




INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

Clark County Signals Study
Final Tech Memo


Appendix B: Roadway Design Criteria Documents




ROADWAY DESIGN CRITERIA DOCUMENT

Road Name:	Bird Road		
PID #	NA		
DLZ Project #	1321/1005/03		
Prepared By:	David Lee		
Date:	7/14/2014		
Checked By:			
Date:			
Date of Last L&D Update:	1/17/2014		
Design Exceptions:		PENDING ANALYSIS	
ITEM	CRITERIA	L&D LOCATION	COMMENTS
GENERAL EXISTING INFORMATION			
Legal Speed	35 MPH		
Design Speed	40 MPH		
Functional Classification	Major Collector		
Locale (Rural or Urban)	Rural		
National Highway System (NHS)	No		
HORIZONTAL ALIGNMENT			
Maximum Centerline Deflection Without Curve	2° 05'	Figure 202-1E	
Maximum Degree of Curve	12° 45'	Figure 202-2E	
Maximum Curve Without a Spiral	N/A	Figure 202-11E	
Maximum Pavement Transition/Taper Rates	26.67:1	Section 301.1.4	L = WS ² /60.
Maximum Diverging Taper Rates	5:1	Section 301.1.4	
Allowable Intersection Angles	70° to 90°	Section 401.3	
VERTICAL PROFILE			
Maximum Grades	7-10% (Level to Hilly)	Figure 203-1E	Rural Collector
Grades 1% steeper may be used-see figure notes.		Figure 203-1E	Extreme cases
Minimum Grades	Flat	Section 203.2.2	Flat grades are acceptable on uncurbed pavements
VERTICAL CURVES			
Maximum Grade Change Without Vertical Curve	0.75%	Figure 203-2E	
Crest Curve Design K	Min = 44	Figure 203-3E	
Crest Curve Design Stopping Sight Distance	Min = 305	Figure 203-3E	
Crest Curve- Minimum Length	120'	Section 203.3.3	
Sag Curve Design K	Min = 64	Figure 203-6E	
Sag Curve Design Stopping Sight Distance	Min = 305'	Figure 203-6E	
Sag Curve- Minimum Length	120'	Section 203.3.4	
SUPERELEVATION			
Maximum Degree of Curve Without Superelevation	1° 08'	Figure 202-3E	Low Speed Rural
Max. Design Superelevation Rate	ed = 0.080	Figure 202-7E	Rural Highways
Superelevation Transitions	See ODOT L&D, Vol 1	Figure 202-4E & 202-8E	Urban Highways
Method of Superelevation	See ODOT L&D, Vol 1	Figure 202-5dE	50% to 70% on Tangent
TYPICAL SECTION			
Minimum Lane Width	12'	Figure 301-2E	Rural collector >2000 adt
Normal Pavement Cross Slope	0.016	Section 301.1.5	
Graded Shoulder Width	8' / 11'	Figure 301-3E	With out / With Barrier
Treated Shoulder Width	4'	Figure 301-3E	
Median	N/A		
Clear Zone Width-Foreslopes	13' (6:1 or Flatter)	Figure 600-1E	ADT 1501-6000
	15' (Steeper than 6:1 to 4:1)	Figure 600-1E	
Clear Zone Width-Backslopes	13' (6:1 or Flatter)	Figure 600-1E	
	13' (Steeper than 6:1 to 4:1)	Figure 600-1E	
	13' (Steeper than 4:1)	Figure 600-1E	
Type of Grading	Clear Zone	Section 307.2.1	Figure 307-3E
Fill Slope	4:1/3:1 max	Figure 307-3E	2:1 Max with Barrier
Cut Slope	4:1/3:1 max	Figure 307-3E	2:1 Max with Barrier
Guardrail Offset from Traveled Way	8'	Figure 301-3E	


