Environmental Impact Assessment

October 2020

India: Bengaluru Metro Rail Project

Phase 2B (Airport Metro Line)
KR Puram to Kempegowda International Airport

Volume 6
Annex 5

Prepared by Bangalore Metro Rail Corporation Ltd. (BMRCL), India for the Asian Development Bank.

NOTES

(i) The fiscal year (FY) of the Government of India and its agencies ends on 31 March. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2019 ends on 31 March 2019.

(ii) In this report, "$" refers to United States dollars.

APPENDIX C NOISE CONTOUR MAPS

ORR- KR PURAM

YEARS 2024, 2031, 2041

KR Puram to Kempegowda International Airport

120 2024 2B with Parapet Wall
Noise Contour Map
Leq,d

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:2887

0 25 50 100 150 200 m

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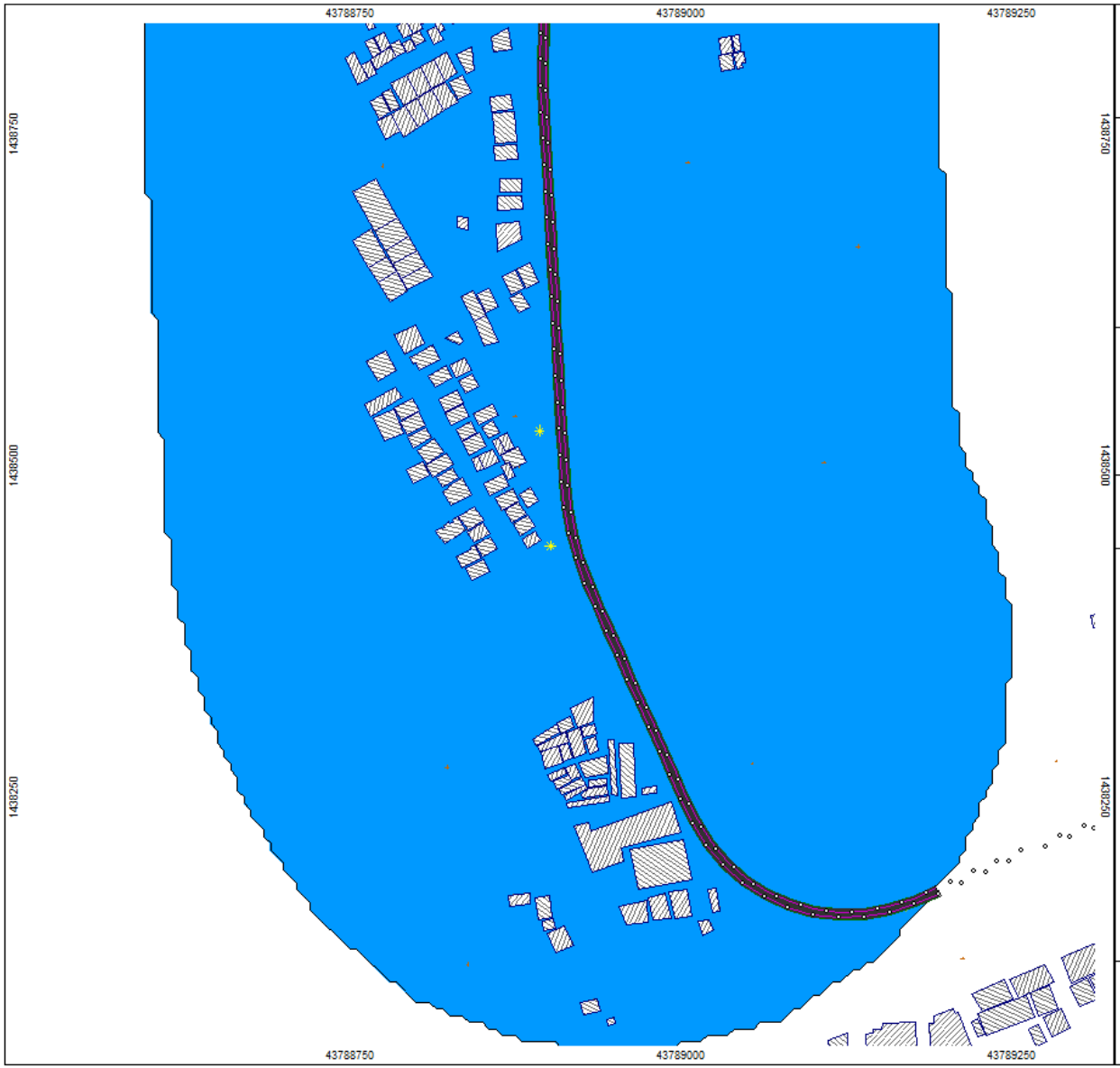

KR Puram to Kempegowda International Airport

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

120 2024 2B with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
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Length scale 1:2887
0 25 50 100 150 200 m

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KR Puram to Kempegowda International Airport

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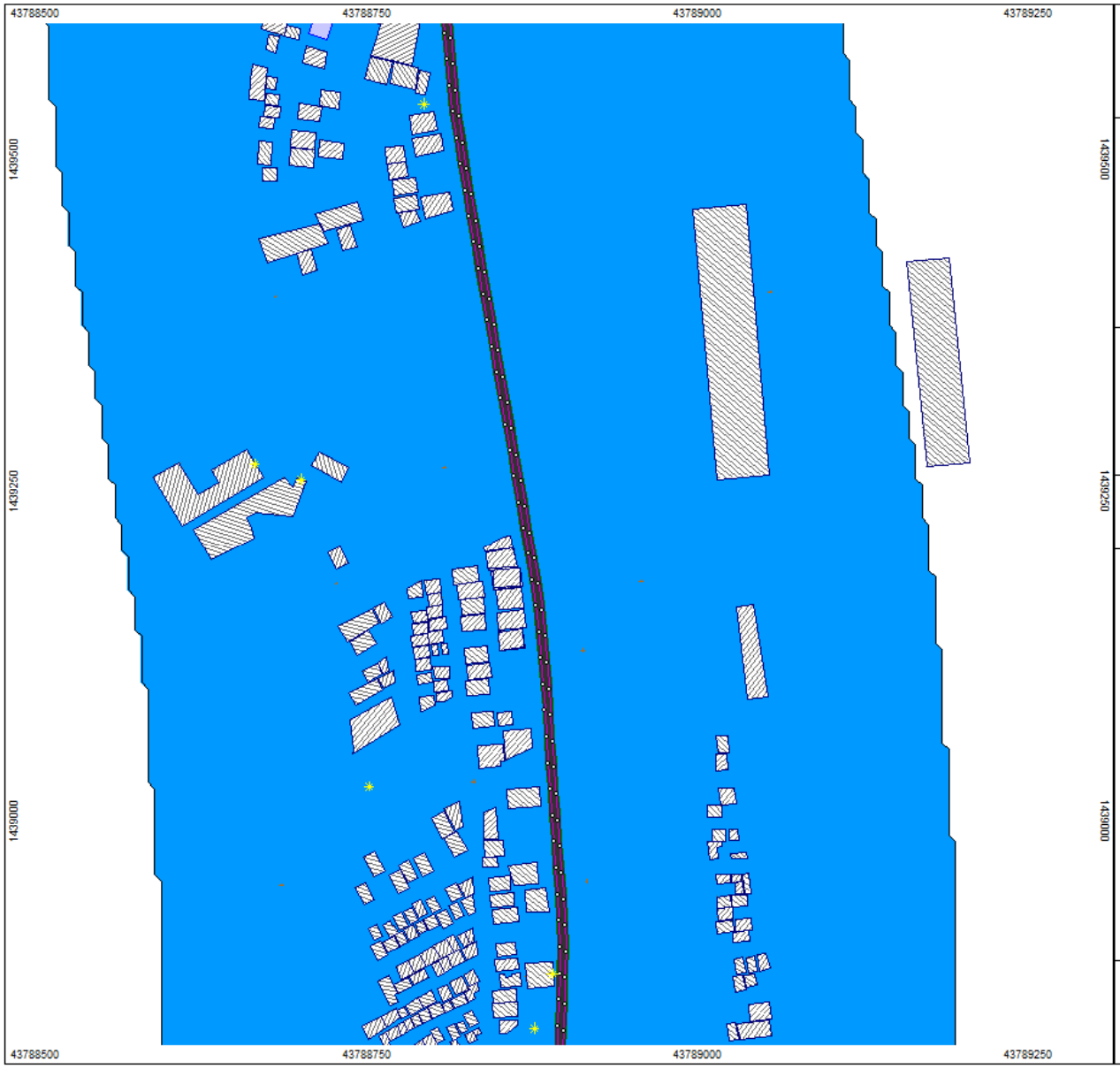

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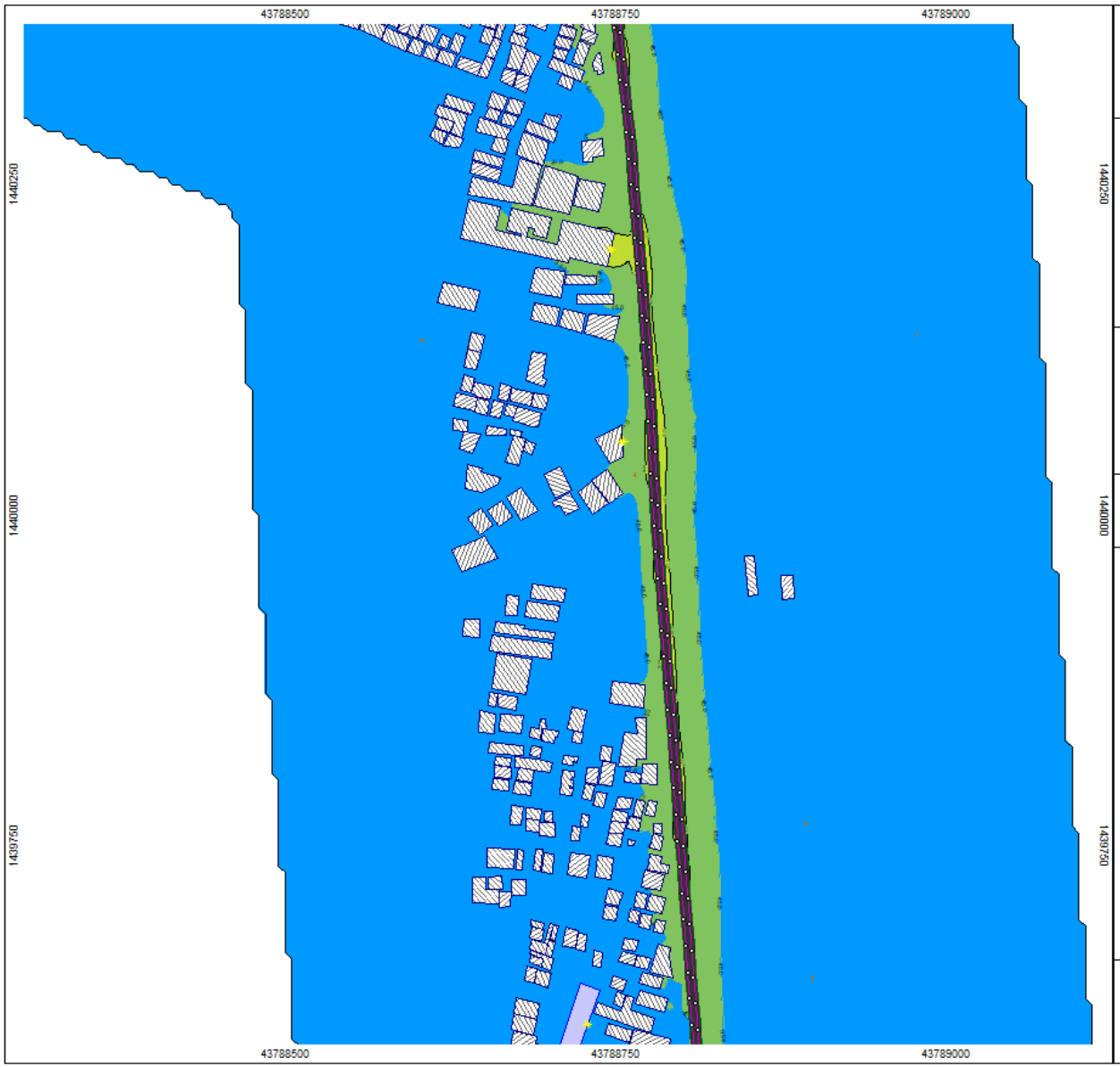

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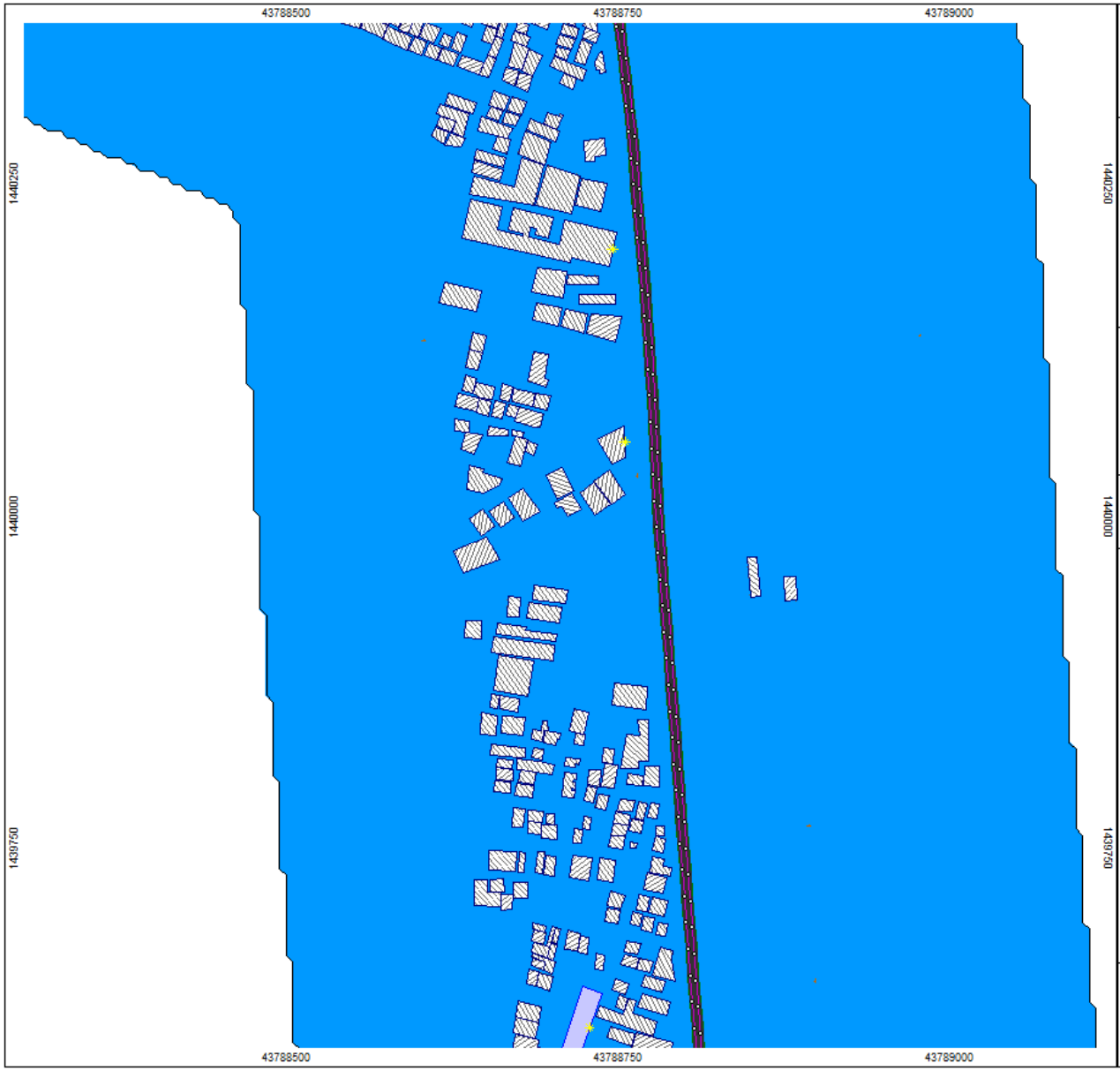

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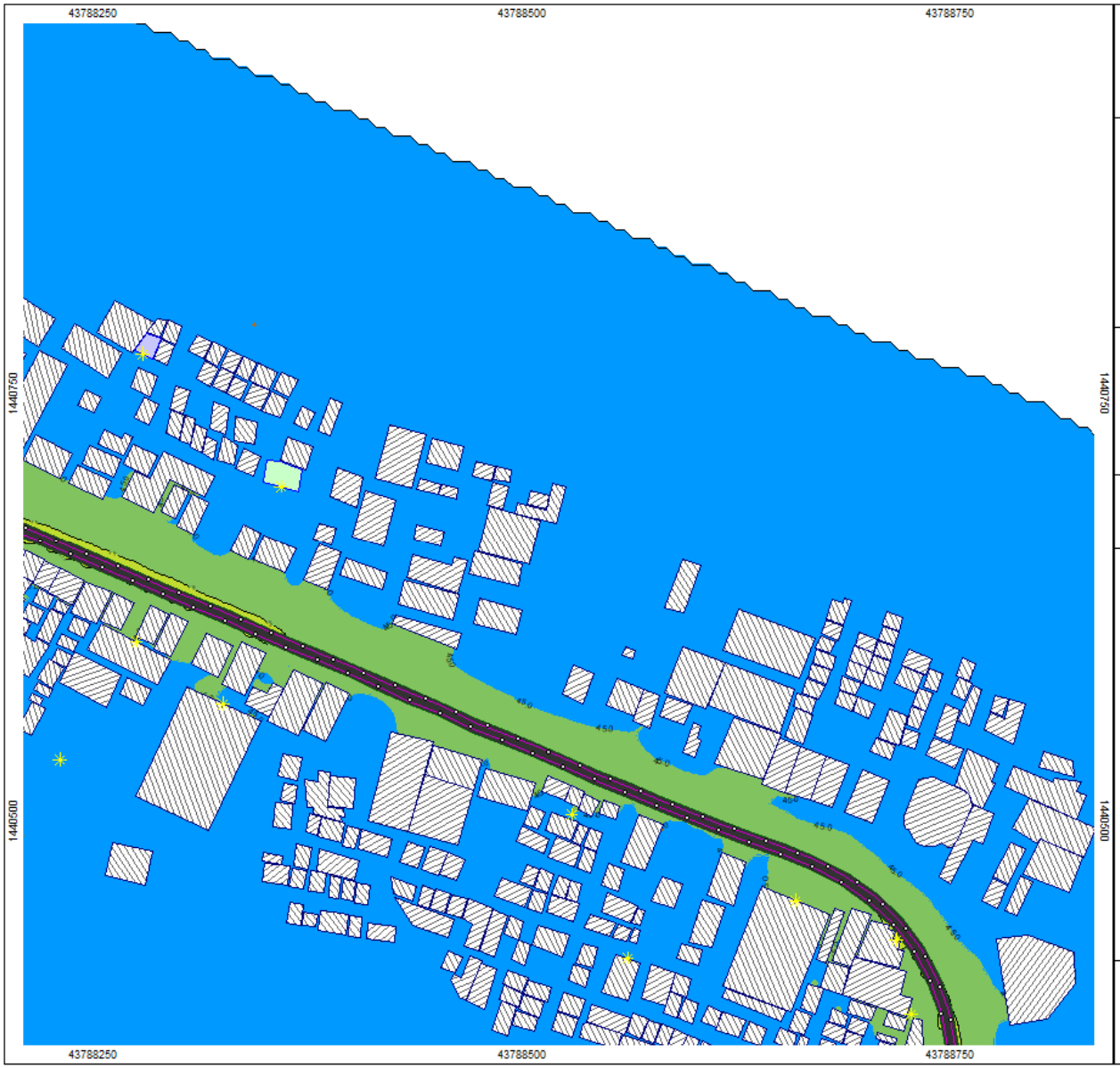

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- Elevation point
- Bodeneffekte
- Noise calculation area

Length scale 1:2232

0 20 40 80 120 160 m

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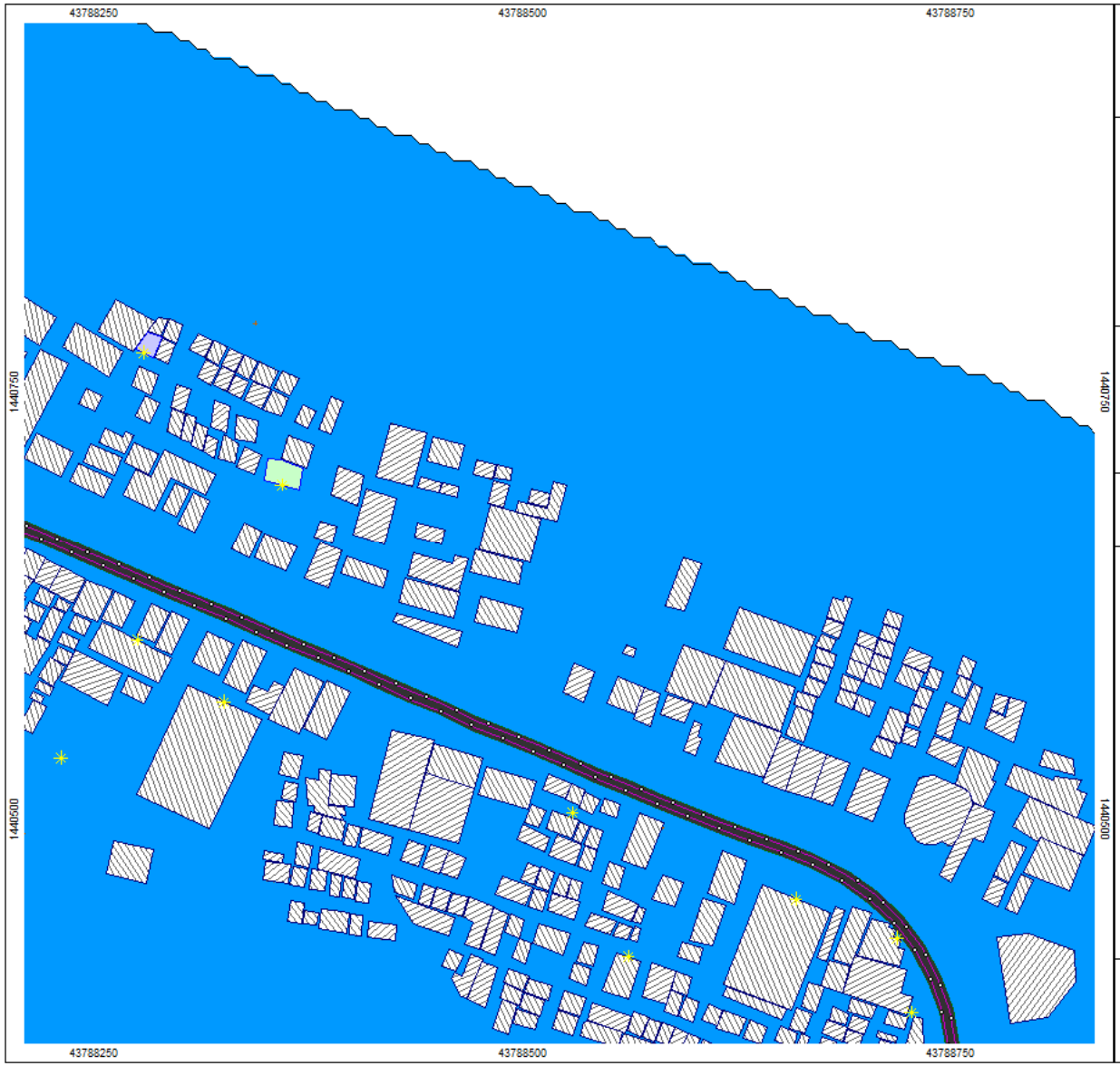

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Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
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- Bodeneffekte
- Noise calculation area

N

Length scale 1:2232

0 20 40 80 120 160 m

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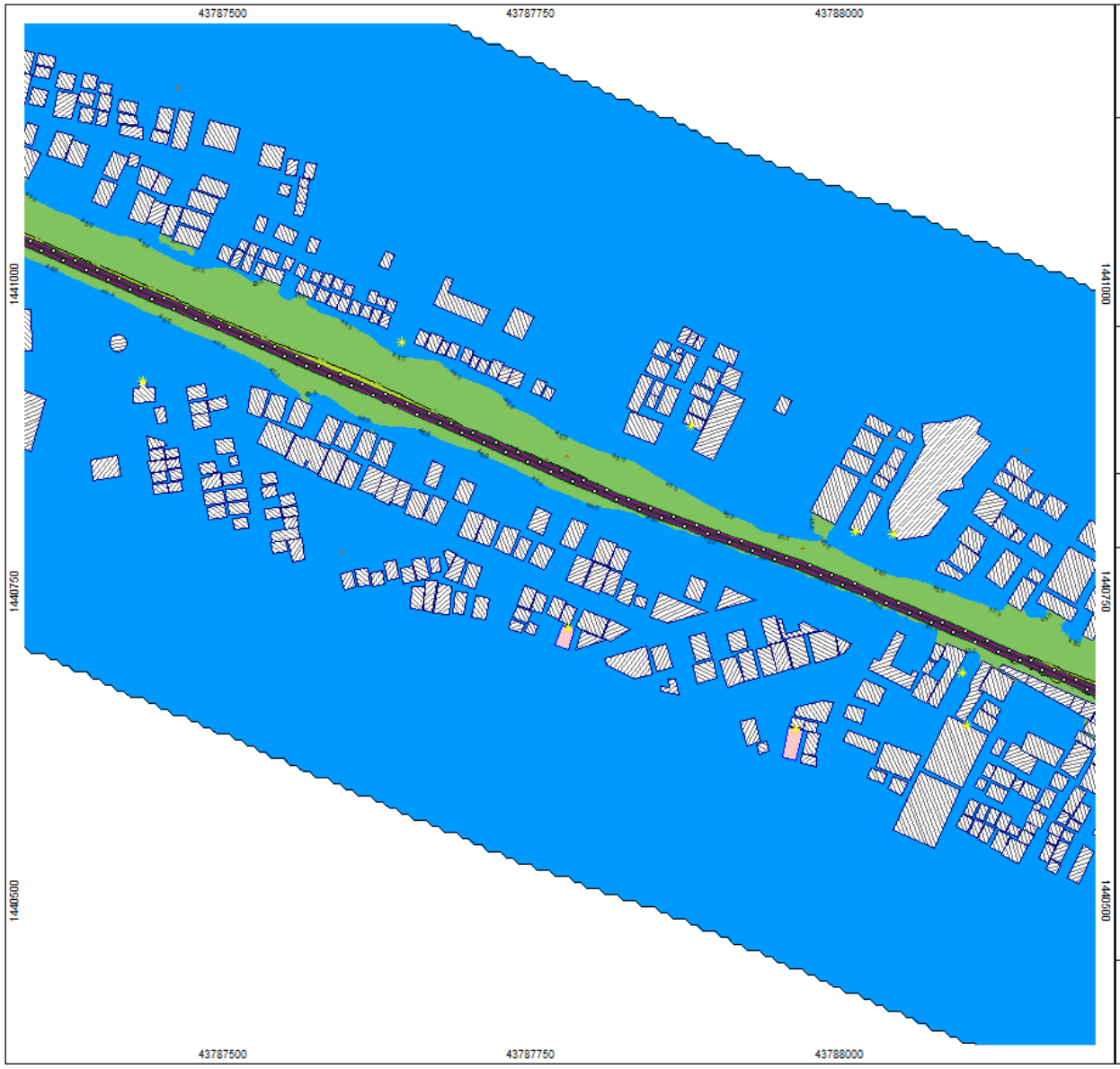

KR Puram to Kempegowda International Airport

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120 2024 2B with Parapet Wall
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Leq,d
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Created: 9/10/2020
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- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3101
0 25 50 100 150 200 m

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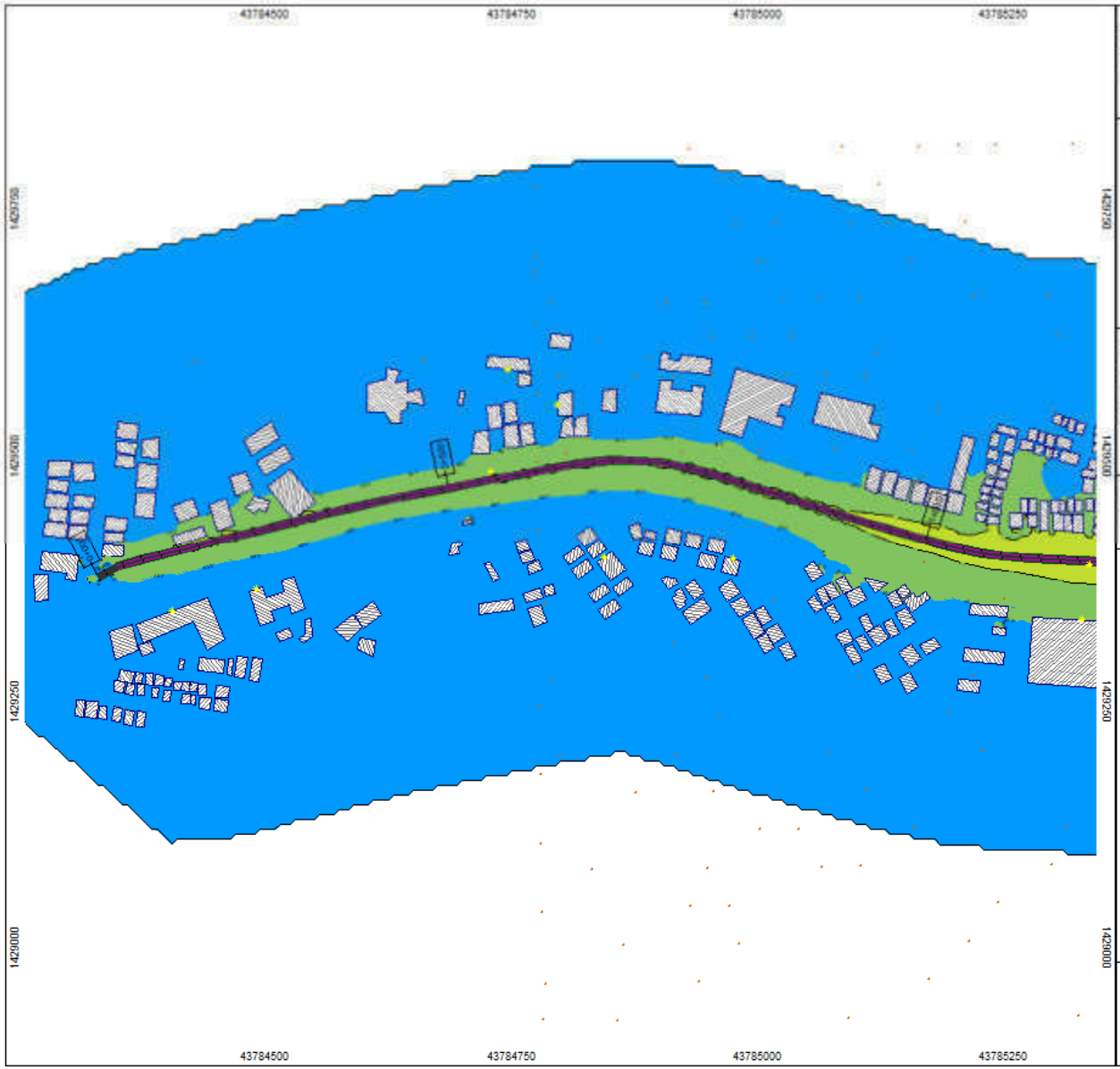

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 8/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2019

