima County Department of Transportation

ROADWAY PLAN & PROFILE SHEET
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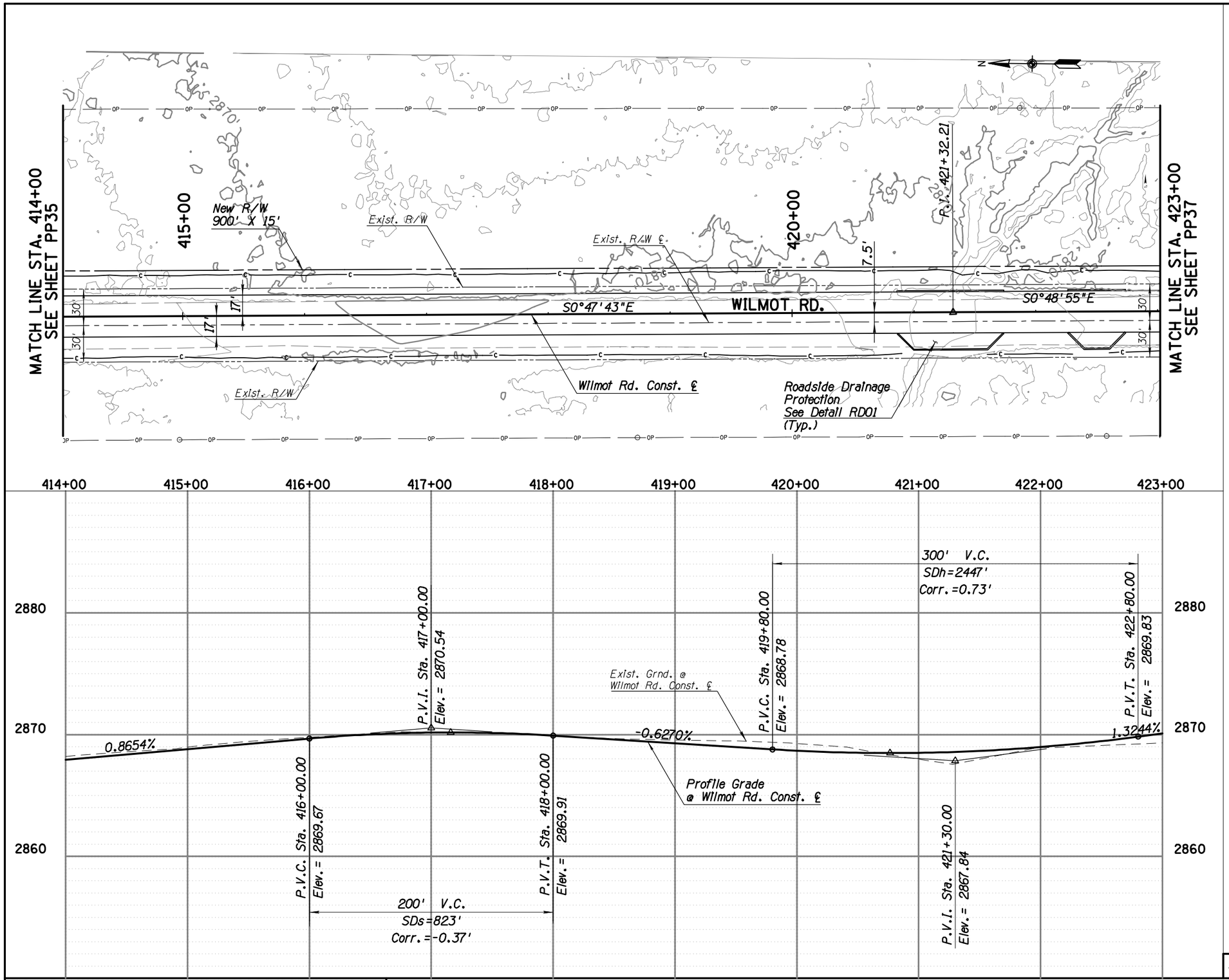
NORTH OF SAHUARITA ROAD
STA. 405+00 TO STA. 414+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP35 of PP42 | Page 43 of 52



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Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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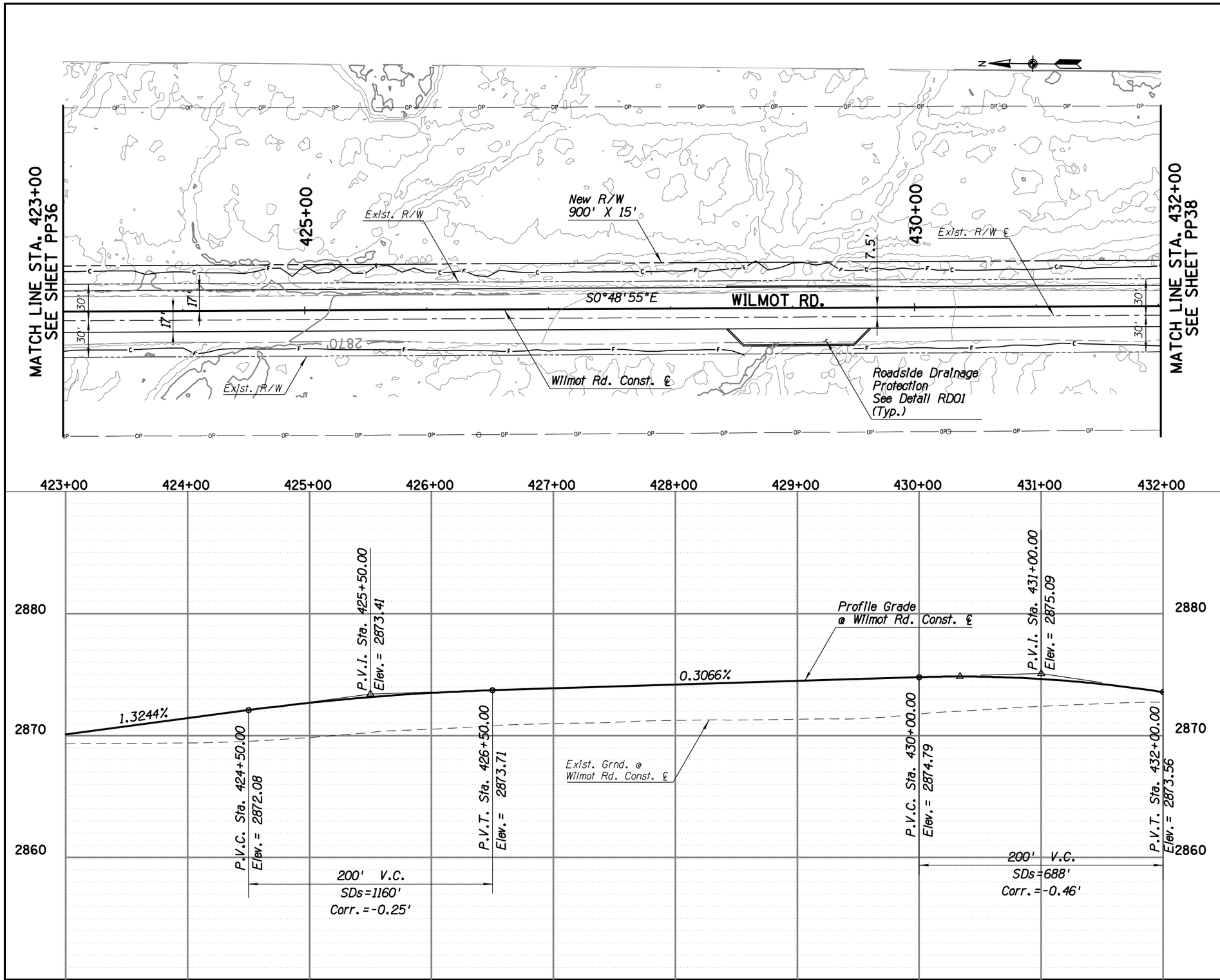
NORTH OF SAHUARITA ROAD
STA. 414+00 TO STA. 423+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP36 of PP42 | Page 44 of 52



