

COLORADO DEPARTMENT OF TRANSPORTATION NOISE ABATEMENT DETERMINATION WORKSHEET

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Pro	ject/STIP # <u>US160 SDEIS Grandview - Three Springs</u>	Segment MIT1ab	Date of Analysis: 8/2/2011	<u>.</u>	
ser	ject Name & Location: <u>R52, R55-C57, R118-R119, R3</u>	18, R320-R323R	318, south side of US160 wall a	long	
A.	<u>FEASIBILITY</u> :				
	 Can a 5dBA noise reduction be achieved by const Are there any fatal flaw drainage, terrain, safety, of barrier or berm? YES x NO 				
	3. Can a noise barrier or berm less than 20 feet tall be	e constructed? x	YES INO		
В.	REASONABLENESS:				
	1. Has the Design goal of 7 dBA noise reduction for receptor? x YES ☐ NO	abatement measu	re been met for at least one imp	acted	
	 Is the Cost Benefit Index below \$6800 per receptor Are more than 50% of benefited resident/owners in 	r per dBA? 🗖 Y n favor of the rece	ES x NO ommended noise abatement me	asure?	
	□ YES □ NO				
C.	 INSULATION CONSIDERATION: Are normal noise abatement measures physically in a yes NO 	nfeasible or econ	omically unreasonable?		
If+l	x YES NO ne answer to 1 is YES, then:				
11 11	 a. Does this project have noise impacts to NAC. b. If yes, is it reasonable and feasible to provide 				
D.	ADDITIONAL CONSIDERATIONS:				
	• These walls are not continuous, requiring gaps for		to service rd.		
	Hilly terrain affects the effectiveness of barrier hei				
	The CBI for the most optimized wall geometries as	e \$7276 and \$10.	,093.		
E.	STATEMENT OF LIKELIHOOD:				
1.	Are noise mitigation measures feasible?	x YES	□ NO		
2.	Are noise mitigation measures reasonable?	☐ YES	x NO		
3.	Is insulation of buildings both feasible and reasonable?	☐ YES	x NO		
4.	Shall noise abatement measures be provided?	☐ YES	x NO		
F.	ABATEMENT DECISION DESCRIPTION AND JUS	TIFICATION:			
requ	Ta,b,c, barrier geometries needed to meet the noise red ired 3 reasonableness criteria cannot be met for abateme commended for this location.				
	The second secon				
Con	Completed by: Date: August 2, 2011				



COLORADO DEPARTMENT OF TRANSPORTATION NOISE ABATEMENT DETERMINATION WORKSHEET

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Pro	oject/STIP # <u>US160 SDEIS Grandview - Three Springs S</u>	egment MIT1d	Date of Ana	ılysis: <u>8/2/2011</u>	
Pro	oject Name & Location: R52 to R119, R320-R323 south s	side of US160;wa	ll location alon	g eastbound exit ramp	
A.	 FEASIBILITY: Can a 5dBA noise reduction be achieved by construction. Are there any fatal flaw drainage, terrain, safety, or barrier or berm? ☐ YES x NO Can a noise barrier or berm less than 20 feet tall be 	maintenance iss	ues involving th		
B.	REASONABLENESS: 1. Has the Design goal of 7 dBA noise reduction for a receptor? x YES □ NO 2. Is the Cost Benefit Index below \$6800 per receptor 3. Are more than 50% of benefited resident/owners in □ YES □ NO	per dBA? 🗖 Y	ES x NO		
	 INSULATION CONSIDERATION: Are normal noise abatement measures physically in x YES □ NO 	feasible or econo	omically unreaso	onable?	
If the	he answer to 1 is YES, then:				
	a. Does this project have noise impacts to NAC Ab. If yes, is it reasonable and feasible to provide in			YES x NO YES □ NO	
D.	 ADDITIONAL CONSIDERATIONS: This wall is continuous along outside of eastbound ramp to CR 233, however elevation differences between US160 mainline and ramp as it approaches CR233 allows line-of-sight traffic exposure to impacted area. Hilly terrain affects the effectiveness of barrier height in this area. CBI of \$14,571 for this wall is not reasonable. Icing along shadow zone of 18ft tall wall along ramp travel lane needs to be checked. 			ure to impacted area.	
D	STATEMENT OF LIVELIJOOD.				
	STATEMENT OF LIKELIHOOD:	VEG	E NO		
1.	Are noise mitigation measures feasible?	x YES	□ NO		
	Are noise mitigation measures reasonable?	O YES	x NO		
	Is insulation of buildings both feasible and reasonable?	•	x NO		
4.	Shall noise abatement measures be provided?	YES	x NO		
F.	ABATEMENT DECISION DESCRIPTION AND JUST	TIFICATION:			
reas	If 1d barrier geometry needed to meet the noise reduction conableness criteria cannot be met for abatement measure emmended for this location.				
Con	Completed by: Date:August 2, 2011				