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
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- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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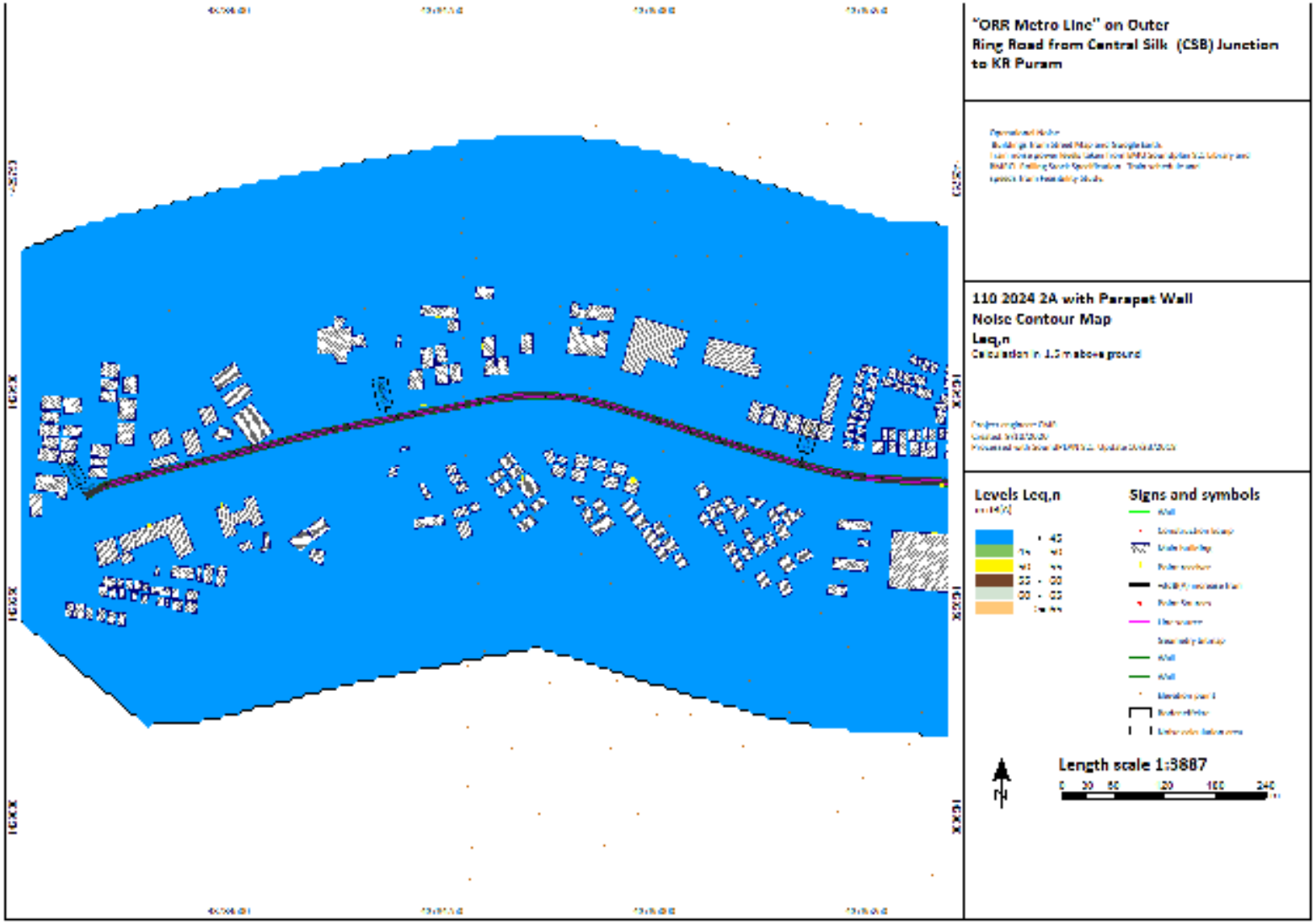

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Levels Leq,n

Signs and symbols

Length scale 1:3887

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols

Wall
Main building
Point receiver
Point Sources
Wall
Wall

Length scale 1:3887

0 30 60 120 180 240 m

N

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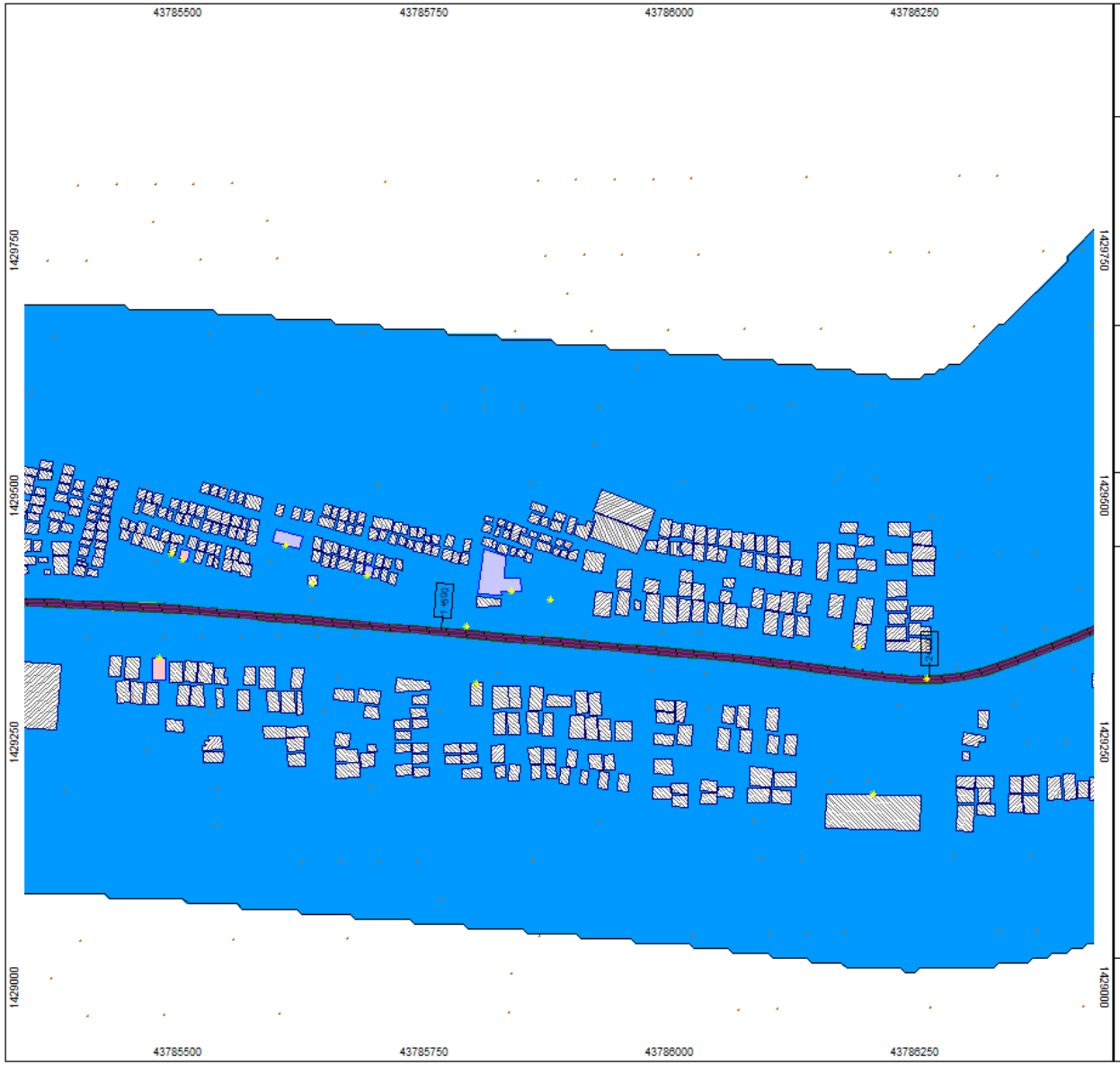

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
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110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n

Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
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Signs and symbols

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- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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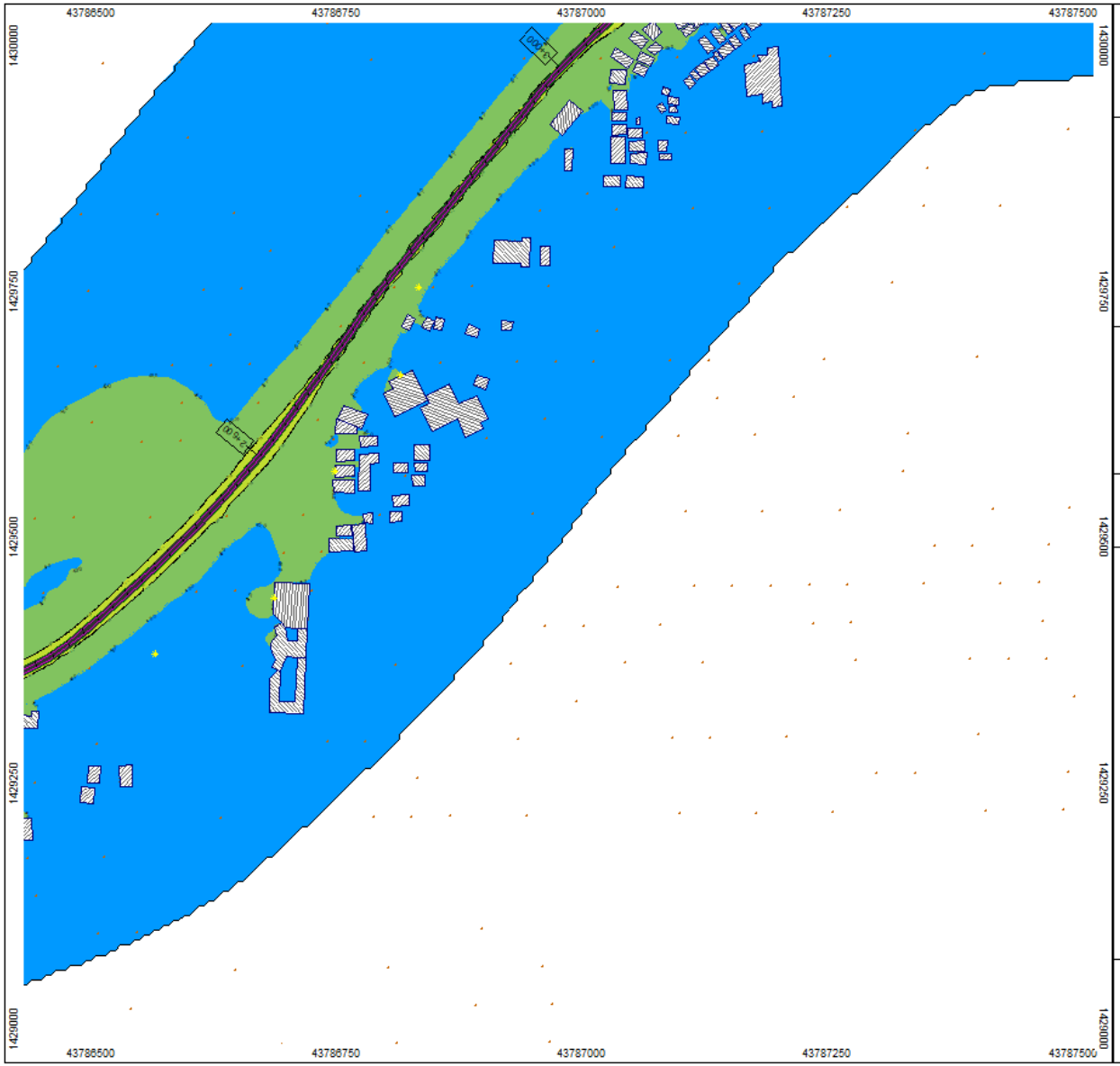

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
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110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
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Signs and symbols

- Wall
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- Wall
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- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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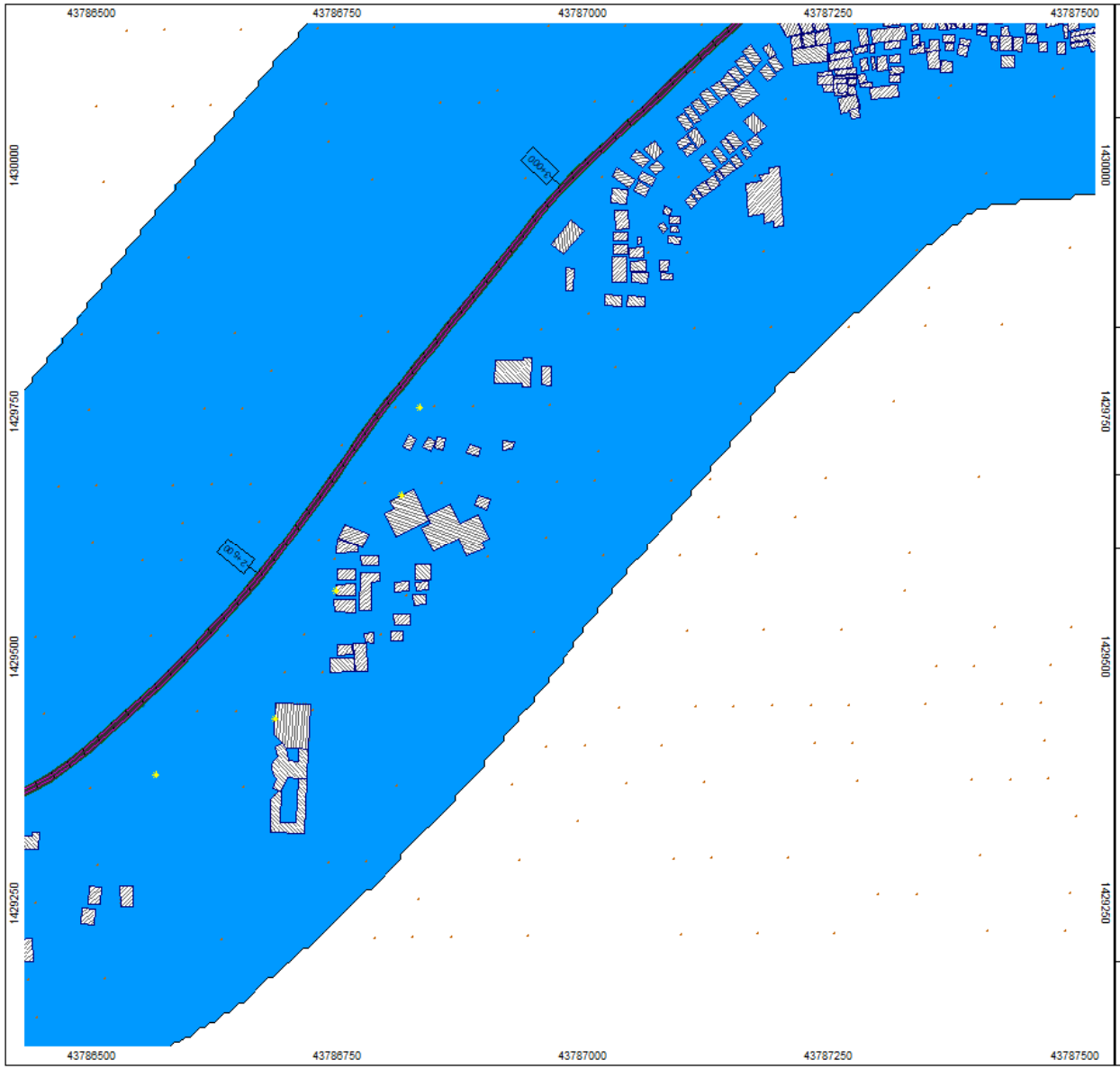

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
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Signs and symbols

- Wall
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N

Length scale 1:3887
0 30 60 120 180 240 m

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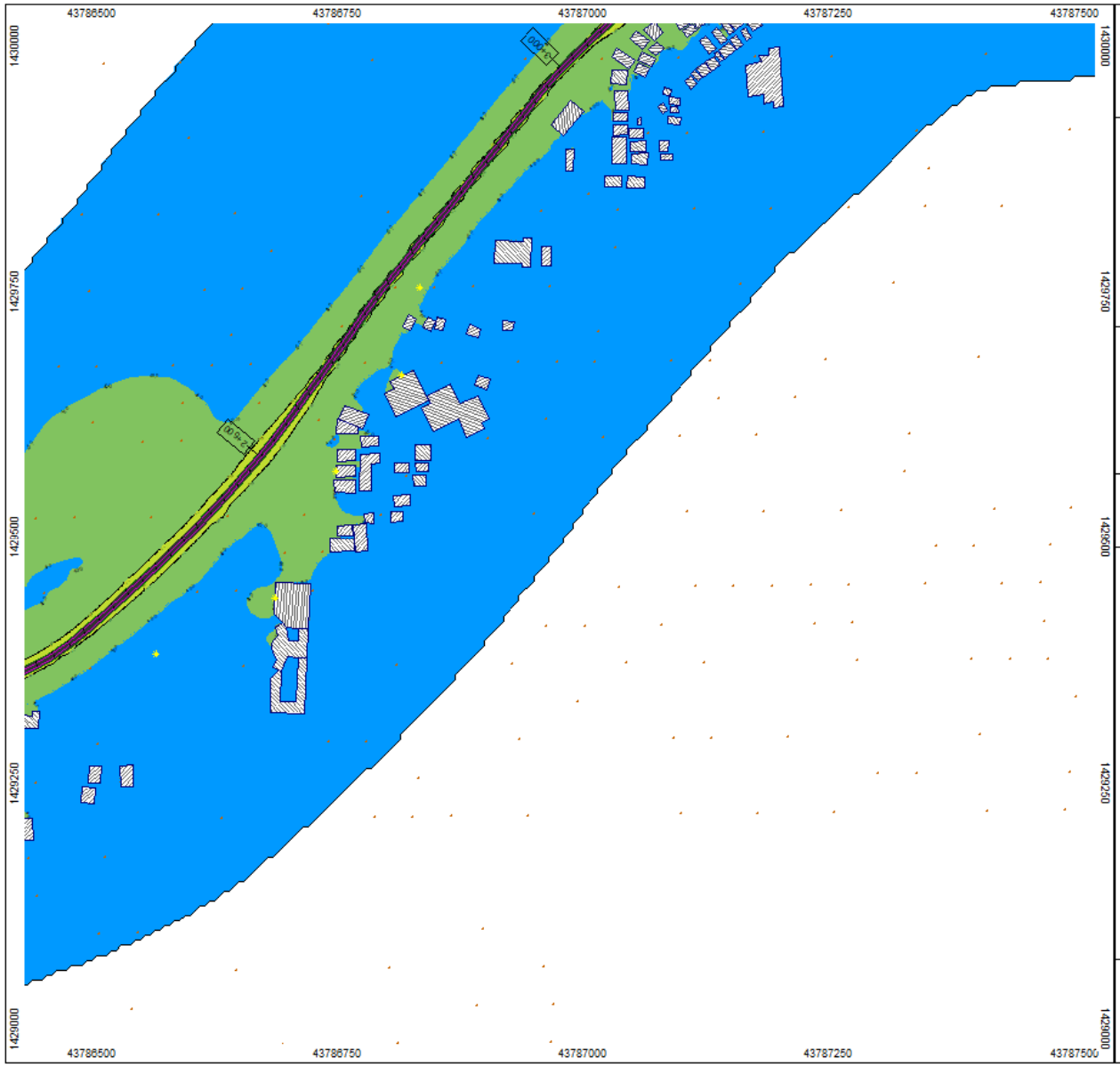

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d

Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
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N

Length scale 1:3887

0 30 60 120 180 240 m

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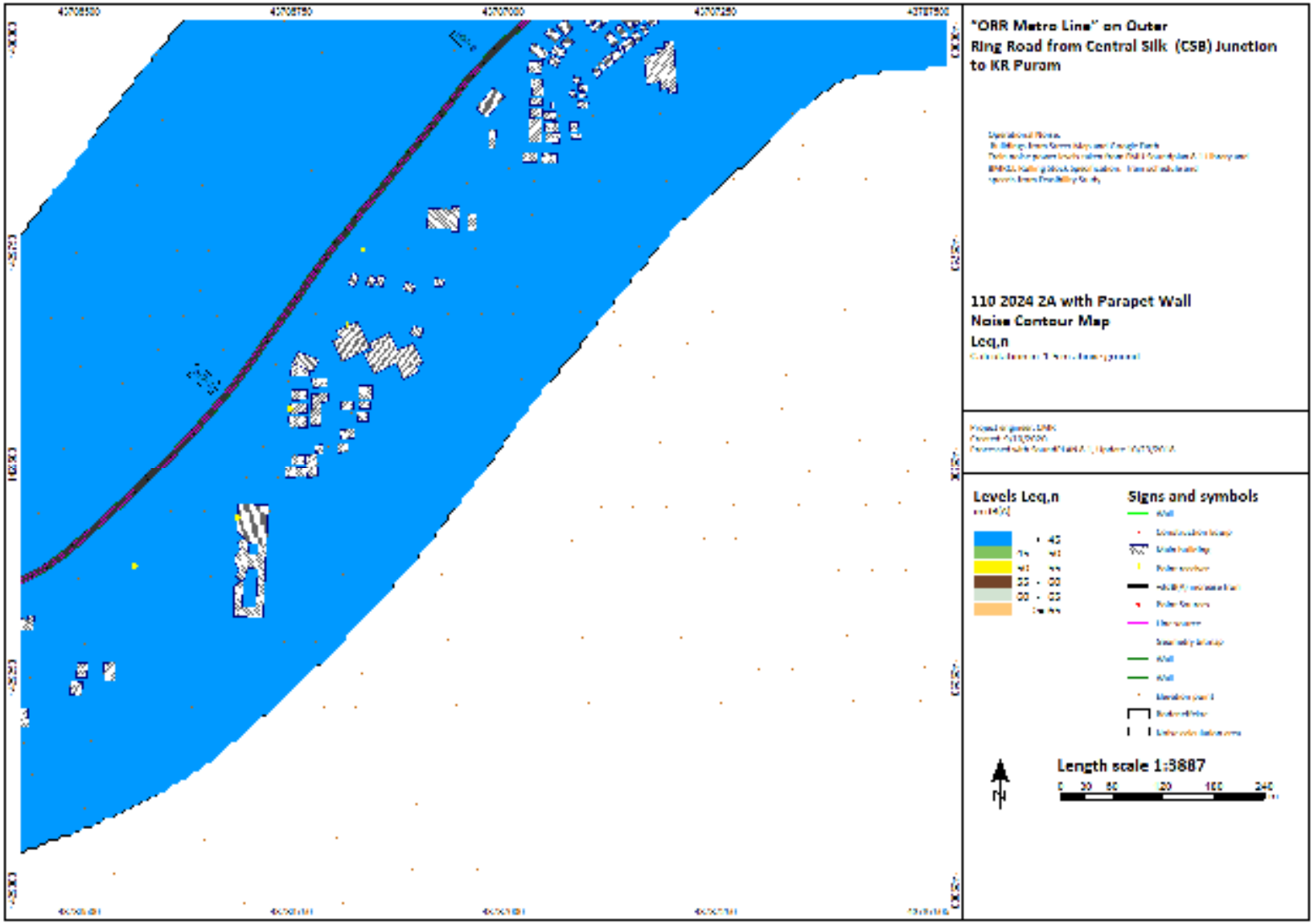
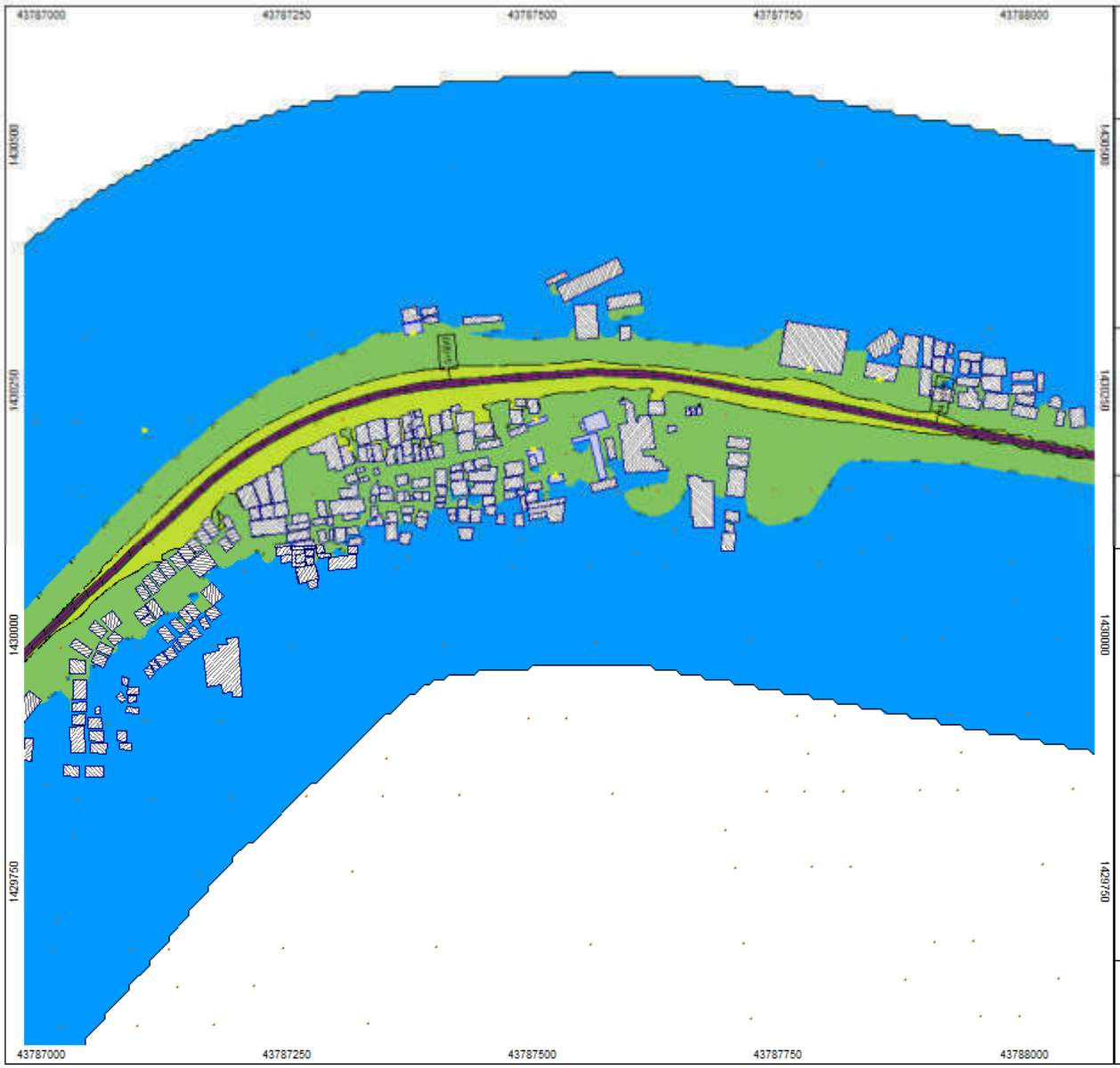

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram
110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Levels Leq,n
Signs and symbols
Length scale 1:3887



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from DMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMK
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
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Signs and symbols

- Wall
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- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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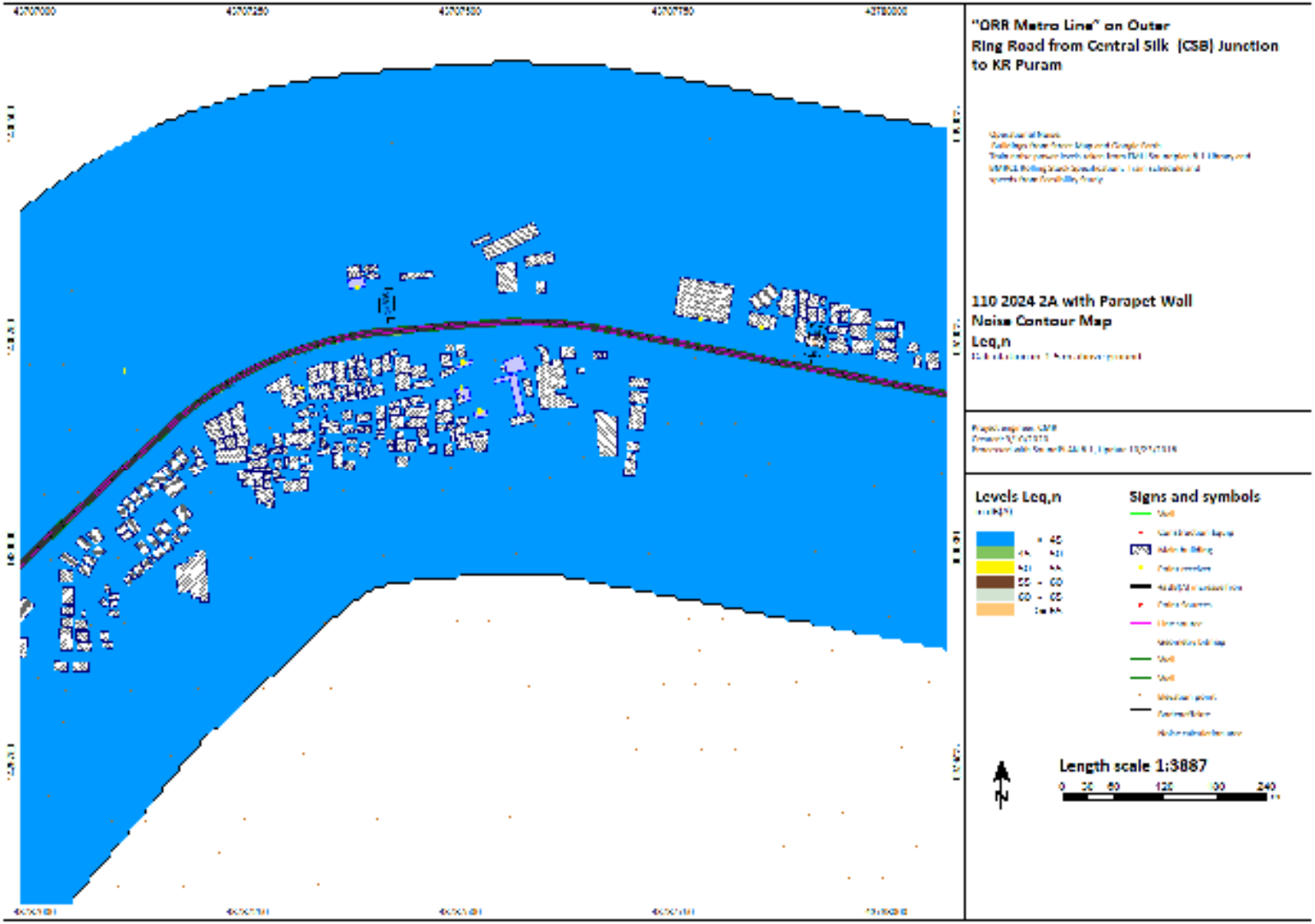
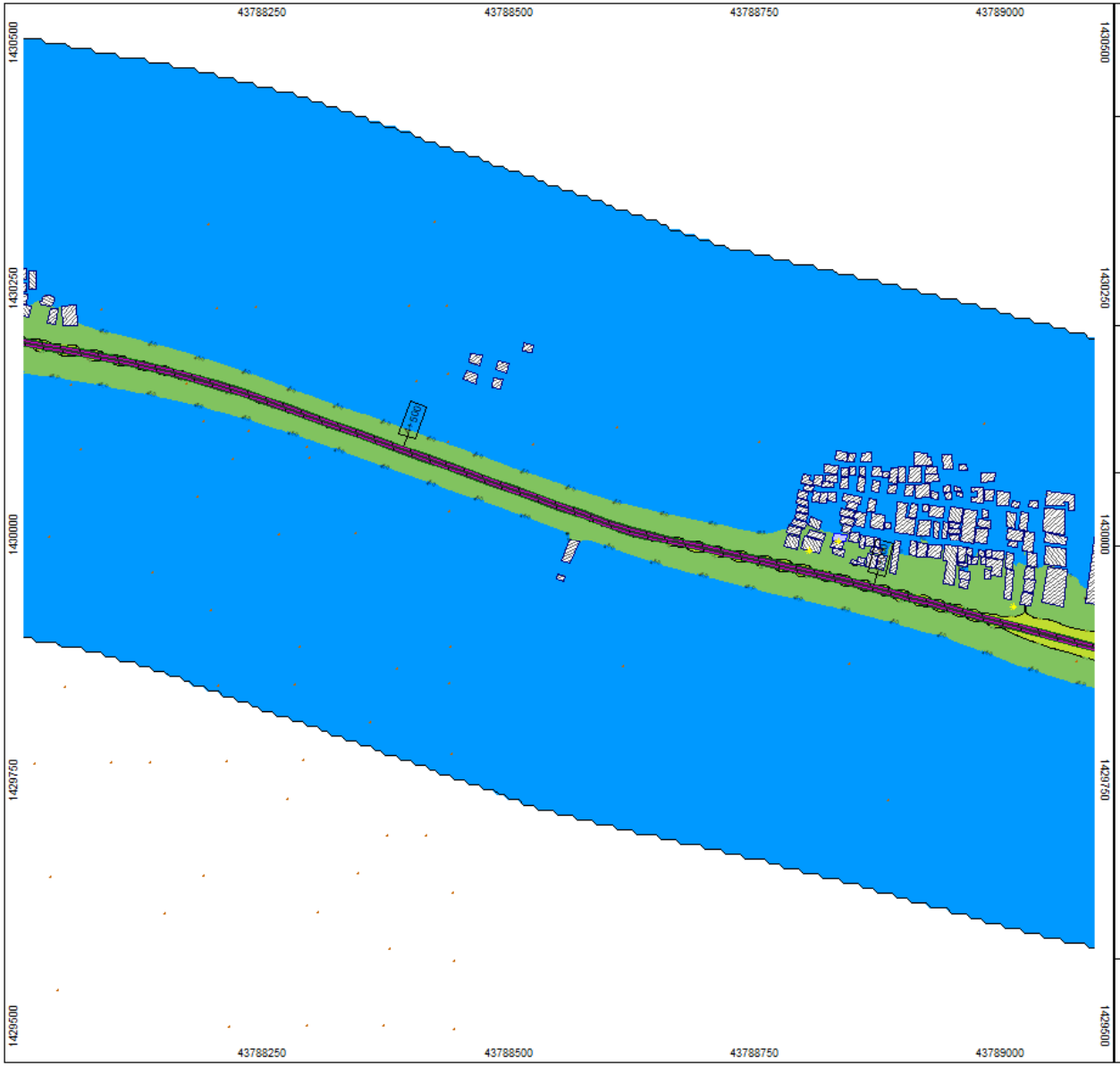