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Priscilla S. Cornelio, P.E., Director

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Drawn	MPK	01/15
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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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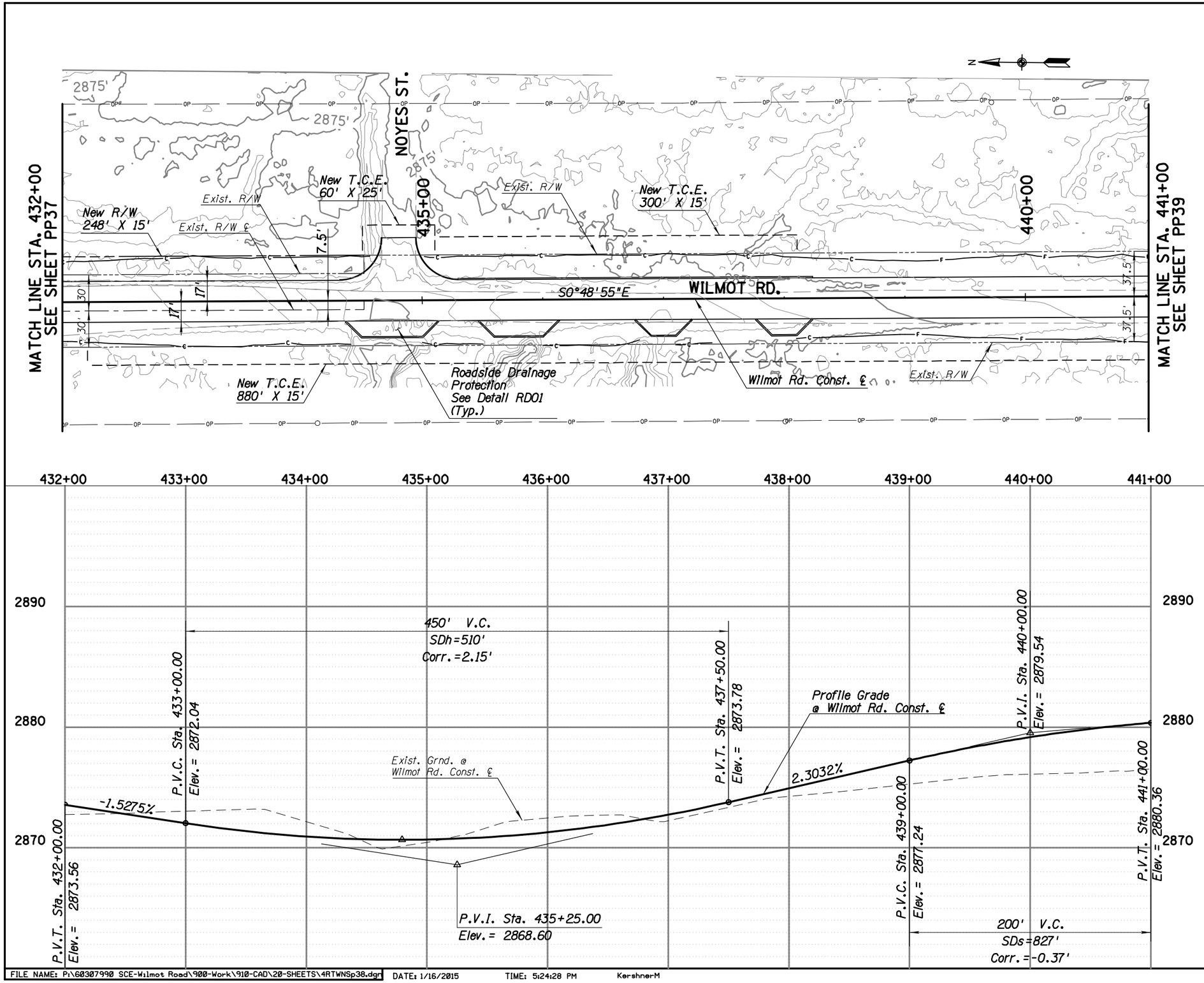
NORTH OF SAHUARITA ROAD
STA. 423+00 TO STA. 432+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP37 of PP42 | Page 45 of 52