COLORADO DEPARTMENT OF TRANSPORTATION NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

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Project/STIP # US160 SDEIS Grandview - Three Springs Segment MIT2ns Date of Analysis: 8/2/2011
Project Name & Location: R304-R307 and R309-R312, R315; wall along US550 service Rd, Revised F Modified and Eastern Realignment only
 A. FEASIBILITY: 1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm? x YES □ NO 2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm? □ YES x NO 3. Can a noise barrier or berm less than 20 feet tall be constructed? □ YES □ NO
 B. <u>REASONABLENESS</u>: 1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor? ☐ YES x NO 2. Is the Cost Benefit Index below \$6800 per receptor per dBA? ☐ YES ☐ NO 3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure? ☐ YES ☐ NO
 C. <u>INSULATION CONSIDERATION</u>: 1. Are normal noise abatement measures physically infeasible or economically unreasonable? x YES □ NO
If the answer to 1 is YES, then:
 2. a. Does this project have noise impacts to NAC Activity Category D? ☐ YES x NO b. If yes, is it reasonable and feasible to provide insulation for these buildings? ☐ YES ☐ NO
 D. ADDITIONAL CONSIDERATIONS: Walls n and s were considered both as separate walls and as a continuous wall between the 2 neighborhoods along the Revised F Modified service road, however elevation differences between US550 mainline, service roads, and receptors allows line-of-sight traffic exposure to portions of the impacted area. Terrain affects the effectiveness of barrier height in this area. None of the wall configurations can achieve the design goal noise reduction of 7 dBA with a wall under 20 ft in height.
E. STATEMENT OF LIKELIHOOD:

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

1. Are noise mitigation measures feasible?

2. Are noise mitigation measures reasonable?

3. Is insulation of buildings both feasible and reasonable?

Shall noise abatement measures be provided?

MIT 2n, s barrier geometries can meet the noise reduction design goal with a feasible 20 ft wall; therefore, the required 3 reasonableness criteria cannot be met for abatement measure to be considered reasonable. No abatement is recommended for this location.

x YES

☐ YES

YES

YES

Completed by: _		THE STATE OF THE S	_ Date: _	August 2, 2011
–	Jill Schlaefer	(420)		_

☐ NO

x NO

x NO

x NO



COLORADO DEPARTMENT OF TRANSPORTATION NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines				
Project/STIP # US160 SDEIS Grandview - Three Springs Segment MIT2c Date of Analysis: 8/2/2011				
Project Name & Location: <u>R300-R302;wall location along United Realignment only</u>	US 550 service road	d(Revised F Modified and Eastern		
 A. FEASIBILITY: 1. Can a 5dBA noise reduction be achieved by construction. 2. Are there any fatal flaw drainage, terrain, safety, or barrier or berm? ☐ YES x NO 3. Can a noise barrier or berm less than 20 feet tall be 	r maintenance issue	s involving the proposed noise		
 B. REASONABLENESS: 1. Has the Design goal of 7 dBA noise reduction for a receptor? ☐ YES x NO 2. Is the Cost Benefit Index below \$6800 per receptor 3. Are more than 50% of benefited resident/owners in ☐ YES ☐ NO 	per dBA? 🗖 YES	S □ NO		
 C. <u>INSULATION CONSIDERATION</u>: 1. Are normal noise abatement measures physically in x YES NO 	nfeasible or econom	uically unreasonable?		
If the answer to 1 is YES, then: 2. a. Does this project have noise impacts to NAC A b. If yes, is it reasonable and feasible to provide in				
 D. ADDITIONAL CONSIDERATIONS: Walls n and s were considered both as separate wall neighborhoods along the Revised F Modified service mainline, service roads, and receptors allows line-or Terrain affects the effectiveness of barrier height in Wall configurations cannot achieve the design goal height. 	ce road, however el f-sight traffic expo this area.	evation differences between US550 sure to portions of the impacted area		
 E. STATEMENT OF LIKELIHOOD: 1. Are noise mitigation measures feasible? 2. Are noise mitigation measures reasonable? 3. Is insulation of buildings both feasible and reasonable? 4. Shall noise abatement measures be provided? 	x YES YES YES YES	□ NO x NO x NO x NO		
F. ABATEMENT DECISION DESCRIPTION AND JUST MIT 2c barrier geometry cannot meet the noise reduction des	sign goal with a fea	sible 20 ft wall; therefore, the		
required 3 reasonableness criteria cannot be met for abatements recommended for this location.	nt measure to be co	onsidered reasonable. No abatement		
Completed by:		Date:August 2, 2011		