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram
110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Levels Leq,n
Signs and symbols
Length scale 1:3887
N



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
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110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d

Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
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Length scale 1:3887

0 30 60 120 180 240 m

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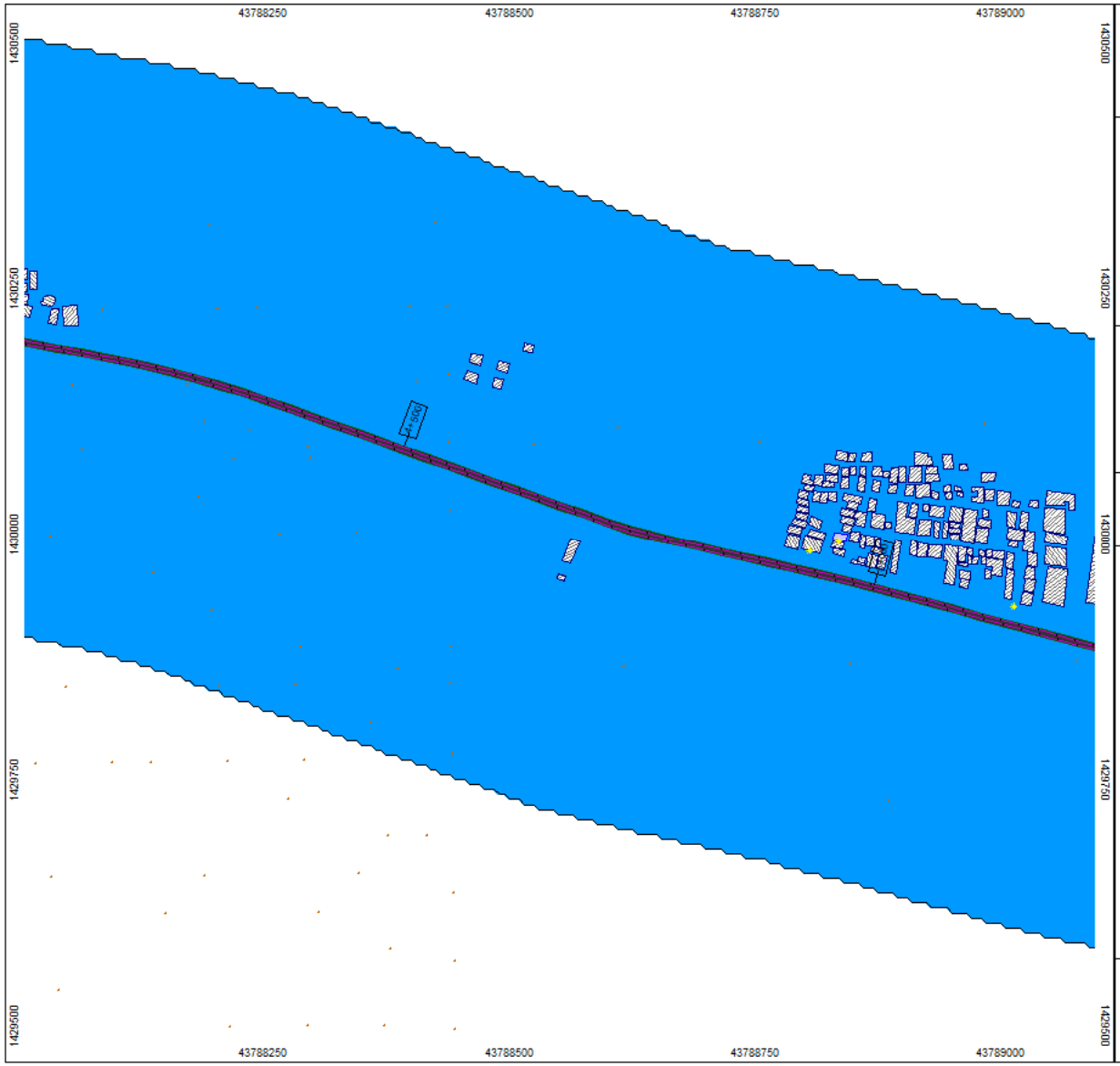

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
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110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n

Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

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	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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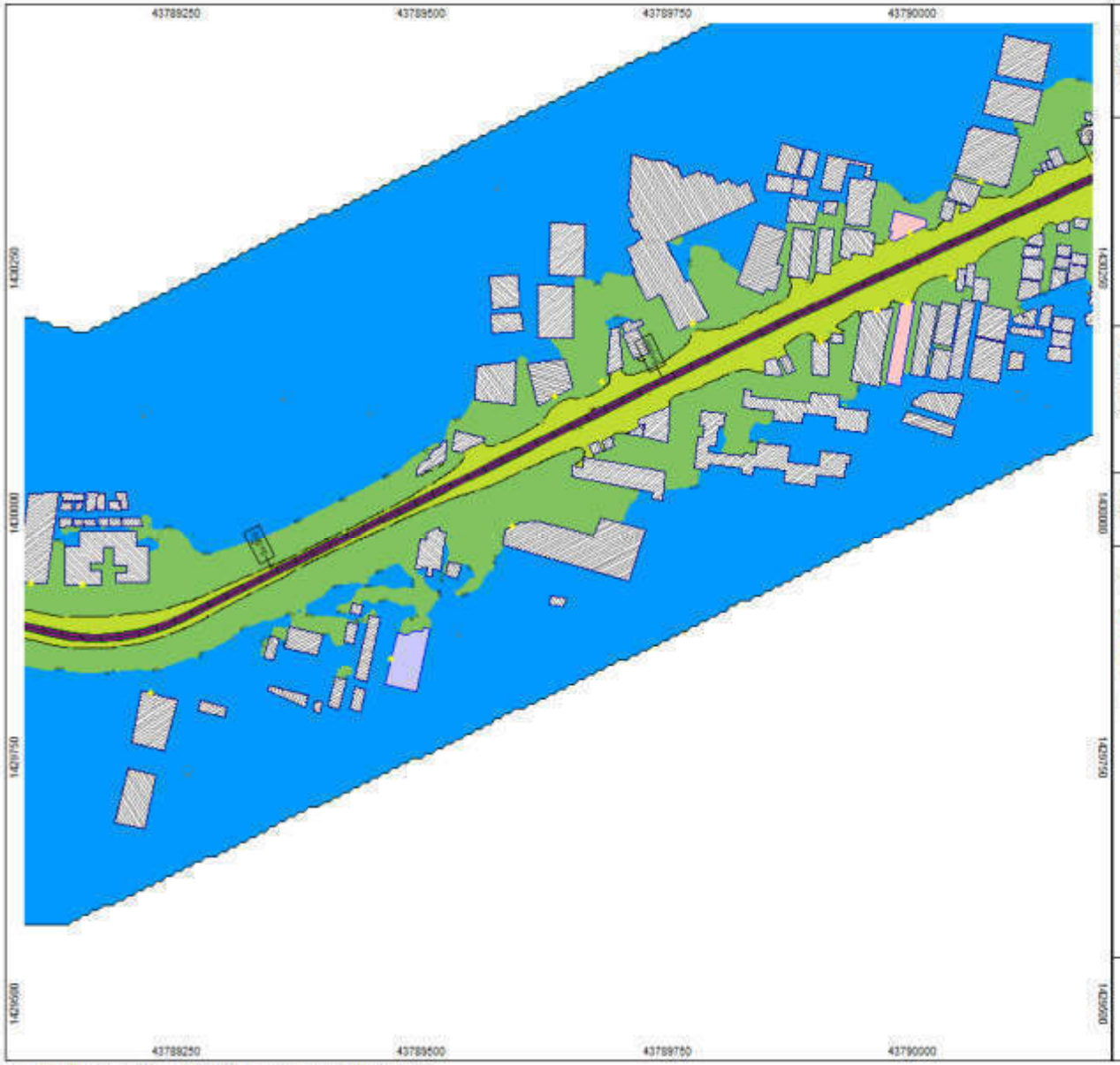

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from DMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols
- Wall
- Construction Equip
- Main building
- Point receiver
- +1dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation points
- Bodenaffekte

Length scale 1:3887
0 30 60 120 180 240 m

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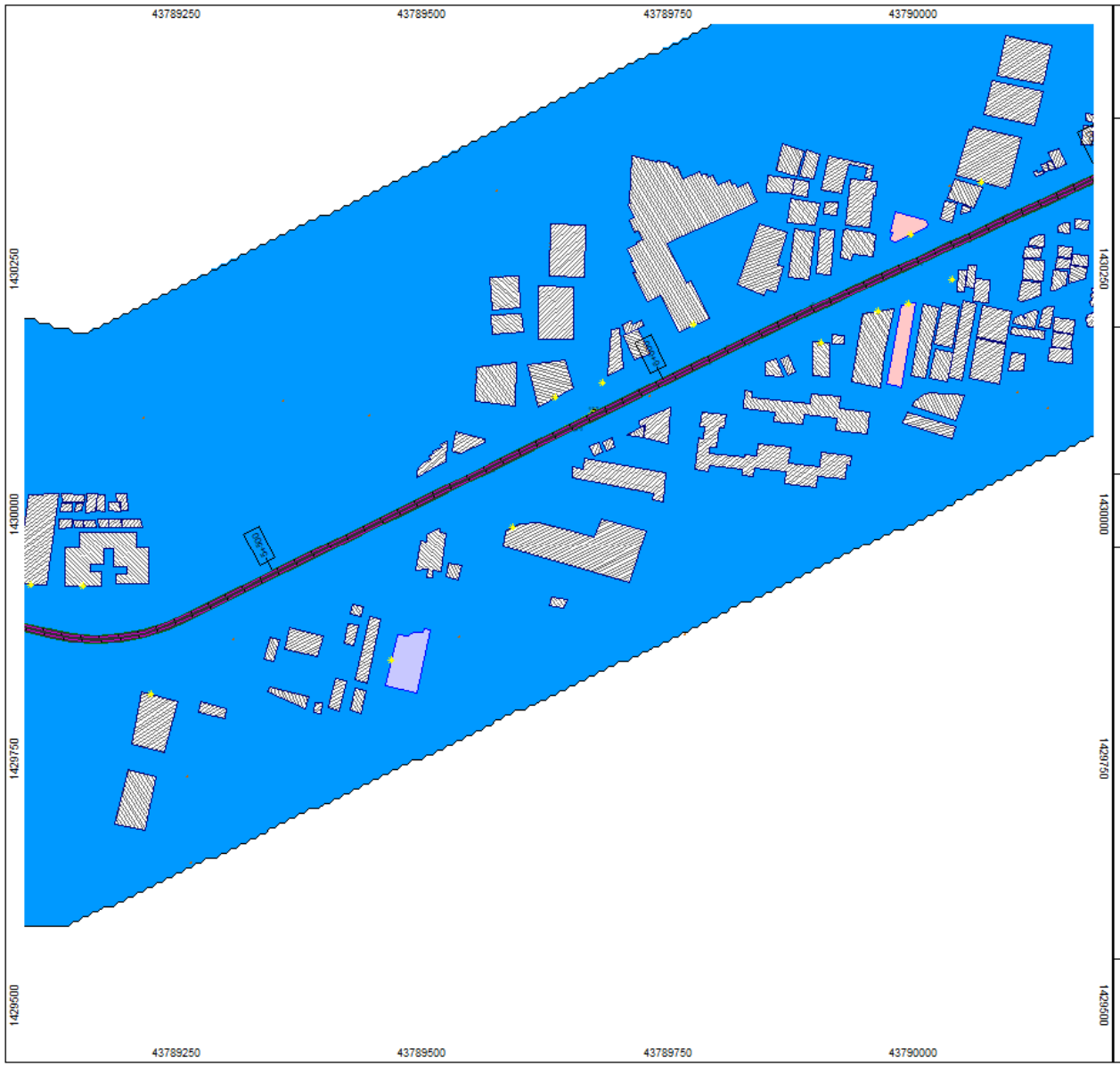

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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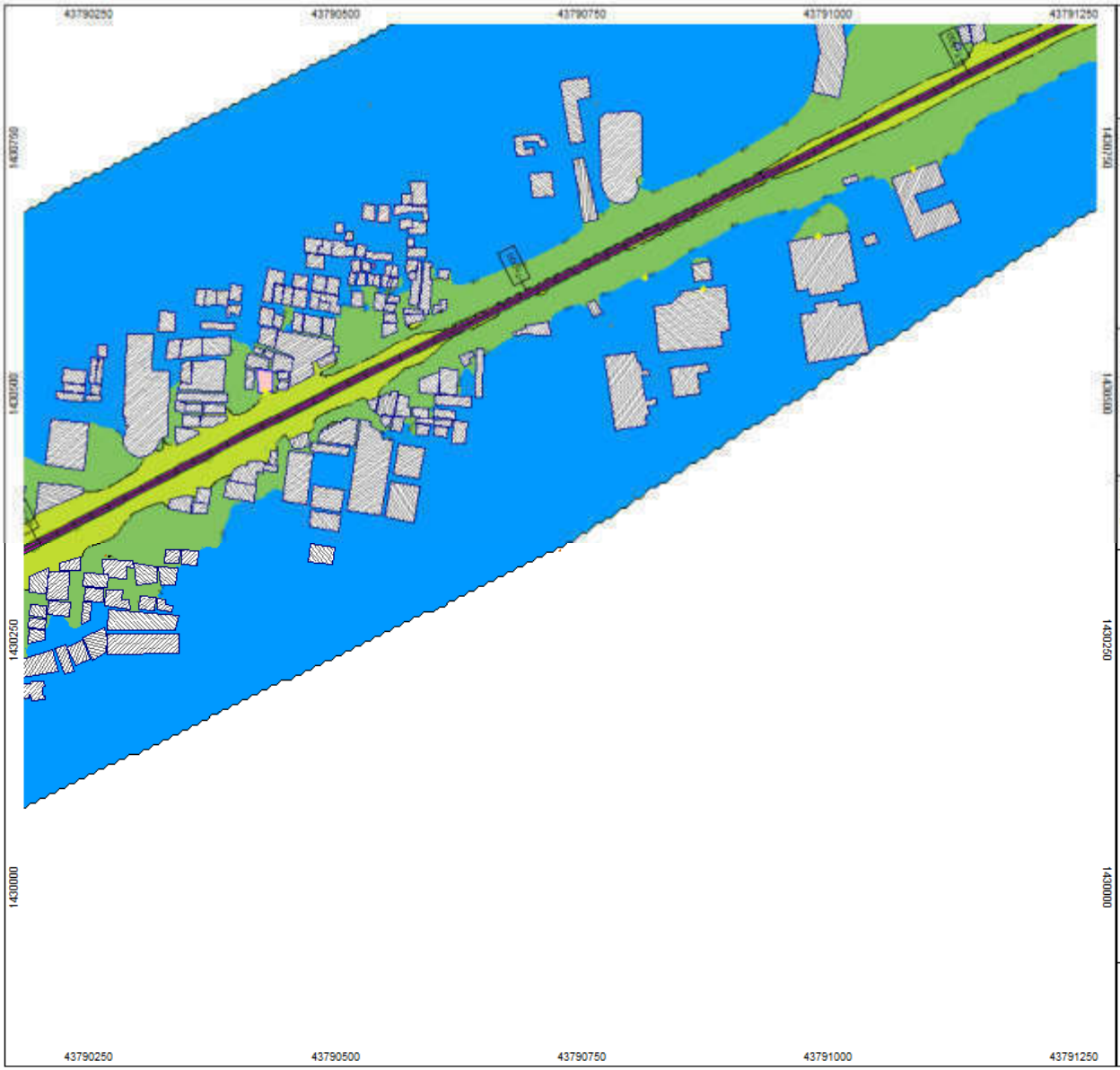

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from CMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887
0 30 60 120 180 240 m

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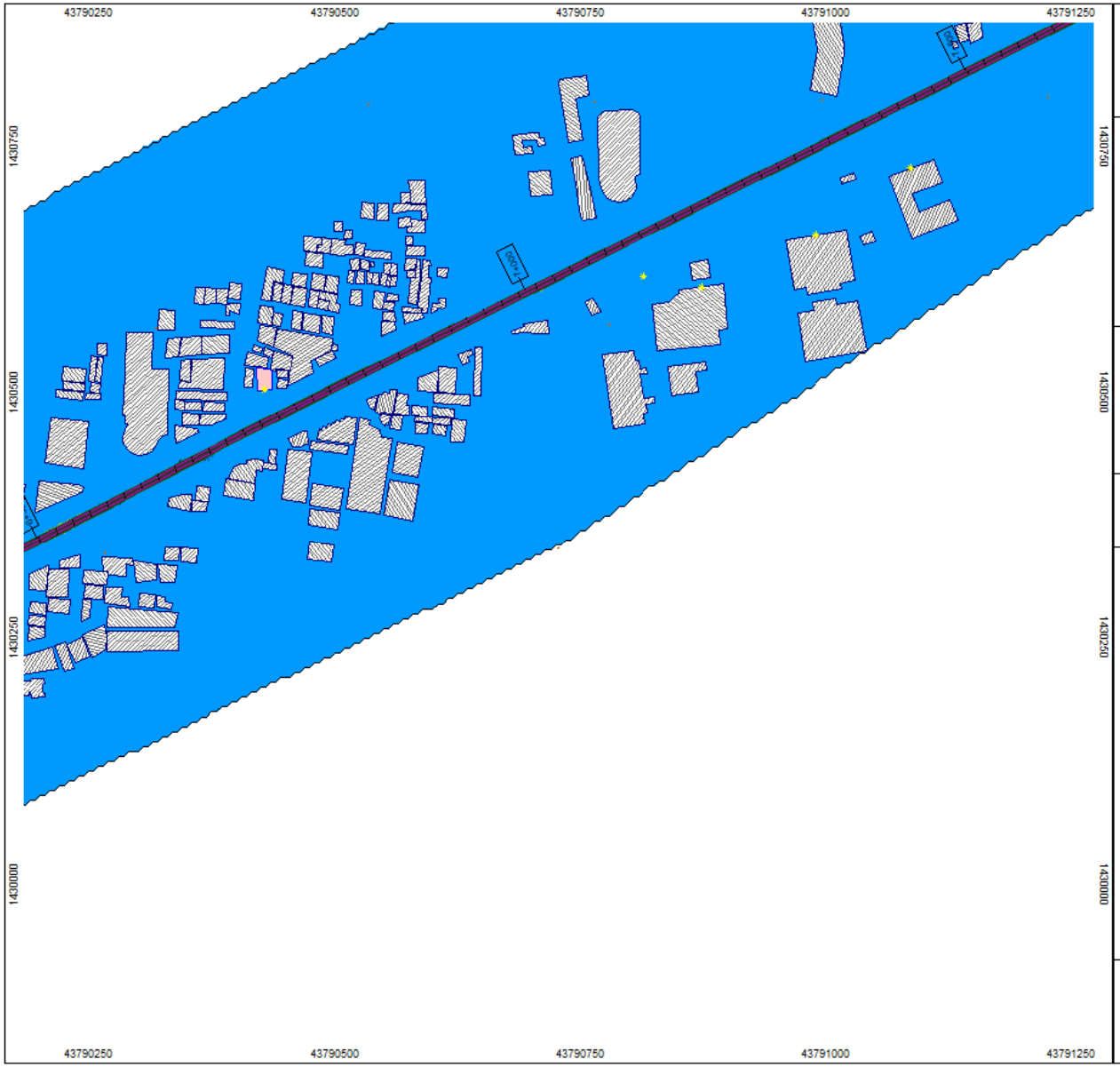

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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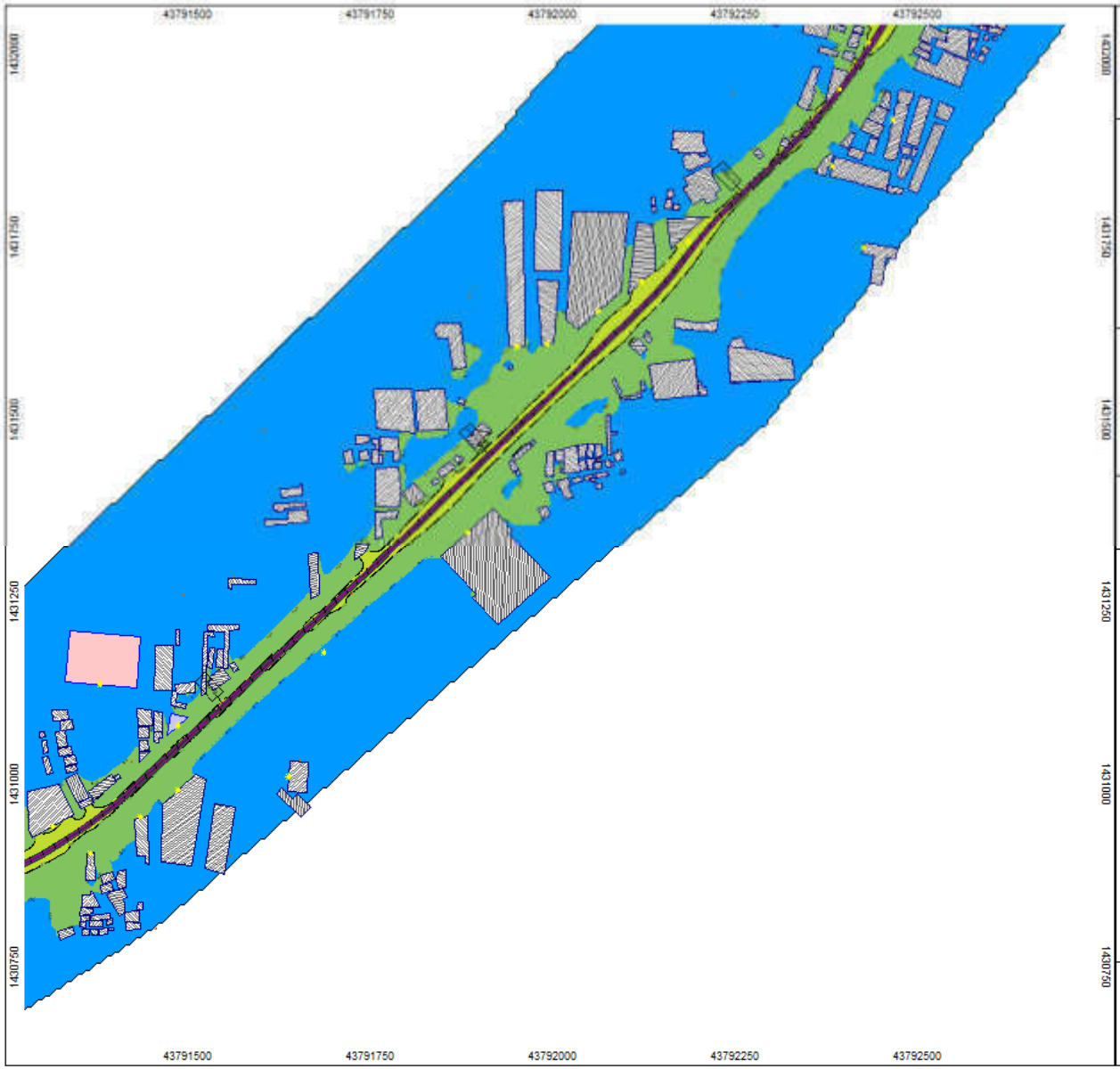

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise
Buildings from Street Map and Google Earth.
Train noise power levels taken from DMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMA
Created:9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5245

0 45 90 180 270 360 m

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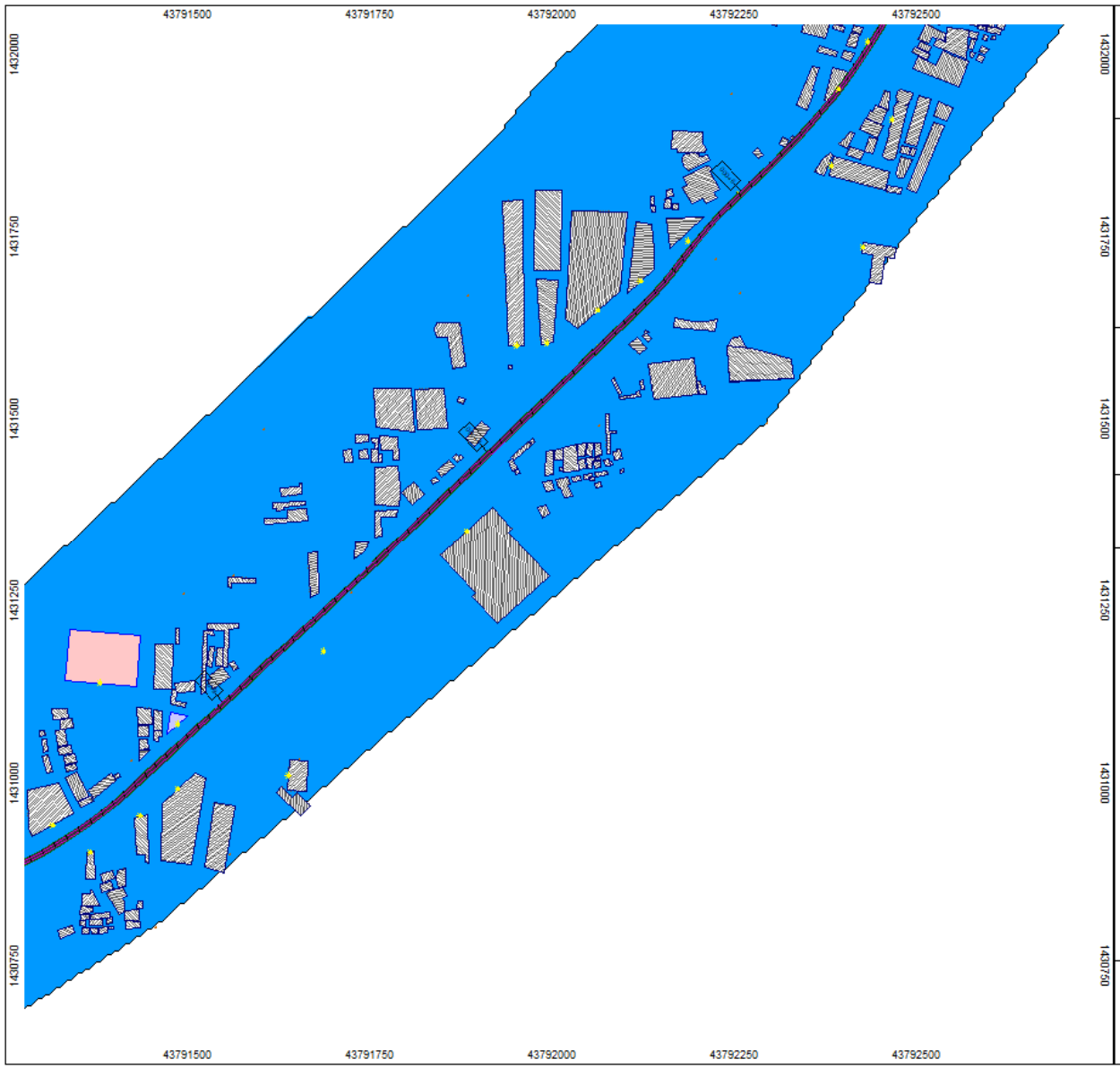

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols
- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5245
0 45 90 180 270 360 m

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"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d

Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
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	>= 65

Signs and symbols

- Wall
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- Main building
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- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5245

0 45 90 180 270 360 m

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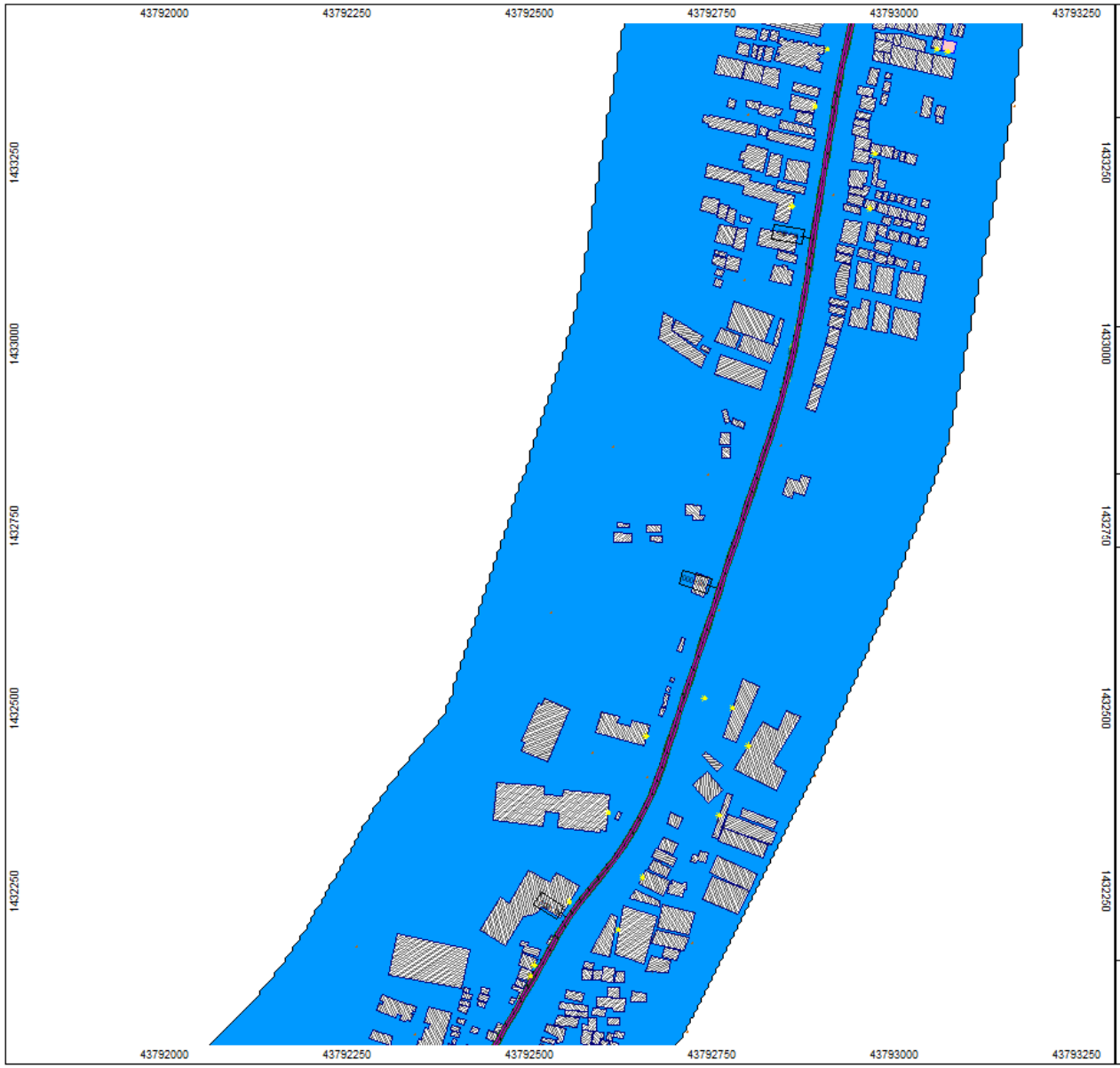

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
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110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

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	50 - 55
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	>= 65

Signs and symbols

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- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5245