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Priscilla S. Cornelio, P.E. Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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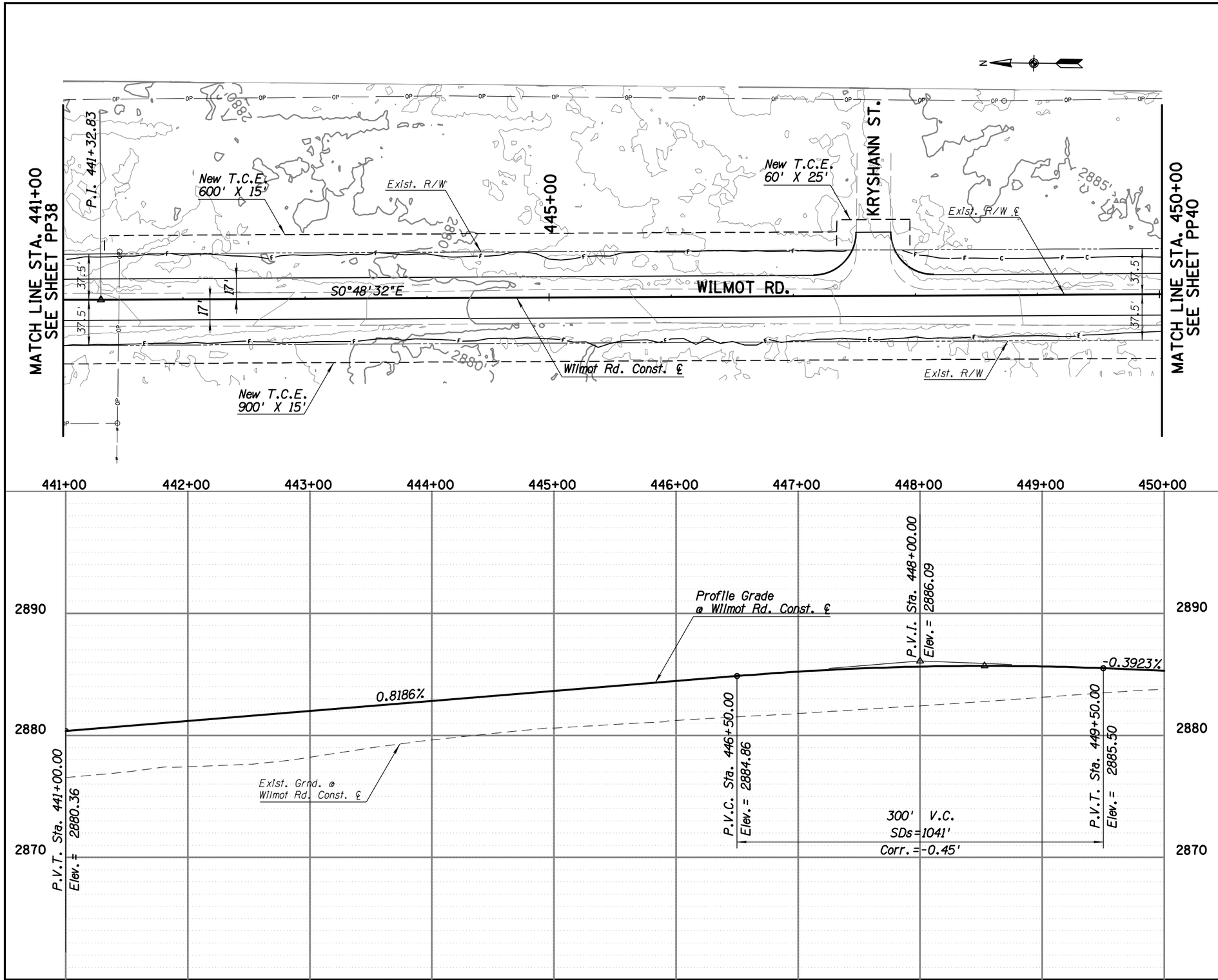
NORTH OF SAHUARITA ROAD
STA. 432+00 TO STA. 44+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scales: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP38 of PP42 | Page 46 of 52



Priscilla S. Cornelio, P.E. Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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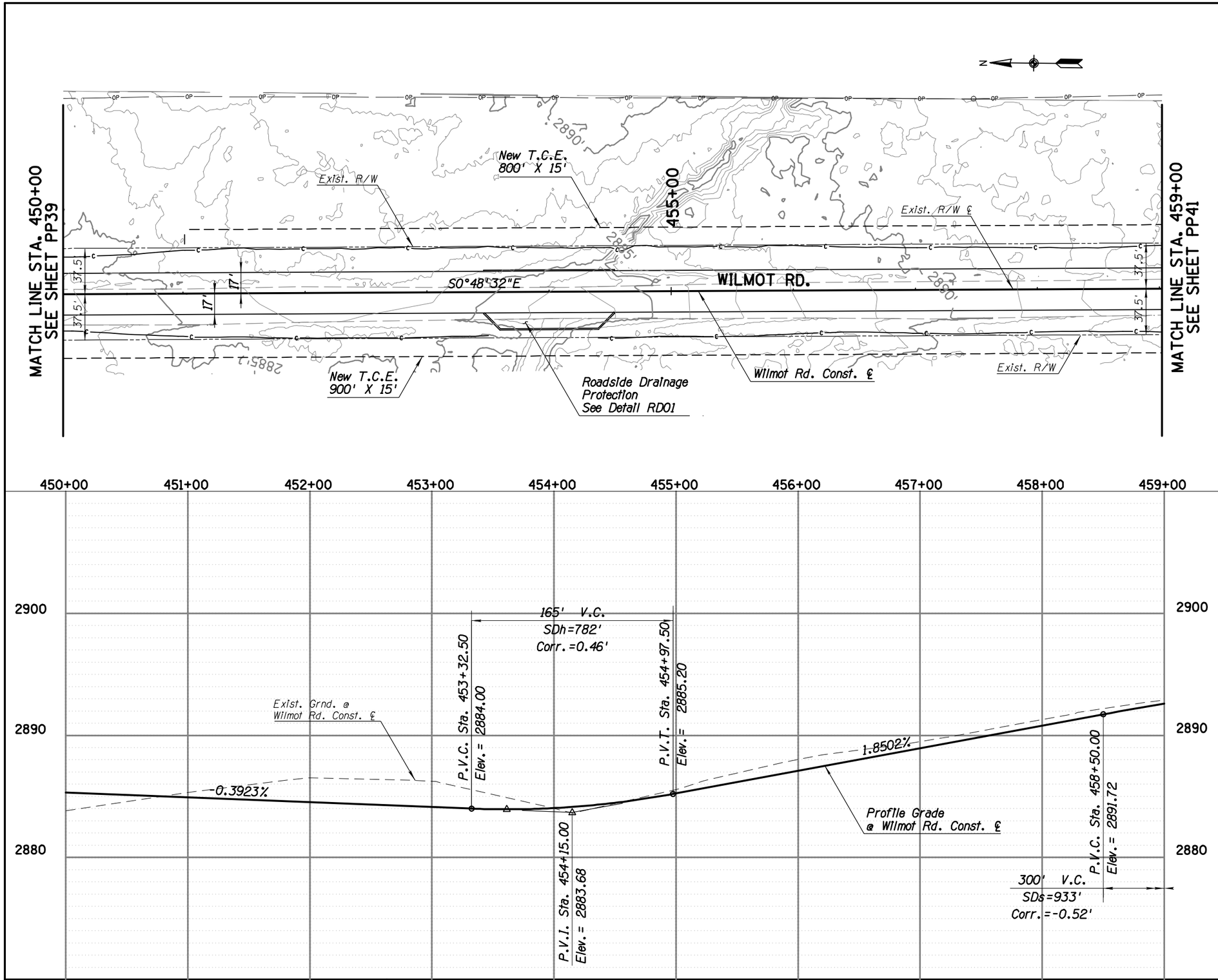
Pima County Department of Transportation