ROADWAY DESIGN CRITERIA DOCUMENT

Road Name:	Old Columbus Road		
PID #	NA		
DLZ Project #	1321/1005/03		
Prepared By:	David Lee		
Date:	7/14/2014		
Checked By:			
Date:			
Date of Last L&D Update:	1/17/2014		
Design Exceptions:		PENDING ANALYSIS	
ITEM	CRITERIA	L&D LOCATION	COMMENTS
GENERAL EXISTING INFORMATION			
Legal Speed	40 MPH		55 MPH east of intersection
Design Speed	40 MPH		
Functional Classification	Major Collector		Urban Collector west of intersection
Locale (Rural or Urban)	Rural		
National Highway System (NHS)	No		
HORIZONTAL ALIGNMENT			
Maximum Centerline Deflection Without Curve	2° 05'	Figure 202-1E	
Maximum Degree of Curve	12° 45'	Figure 202-2E	
Maximum Curve Without a Spiral	N/A	Figure 202-11E	
Maximum Pavement Transition/Taper Rates	26.67:1	Section 301.1.4	L = WS ² /60.
Maximum Diverging Taper Rates	5:1	Section 301.1.4	
Allowable Intersection Angles	70° to 90°	Section 401.3	
VERTICAL PROFILE			
Maximum Grades	7-10% (Level to Hilly)	Figure 203-1E	Rural Collector
Grades 1% steeper may be used-see figure notes.		Figure 203-1E	Extreme cases
Minimum Grades	Flat	Section 203.2.2	Flat grades are acceptable on uncurbed pavements
VERTICAL CURVES			
Maximum Grade Change Without Vertical Curve	0.75%	Figure 203-2E	
Crest Curve Design K	Min = 44	Figure 203-3E	
Crest Curve Design Stopping Sight Distance	Min = 305	Figure 203-3E	
Crest Curve- Minimum Length	120'	Section 203.3.3	
Sag Curve Design K	Min = 64	Figure 203-6E	
Sag Curve Design Stopping Sight Distance	Min = 305'	Figure 203-6E	
Sag Curve- Minimum Length	120'	Section 203.3.4	
SUPERELEVATION			
Maximum Degree of Curve Without Superelevation	1° 08'	Figure 202-3E	Low Speed Rural
Max. Design Superelevation Rate	ed = 0.080	Figure 202-7E	Rural Highways
Superelevation Transitions	See ODOT L&D, Vol 1	Figure 202-4E & 202-8E	Urban Highways
Method of Superelevation	See ODOT L&D, Vol 1	Figure 202-5dE	50% to 70% on Tangent
TYPICAL SECTION			
Minimum Lane Width	12'	Figure 301-2E	Rural collector >2000 adt
Normal Pavement Cross Slope	0.016	Section 301.1.5	
Graded Shoulder Width	8' / 11'	Figure 301-3E	With out / With Barrier
Treated Shoulder Width	4'	Figure 301-3E	
Median	N/A		
Clear Zone Width-Foreslopes	13' (6:1 or Flatter)	Figure 600-1E	ADT 1501-6000
	15' (Steeper than 6:1 to 4:1)	Figure 600-1E	
Clear Zone Width-Backslopes	13' (6:1 or Flatter)	Figure 600-1E	
	13' (Steeper than 6:1 to 4:1)	Figure 600-1E	
	13' (Steeper than 4:1)	Figure 600-1E	
Type of Grading	Clear Zone	Section 307.2.1	Figure 307-3E
Fill Slope	4:1/3:1 max	Figure 307-3E	2:1 Max with Barrier
Cut Slope	4:1/3:1 max	Figure 307-3E	2:1 Max with Barrier
Guardrail Offset from Traveled Way	8'	Figure 301-3E	