0 45 90 180 270 360 m

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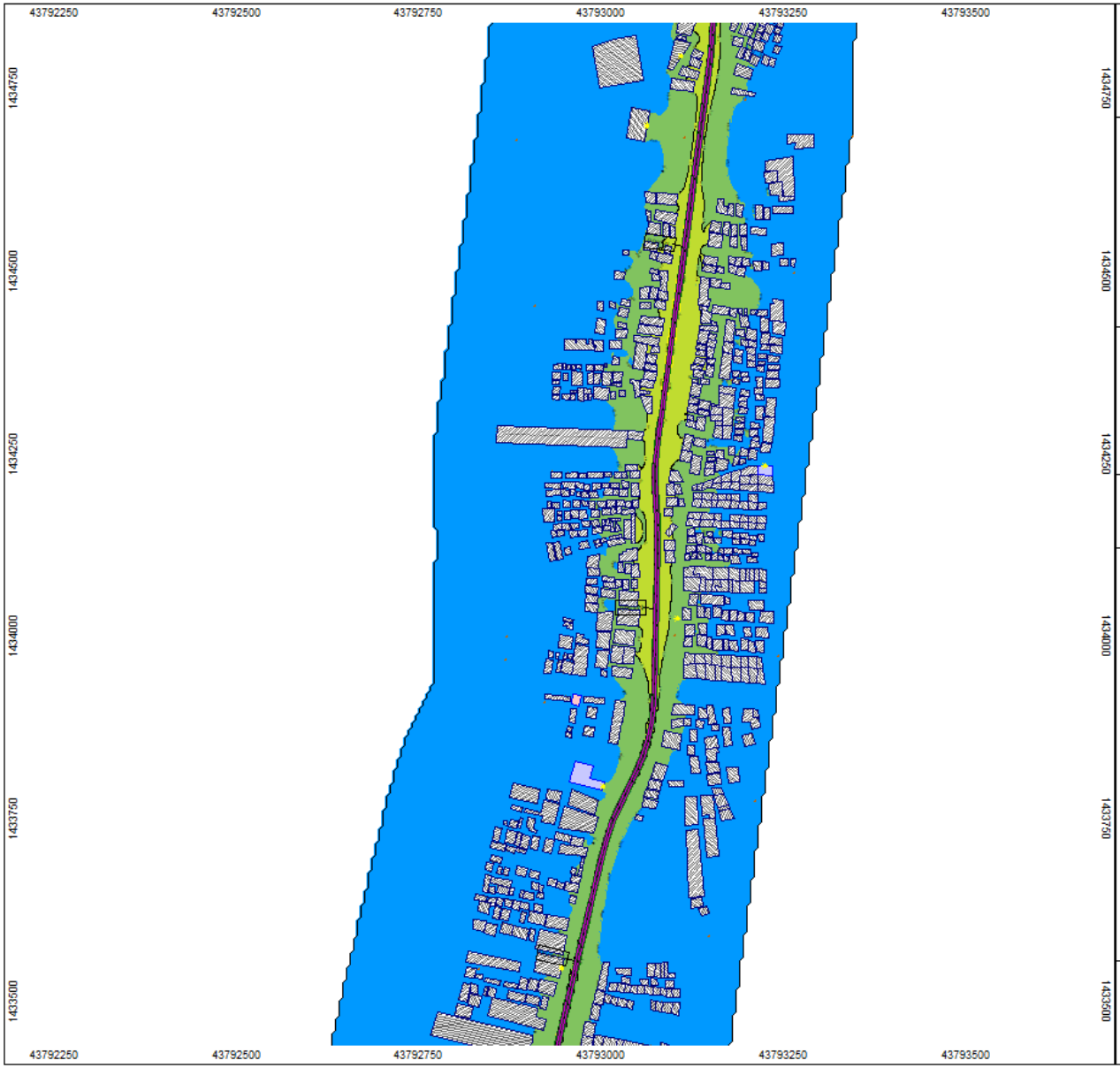

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
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110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d

Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5245

0 45 90 180 270 360 m

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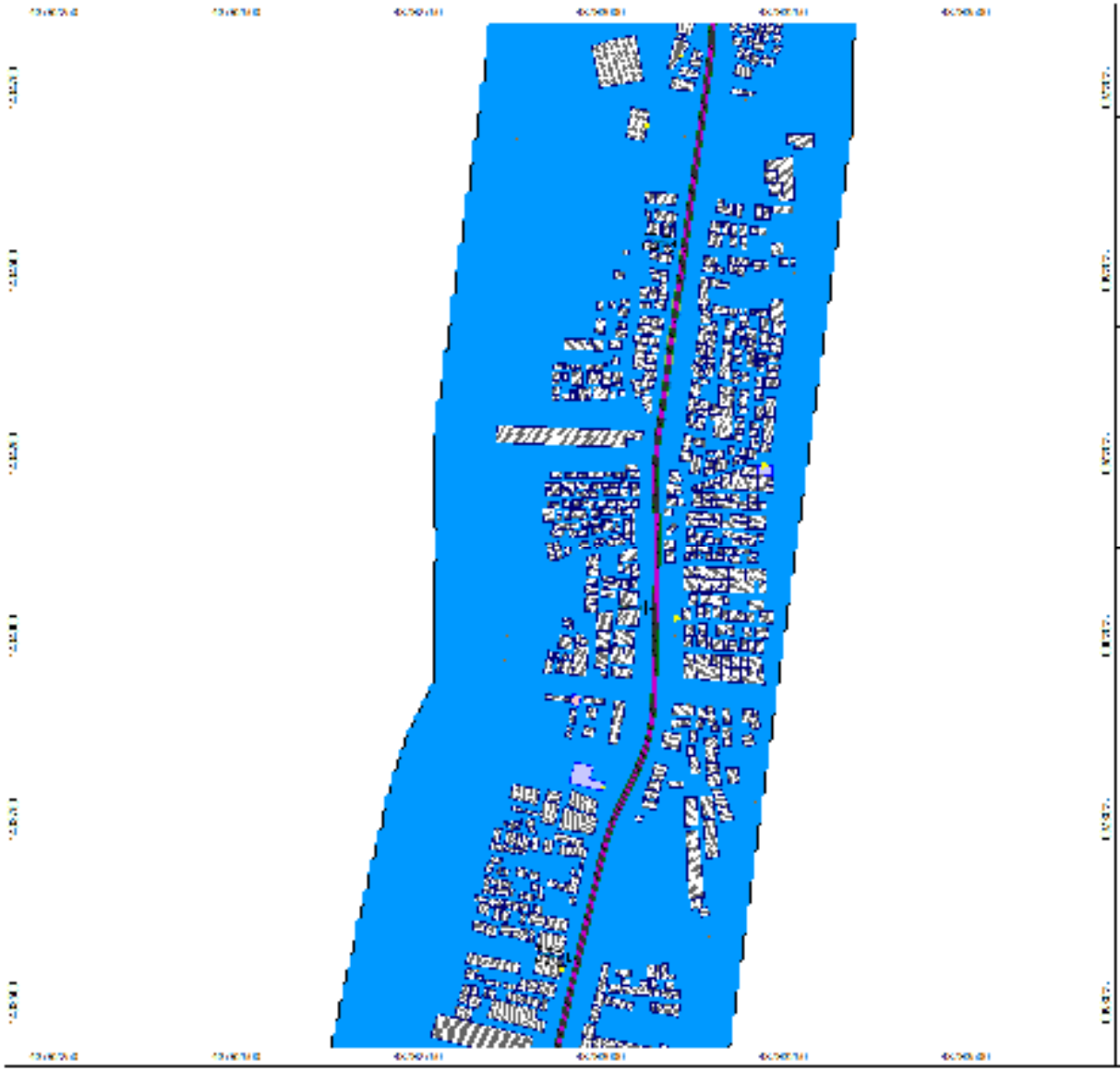


"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

110 2024 2A with Parapet Wall

Noise Contour Map

Leq,n

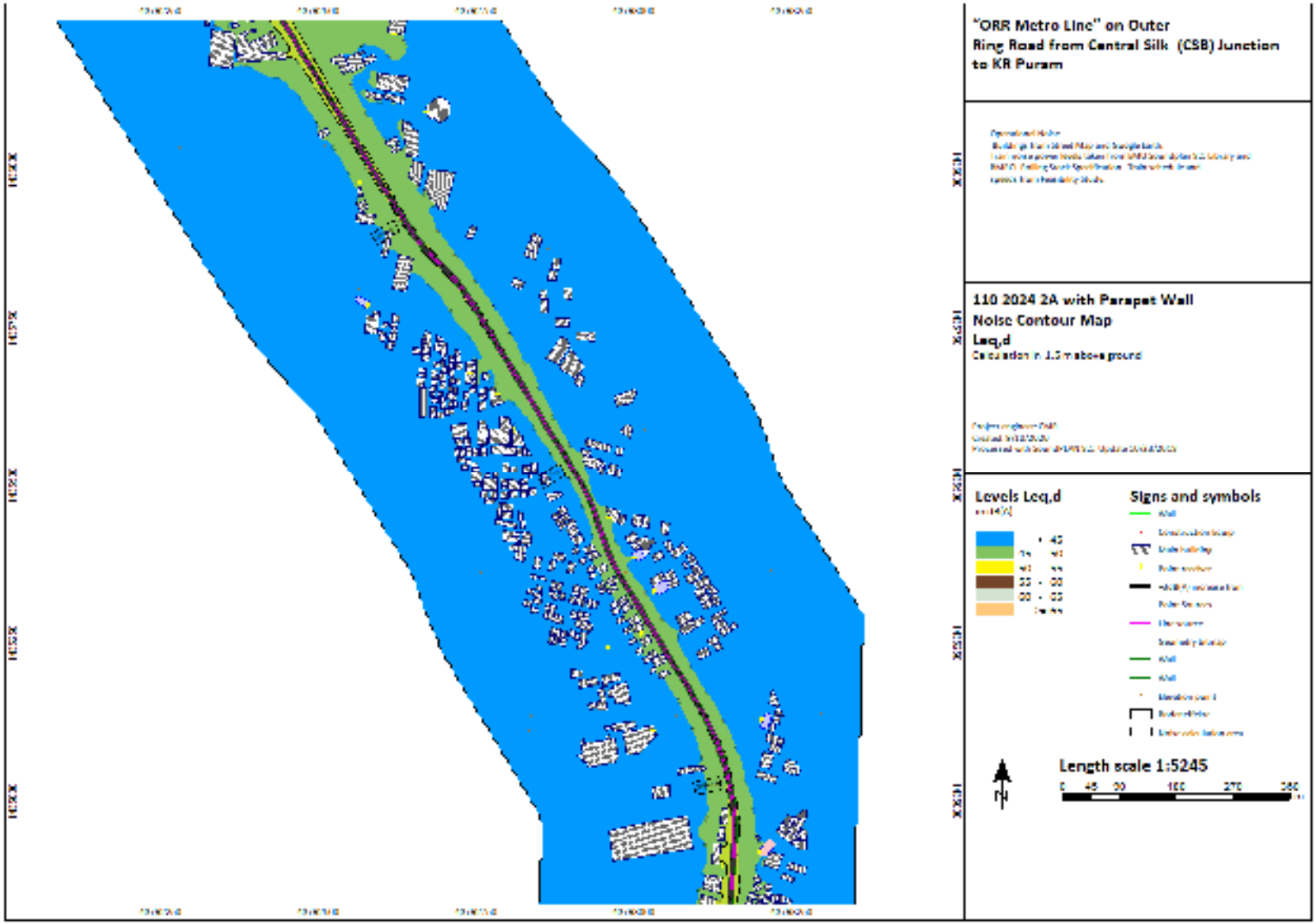
Calculation in 1.5 m above ground

Levels Leq,n

Signs and symbols

Length scale 1:5245

0 45 90 180 270 360



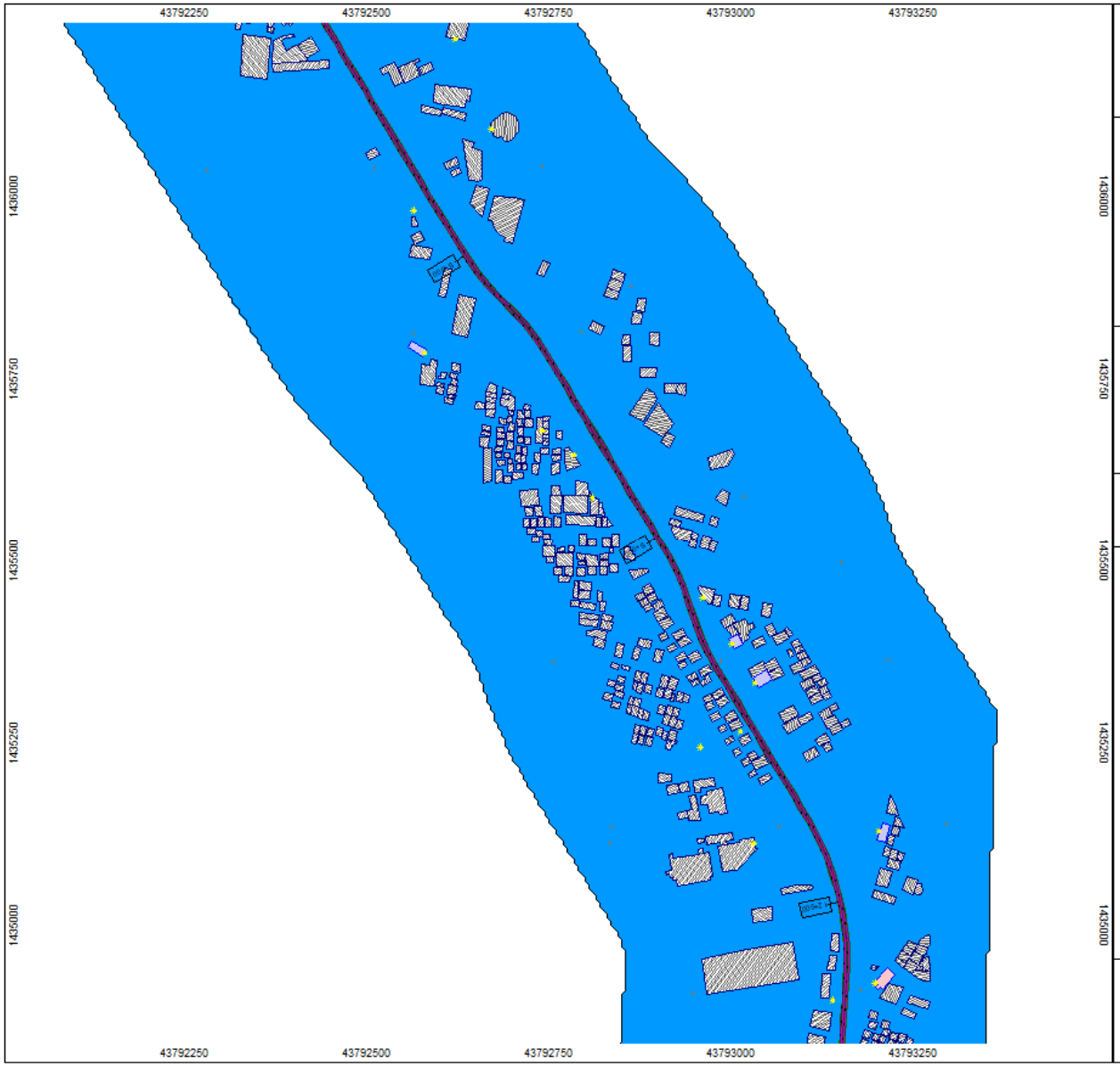
"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Levels Leq,d

Signs and symbols

Length scale 1:5245



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5245
0 45 90 180 270 360 m

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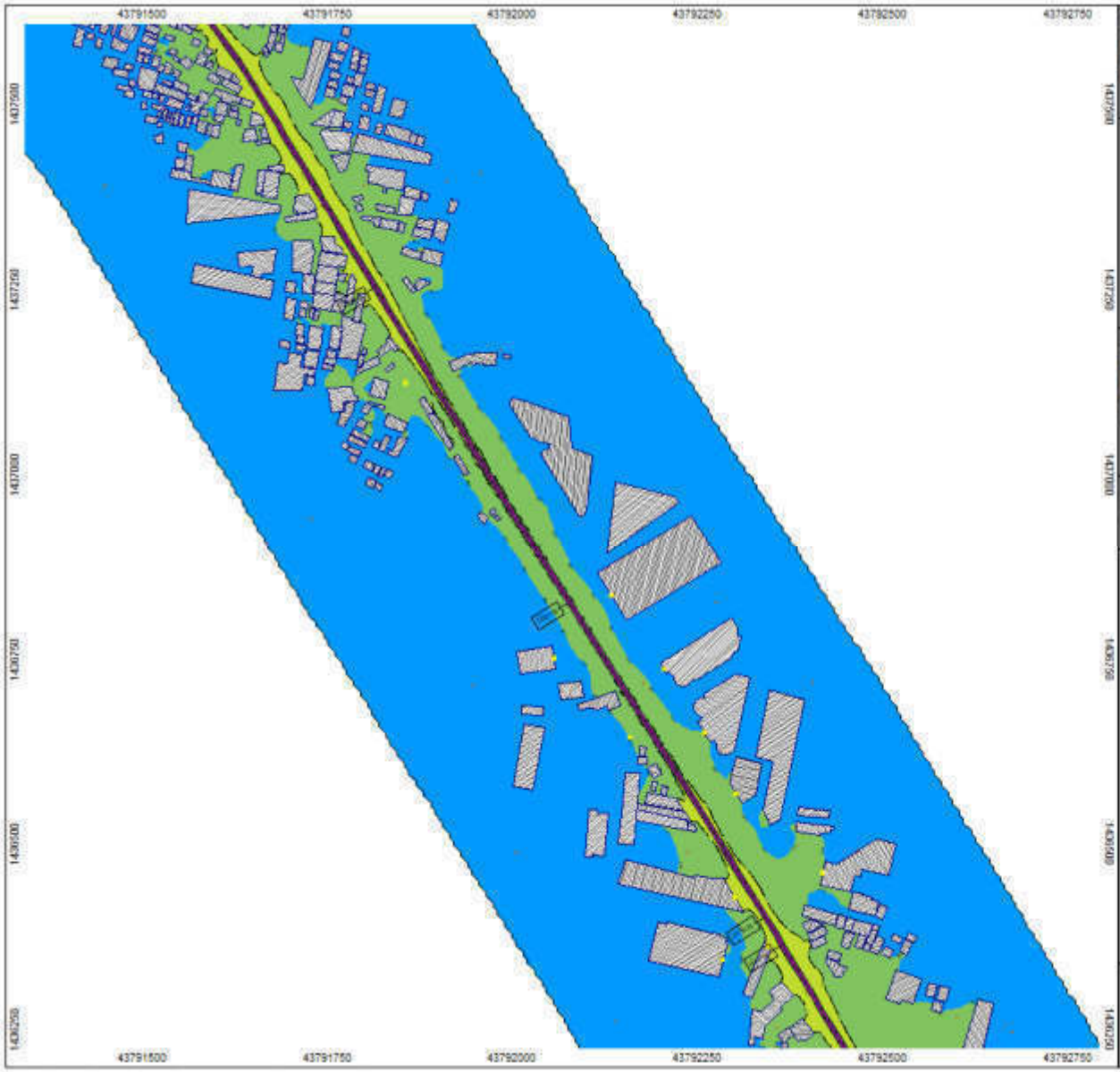

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from DMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekt
- Noise calculation area

N

Length scale 1:5181

0 45 90 180 270 360 m

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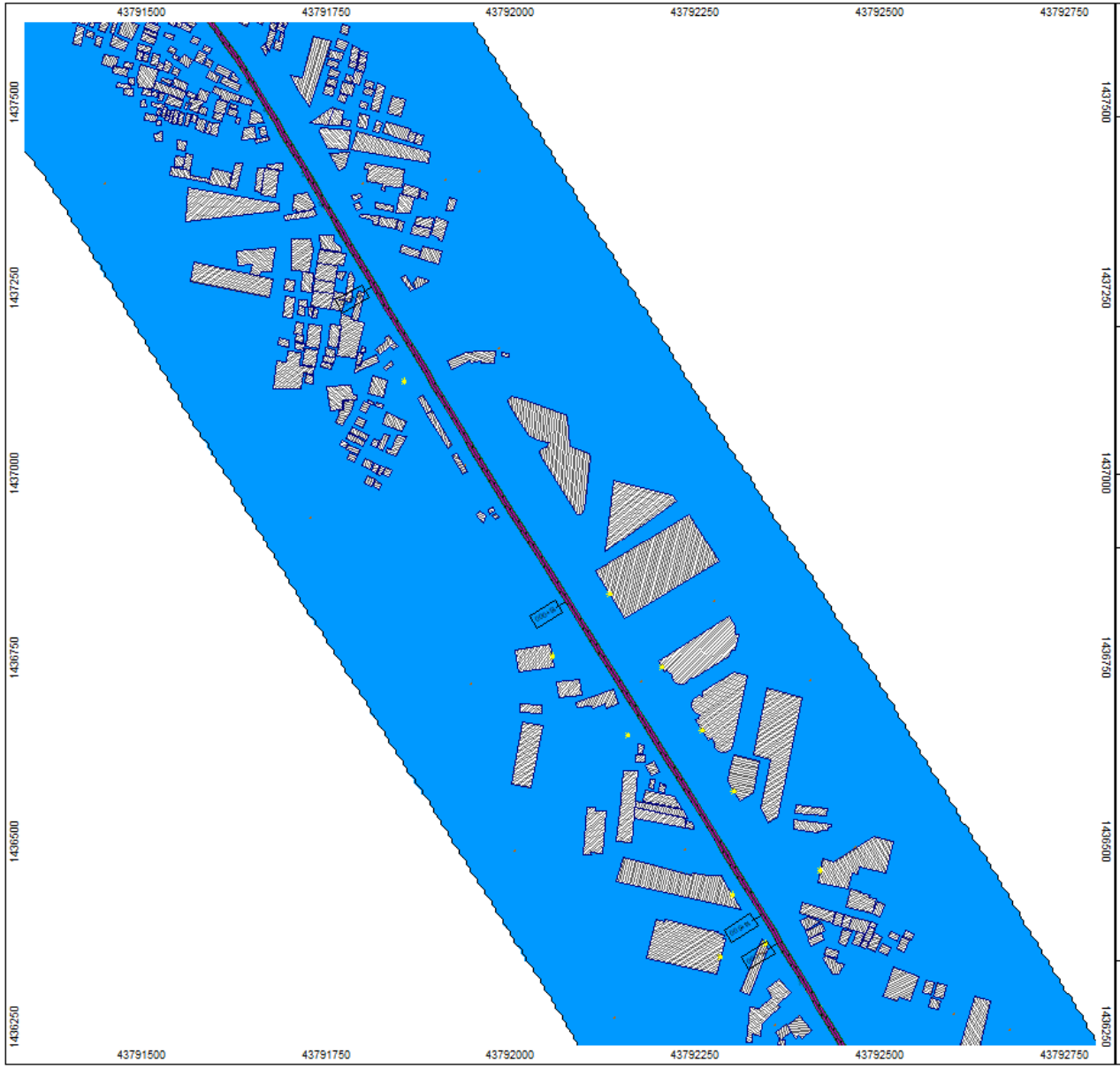

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5181

0 45 90 180 270 360 m

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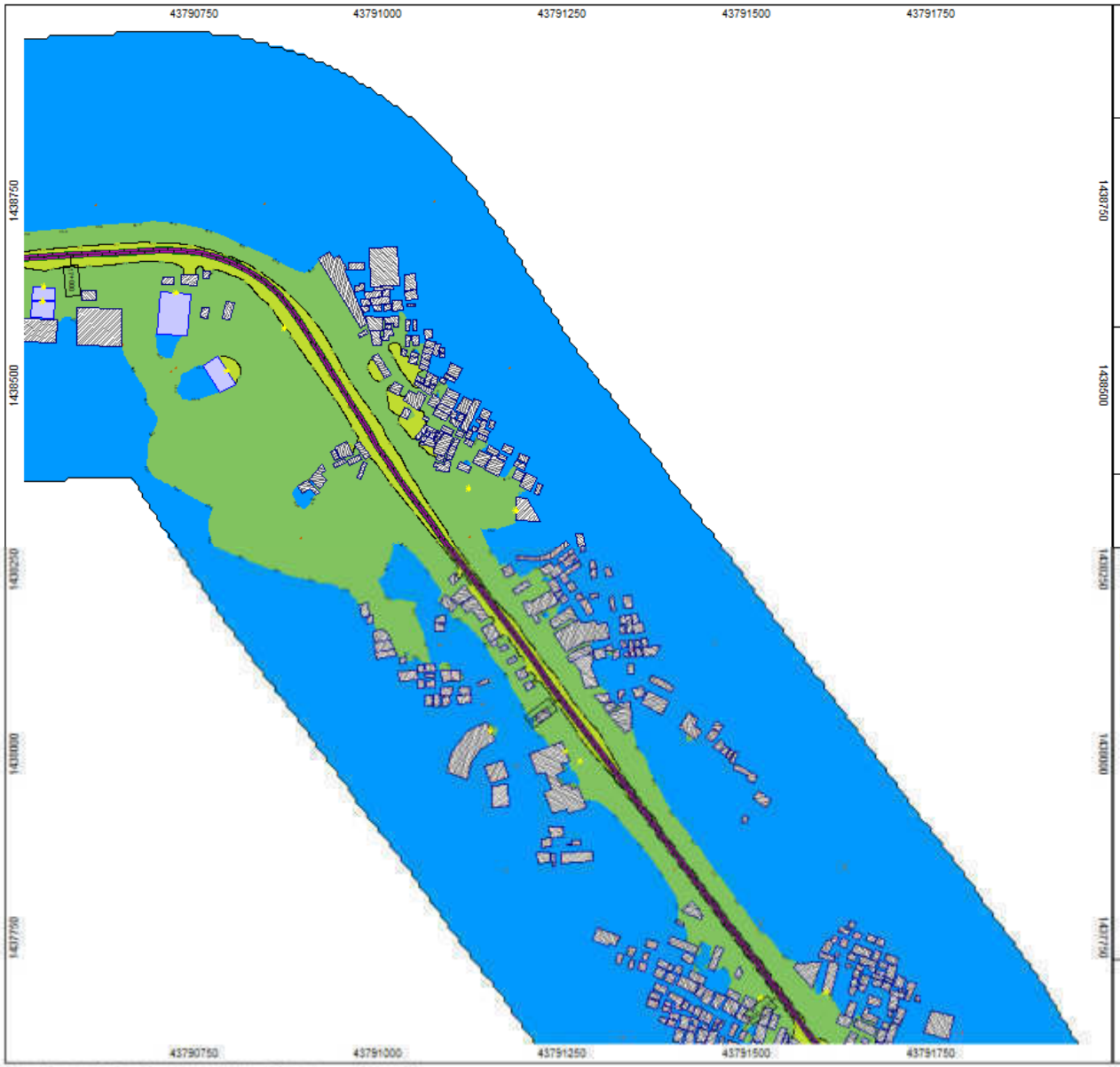

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- 4dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Buildingfloor
- Noise calculation area

Length scale 1:5181

0 45 90 180 270 360 m

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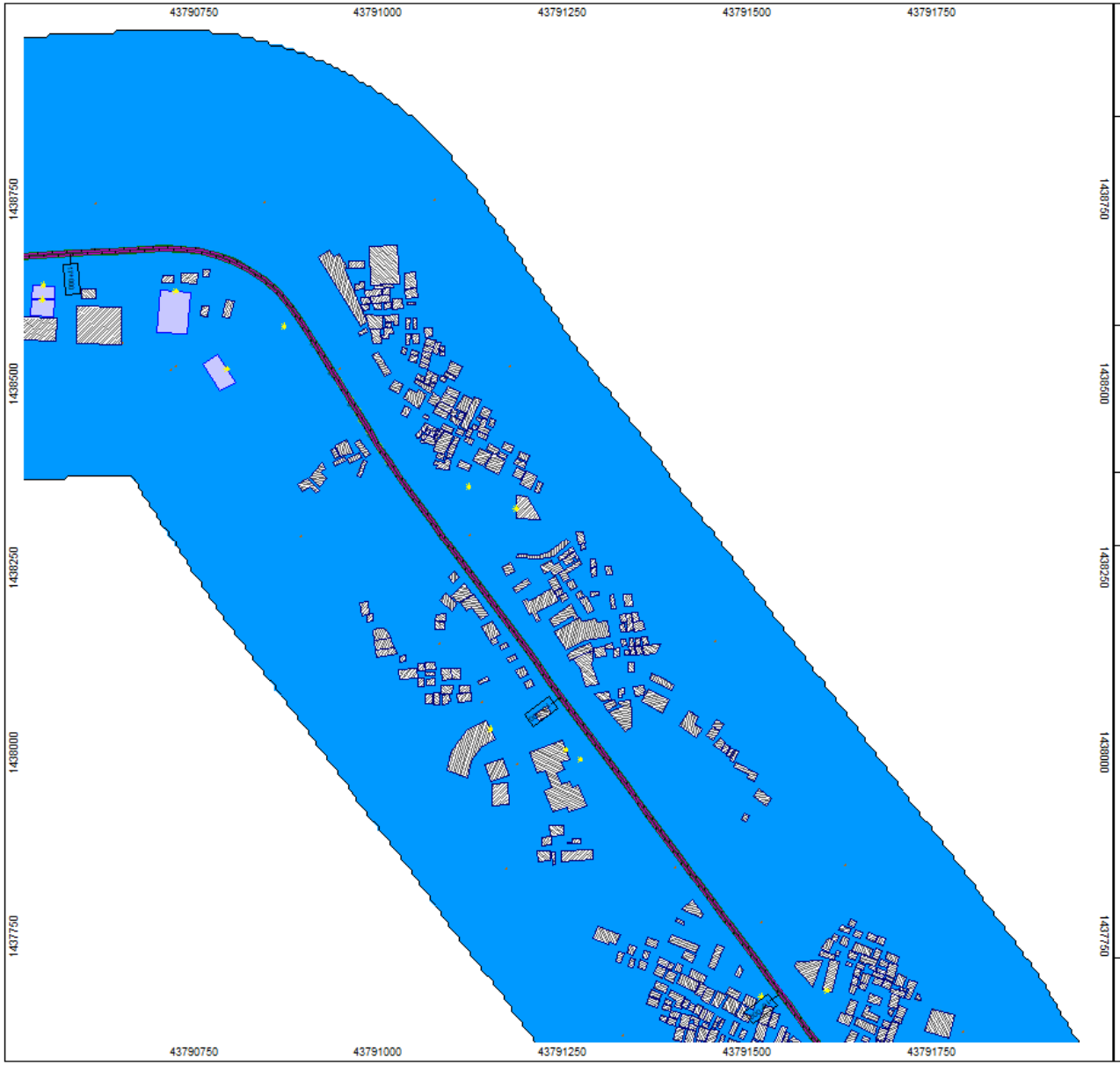

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5181

0 45 90 180 270 360 m

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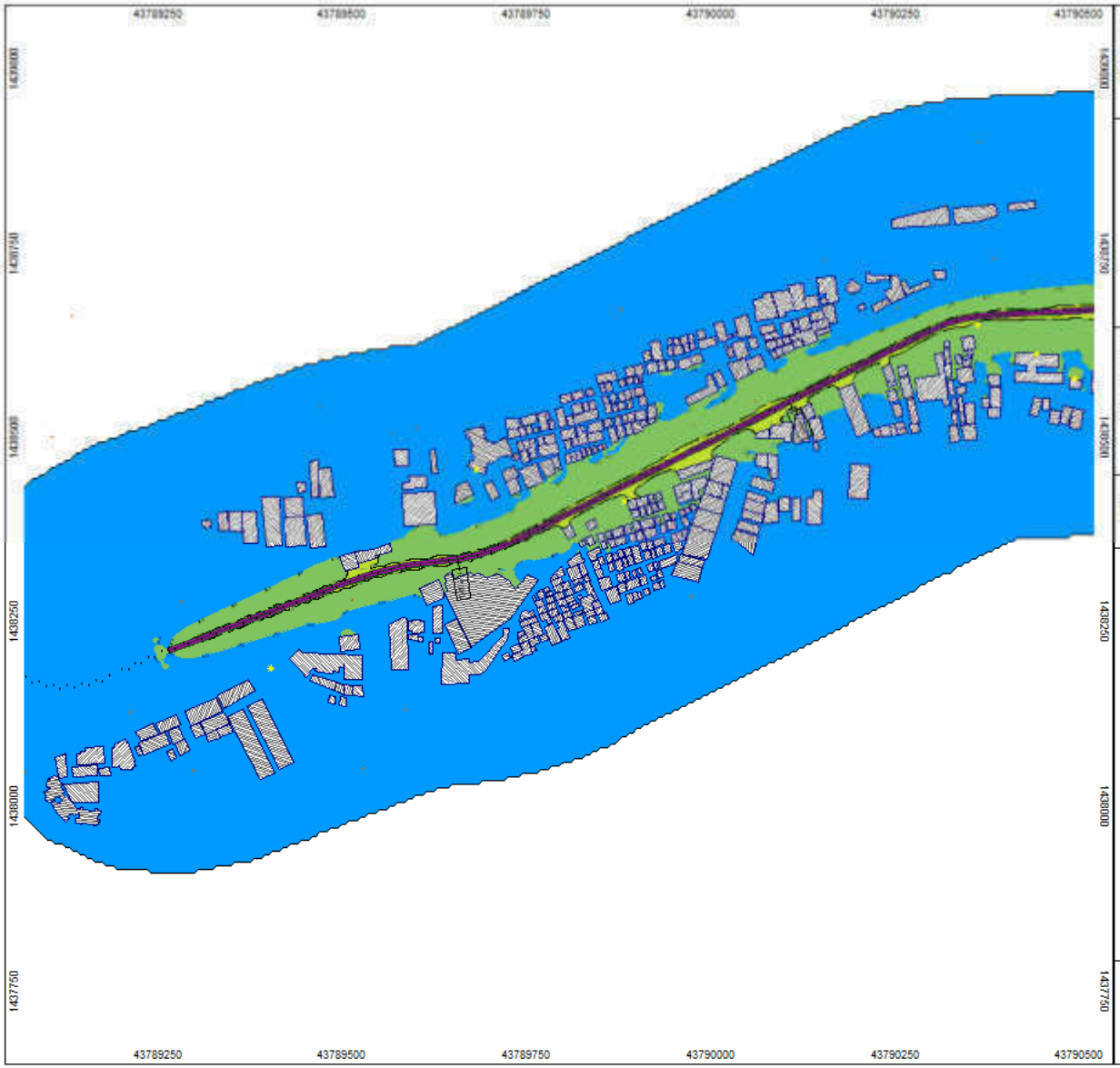