ROADWAY PLAN & PROFILE SHEET
WILMOT ROAD
NORTH OF SAHUARITA ROAD
STA. 441+00 TO STA. 450+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP39 of PP42 | Page 47 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp39.dgn DATE: 1/16/2015 TIME: 5:25:35 PM KershnerM



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Priscilla S. Cornello, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

PRELIMINARY NOT FOR CONSTRUCTION STAGE 1

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ROADWAY PLAN & PROFILE SHEET
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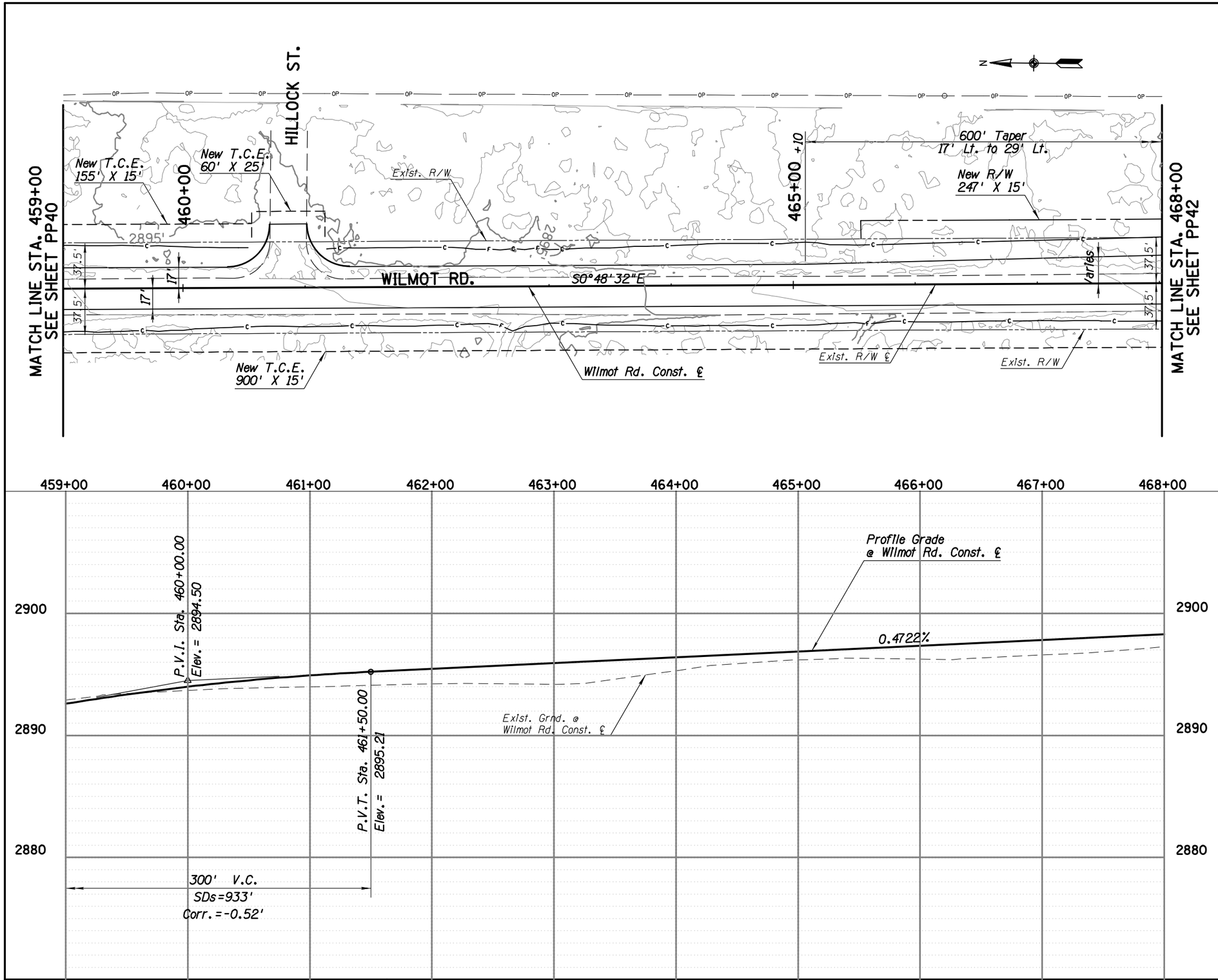
STA. 450+00 TO STA. 459+00
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP40 of PP42 | Page 48 of 52



Priscilla S. Cornelio, P.E. Director

No.	Revision Description	Engineer	Date

		Date
Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
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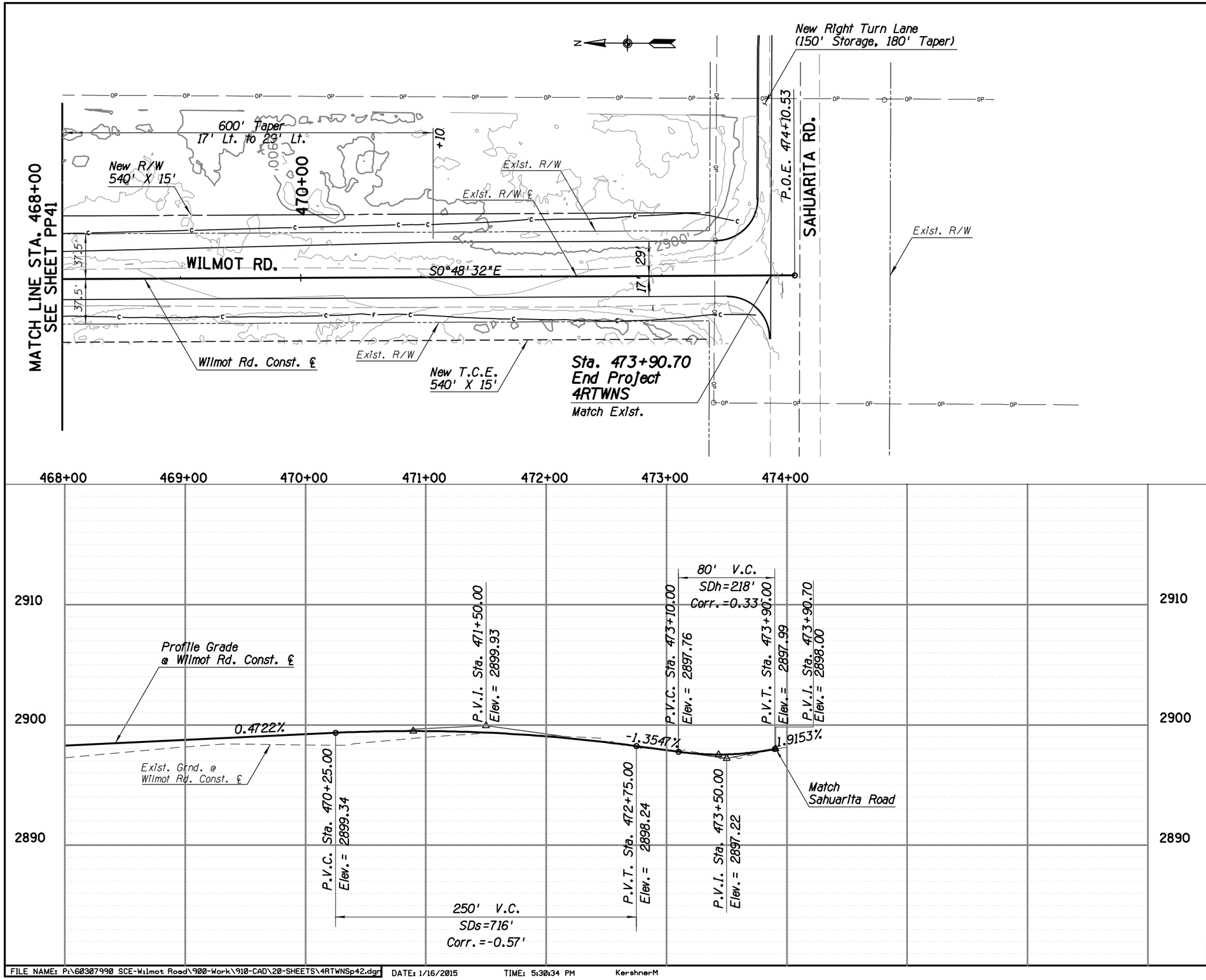
PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS

Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP41 of PP42 | Page 49 of 52

FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp41.dgn DATE: 1/16/2015 TIME: 5:41:06 PM KershnerM



FILE NAME: P:\60307990 SCE-Wilmot Road\900-Work\910-CAD\20-SHEETS\4RTWNSp42.dgn DATE: 1/16/2015 TIME: 5:30:34 PM KershnerM

Priscilla S. Cornello, P.E., Director

Designed	MPK	01/15
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Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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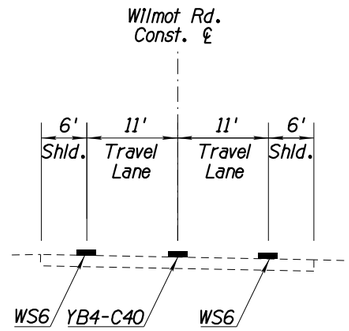
ROADWAY PLAN & PROFILE SHEET
WILMOT ROAD
NORTH OF SAHUARITA ROAD
STA. 468+00 TO STA. 473+91
PROJECT NO. 4RTWNS

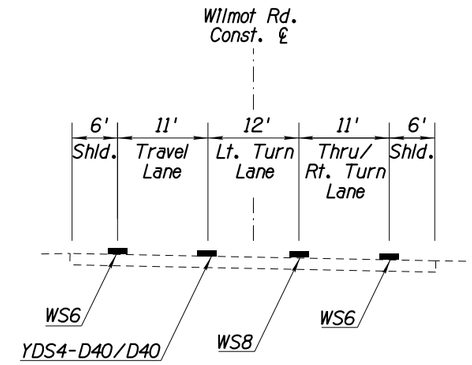
Scale: 1" = 40' Horiz. 1" = 4' Vert. | Sheet PP42 of PP42 | Page 50 of 52

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD – PROJECT NO. 4RTWNS



WILMOT ROAD

Pavement Marking Typical Section
Sta 100+00.00 to Sta xxx+xx.xx



WILMOT ROAD

Pavement Marking Typical Section
Sta xxx+xx.xx to Sta xxx+xx.xx

Priscilla S. Cornelio, P.E., Director

Designed	MPK	01/15
Drawn	MPK	01/15
Checked	MDB	01/15
Proj. Engr.	MPK	01/15

No.	Revision Description	Engineer	Date

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PAVEMENT MARKING SHEET
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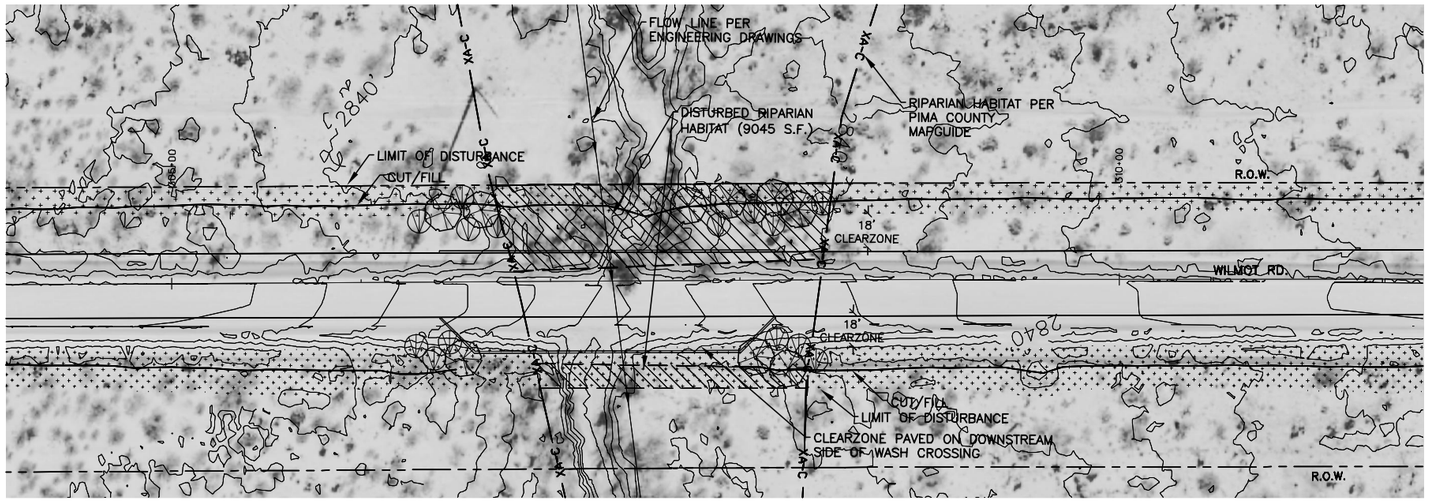
NORTH OF SAHUARITA ROAD