ROADWAY DESIGN CRITERIA DOCUMENT

Road Name:	Springfield-Xenia Road		
PID #	NA		
DLZ Project #	1321/1005/03		
Prepared By:	David Lee		
Date:	7/14/2014		
Checked By:			
Date:			
Date of Last L&D Update:	1/17/2014		
Design Exceptions:		PENDING ANALYSIS	
ITEM	CRITERIA	L&D LOCATION	COMMENTS
GENERAL EXISTING INFORMATION			
Legal Speed	45 MPH		
Design Speed	45 MPH		
Functional Classification	Minor Arterial		
Locale (Rural or Urban)	Urban		
National Highway System (NHS)	No		
HORIZONTAL ALIGNMENT			
Maximum Centerline Deflection Without Curve	1° 40'	Figure 202-1E	
Maximum Degree of Curve	8° 00'	Figure 202-2E	
Maximum Curve Without a Spiral	N/A	Figure 202-11E	
Maximum Pavement Transition/Taper Rates	33.75:1	Section 301.1.4	L = WS ² /60.
Maximum Diverging Taper Rates	5:1	Section 301.1.4	
Allowable Intersection Angles	70° to 90°	Section 401.3	
VERTICAL PROFILE			
Maximum Grades	6-9% (Level to Hilly)	Figure 203-1E	Urban Arterial
Grades 1% steeper may be used-see figure notes.		Figure 203-1E	Extreme cases
Minimum Grades	Flat	Section 203.2.2	Flat grades are acceptable on uncurbed pavements
VERTICAL CURVES			
Maximum Grade Change Without Vertical Curve	0.55%	Figure 203-2E	
Crest Curve Design K	Min = 61	Figure 203-3E	
Crest Curve Design Stopping Sight Distance	Min = 360	Figure 203-3E	
Crest Curve- Minimum Length	135'	Section 203.3.3	
Sag Curve Design K	Min = 79	Figure 203-6E	
Sag Curve Design Stopping Sight Distance	Min = 360'	Figure 203-6E	
Sag Curve- Minimum Length	135'	Section 203.3.4	
SUPERELEVATION			
Maximum Degree of Curve Without Superelevation	5° 40'	Figure 202-3E	Low Speed Urban
Max. Design Superelevation Rate	ed = 0.039	Figure 202-9E	Low Speed Urban
Superelevation Transitions	See ODOT L&D, Vol 1	Figure 202-4E & 202-8E	Urban Highways
Method of Superelevation	See ODOT L&D, Vol 1	Figure 202-5dE	50% to 70% on Tangent
TYPICAL SECTION			
Minimum Lane Width	11'	Figure 301-4E	Urban Roadway
Normal Pavement Cross Slope	0.016	Section 301.1.5	
Graded Shoulder Width	6' / 11'	Figure 301-3E	With out / With Barrier
Treated Shoulder Width	6'	Figure 301-3E	
Median	N/A		
Clear Zone Width-Foreslopes	13' (6:1 or Flatter)	Figure 600-1E	ADT 1501-6000
	15' (Steeper than 6:1 to 4:1)	Figure 600-1E	
Clear Zone Width-Backslopes	13' (6:1 or Flatter)	Figure 600-1E	
	13' (Steeper than 6:1 to 4:1)	Figure 600-1E	
	13' (Steeper than 4:1)	Figure 600-1E	
Type of Grading	Clear Zone	Section 307.2.1	Figure 307-3E
Fill Slope	4:1/3:1 max	Figure 307-3E	2:1 Max with Barrier
Cut Slope	4:1/3:1 max	Figure 307-3E	2:1 Max with Barrier
Guardrail Offset from Traveled Way	8'	Figure 301-3E	

ROADWAY DESIGN CRITERIA DOCUMENT

Road Name:	Leffel Lane		
PID #	NA		
DLZ Project #	1321/1005/03		
Prepared By:	David Lee		
Date:	7/14/2014		
Checked By:			
Date:			
Date of Last L&D Update:	1/17/2014		
Design Exceptions:		PENDING ANALYSIS	
ITEM	CRITERIA	L&D LOCATION	COMMENTS
GENERAL EXISTING INFORMATION			
Legal Speed	45 MPH		
Design Speed	45 MPH		
Functional Classification	Minor Arterial		
Locale (Rural or Urban)	Urban		
National Highway System (NHS)	No		
HORIZONTAL ALIGNMENT			
Maximum Centerline Deflection Without Curve	1° 40'	Figure 202-1E	
Maximum Degree of Curve	8° 00'	Figure 202-2E	
Maximum Curve Without a Spiral	N/A	Figure 202-11E	
Maximum Pavement Transition/Taper Rates	33.75:1	Section 301.1.4	L = WS ² /60.
Maximum Diverging Taper Rates	5:1	Section 301.1.4	
Allowable Intersection Angles	70° to 90°	Section 401.3	
VERTICAL PROFILE			
Maximum Grades	6-9% (Level to Hilly)	Figure 203-1E	Urban Arterial
Grades 1% steeper may be used-see figure notes.		Figure 203-1E	Extreme cases
Minimum Grades	Flat	Section 203.2.2	Flat grades are acceptable on uncurbed pavements
VERTICAL CURVES			
Maximum Grade Change Without Vertical Curve	0.55%	Figure 203-2E	
Crest Curve Design K	Min = 61	Figure 203-3E	
Crest Curve Design Stopping Sight Distance	Min = 360	Figure 203-3E	
Crest Curve- Minimum Length	135'	Section 203.3.3	
Sag Curve Design K	Min = 79	Figure 203-6E	
Sag Curve Design Stopping Sight Distance	Min = 360'	Figure 203-6E	
Sag Curve- Minimum Length	135'	Section 203.3.4	
SUPERELEVATION			
Maximum Degree of Curve Without Superelevation	5° 40'	Figure 202-3E	Low Speed Urban
Max. Design Superelevation Rate	ed = 0.039	Figure 202-9E	Low Speed Urban
Superelevation Transitions	See ODOT L&D, Vol 1	Figure 202-4E & 202-8E	Urban Highways
Method of Superelevation	See ODOT L&D, Vol 1	Figure 202-5dE	50% to 70% on Tangent
TYPICAL SECTION			
Minimum Lane Width	11'	Figure 301-4E	Urban Roadway
Normal Pavement Cross Slope	0.016	Section 301.1.5	
Graded Shoulder Width	6' / 11'	Figure 301-3E	With out / With Barrier
Treated Shoulder Width	6'	Figure 301-3E	
Median	N/A		
Clear Zone Width-Foreslopes	13' (6:1 or Flatter)	Figure 600-1E	ADT 1501-6000
	15' (Steeper than 6:1 to 4:1)	Figure 600-1E	
Clear Zone Width-Backslopes	13' (6:1 or Flatter)	Figure 600-1E	
	13' (Steeper than 6:1 to 4:1)	Figure 600-1E	
	13' (Steeper than 4:1)	Figure 600-1E	
Type of Grading	Clear Zone	Section 307.2.1	Figure 307-3E
Fill Slope	4:1/3:1 max	Figure 307-3E	2:1 Max with Barrier
Cut Slope	4:1/3:1 max	Figure 307-3E	2:1 Max with Barrier
Guardrail Offset from Traveled Way	8'	Figure 301-3E	