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise:
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5181

0 45 90 180 270 360 m

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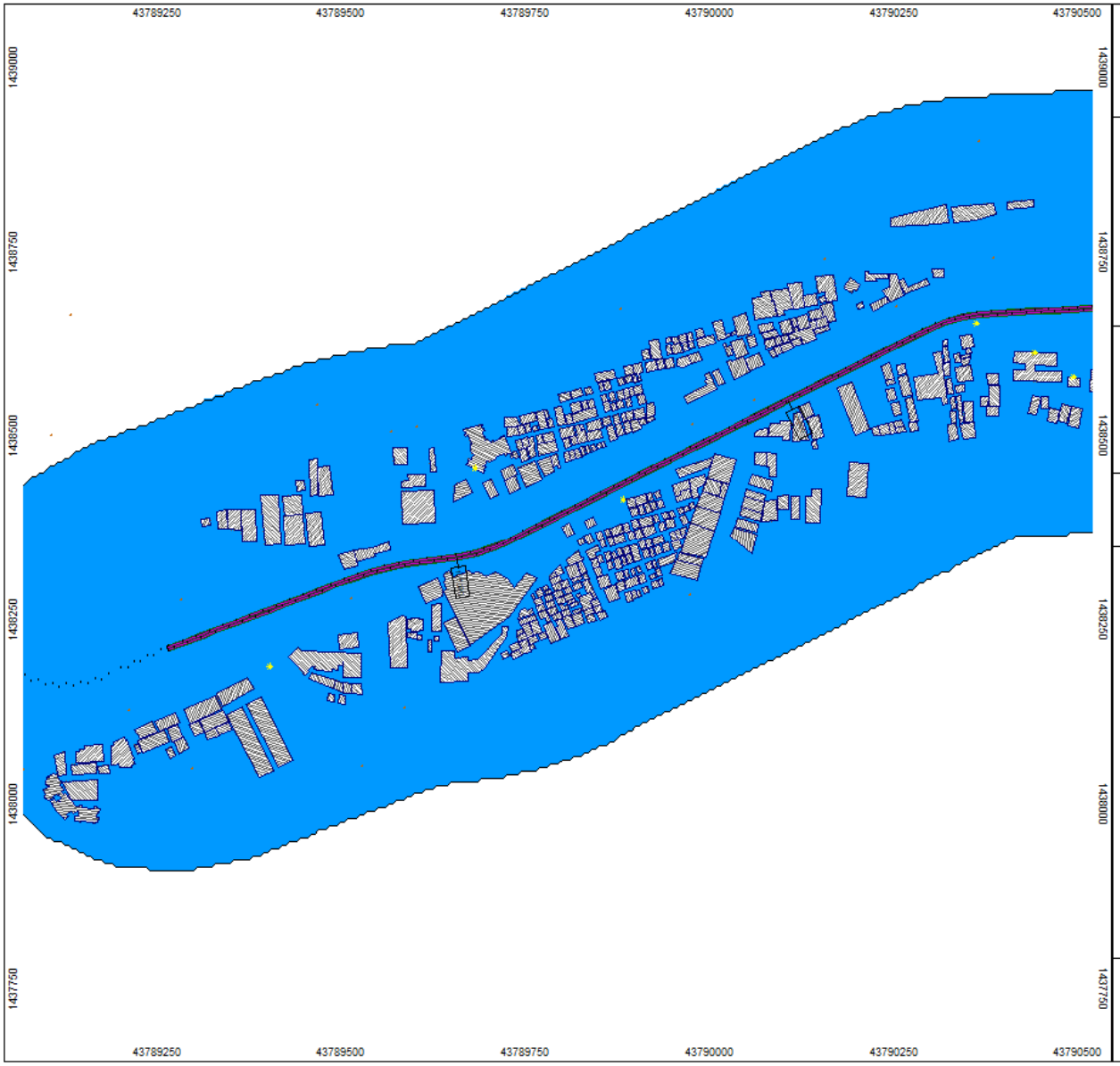

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2024 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5181

0 45 90 180 270 360 m

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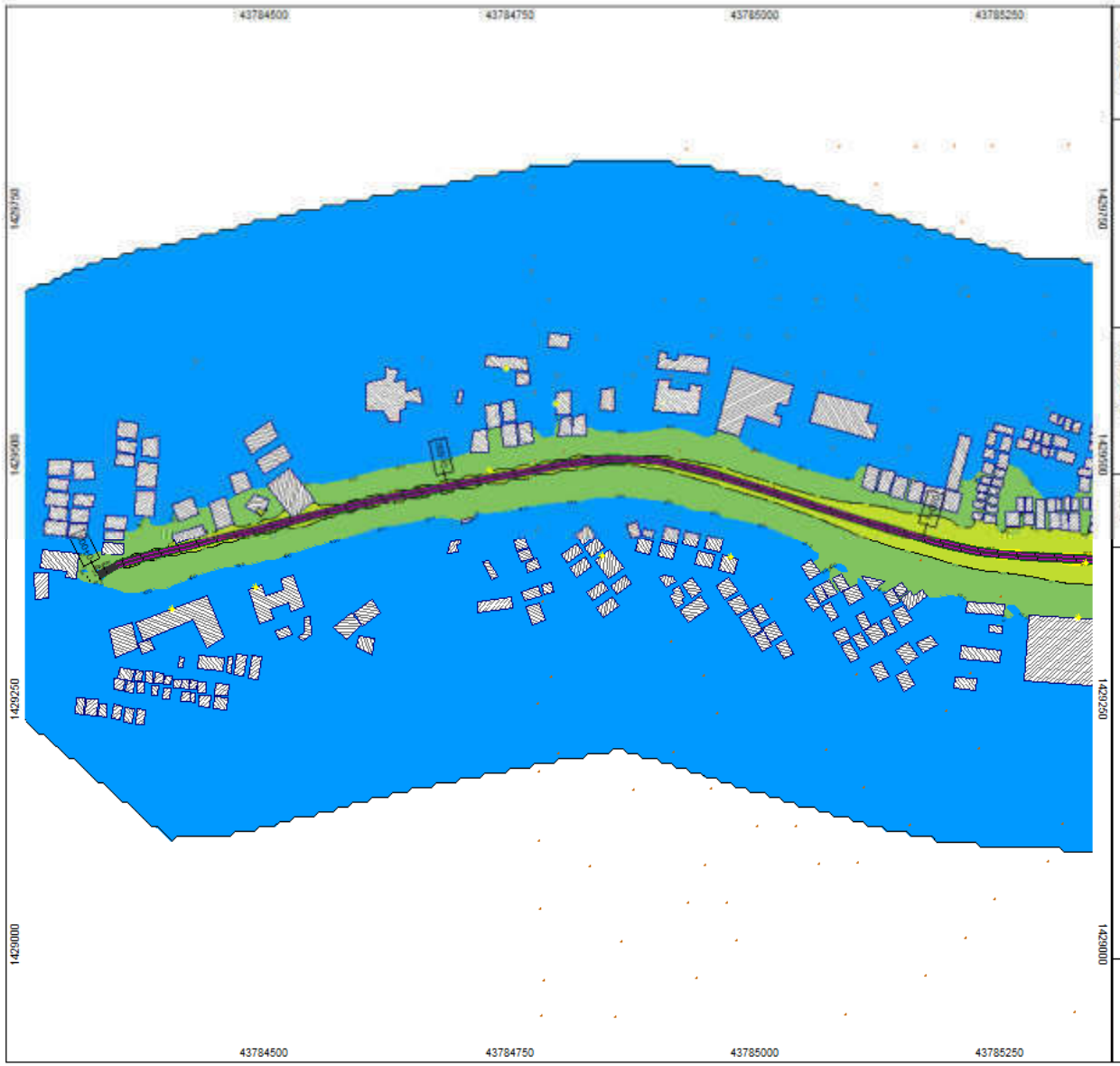
Year 2031



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2031 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

Length scale 1:3887

0 30 60 120 180 240 m

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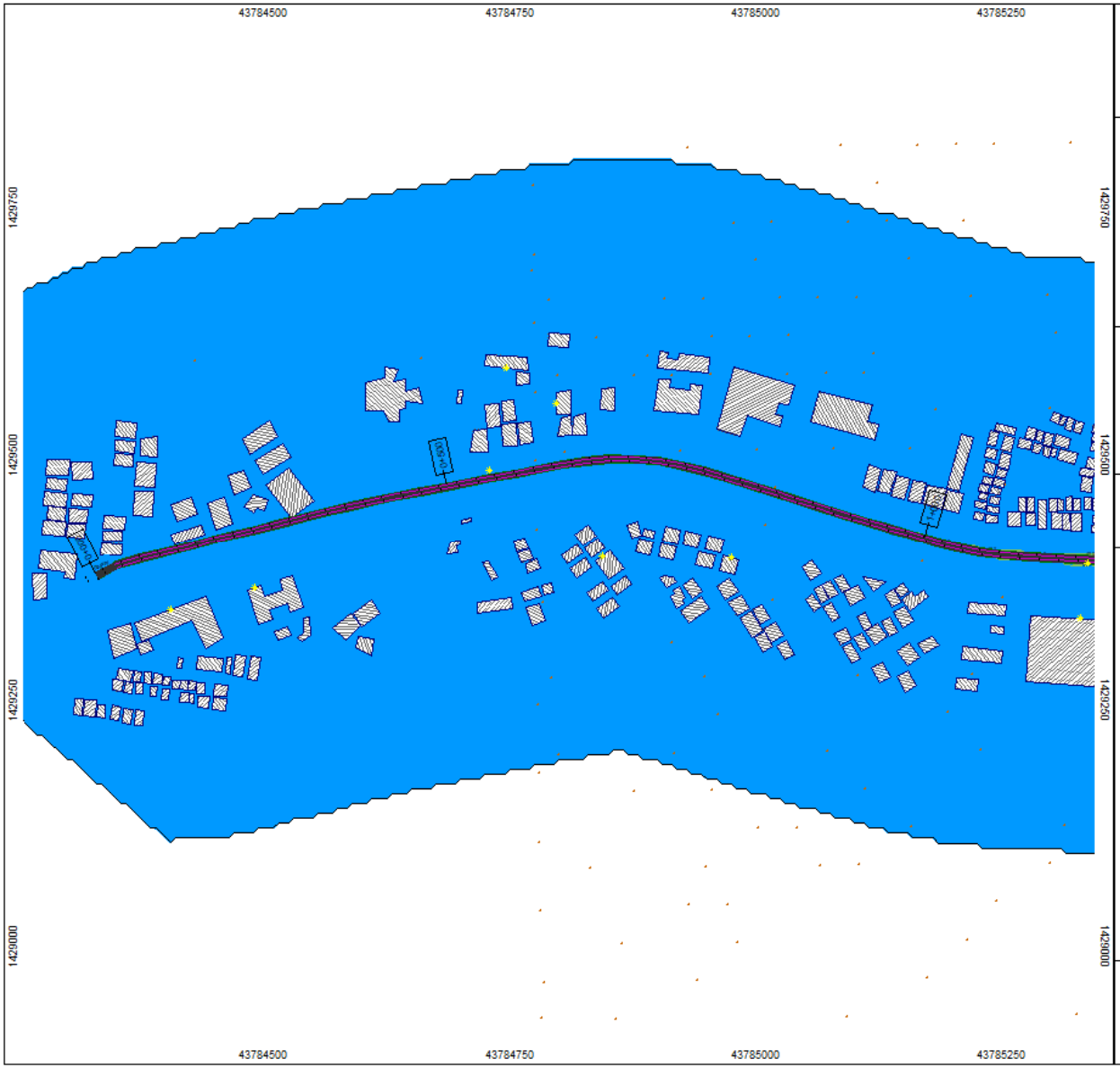

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2031 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
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- Line source
- Geometry bitmap
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- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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Level
< 45
45 - 50
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55 - 60
60 - 65
>= 65

Signs and symbols
Wall
Main building
Point receiver
Point Sources
Line source
Geometry bitmap
Wall
Wall

N

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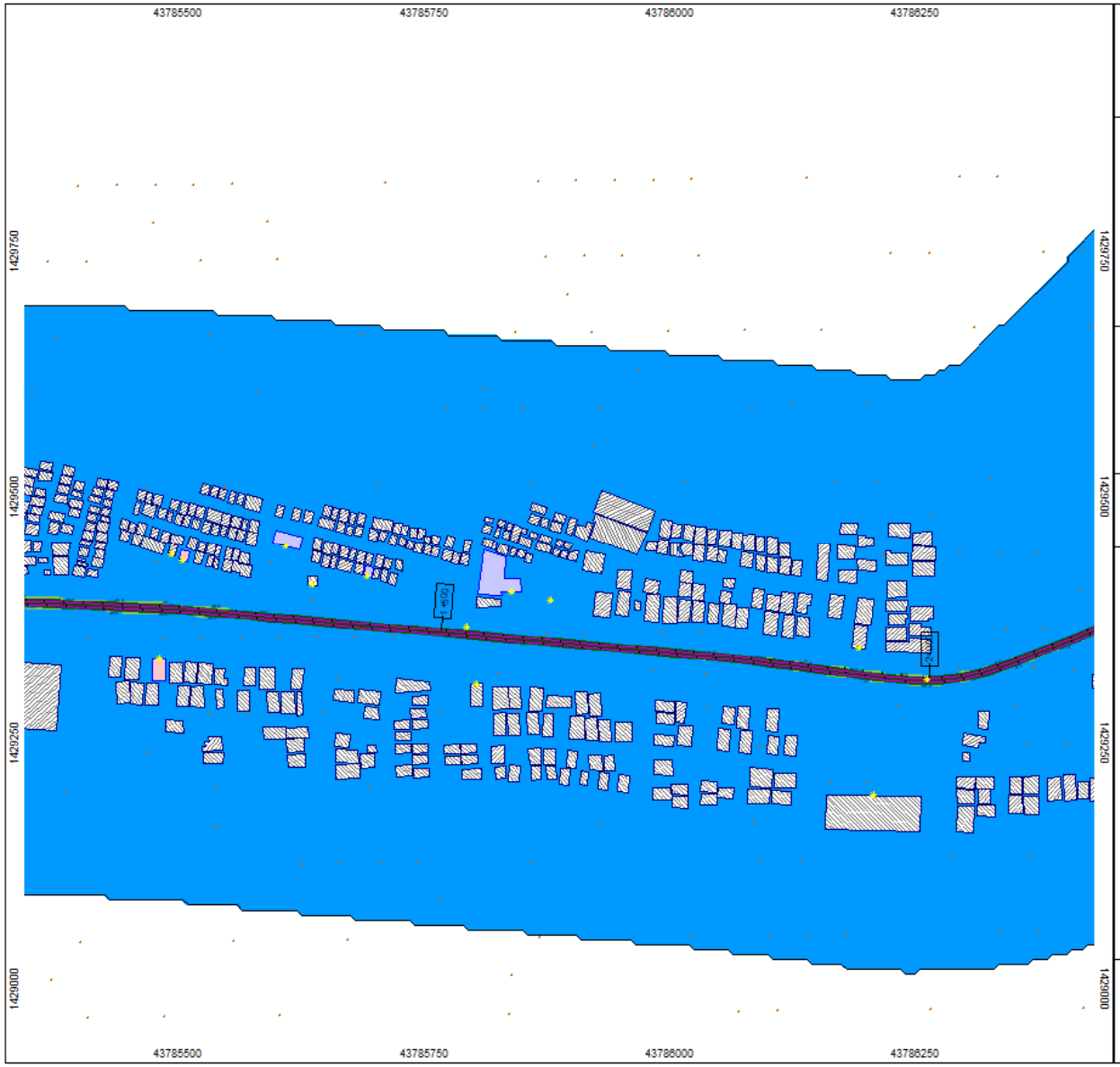

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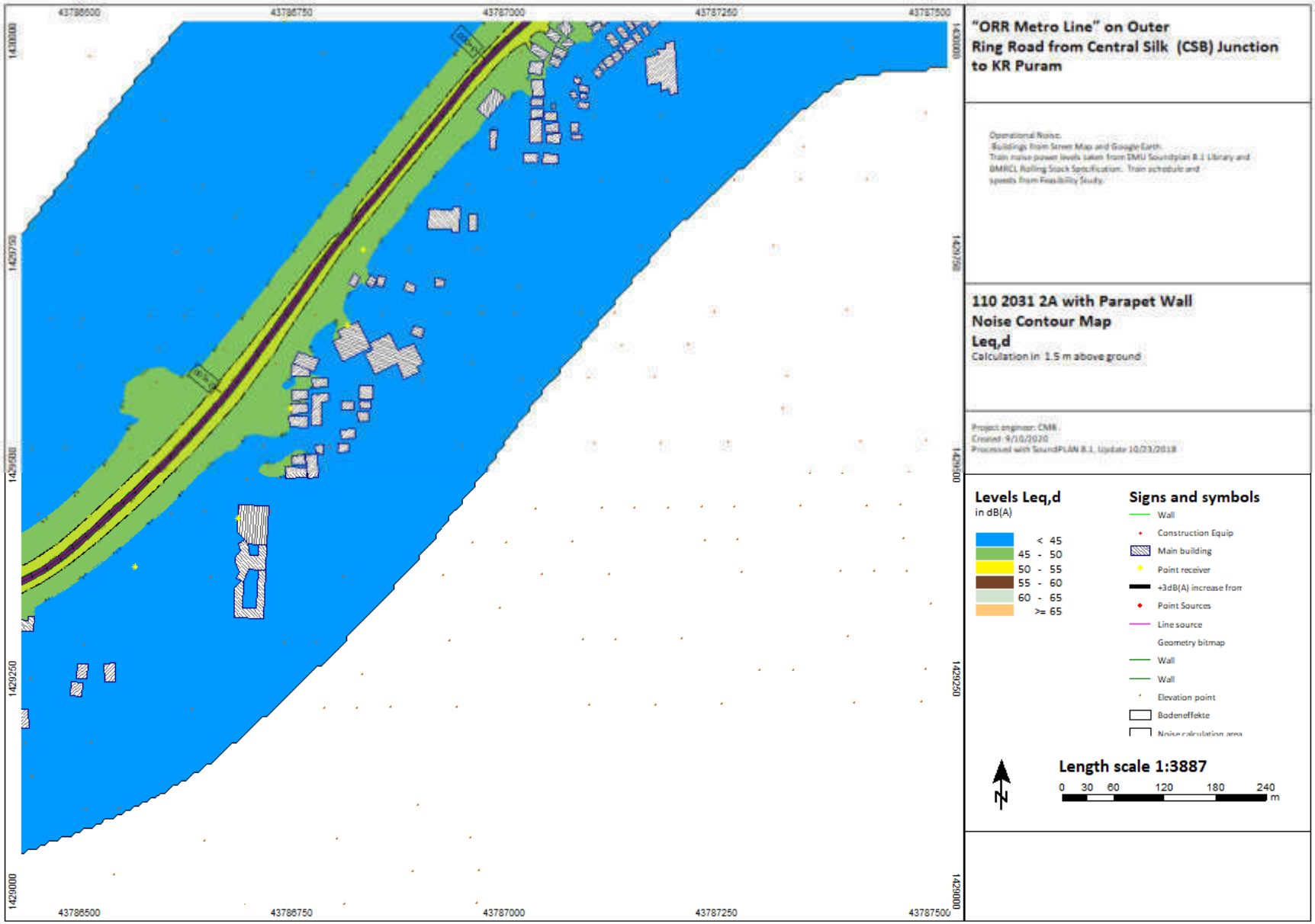

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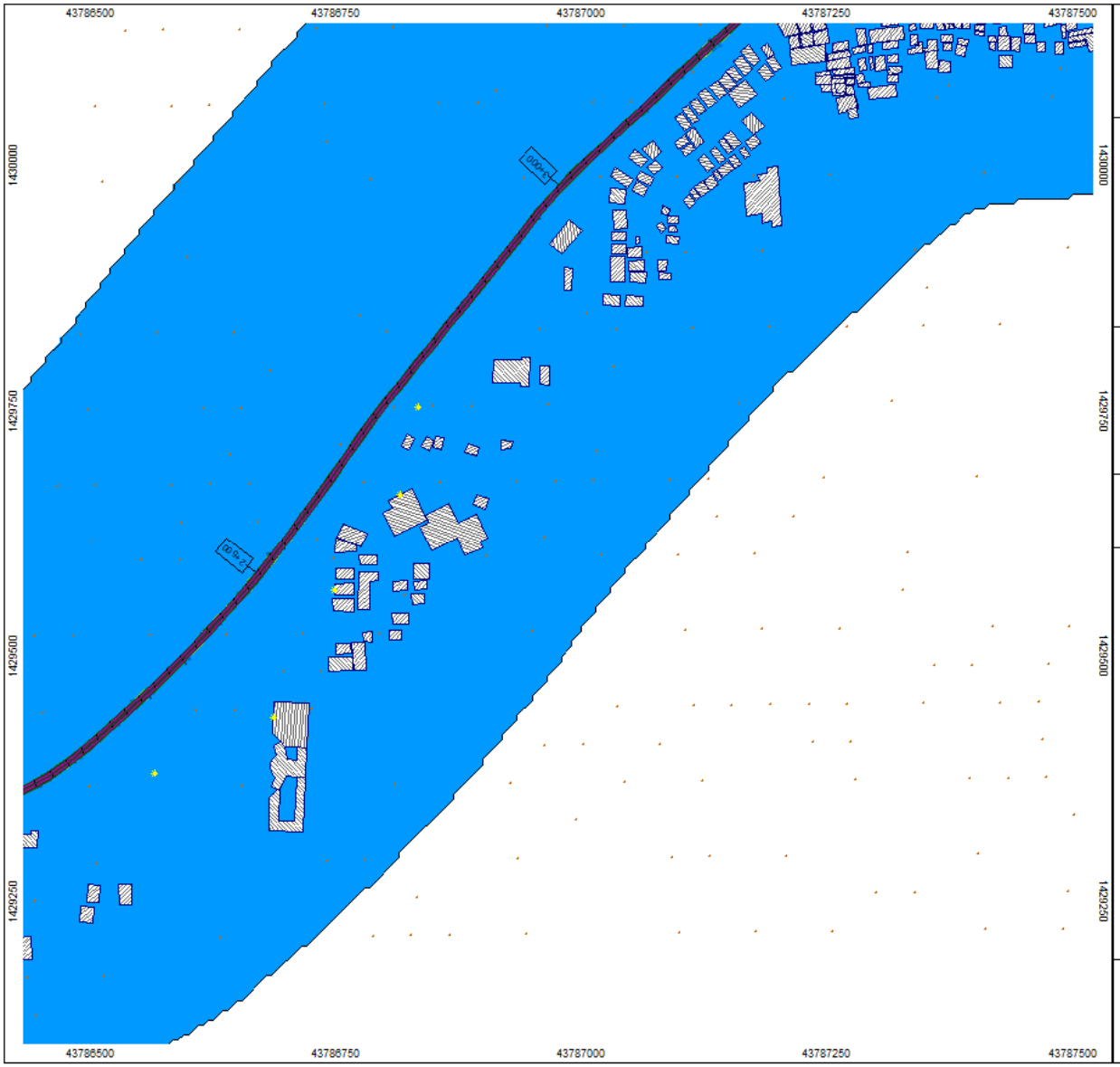

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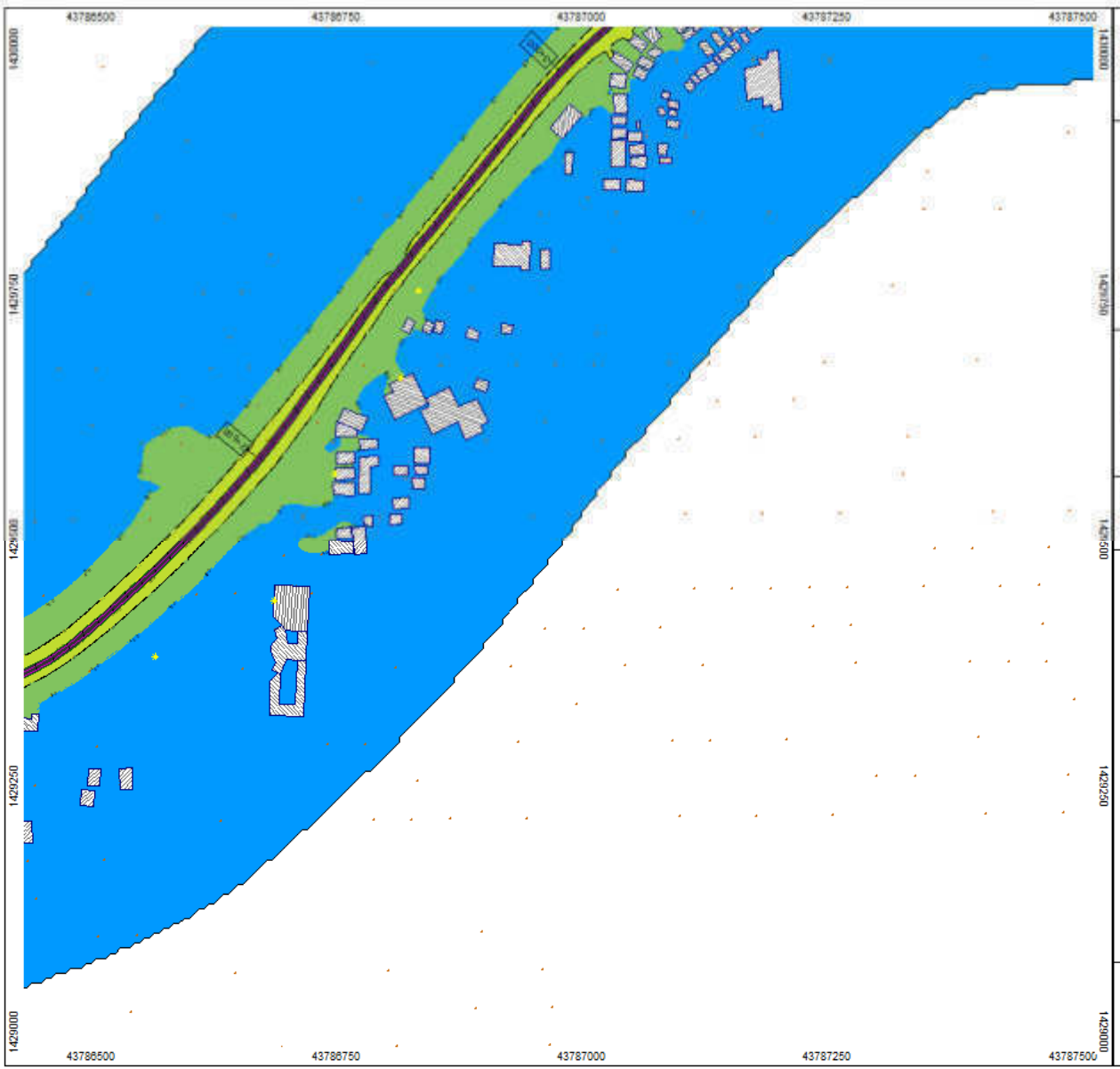

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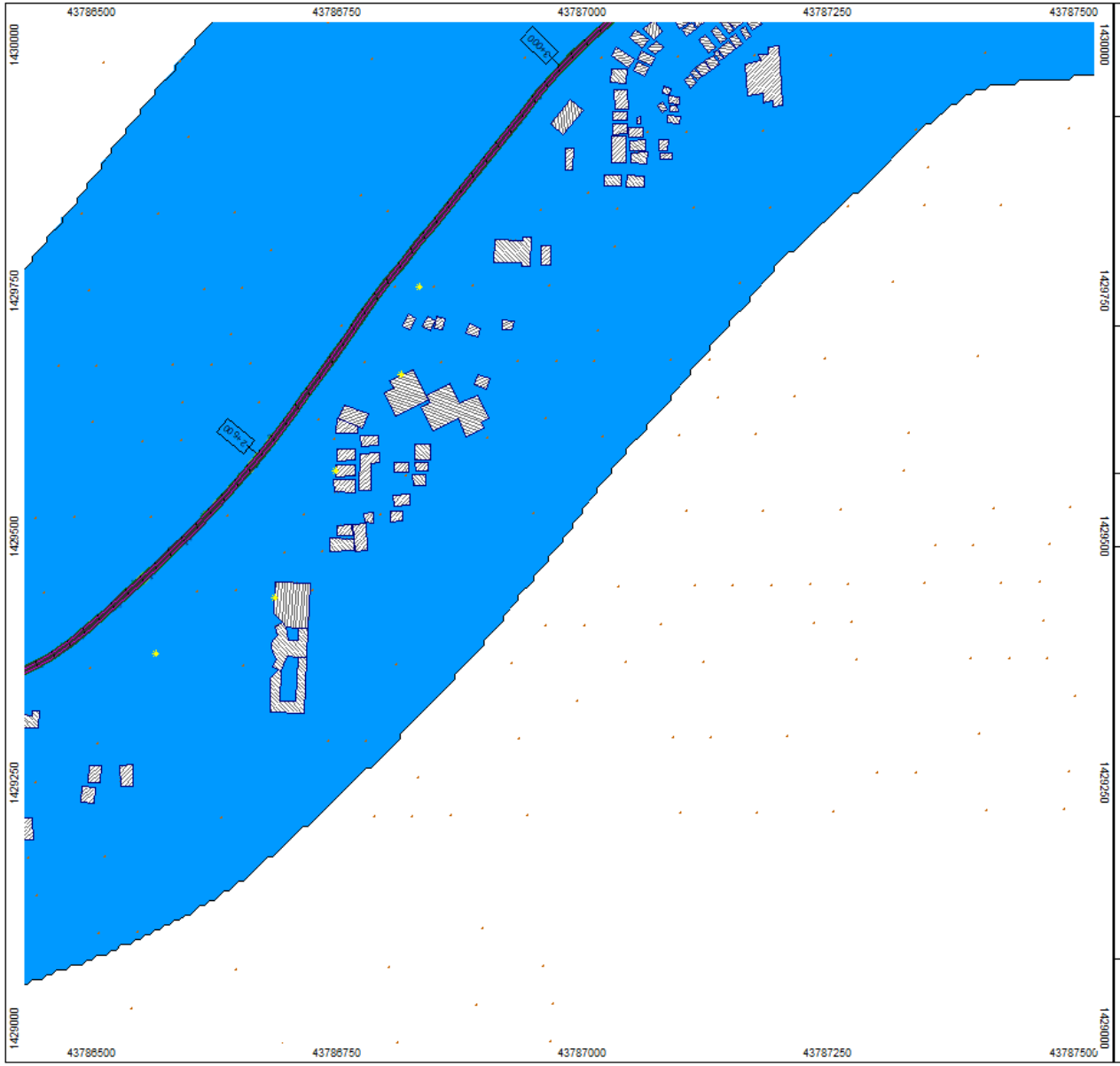