PROJECT NO. 4RTWNS

WILMOT ROAD IMPROVEMENTS, NORTH OF SAHUARITA ROAD - PROJECT NO. 4RTWNS

Scale:	N.T.S.	Sheet PM01 of PM01	Page 51 of 52

FILE NAME: $FILE$ DATE: $DATE$ TIME: $TIME$ $USERNAME$



TYPICAL LANDSCAPE PLAN

SCALE: 1" = 40'-0"

RIPARIAN/ESR REVEGETATION SCHEDULE

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	QUANTITY	# SLOW RELEASE DRI-WATER GEL PACS	NOTES
TREES						
	ACACIA CONSTRICTA	WHITETHORN ACACIA	30" TREE POT	XX	3	SEE DETAILS
	PARKINSONIA FLORIDA	BLUE PALO VERDE	30" TREE POT	XX	3	"
	PROSOPIS VELUTINA	VELVET MESQUITE	30" TREE POT	XX	3	"
SHRUBS						
	ACACIA GREGGII	CATCLAW ACACIA	15" TALL POT	XX	2	SEE DETAILS
	ATRIPLEX CANESCENS	FOUR-WING SALTBUSH	15" TALL POT	XX	2	"
	CELTIS PALLIDA	DESERT HACKBERRY	15" TALL POT	XX	2	"
	CONDALIA WARNOCKII	CONDALIA	15" TALL POT	XX	2	"
	LARREA DIVARICATA	CREOSOTE	15" TALL POT	XX	2	"
	LYCIUM ANDERSONII VAR. ANDERSONII	ANDERSON'S WOLFBERRY	15" TALL POT	XX	2	"
	ZIZYPHUS OBTUSIFOLIA	GRAYTHORN	15" TALL POT	XX	2	"

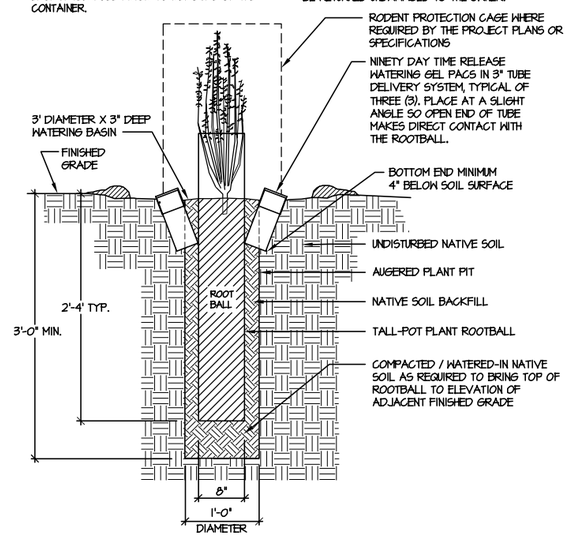
SEED-MIX - UPLAND

UPLAND SEED MIX
A* = SEED AVAILABLE

BOTANICAL NAME	COMMON NAME		POUNDS OF SEED (25 LB PLS/ACRE)
FORBS AND SUBSHRUBS			
BAILEYA MULTIRADIATA	DESERT MARIGOLD	A*	1 PLS/ACRE FOR EACH SPECIES LISTED FOR A TOTAL OF 16 PLS/ACRE
ENCELIA FARINOSA	BRITTLEBUSH	A*	
ERICAMERIA LARICIFOLIA	TURPENTINE BUSH	A*	
ESCHSCHOLZIA CALIFORNICA SSP. MEXICANA	MEXICAN GOLD POPPY	A*	
HYMENOCLEA MONOGYRA	BURROBRUSH	A*	
ISOCOMA TENUISECTA	BURROWEED	A*	
KALLSTROEMIA GRANDIFLORA	ARIZONA POPPY	A*	
LESQUERELLA GORDONNI	GORDON'S BLADDERPOD	A*	
LUPINUS SPARSIFLORUS SSP. MOHAVENSIS	COULTER'S LUPINE	A*	
PENSTEMON PARRYI	PARRY'S PENSTEMON	A*	
PHACELIA DISTANS	BLUE PHACELIA	A*	
SALVIA COLUMBARIAE	CHIA	A*	
SENNA COVESII	DESERT SENNA	A*	
SPHAERALCEA SPP. (S. AMBIGUA S. LAXA AND/OR S. EMORYI)		A*	
VERBENA GOODDINGII	GOODING'S VERBENA	A*	
ZINNIA PUMILA	DESERT ZINNIA	A*	
GRASSES			
ARISTIDA PURPUREA	PURPLE THREEAWN	A*	AT LEAST 9 SPECIES FROM THIS CATEGORY FOR A MINIMUM 9 PLS/ACRE.
ARISTIDA TERNIPES	SPIDER GRASS	A*	
BOTHRIOCHLOA BARBINODIS	CANE BEARDGRASS	A*	
BOUTELOUA ARISTIDOIDES	NEEDLE GRAMA	A*	
BOUTELOUA CURTIPENDULA	SIDEOATS GRAMA	A*	
BOUTELOUA ROTHROCKII	ROTHROCK GRAMA	A*	
CHLORIS VERGATA	FEATHER FINGERGRASS	A*	
LEPTOCHLOA DUBIA	GREEN SPRANGLE TOP	A*	
MUHLENBERGIA PORTERI	BUSH MUHLY	A*	
SETARIA MACROSTACHYA	PLAINS BRISTLEGRASS	A*	
SPOROBOLUS AIROIDES	ALKALI SACATON	A*	
SPOROBOLUS CRYPTANDRUS	SAND DROPSEED	A*	

NOTES:

1. EXCAVATED PLANT PITS SHALL BE FILLED WITH WATER AND ALLOWED TO DRAIN THREE TIMES PRIOR TO THE PLANTING OF THE TALL-POT NURSERY STOCK.
2. REMOVE TALL-POT BOTTOM SCREEN PRIOR TO THE START OF PLANTING OPERATIONS.
3. THE PLANT ROOTBALL AND TALL-POT CONTAINER SHALL BE INSERTED INTO THE EXCAVATED HOLE PRIOR TO REMOVAL OF THE CONTAINER.
4. AFTER INSTALLATION IN THE PIT, THE TALL-POT CONTAINER SHALL BE CAREFULLY REMOVED FROM THE ROOTBALL BY RAISING THE CONTAINER WITH HAY-HOOKS OR OTHER APPROPRIATE EQUIPMENT.
5. AFTER REMOVAL FROM THE CONTAINER, THE PLANT SHALL BE BACKFILLED WITH NATIVE SOIL AND WATERED-IN TO PREVENT SETTLEMENT.
6. THE TALL-POT CONTAINERS AND SCREENS SHALL BE RETURNED UNDAMAGED TO THE OWNER.



1 TALL POT PLANTING DETAIL

SCALE: N.T.S.