COLORADO DEPARTMENT OF TRANSPORTATION NOISE ABATEMENT DETERMINATION WORKSHEET

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Projec	t/STIP# <u>US160 SDEIS Grandview - Three Springs S</u>	egment MIT3a	Date of	Analysis: <u>8/2/2011</u>
Projec	t Name & Location: <u>R324, R68-69, R74, C75, R75a-c</u>	i; wall along south	side US1	60 service road and ramp
1. = 2.	EASIBILITY: Can a 5dBA noise reduction be achieved by constru Are there any fatal flaw drainage, terrain, safety, or barrier or berm? YES x NO Can a noise barrier or berm less than 20 feet tall be	maintenance issue	es involvir	ng the proposed noise
	· · · · · · · · · · · · · · · · · · ·	per dBA? □ YE	s 🗖 NO	-
	SULATION CONSIDERATION: Are normal noise abatement measures physically in x YES NO	feasible or econon	nically um	reasonable?
If the a	nswer to 1 is YES, then:			
2.	a. Does this project have noise impacts to NAC Ab. If yes, is it reasonable and feasible to provide in			☐ YES x NO ? ☐ YES ☐ NO
D. <u>AI</u>	DDITIONAL CONSIDERATIONS: Walls that were considered along service road requi Wall along outside of CR 233 to US160 ramp is con mainline and ramp as it approaches CR233 allows li area. Wall configurations cannot achieve the design goal	tinuous, however ine-of-sight traffic	elevation exposure	differences between US160
E. ST	ATEMENT OF LIKELIHOOD:			
	e noise mitigation measures feasible?	x YES	□ NO	
	e noise mitigation measures reasonable?	☐ YES	x NO	
	insulation of buildings both feasible and reasonable?	☐ YES	x NO	
	all noise abatement measures be provided?	☐ YES	x NO	
	SATEMENT DECISION DESCRIPTION AND JUST		7.10	
MIT 3a criteria location	barrier geometry cannot meet the noise reduction des cannot be met for abatement measure to be considered.	ign goal; therefore d reasonable. No a	e, the requi abatement	ired 3 reasonableness is recommended for this
Comple	eted by:		Date:	August 2, 2011
	Jill Schlaefer	-	~	



COLORADO DEPARTMENT OF TRANSPORTATION NOISE ABATEMENT DETERMINATION WORKSHEET

Pro	eject/STIP # US160 SDEIS Grandview - Three Springs S	Segment MIT3b	Date of Analysis: 8/2/2011		
Pro	Preject Name & Location: R70-R73; wall along north side US160 ramp and mainline				
A.	 FEASIBILITY: Can a 5dBA noise reduction be achieved by constr Are there any fatal flaw drainage, terrain, safety, or barrier or berm? ☐ YES x NO Can a noise barrier or berm less than 20 feet tall be 	r maintenance issue	es involving the proposed noise		
B.	 REASONABLENESS: 1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor? x YES □ NO 2. Is the Cost Benefit Index below \$6800 per receptor per dBA? □ YES x NO 3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure? □ YES □ NO 				
C.	 INSULATION CONSIDERATION: Are normal noise abatement measures physically in x YES □ NO 	nfeasible or econom	nically unreasonable?		
If t	he answer to 1 is YES, then:	atinita Catanana E	99 = 1 VEC NO		
	a. Does this project have noise impacts to NAC Ab. If yes, is it reasonable and feasible to provide it				
D.	 D. <u>ADDITIONAL CONSIDERATIONS</u>: This wall is continuous along outside of westbound US160 to CR 233 ramp, however elevation differences between US160 mainline and ramp as it approaches CR233 allows line-of-sight traffic exposure to portions of the impacted area. CBI of \$8438 for this wall is not reasonable. 				
E.	STATEMENT OF LIKELIHOOD:				
1.	Are noise mitigation measures feasible?	x YES	□ NO		
2.	Are noise mitigation measures reasonable?	☐ YES	x NO		
3.	Is insulation of buildings both feasible and reasonable?	☐ YES	x NO		
4.	Shall noise abatement measures be provided?	☐ YES	x NO		
F.	ABATEMENT DECISION DESCRIPTION AND JUST	ΓΙΓΙCATION:			
reas	MIT 3b barrier geometry needed to meet the noise reduction design goal, exceeds the CBI; therefore, the required 3 reasonableness criteria cannot be met for abatement measure to be considered reasonable. No abatement is recommended for this location.				
Cor	Completed by: Date:August 2, 2011_				