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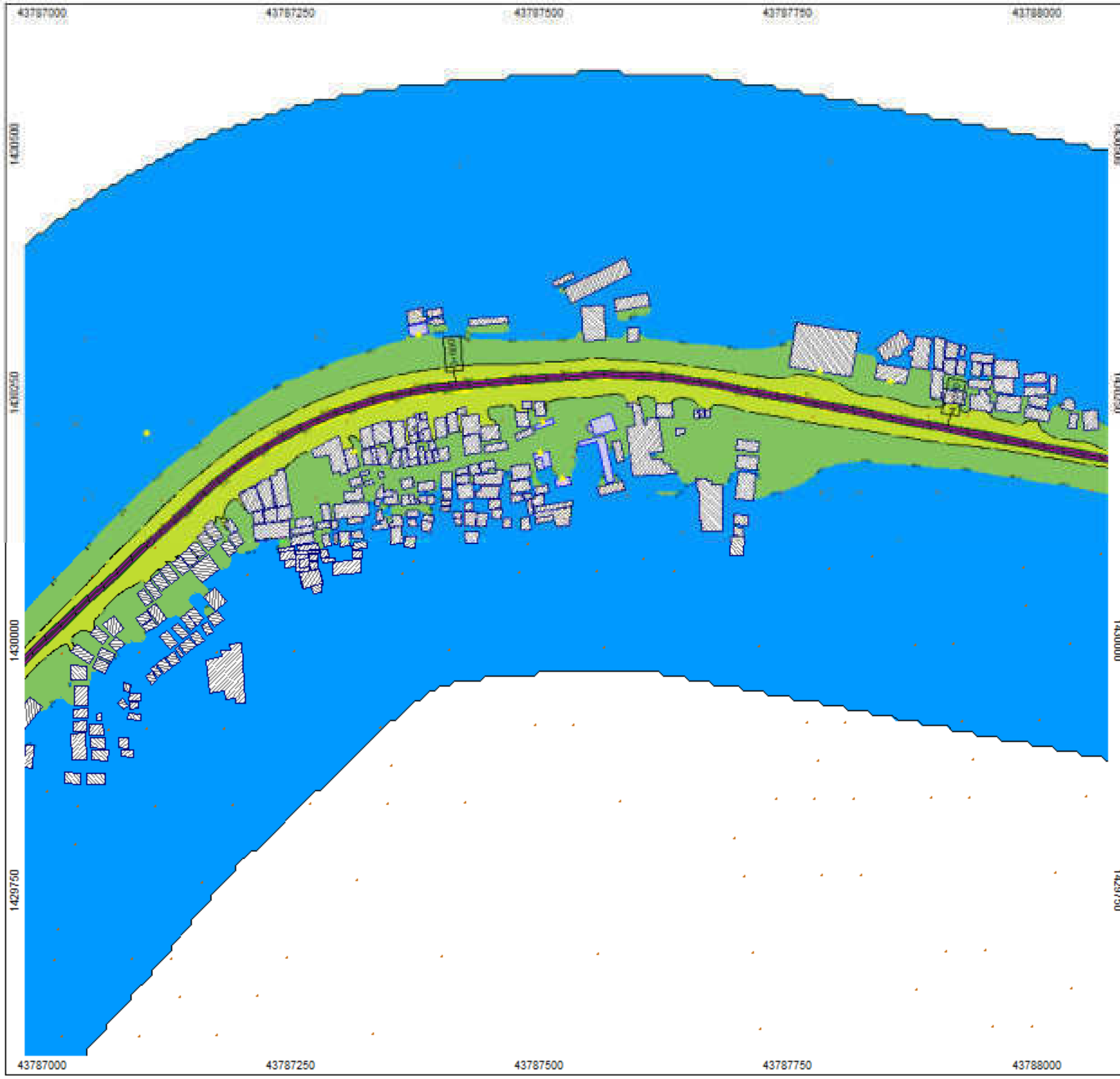

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Elevation point
Bodeneffekte
Noise calculation area

Length scale 1:3887
0 30 60 120 180 240 m

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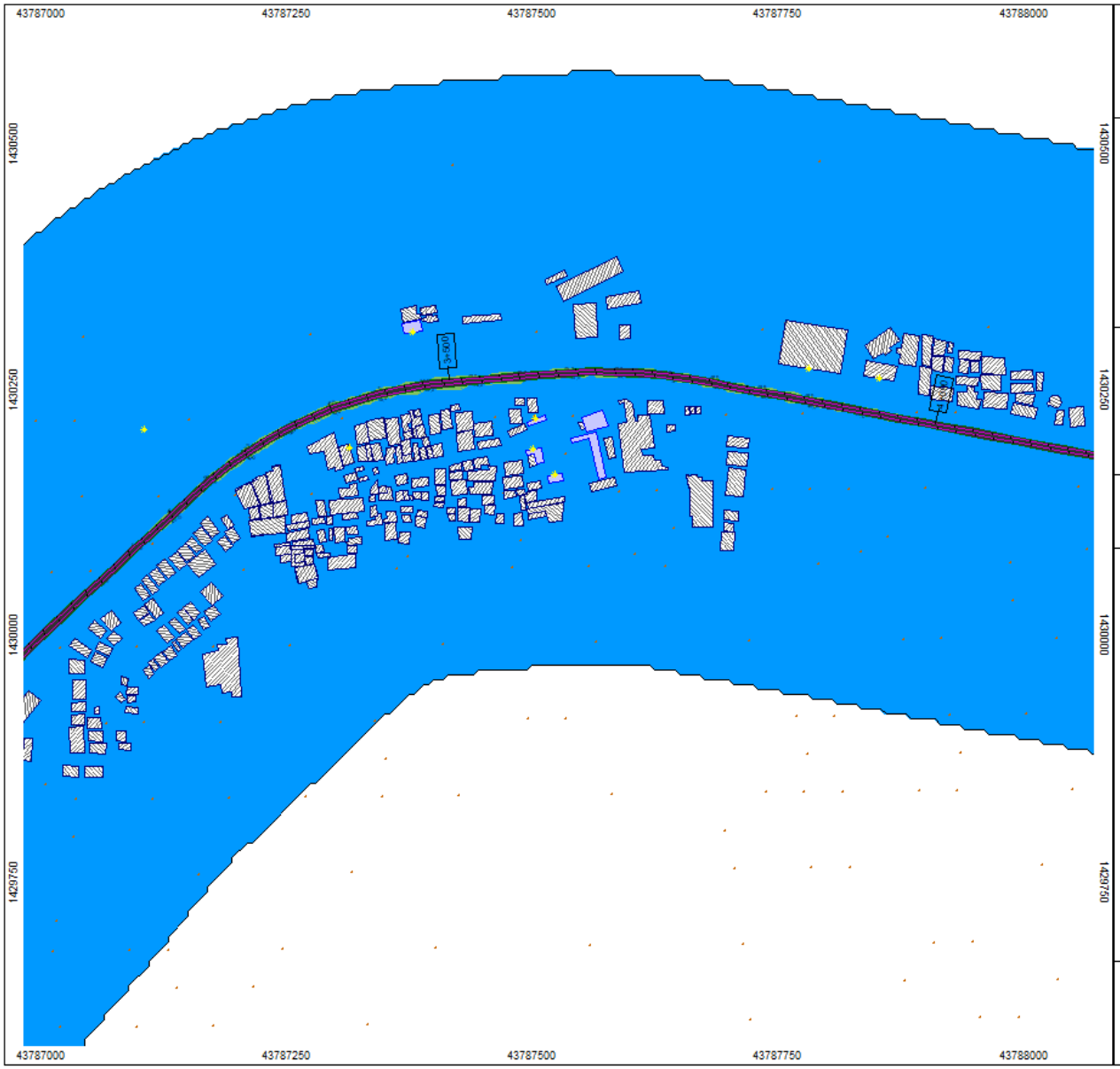

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Length scale 1:3887

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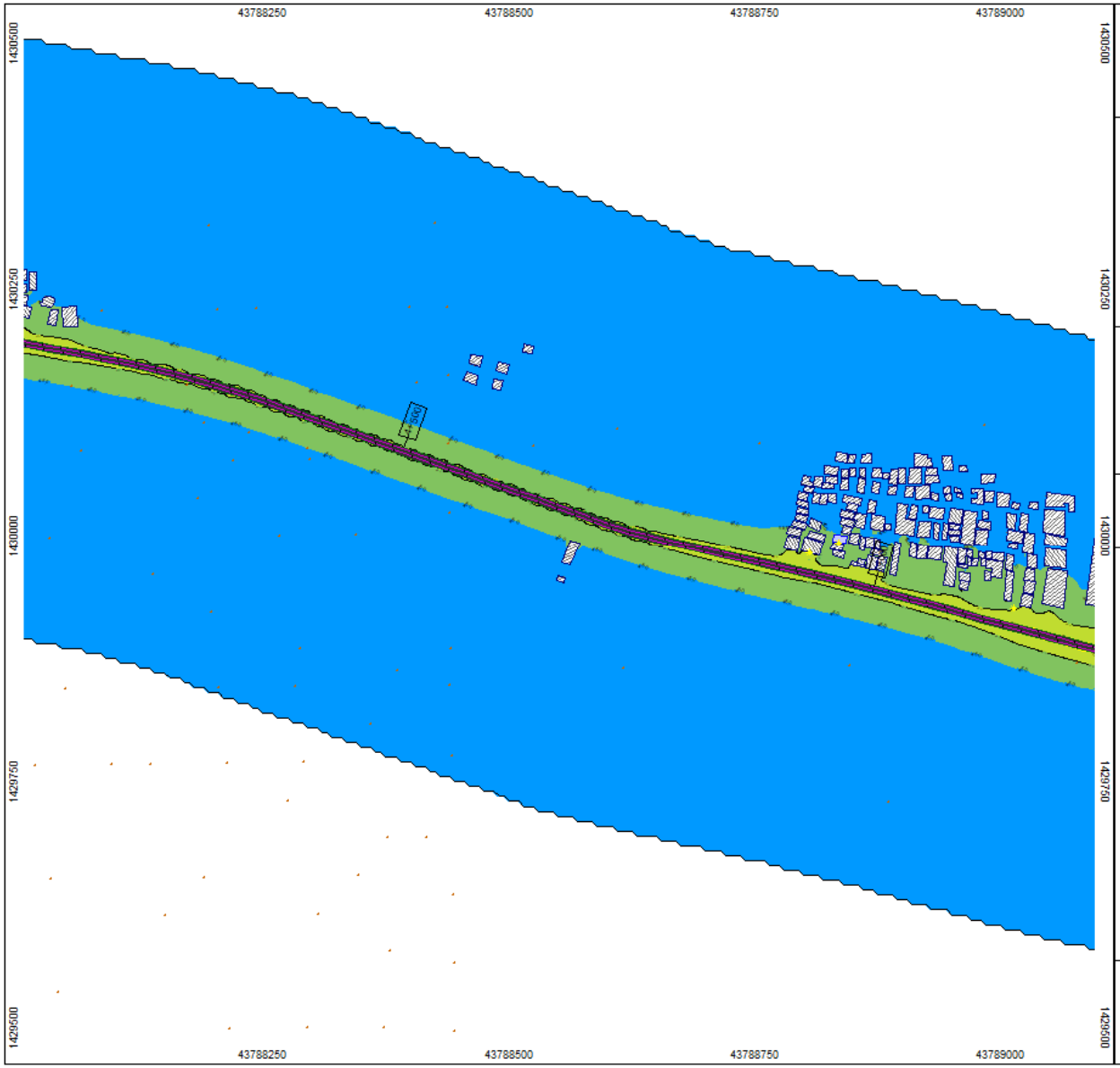

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- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

Length scale 1:3887

0 30 60 120 180 240 m

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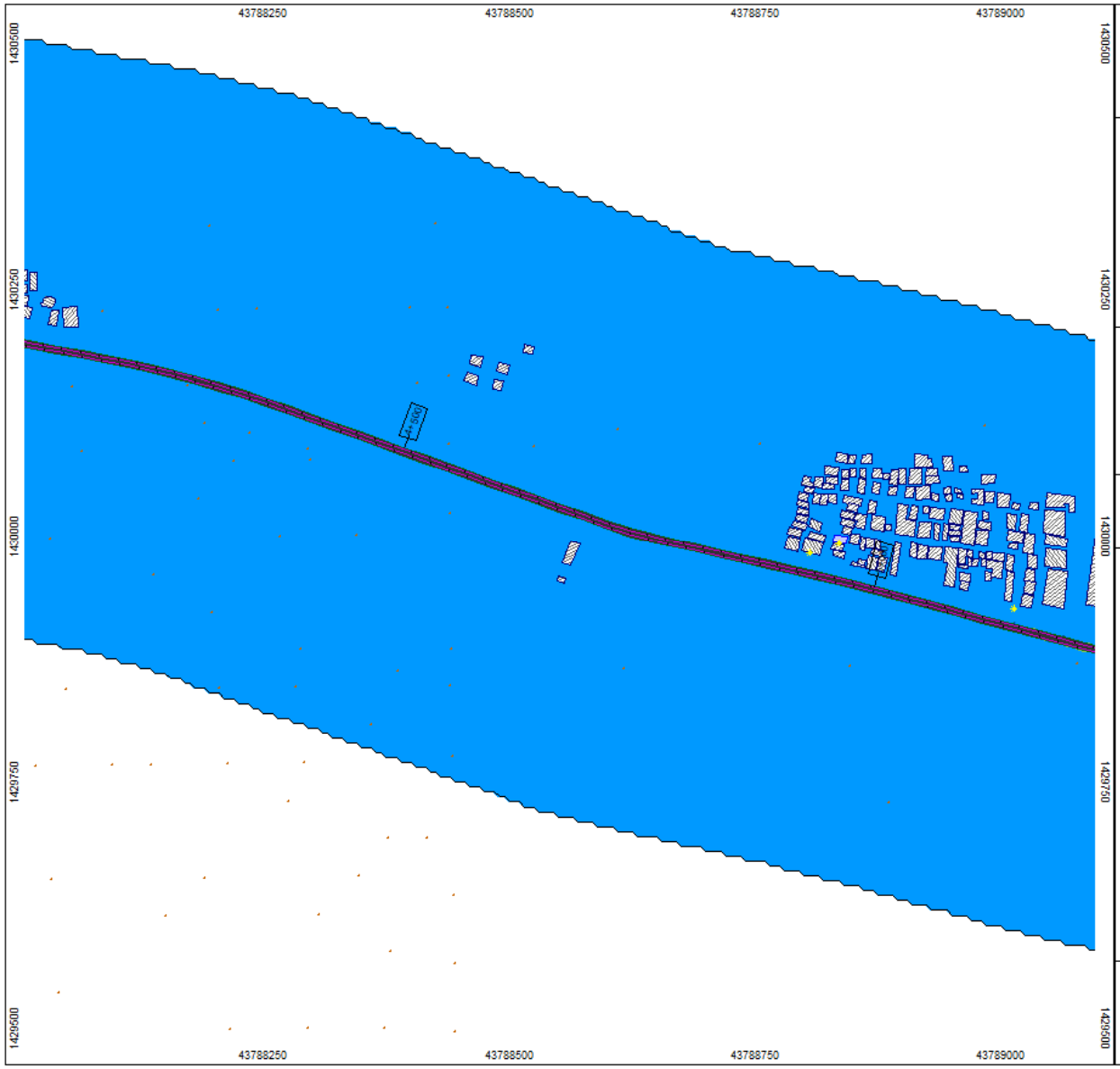

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- Line source
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- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

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Length scale 1:3887

0 30 60 120 180 240 m

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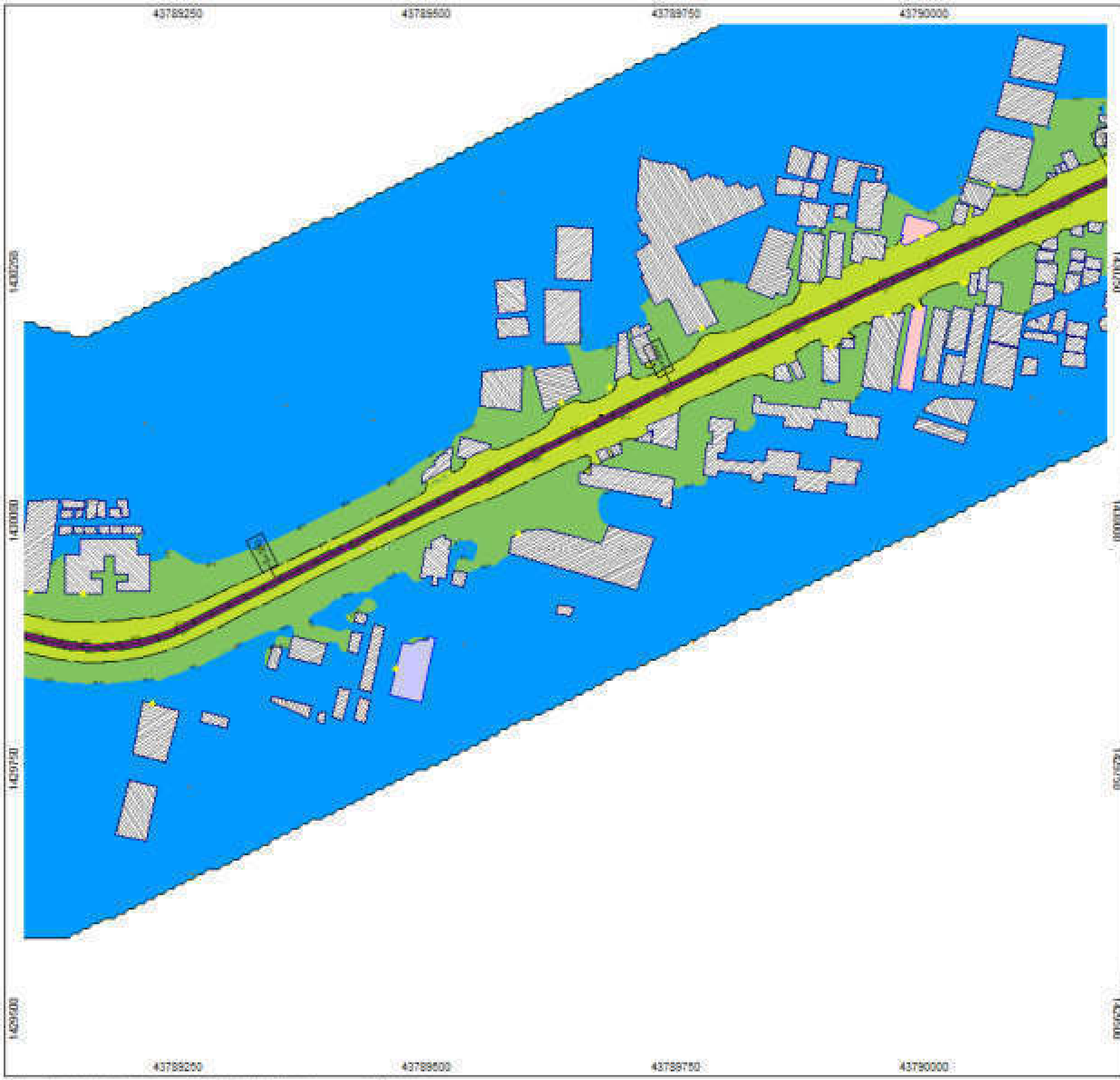

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Operational Noise:
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Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1. Update 10/23/2018

Levels Leq,d
in dB(A)

Level
< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Deviation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887
0 30 60 120 180 240 m

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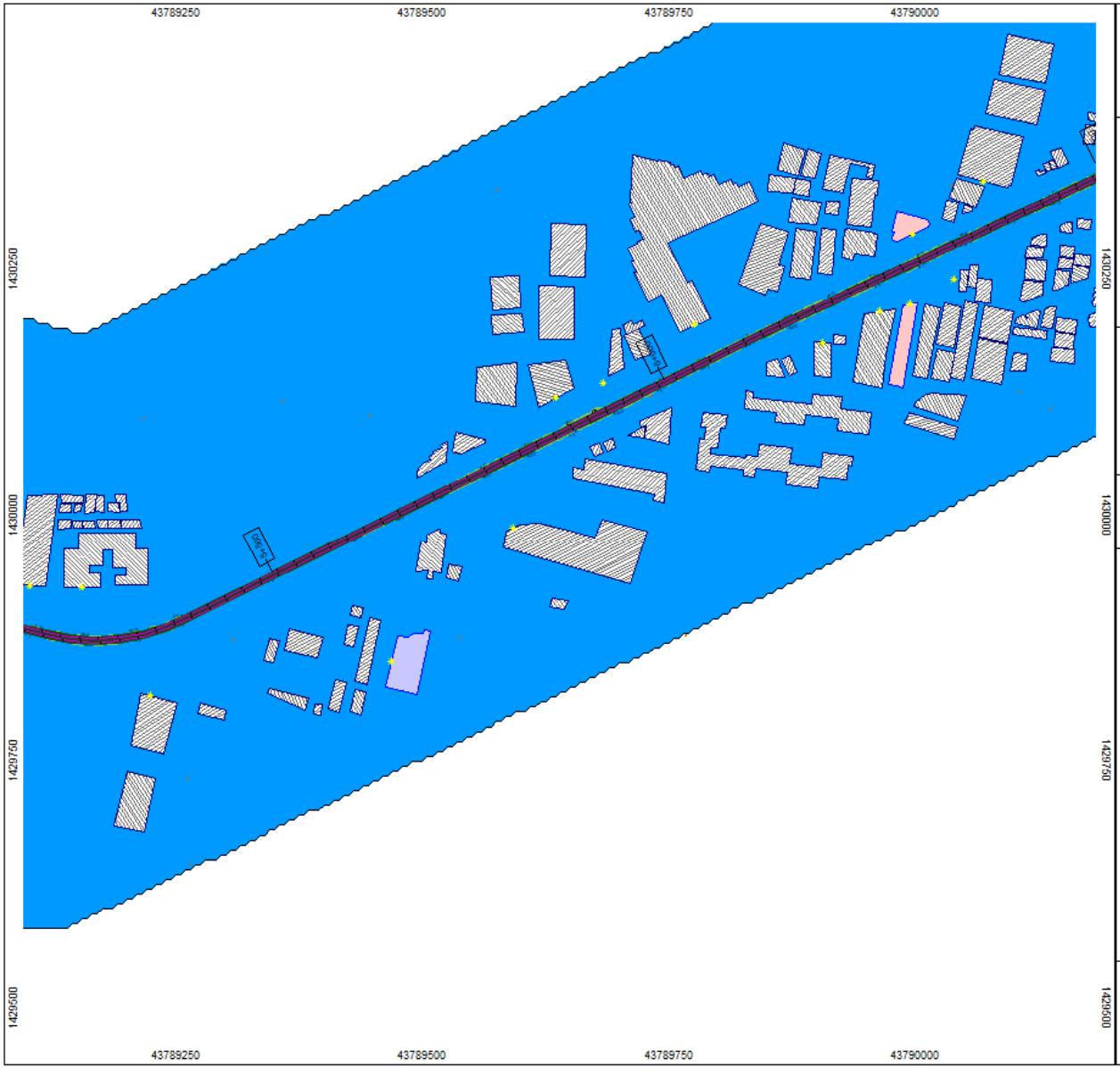

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0 30 60 120 180 240 m

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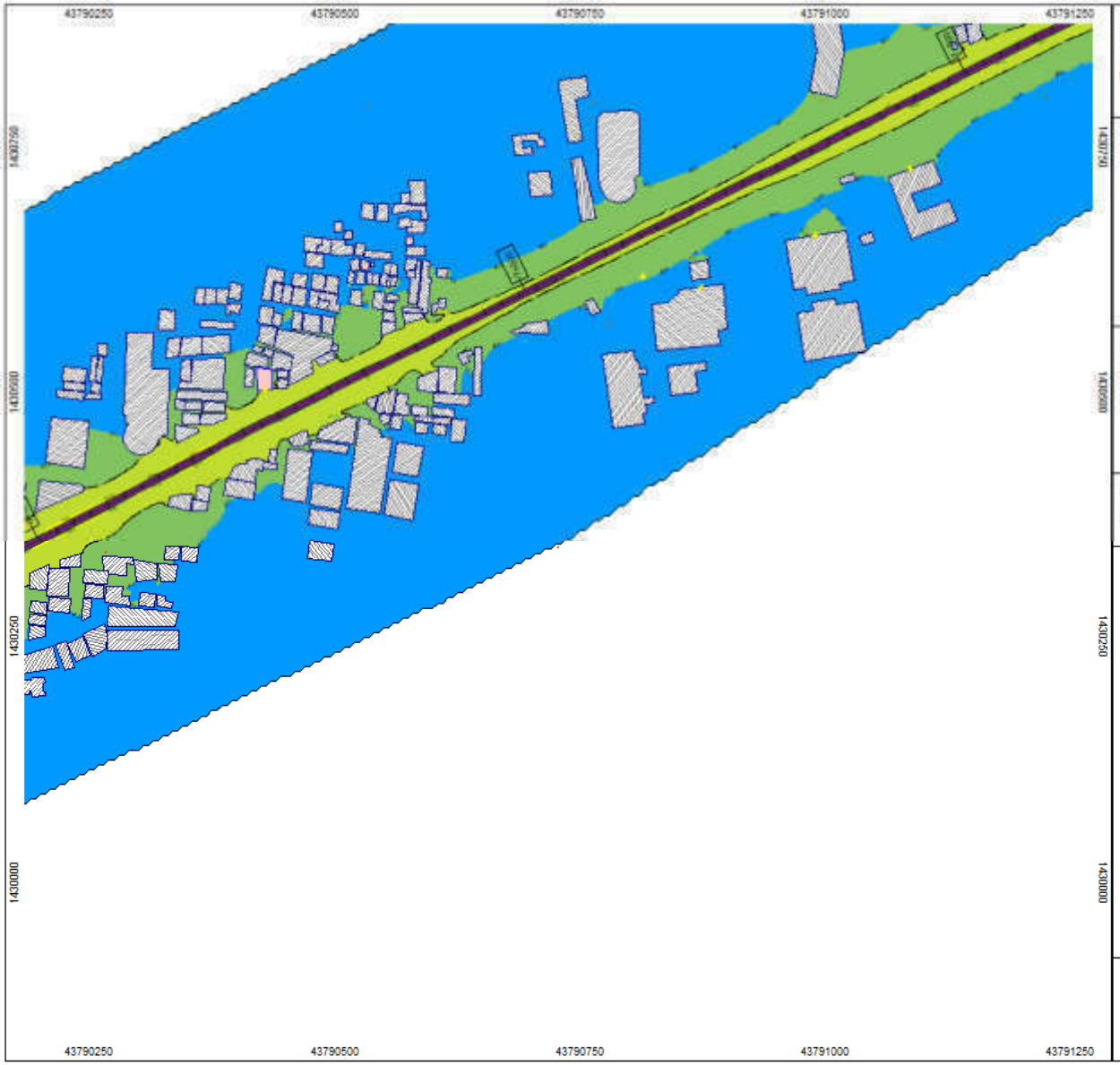

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Leq,d
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Levels Leq,d
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	< 45
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Length scale 1:3887
0 30 60 120 180 240 m

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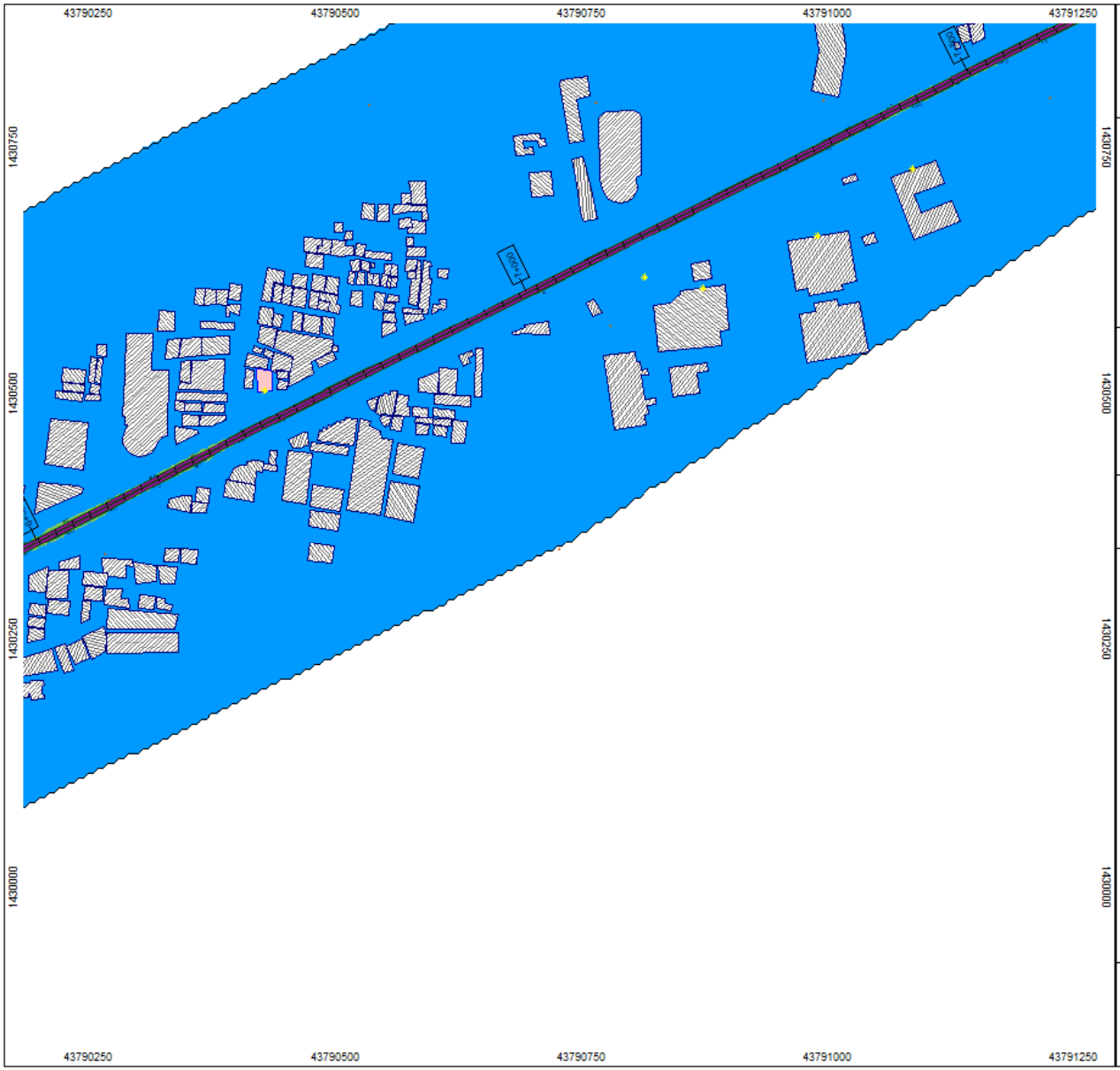

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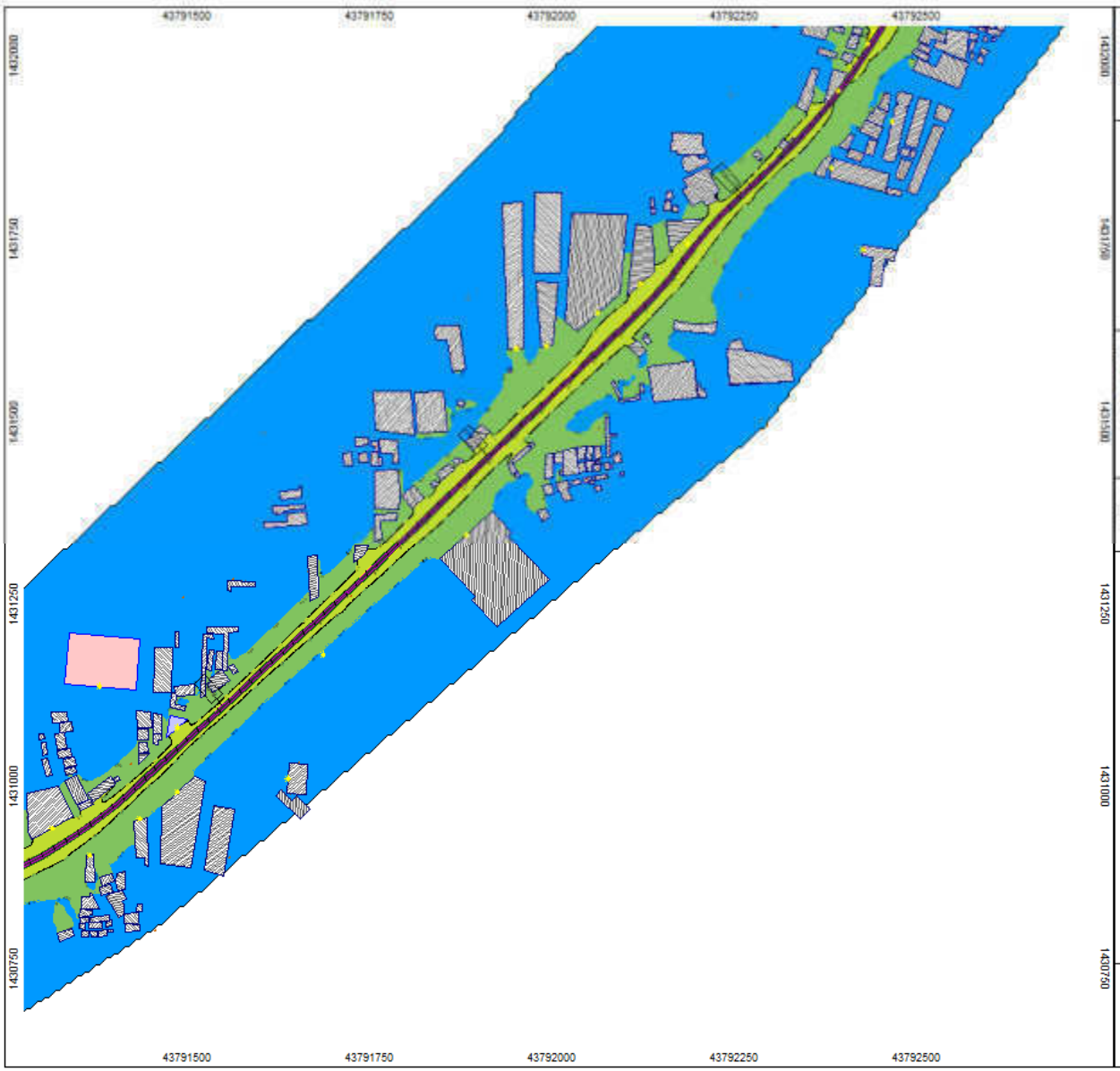