NOTE:

PLANT NUMBERS SHOWN ON TYPICAL SHEET WERE CALCULATED USING THE TOTAL NUMBER OF DISTURBED RIPARIAN HABITAT AREAS (27) AND DIVIDING BY THE TOTAL REQUIRED MITIGATION PLANT QUANTITIES FROM ATTACHED SPREADSHEETS.

230/27 = 9 TREES PER DISTURBED AREA
356/27 = 14 SHRUBS PER DISTURBED AREA

DISTRIBUTION WILL VARY DEPENDING ON THE SIZE OF THE AREA DISTURBED

TYPICAL PLAN PROPOSES THE USE OF TREE POTS WITH DRI-WATER GEL PACS RATHER THAN IRRIGATED 15 GAL AND 5 GAL TREES. THIS WILL NEED TO BE DISCUSSED WITH REVIEWERS BEFORE COMPLETION OF ROADWAY PLANS.

ESTIMATED COUNT OF ESR PLANTS DISTURBED IN PROJECT AREA = 300
COUNT MADE USING AERIAL PHOTOS AND DISTURBANCE LIMIT PROVIDED BY THE ENGINEER. THERE ARE NO SAGUARO WITHIN THE PROJECT LIMIT.

IN-LIEU FEE CALCULATION SPREADSHEET

DOWNLOADED FROM THE PIMA COUNTY FLOOD CONTROL DISTRICT WEBSITE

Calculating In-Lieu Fee Costs for Commercial and Sudivision Development

Shaded fields are editable - Enter value in Acres

			Option to basic requirement (Xeroriparian)****	
Xeroriparian Class B Habitat (XB)*				
Total mapped habitat onsite		0.55 Acre(s)		
Area of disturbed RRH		0.40 Acre(s)		
% of mapped habitat disturbed		73% Acre(s)		
Area of mitigation		0.40 Acre(s)		
Total number of trees required (60 trees/ac)	60	24 Trees	19	Trees
Total number of shrubs required (80 shrubs/ac)	80	32 Shrubs	26	Shrubs
Xeroriparian Class C Habitat (XC)*				
Total mapped habitat onsite		4.60 Acre(s)		
Area of disturbed RRH		1.81 Acre(s)		
Area of mitigation		1.81 Acre(s)		
Total number of trees required (45 trees/ac)	45	81 Trees	65	Trees
Total number of shrubs required (70 shrubs/ac)	70	126.7 Shrubs	101	Shrubs
Xeroriparian Class D Habitat (XD)*				
Total mapped habitat onsite		2.38 Acre(s)		
Area of disturbed RRH		0.71 Acre(s)		
Area of mitigation		0.71 Acre(s)		
Total number of trees required (30 trees/ac)	30	21.3 Trees	17	Trees
Total number of shrubs required (x shrubs/ac)*	50	35.5 Shrubs	28	Shrubs

ILF calculation		
15-gallon trees	64	$4,764.44
5-gallon trees	63	$1,728.00
5-gallon shrubs	98	$2,212.00
1-gallon shrubs	97	$1,139.75
Hydroseed	3 Acre(s)	$10,176.20
Irrigation	3 Acre(s)	$2,953.26
5-year maintenance	3 Acre(s)	$4,429.89
Monitoring Report	5 Years	$22,500.00
Total Cost		**$49,903.54**
If 20% of RRH is exceeded (add 5% surcharge)* **		**$52,398.72**
If 40% of RRH is exceeded (add 10% surcharge)* **		**$57,638.59**
If 60% of RRH is exceeded (add 20% surcharge)* **		**$69,166.31**

Calculating In-Lieu Fee Costs for Commercial and Subdivision Development

Shaded fields are editable - Enter value in Acres

IRA w/ Underlying Xeroriparian Class C Habitat (IRA/XC)*					
Total mapped habitat onsite		8.06 Acre(s)			
Area of disturbed RRH		2.39 Acre(s)			
% of mapped habitat disturbed		30% Acre(s)			
Area of mitigation		3.59 Acre(s)			
Total number of trees required (45 trees/ac)	45	161 Trees	129	na	Trees
Total number of shrubs required (70 shrubs/ac)	70	251 Shrubs	201	na	Shrubs

ILF Calculation			
15-gallon trees	81		$6,030.00
5-gallon trees	80		$2,194.29
5-gallon shrubs	126		$2,844.00
1-gallon shrubs	125		$1,468.75
Hydroseed	3.59	Acre(s)	$12,511.15
Irrigation	3.59	Acre(s)	$3,761.11
5-year maintenance	3.59	Acre(s)	$5,641.67
Monitoring Report	5	Years	$26,925.00
Total Cost			**$61,375.96**
If 20% of RRH is exceeded (add 5% surcharge)* **			**$64,444.76**
If 40% of RRH is exceeded (add 10% surcharge)* **			**$70,889.24**
If 60% of RRH is exceeded (add 20% surcharge)* **			**$85,067.08**

Priscilla S. Cornelio, P.E., Director

No.	Revision Description	Engineer	Date

		Date
Designed	DDS	1/15
Drawn	PJB	1/15
Checked	SRM	1/15
Proj. Engr.	DDS	1/15

15% SUBMITTAL
APRIL 2014

McGann & Associates
Landscape Architects and Planners
4151 N. Mesa, Suite E-210
Tucson, Arizona 85704
Telephone: (520) 297-9540 Fax: (520) 297-9545

Arizona Blue Stake
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Call Two Working Days Before You Dig