COLORADO DEPARTMENT OF TRANSPORTATION NOISE ABATEMENT DETERMINATION WORKSHEET

Pro	oject/STIP # <u>US160 SDEIS Grandview – Three Springs S</u>	Segment MIT4a	Date o	of Analysis: <u>8/2/2011</u>	
Pro	Project Name & Location: R83-R84, R86; wall along south side US160 service road and mainline				
A.	 FEASIBILITY: Can a 5dBA noise reduction be achieved by construction. Are there any fatal flaw drainage, terrain, safety, or barrier or berm? ☐ YES x NO Can a noise barrier or berm less than 20 feet tall be 	maintenance iss	ues involv	ing the proposed noise	
B.	 REASONABLENESS: 1. Has the Design goal of 7 dBA noise reduction for a receptor? x YES □ NO 2. Is the Cost Benefit Index below \$6800 per receptor 3. Are more than 50% of benefited resident/owners in □ YES □ NO 	per dBA? 🗂 Y	ES x NO	-	
C.	 INSULATION CONSIDERATION: Are normal noise abatement measures physically in x YES □ NO 	rfeasible or econo	omically u	nreasonable?	
If tl	If the answer to 1 is YES, then: 2. a. Does this project have noise impacts to NAC Activity Category D?				
D.	 ADDITIONAL CONSIDERATIONS: Along the service road the wall requires gaps for dr CBI of \$25,079 for this wall is not reasonable. 	iveway access.			
1. 2.	STATEMENT OF LIKELIHOOD: Are noise mitigation measures feasible? Are noise mitigation measures reasonable? Is insulation of buildings both feasible and reasonable? Shall noise abatement measures be provided?	x YES YES YES YES	☐ NO x NO x NO x NO		
F.	ABATEMENT DECISION DESCRIPTION AND JUST	<u>ΓΙΓΙCATION</u> :			
reas	1 4a barrier geometry needed to meet the noise reduction conableness criteria cannot be met for abatement measure emmended for this location.				
Con	Completed by: Date: August 2, 2011_				



COLORADO DEPARTMENT OF TRANSPORTATION NOISE ARATEMENT DETERMINATION WORKSHEET

	Instructions: To complete this form refer				
Pro	roject/STIP # <u>US160 SDEIS Grandview - Three Springs Standview</u>	egment MIT4b	1 and b2-4Dat	e of Analysis: <u>8/2/2011</u>	
Pro	roject Name & Location: R81, R81a-b, R82, C116 and R85	5, R87-R88, R9	2; wall along 1	north side US160 mainli	
A.	 FEASIBILITY: Can a 5dBA noise reduction be achieved by construent to the construction. Are there any fatal flaw drainage, terrain, safety, or barrier or berm? YES x NO Can a noise barrier or berm less than 20 feet tall be 	maintenance is	ssues involving	the proposed noise	
B.	 REASONABLENESS: 1. Has the Design goal of 7 dBA noise reduction for al receptor? x YES □ NO 2. Is the Cost Benefit Index below \$6800 per receptor 3. Are more than 50% of benefited resident/owners in □ YES □ NO 	per dBA? 🗖 `	YES x NO	-	
	 INSULATION CONSIDERATION: 1. Are normal noise abatement measures physically in x YES □ NO 	feasible or eco	nomically unre	asonable?	
If t	the answer to 1 is YES, then:				
	a. Does this project have noise impacts to NAC Ab. If yes, is it reasonable and feasible to provide in	_	-	□ YES x NO □ YES □ NO	
D.	 ADDITIONAL CONSIDERATIONS: MIT4b1 assumes that all access is rerouted to another. On MIT4b1 cut-slope along north side of US160 medge, reducing practical wall height and allowing linuphill, thus preventing feasible 5 dBA noise reduction. MIT4b2-4 requires several gaps for driveway access. CBI of MIT4b2-4 of \$35,137 for this wall is not reason. 	ainline require ne-of-sight to to on. s reducing effe	s that wall to be raffic from rece	e constructed at cutslope ptors located farther	
1.	STATEMENT OF LIKELIHOOD: Are noise mitigation measures feasible? Are noise mitigation measures reasonable? Is insulation of buildings both feasible and reasonable? Shall noise abatement measures be provided?	x YES YES YES YES	□ NO x NO x NO x NO		
F.	ABATEMENT DECISION DESCRIPTION AND JUST	IFICATION:			
MI7 the reas	MIT4b1 wall is not feasible. MIT 4b2-4 barrier geometry needed to meet the noise reduction design goal exceeds the CBI; therefore, the required 3 reasonableness criteria cannot be met for abatement measure to be considered reasonable. No abatement is recommended for this location. Completed by: Date: August 2, 2011				