ROADWAY DESIGN CRITERIA DOCUMENT

Road Name:	Selma Road		
PID #	NA		
DLZ Project #	1321/1005/03		
Prepared By:	David Lee		
Date:	7/14/2014		
Checked By:			
Date:			
Date of Last L&D Update:	1/17/2014		
Design Exceptions:		PENDING ANALYSIS	
ITEM	CRITERIA	L&D LOCATION	COMMENTS
GENERAL EXISTING INFORMATION			
Legal Speed	45 MPH		
Design Speed	45 MPH		
Functional Classification	Minor Arterial		Urban Collector south of intersection
Locale (Rural or Urban)	Urban		
National Highway System (NHS)	No		
HORIZONTAL ALIGNMENT			
Maximum Centerline Deflection Without Curve	1° 40'	Figure 202-1E	
Maximum Degree of Curve	8° 00'	Figure 202-2E	
Maximum Curve Without a Spiral	N/A	Figure 202-11E	
Maximum Pavement Transition/Taper Rates	33.75:1	Section 301.1.4	L = WS ² /60.
Maximum Diverging Taper Rates	5:1	Section 301.1.4	
Allowable Intersection Angles	70° to 90°	Section 401.3	
VERTICAL PROFILE			
Maximum Grades	6-9% (Level to Hilly)	Figure 203-1E	Urban Arterial
Grades 1% steeper may be used-see figure notes.		Figure 203-1E	Extreme cases
Minimum Grades	Flat	Section 203.2.2	Flat grades are acceptable on uncurbed pavements
VERTICAL CURVES			
Maximum Grade Change Without Vertical Curve	0.55%	Figure 203-2E	
Crest Curve Design K	Min = 61	Figure 203-3E	
Crest Curve Design Stopping Sight Distance	Min = 360	Figure 203-3E	
Crest Curve- Minimum Length	135'	Section 203.3.3	
Sag Curve Design K	Min = 79	Figure 203-6E	
Sag Curve Design Stopping Sight Distance	Min = 360'	Figure 203-6E	
Sag Curve- Minimum Length	135'	Section 203.3.4	
SUPERELEVATION			
Maximum Degree of Curve Without Superelevation	5° 40'	Figure 202-3E	Low Speed Urban
Max. Design Superelevation Rate	ed = 0.039	Figure 202-9E	Low Speed Urban
Superelevation Transitions	See ODOT L&D, Vol 1	Figure 202-4E & 202-8E	Urban Highways
Method of Superelevation	See ODOT L&D, Vol 1	Figure 202-5dE	50% to 70% on Tangent
TYPICAL SECTION			
Minimum Lane Width	11'	Figure 301-4E	Urban Roadway
Normal Pavement Cross Slope	0.016	Section 301.1.5	
Graded Shoulder Width	6' / 11'	Figure 301-3E	With out / With Barrier
Treated Shoulder Width	6'	Figure 301-3E	
Median	N/A		
Clear Zone Width-Foreslopes	13' (6:1 or Flatter)	Figure 600-1E	ADT 1501-6000
	15' (Steeper than 6:1 to 4:1)	Figure 600-1E	
Clear Zone Width-Backslopes	13' (6:1 or Flatter)	Figure 600-1E	
	13' (Steeper than 6:1 to 4:1)	Figure 600-1E	
	13' (Steeper than 4:1)	Figure 600-1E	
Type of Grading	Clear Zone	Section 307.2.1	Figure 307-3E
Fill Slope	4:1/3:1 max	Figure 307-3E	2:1 Max with Barrier
Cut Slope	4:1/3:1 max	Figure 307-3E	2:1 Max with Barrier
Guardrail Offset from Traveled Way	8'	Figure 301-3E	