Pima County Department of Transportation

ROADWAY PLAN & PROFILE SHEET
WILMOT ROAD
NORTH OF SAHUARITA ROAD
PROJECT NO. 4RTWNS

TYPICAL LANDSCAPE PLAN

Scale: 1"= 40' Horiz | Sheet L1 of LX | Page 52 of 52

SCHLESINGER CONSULTING ENGINEERING, PLLC

Appendix II
Cost Estimate

February 2015

WILMOT ROAD, NORTH OF SAHUARITA ROAD
30% COST ESTIMATE

Date: 1/16/2015

	ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	AMOUNT
1	1010010	FUEL ADJUSTMENT ALLOWANCE	USD	35,000	$1.00	$35,000.00
2	2010011	CLEARING AND GRUBBING	ACRE	37	$5,000.00	$185,824.00
3	2010004	PRESERVATION FENCING	L.F.	12,000	$2.00	$24,000.00
4	2010010	CLEARING AND GRUBBING (NOXIOUS AND INVASIVE SPECIES CONTROL ALLOWANCE)	USD	20,000	$1.00	$20,000.00
5	2030300	ROADWAY EXCAVATION	C.Y.	102,096	$12.00	$1,225,152.00
6	2030401	DRAINAGE EXCAVATION	C.Y.	1,500	$8.00	$12,000.00
7	3040001	CEMENT-TREATED BASE	C.Y.	47,735	$30.00	$1,432,050.00
8	4060002	ASPHALTIC CONCRETE (NO. 2)	TON	15,989	$80.00	$1,279,120.00
9	4060510	BITUMINOUS MATERIAL PRICE ADJUSTMENT ALLOWANCE	USD	35,000	$1.00	$35,000.00
10	5150005	UTILITY POTHOLING, DEPTH <12'	EACH	10	$300.00	$3,000.00
11	5150007	UTILITY POTHOLING, DEPTH ≥12'	EACH	10	$400.00	$4,000.00
12	5150101	UTILITY IMPACT ALLOWANCE	USD	10,000	$1.00	$10,000.00
13	7010001	MAINTENANCE AND PROTECTION OF TRAFFIC (5%)	L.S.	1	$253,022.00	$253,022.00
14	7010005	TRAFFIC CONTROL (3%)	L.S.	1	$151,813.00	$151,813.00
15	7010007	CONSTRUCTION AREA ELEMENTS (PREDETERMINED REIMBURSEMENT RATE ALLOWANCE)	USD	25,000	$1.00	$25,000.00
16	60700XX	SIGNING	L.S.	1	$25,000.00	$25,000.00
17	70400XX	PAVEMENT MARKING	L.S.	1	$110,000.00	$110,000.00
18	80600XX	LANDSCAPE (4%)	L.S.	1	$202,418.00	$202,418.00
19	81000XX	SWPPP (2%)	L.S.	1	$101,209.00	$101,209.00
20	9010001	MOBILIZATION (6%)	L.S.	1	$303,627.00	$303,627.00
21	9080402	CONCRETE HEADER	L.F.	550	$15.00	$8,250.00
22	9080504	CONCRETE FORD WALL (1'x4')	L.F.	9,946	$50.00	$497,300.00
23	9090002	SURVEY MONUMENT	EACH	19	$250.00	$4,750.00
24	9130001	RIPRAP (DUMPED)	C.Y.	1,000	$75.00	$75,000.00
25	9250001	CONSTRUCTION SURVEYING AND LAYOUT (2%)	L.S.	1	$101,209.00	$101,209.00
26	9260001	ENGINEER'S FIELD OFFICE	L.S.	1	$20,000.00	$20,000.00
27	9300100	INCIDENTAL ITEMS ALLOWANCE	USD	30,000	$1.00	$30,000.00
		ROADWAY TOTAL				**$6,173,744.00**
		ENGINEERING DESIGN				$750,000.00
		CONTINGENCIES (20%)				$1,234,749.00
		UTILITY RELOCATION WORK				$100,000.00
		RIGHT-OF-WAY				$204,544.00
		POST DESIGN SERVICES (1%)				$61,737.00
		CONSTRUCTION ADMINISTRATION (15%)				$926,062.00
		TOTAL PROJECT COST				**$9,450,836.00**

SCHLESINGER CONSULTING ENGINEERING, PLLC

Appendix III
Pavement Structure Alternatives

February 2015

Alternative No.	Grading Treatment	Subgrade Treatment			Surface and Base Treatment			Results		
	Roadway Excavation	Subgrade Removal and Replacement	Cement Treated Subgrade	GeoGrid	Aggregate Base	Asphaltic Concrete	Chip Seal	Resultant ESAL Capacity	Cost	Cost/ ESAL Capacity
1	RE1. Excavate to the bottom of aggregate base	SGRR 1. Remove and Replace Subgrade to raise min. R value to 15			AB1. 6"	AC1. 3"		53,603	$4,712,097	$87.91
2	RE1. Excavate to the bottom of aggregate base	SGRR 1. Remove and Replace Subgrade to raise min. R value to 15			AB2. 5"	AC2. 4"		132,433	$5,186,209	$39.16
3	RE1. Excavate to the bottom of aggregate base	SGRR 1. Remove and Replace Subgrade to raise min. R value to 15		G1. Place Bi-axial Geo-grid Raise R-value to 25.	AB1. 6"	AC1. 3"		151,221	$5,545,162	$36.67
4	RE1. Excavate to the bottom of aggregate base	SGRR 1. Remove and Replace Subgrade to raise min. R value to 15		G1. Place Bi-axial Geo-grid Raise R-value to 25.	AB2. 5"	AC2. 4"		374,520	$6,019,274	$16.07
5	RE1. Excavate to the bottom of aggregate base	SGRR 2. Remove and Replace Subgrade to raise min. R value to 20			AB1. 6"	AC1. 3"		94,234	$4,747,653	$50.38
6	RE1. Excavate to the bottom of aggregate base	SGRR 2. Remove and Replace Subgrade to raise min. R value to 20			AB2. 5"	AC2. 4"		232,898	$5,221,765	$22.42
7	RE1. Excavate to the bottom of aggregate base	SGRR 2. Remove and Replace Subgrade to raise min. R value to 20		G1. Place Bi-axial Geo-grid Raise R-value to 25.	AB1. 6"	AC1. 3"		232,722	$5,580,718	$23.98
8	RE1. Excavate to the bottom of aggregate base	SGRR 2. Remove and Replace Subgrade to raise min. R value to 20		G1. Place Bi-axial Geo-grid Raise R-value to 25.	AB2. 5"	AC2. 4"		575,501	$6,054,830	$10.52
9	RE2. Excavate to finish	SGRR 1. Remove and Replace Subgrade to raise min. R value to 15	CTS2. 9"				CS1. Dbl. Shot	42,438	$3,138,017	$73.94
10	RE2. Excavate to finish	SGRR 1. Remove and Replace Subgrade to raise min. R value to 15	CTS3. 12"				CS1. Dbl. Shot	230,612	$3,412,928	$14.80
11	RE2. Excavate to finish	SGRR 2. Remove and Replace Subgrade to raise min. R value to 20	CTS2. 9"				CS1. Dbl. Shot	74,627	$3,173,573	$42.53
12	RE2. Excavate to finish	SGRR 2. Remove and Replace Subgrade to raise min. R value to 20	CTS3. 12"				CS1. Dbl. Shot	405,505	$3,448,484	$8.50
13	RE2. Excavate to finish	SGRR 1. Remove and Replace Subgrade to raise min. R value to 15	CTS3. 12"			AC3. 2"		1,338,753	$5,920,244	$4.42
14	RE2. Excavate to finish	SGRR 2. Remove and Replace Subgrade to raise min. R value to 20	CTS3. 12"			AC3. 2"		2,353,805	$5,955,798	$2.53