COLORADO DEPARTMENT OF TRANSPORTATION NOISE ABATEMENT DETERMINATION WORKSHEET

	·				
Pro	pject/STIP # US160 SDEIS Grandview - Three Springs Segment MIT6 Date of Analysis: 8/2/2011				
Pro	Project Name & Location: R13E-R18E; wall location along southeast side US550 mainline on Eastern Realignment				
A.	 FEASIBILITY: Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm? x YES □ NO Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm? □ YES x NO Can a noise barrier or berm less than 20 feet tall be constructed? x YES □ NO 				
B.	 REASONABLENESS: Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor? x YES □ NO Is the Cost Benefit Index below \$6800 per receptor per dBA? □ YES x NO Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure? □ YES □ NO 				
	 INSULATION CONSIDERATION: Are normal noise abatement measures physically infeasible or economically unreasonable? x YES □ NO 				
If tl	the answer to 1 is YES, then:				
	 a. Does this project have noise impacts to NAC Activity Category D? b. If yes, is it reasonable and feasible to provide insulation for these buildings? YES NO 				
D.	 D. ADDITIONAL CONSIDERATIONS: This wall is continuous along the southeast side of US550 mainline and does not consider local roadway realignments that may be necessary for local access. Homes are located on very large lots and are located far apart. CBI of \$58,310 for this wall is not reasonable. Icing along shadow zone of 20ft tall wall along northbound travel lane needs to be checked. 				
	CTATEMENT OF LIVELIHOOD.				
Ε.	STATEMENT OF LIKELIHOOD:				
1.	Are noise mitigation measures feasible? x YES				
2.	Are noise mitigation measures reasonable?				
3.	Is insulation of buildings both feasible and reasonable?				
4.	Shall noise abatement measures be provided? TYES x NO				
F.	ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:				
reas	6 barrier geometry needed to meet the noise reduction design goal, exceeds the CBI; therefore, the required 3 conableness criteria cannot be met for abatement measure to be considered reasonable. No abatement is emmended for this location.				
Con	Completed by: Date: August 2, 2011_				



COLORADO DEPARTMENT OF TRANSPORTATION NOISE ABATEMENT DETERMINATION WORKSHEET

Project/STIP # <u>US160 SDEIS Grandview - Three Springs Segment MIT7</u> Date of Analysis: <u>8/2/2011</u>					
Pro	oject Name & Location: Webb Ranch R155; wall location	n along east side (US550 mainline on Revised G Modified		
A.	 FEASIBILITY: Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm? x YES NO Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm? YES x NO Can a noise barrier or berm less than 20 feet tall be constructed? x YES NO 				
B.	REASONABLENESS: 1. Has the Design goal of 7 dBA noise reduction for receptor? x YES □ NO 2. Is the Cost Benefit Index below \$6800 per recepto 3. Are more than 50% of benefited resident/owners in □ YES □ NO	rperdBA? □ YI	ES x NO		
C.	 INSULATION CONSIDERATION: Are normal noise abatement measures physically in x YES NO 	nfeasible or econo	mically unreasonable?		
If tl	he answer to 1 is YES, then:				
	a. Does this project have noise impacts to NAC ab. If yes, is it reasonable and feasible to provide a				
D.	 ADDITIONAL CONSIDERATIONS: This wall is continuous along the east side of US55 CR220. Isolated receptor. CBI of \$118,356 for this wall is not reasonable. 	50 mainline and ap	proximately 100 ft along north side of		
С	STATEMENT OF LIKELIHOOD:				
1. 2. 3. 4.	Are noise mitigation measures feasible? Are noise mitigation measures reasonable? Is insulation of buildings both feasible and reasonable? Shall noise abatement measures be provided?	x YES YES YES YES	□ NO x NO x NO x NO		
F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:					
MIT 7 barrier geometry needed to meet the noise reduction design goal, exceeds the CBI; therefore, the required 3 reasonableness criteria cannot be met for abatement measure to be considered reasonable. No abatement is recommended for this location.					
Con	Completed by: Date: August 2, 2011				