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- Noise calculation area

N

Length scale 1:5245
0 45 90 180 270 360 m

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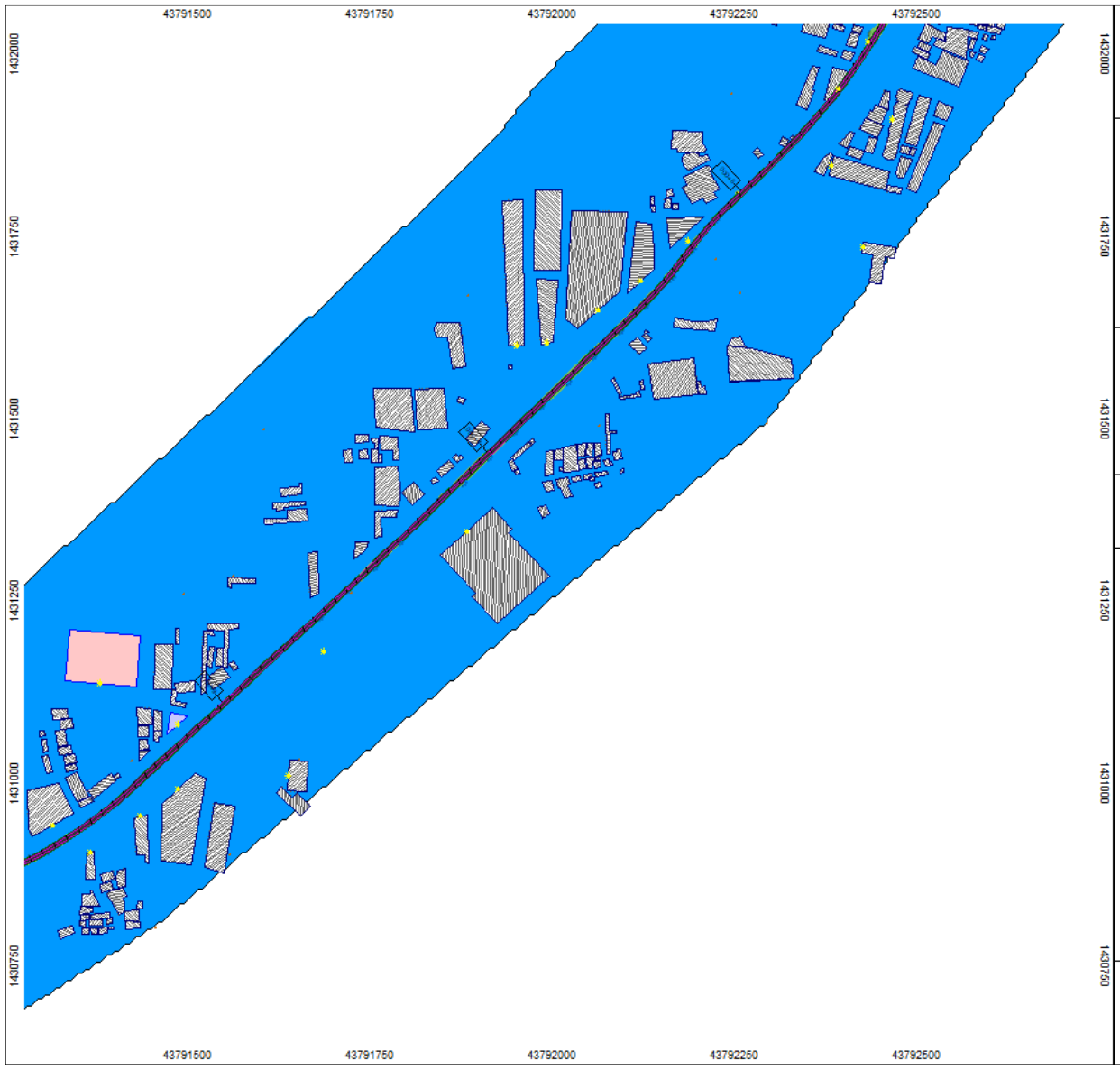

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Geometry bitmap
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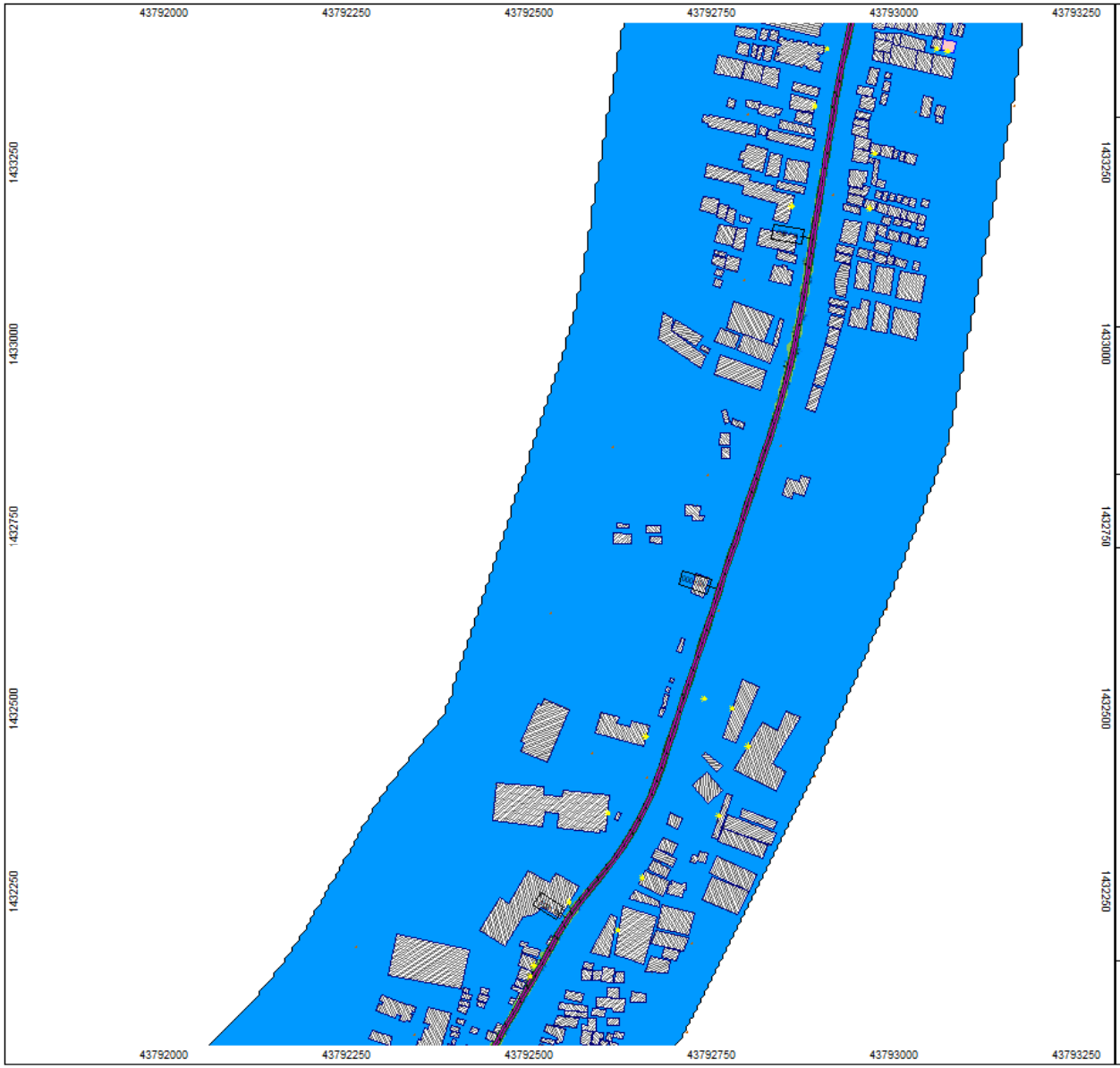

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0 45 90 180 270 360 m

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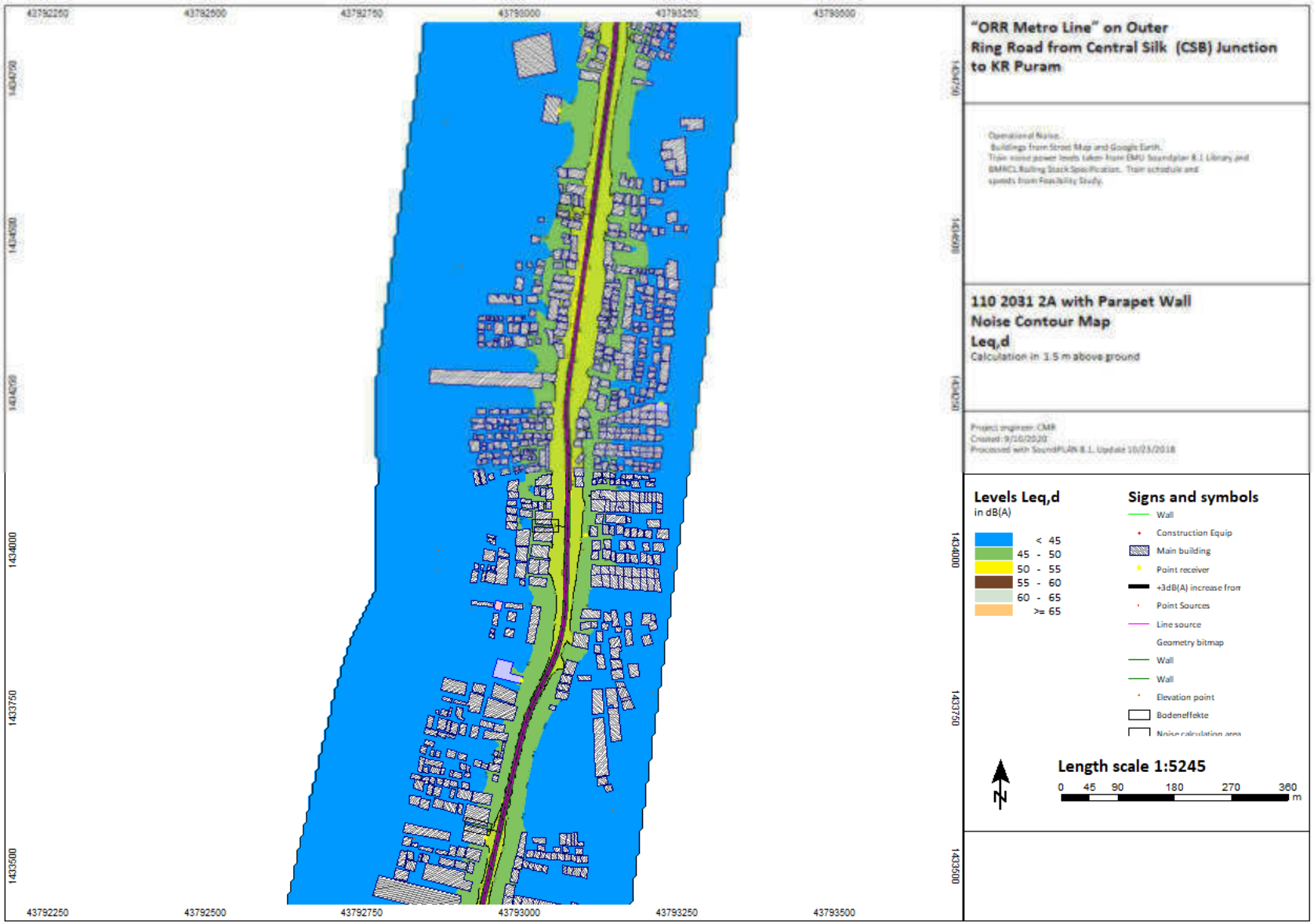

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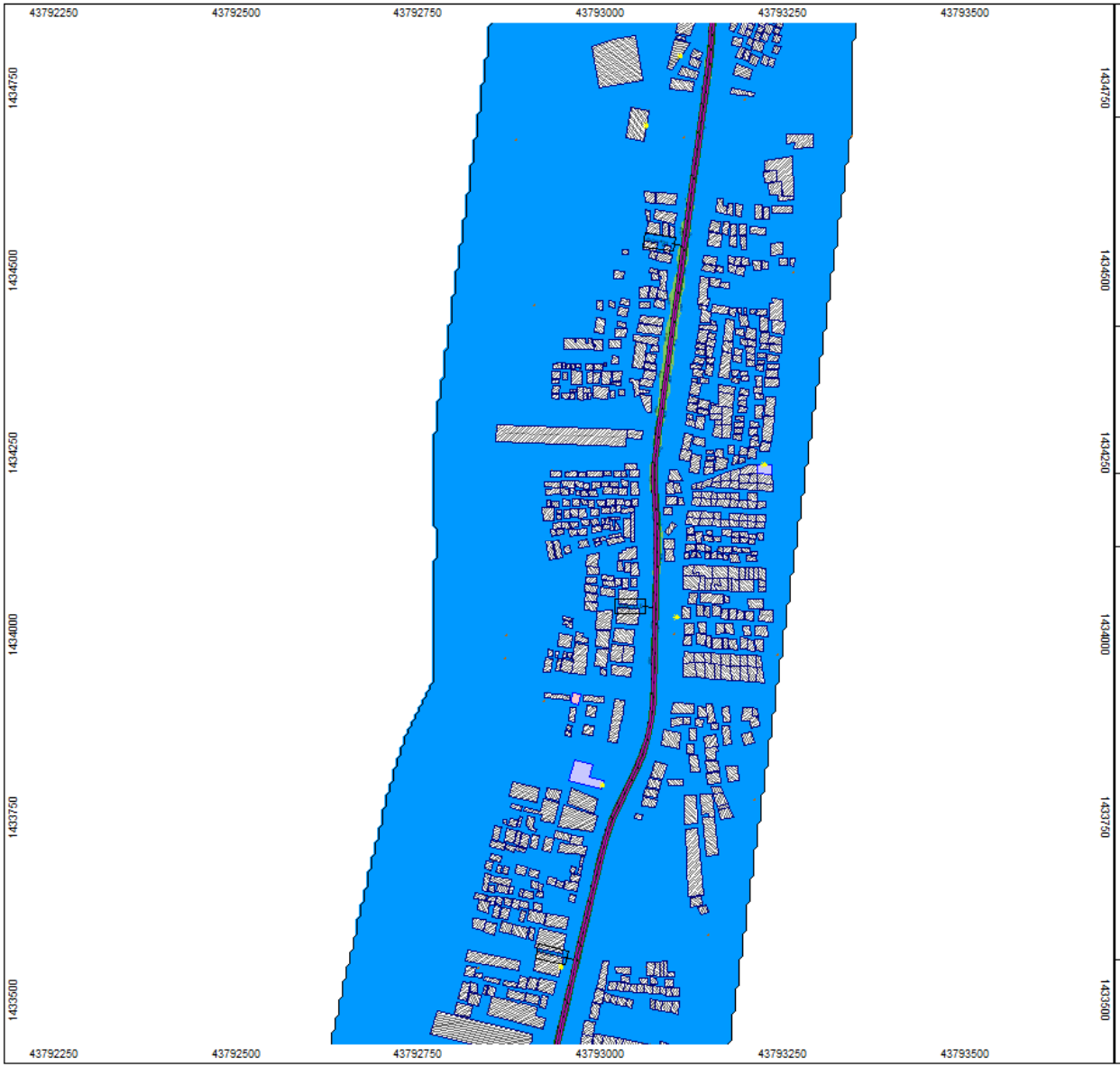

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2031 2A with Parapet Wall
Noise Contour Map
Leq,n

Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5245

0 45 90 180 270 360 m

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"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2031 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

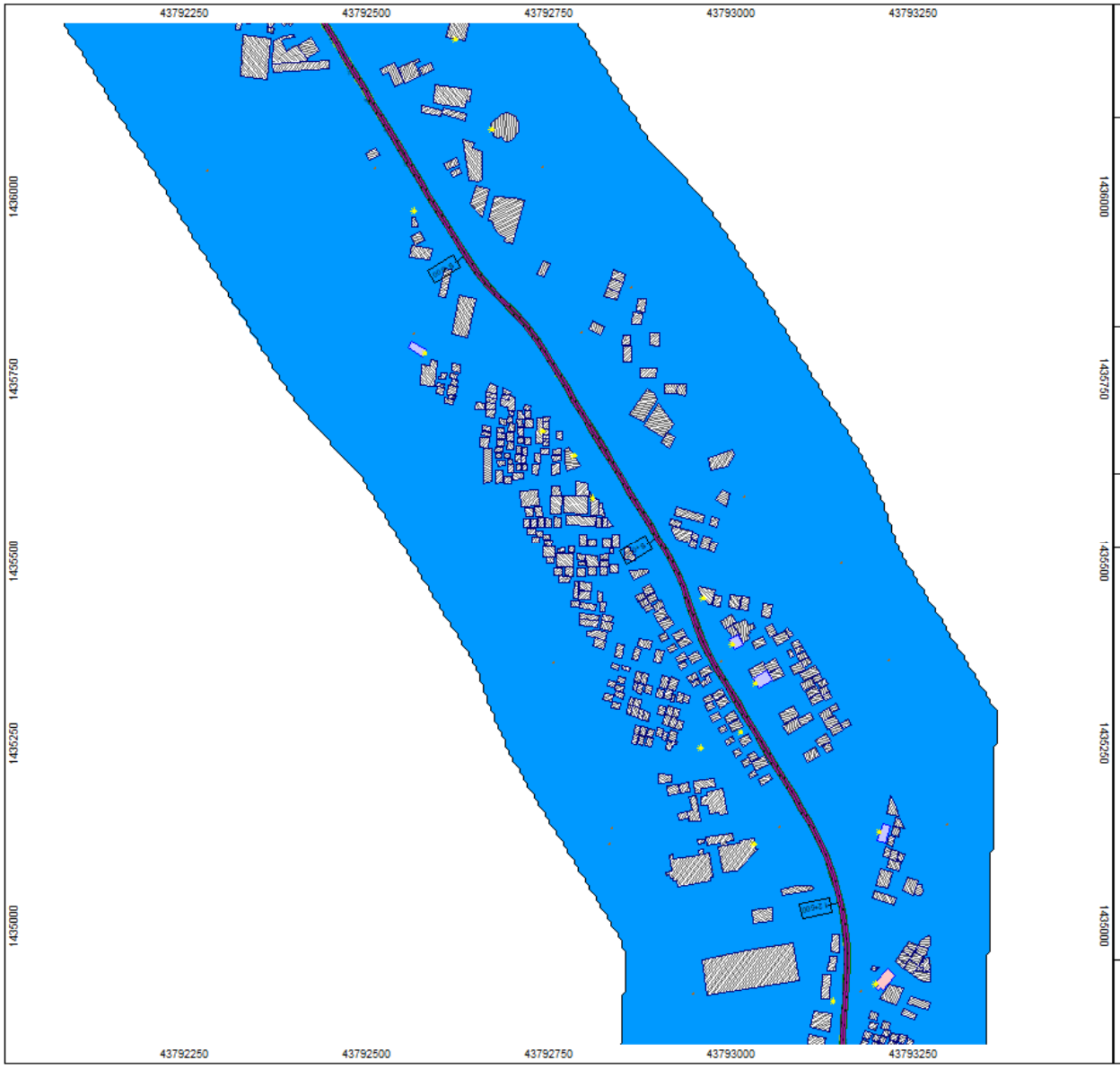
< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols

Wall
Construction Equip
Main building
Point receiver
Point Sources
Line source
Wall
Wall
Elevation point

Length scale 1:5245

0 45 90 180 270 360 m



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2031 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5245

0 45 90 180 270 360 m

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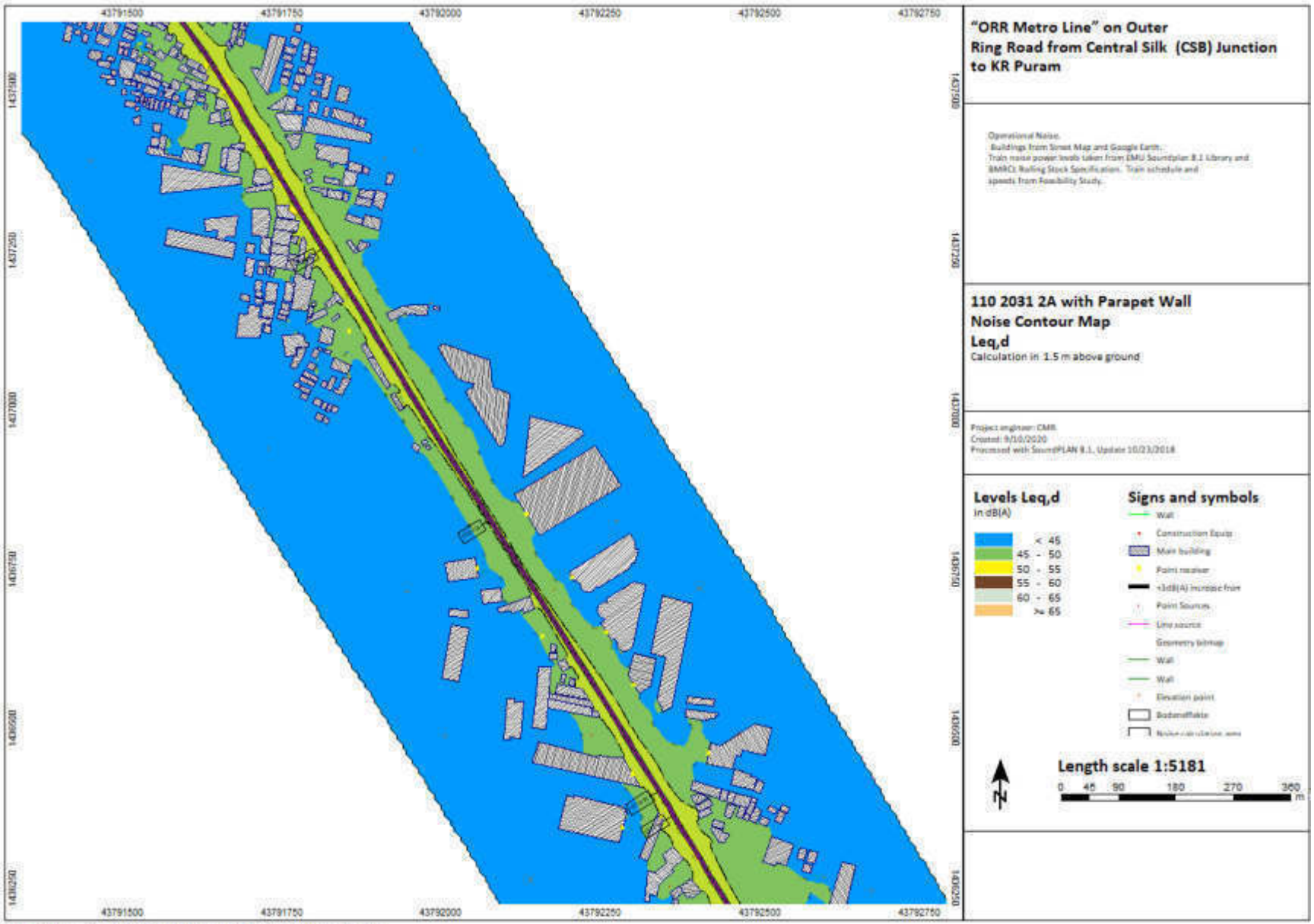

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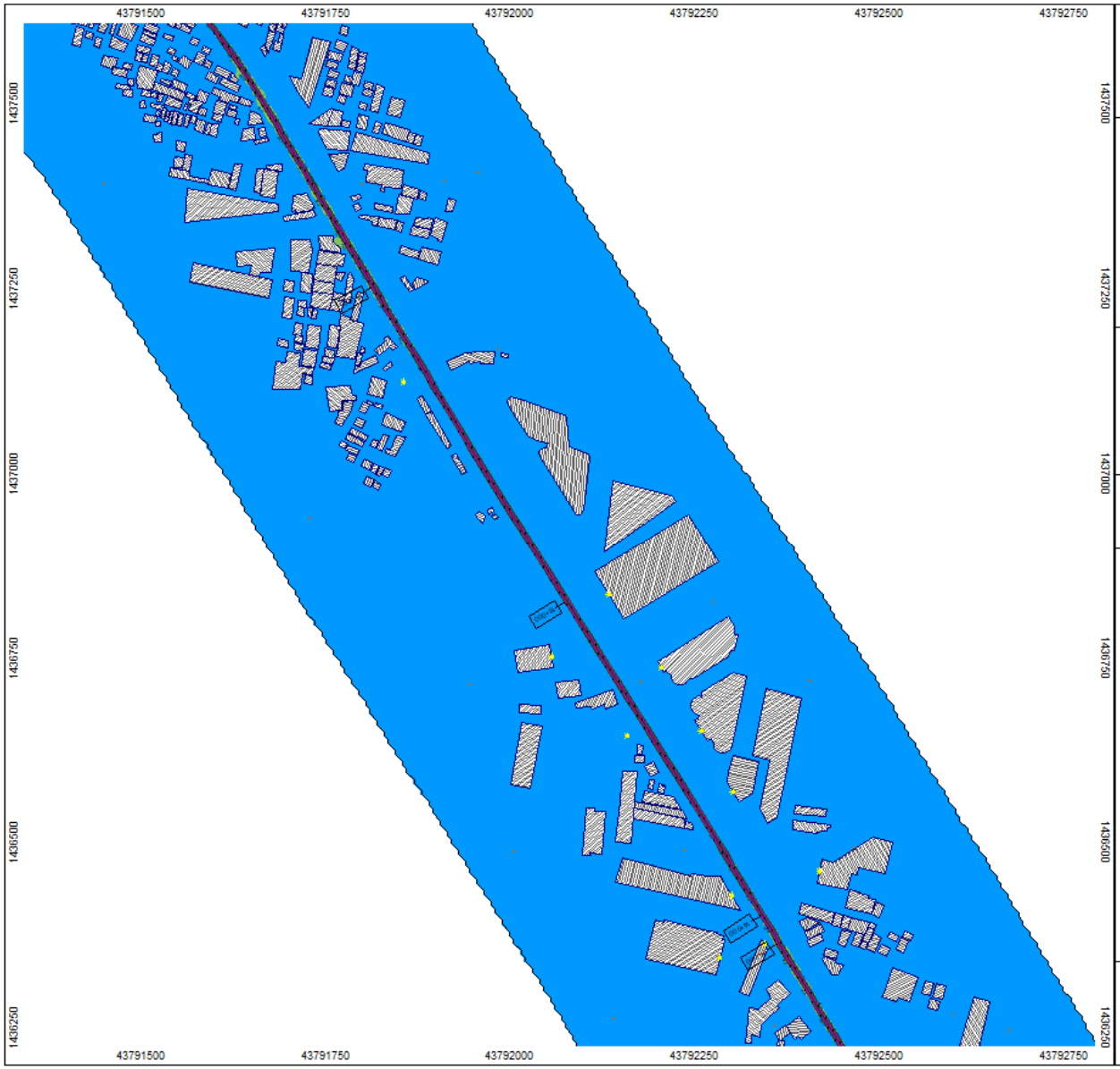

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2031 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5181
0 45 90 180 270 360 m

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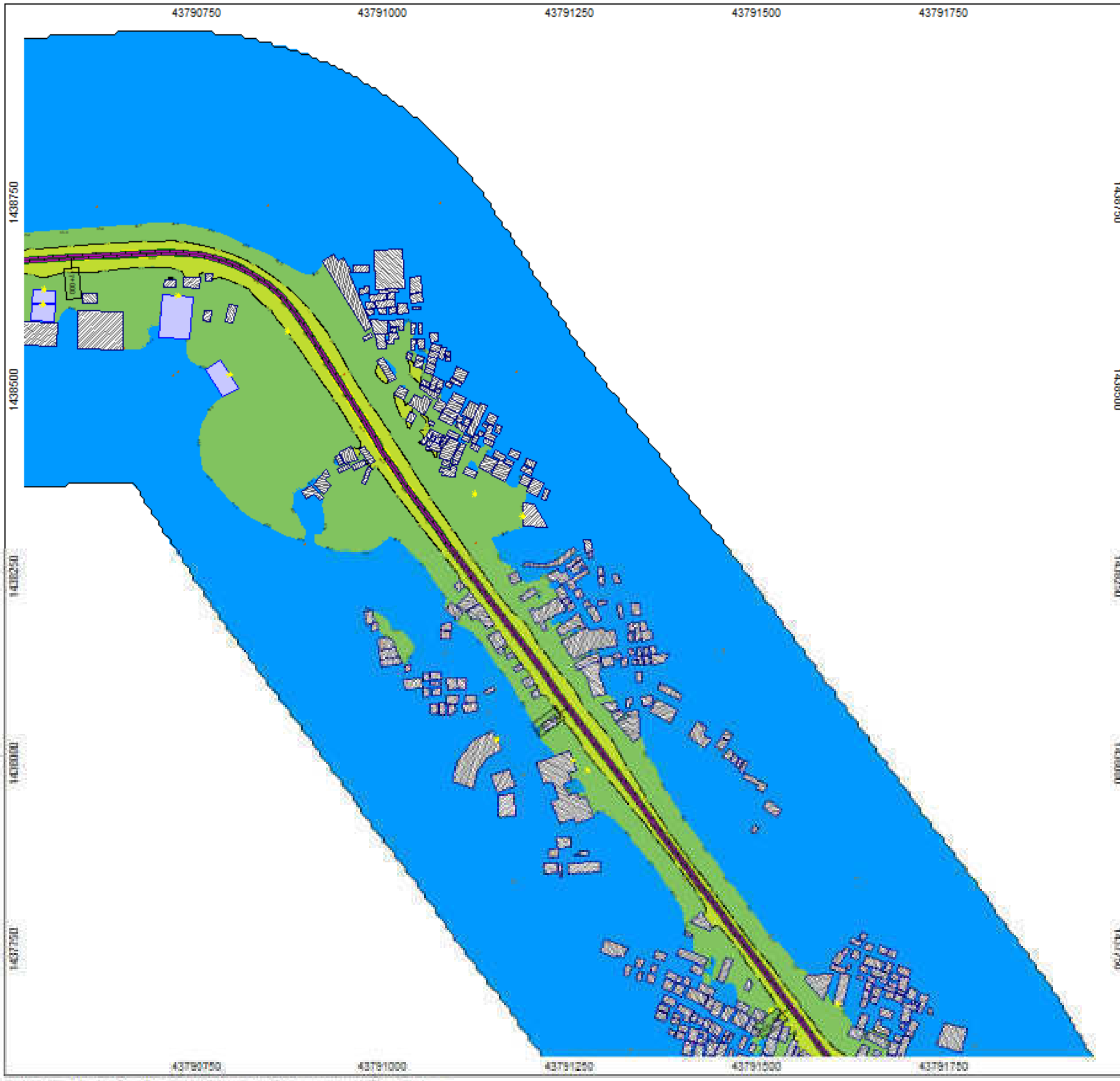


"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2031 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols

Wall

Main building

Point receiver

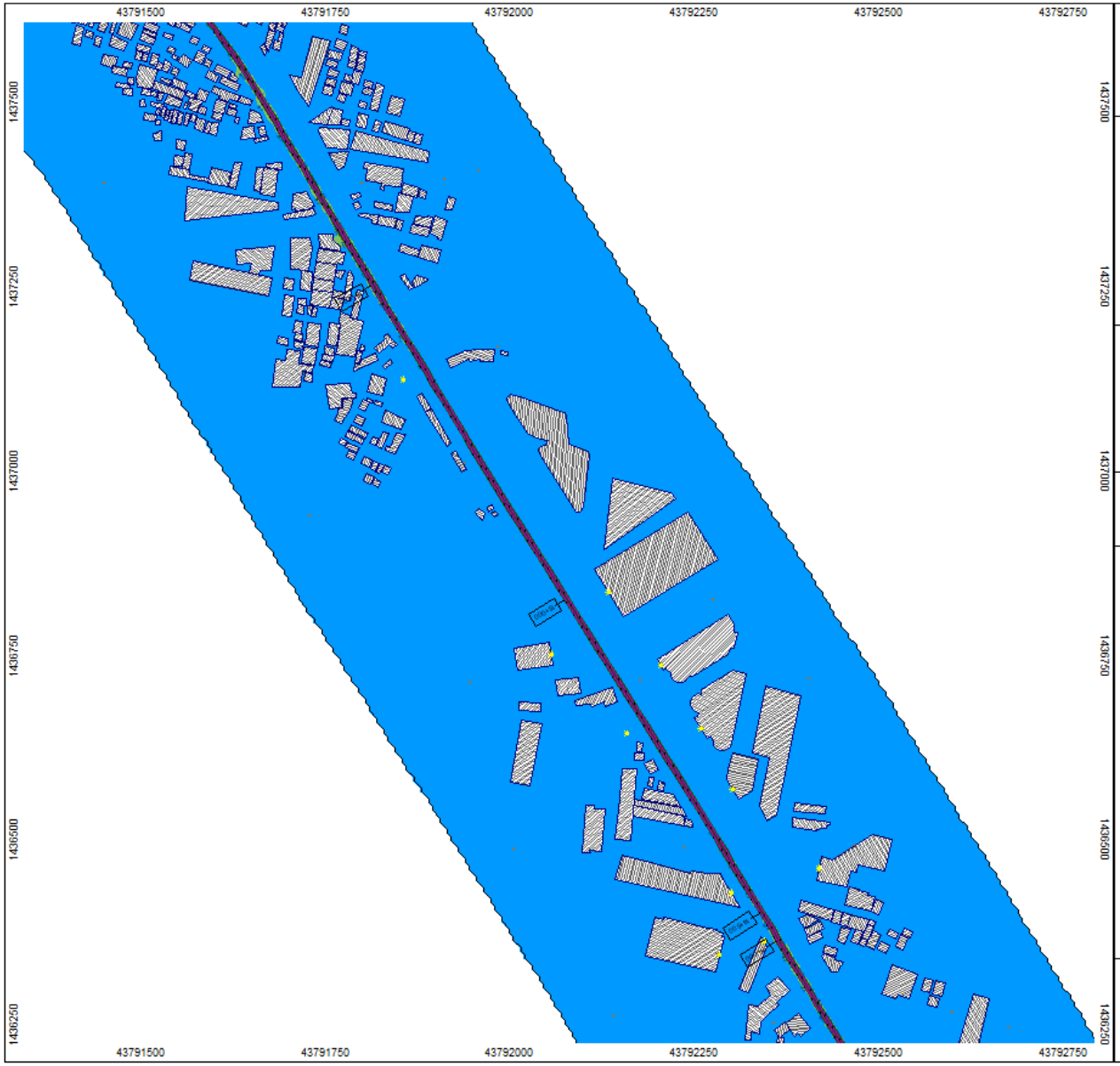
Point Sources

Line source

Wall

Wall

Length scale 1:5181
0 45 90 180 270 360 m



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2031 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5181

0 45 90 180 270 360 m

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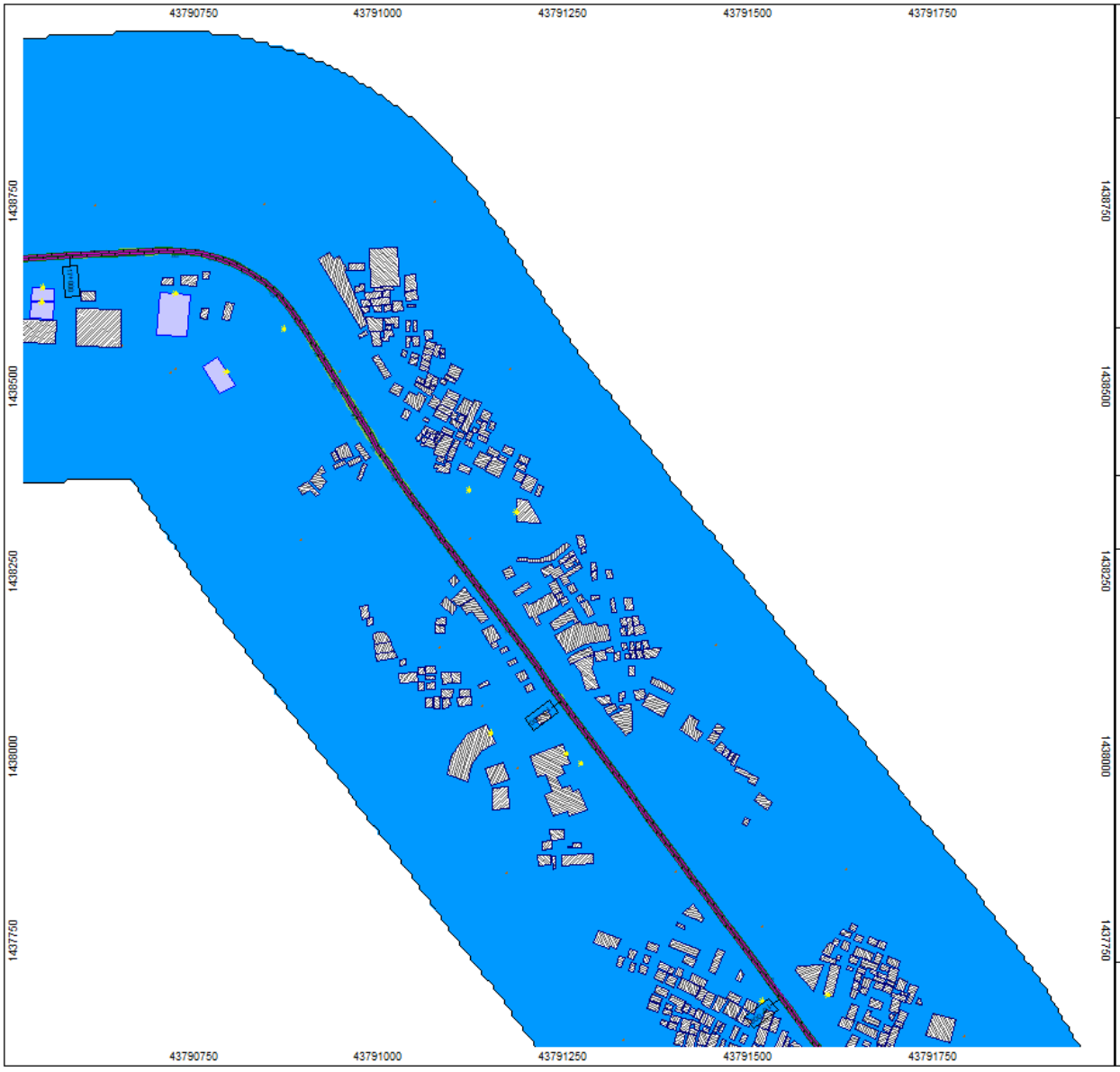

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2031 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5181

0 45 90 180 270 360 m

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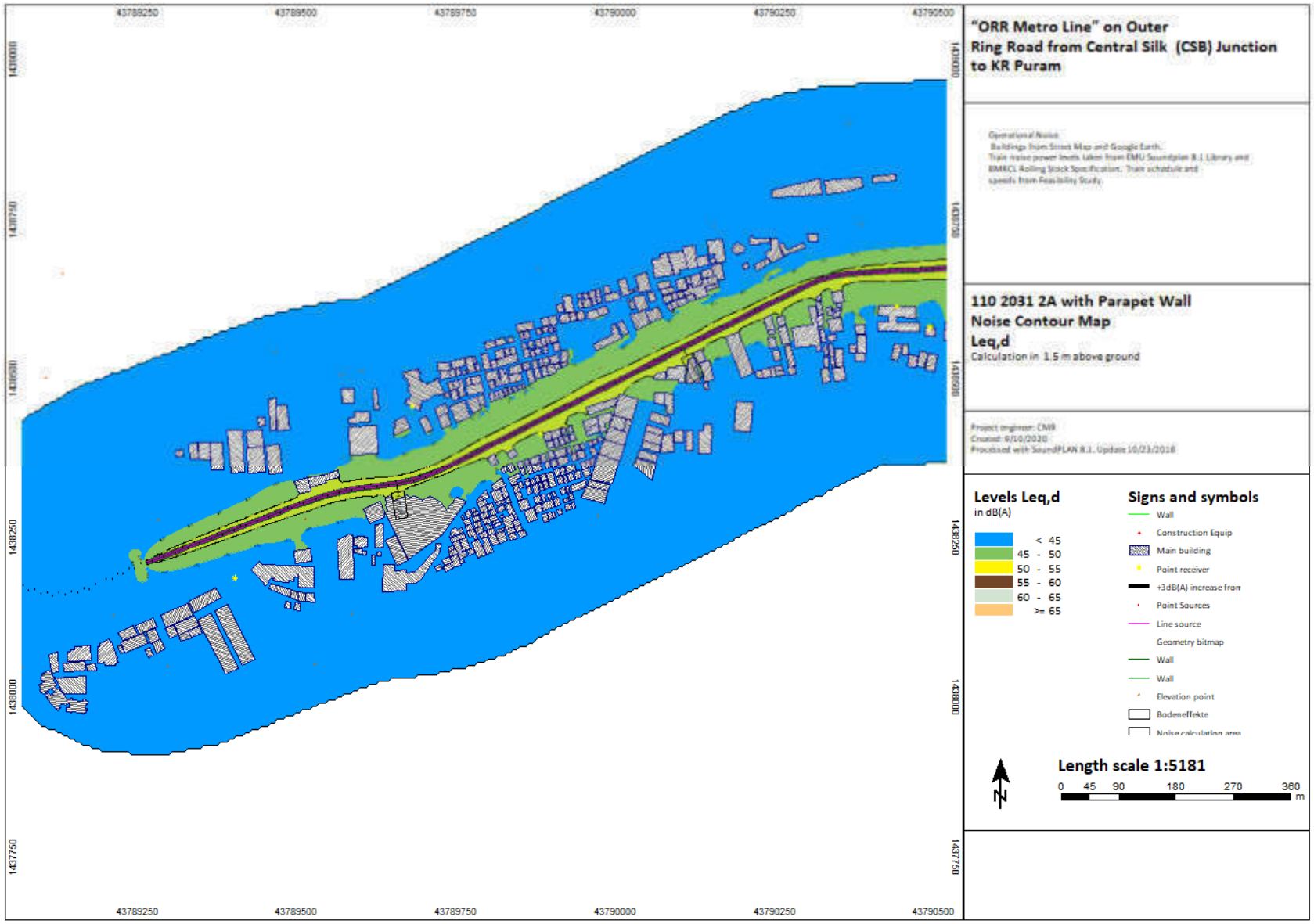

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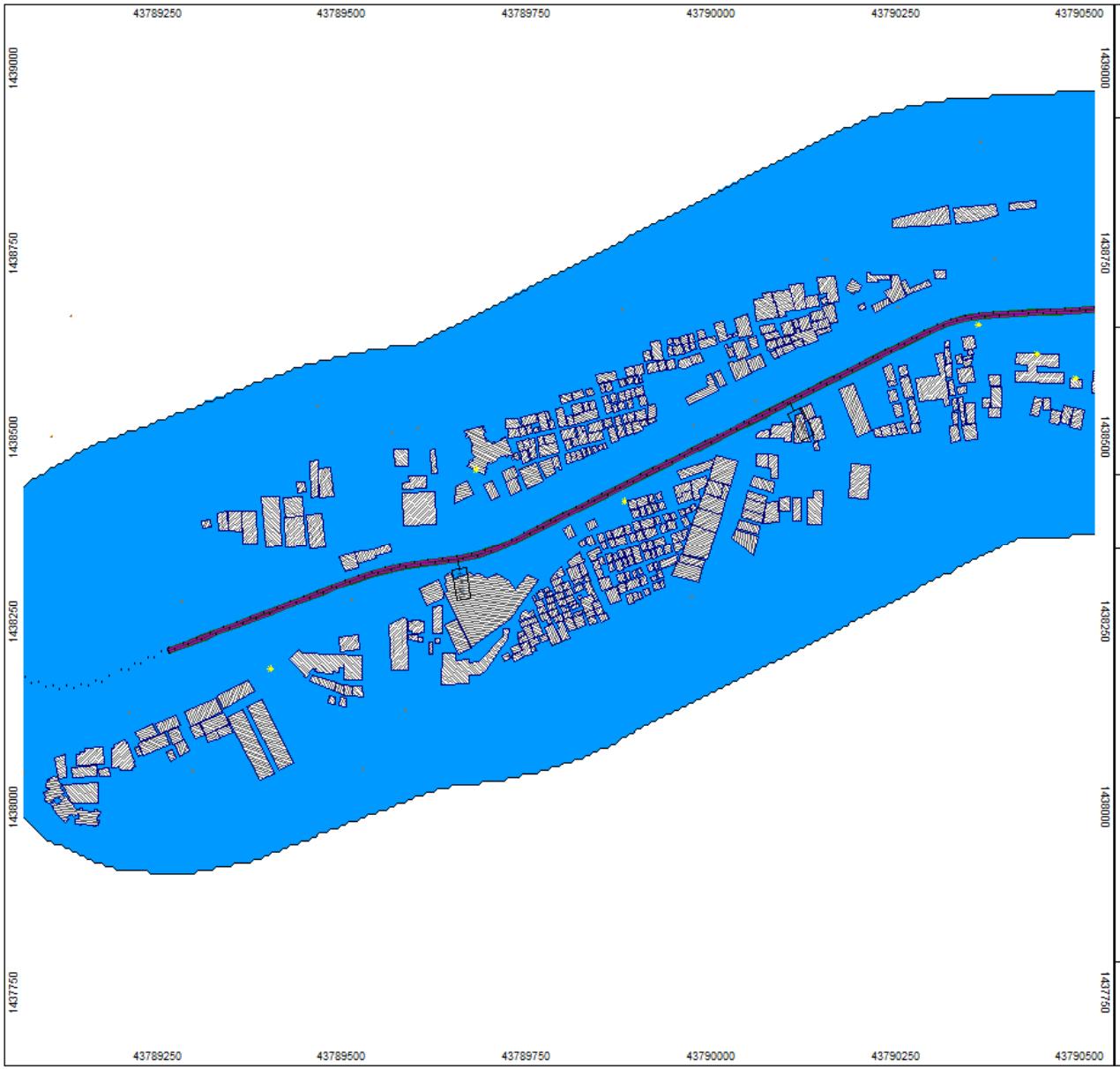

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2031 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5181

0 45 90 180 270 360 m

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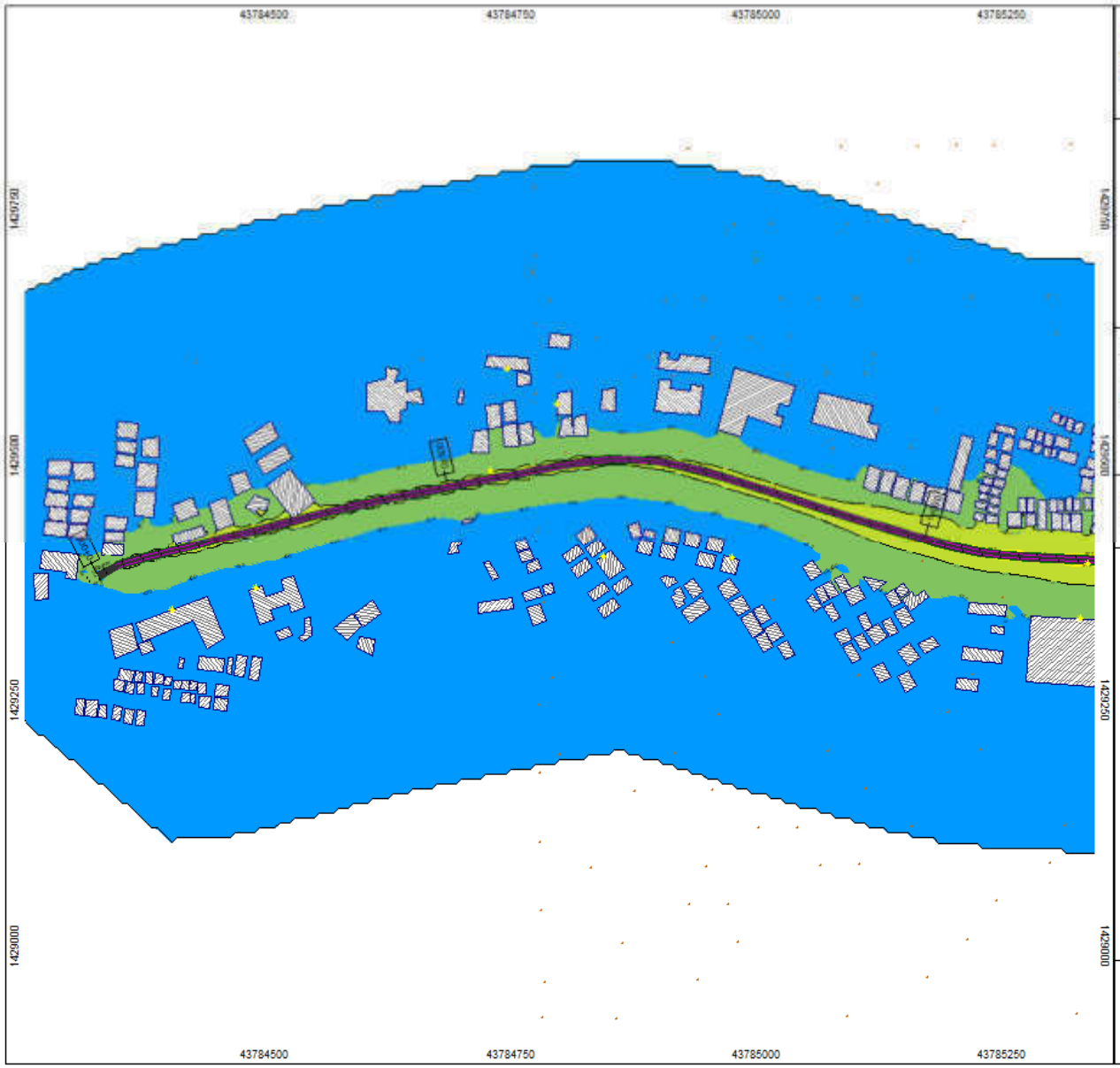
2041



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2041 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/16/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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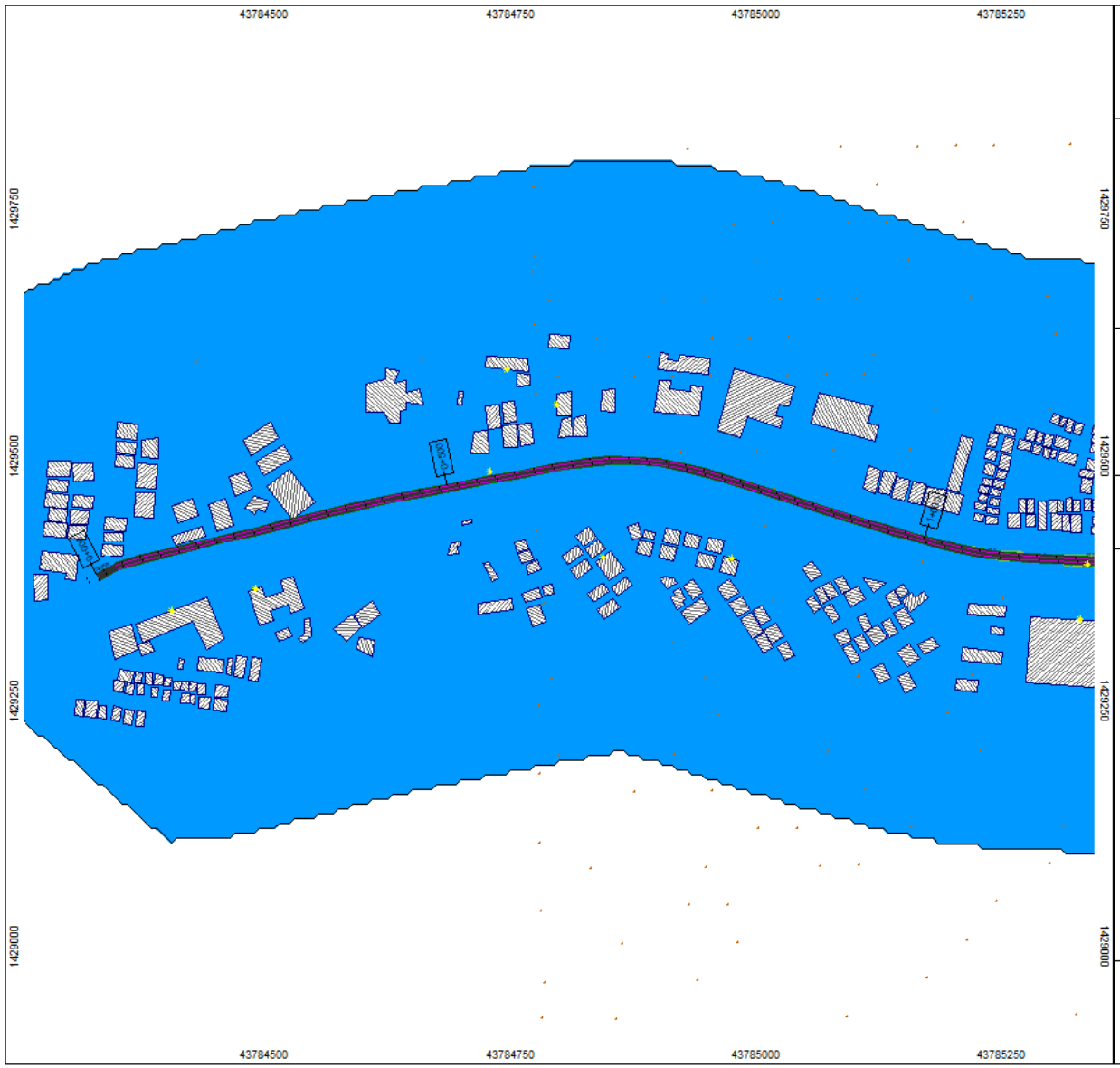

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2041 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2041 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols
Wall
Construction Equip
Main building
Point receiver
+3dB(A) increase from
Point Sources
Line source
Geometry bitmap
Wall
Wall
Elevation point
Buildingeffekte

N

Length scale 1:3887
0 30 60 120 180 240 m

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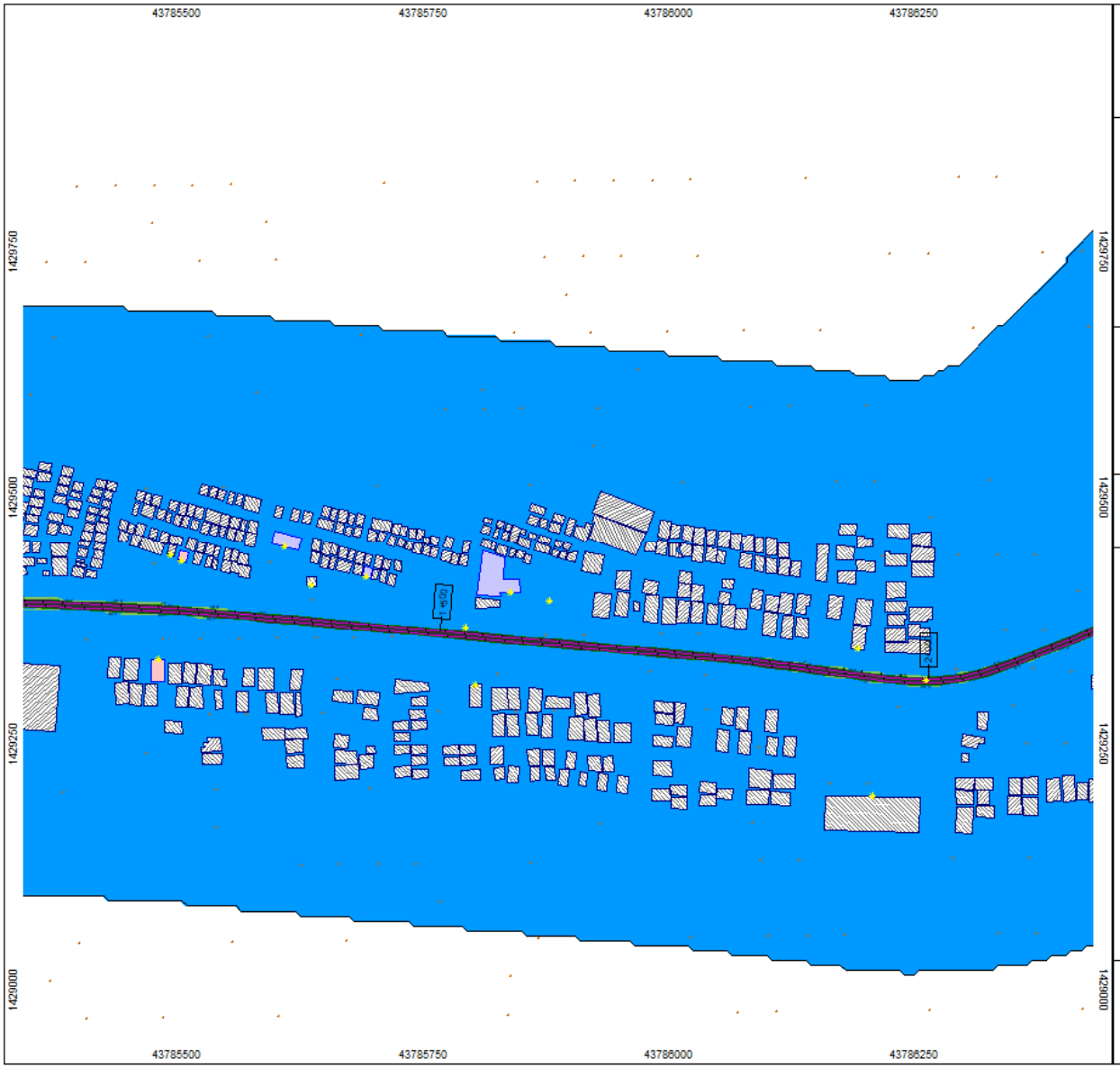

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2041 2A with Parapet Wall
Noise Contour Map
Leq,n

Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
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< 45
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Signs and symbols

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- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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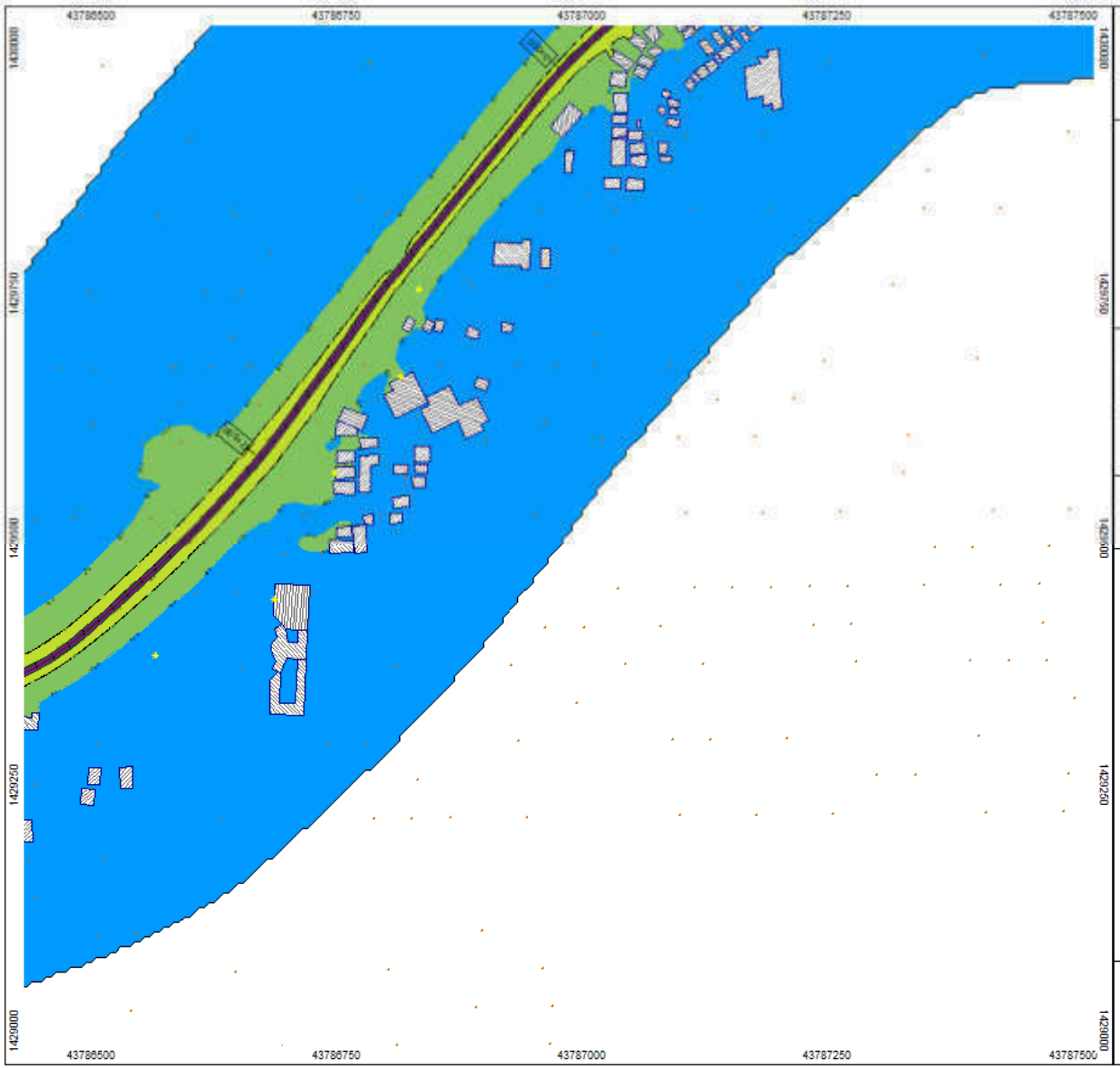

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2041 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/15/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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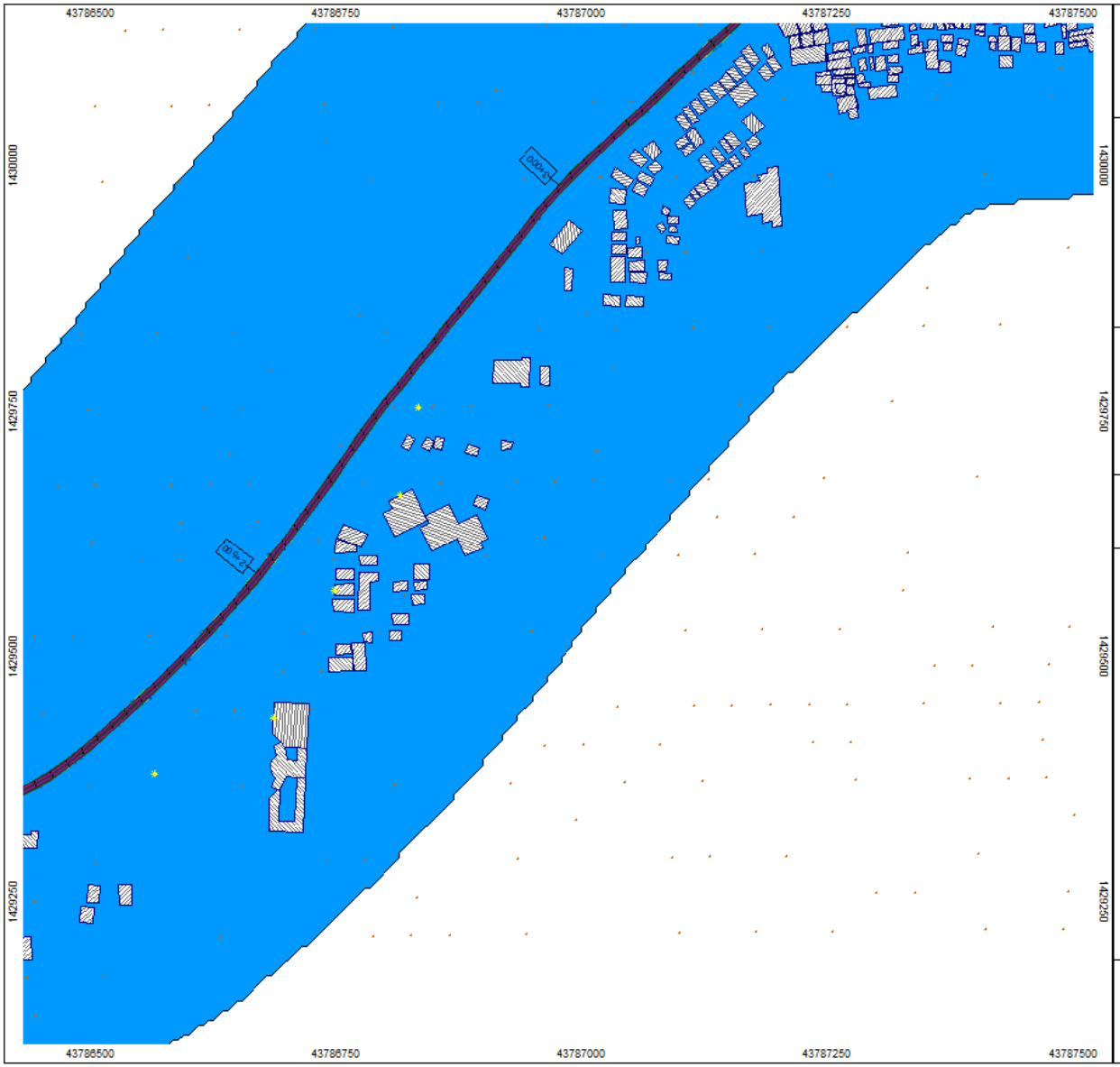

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2041 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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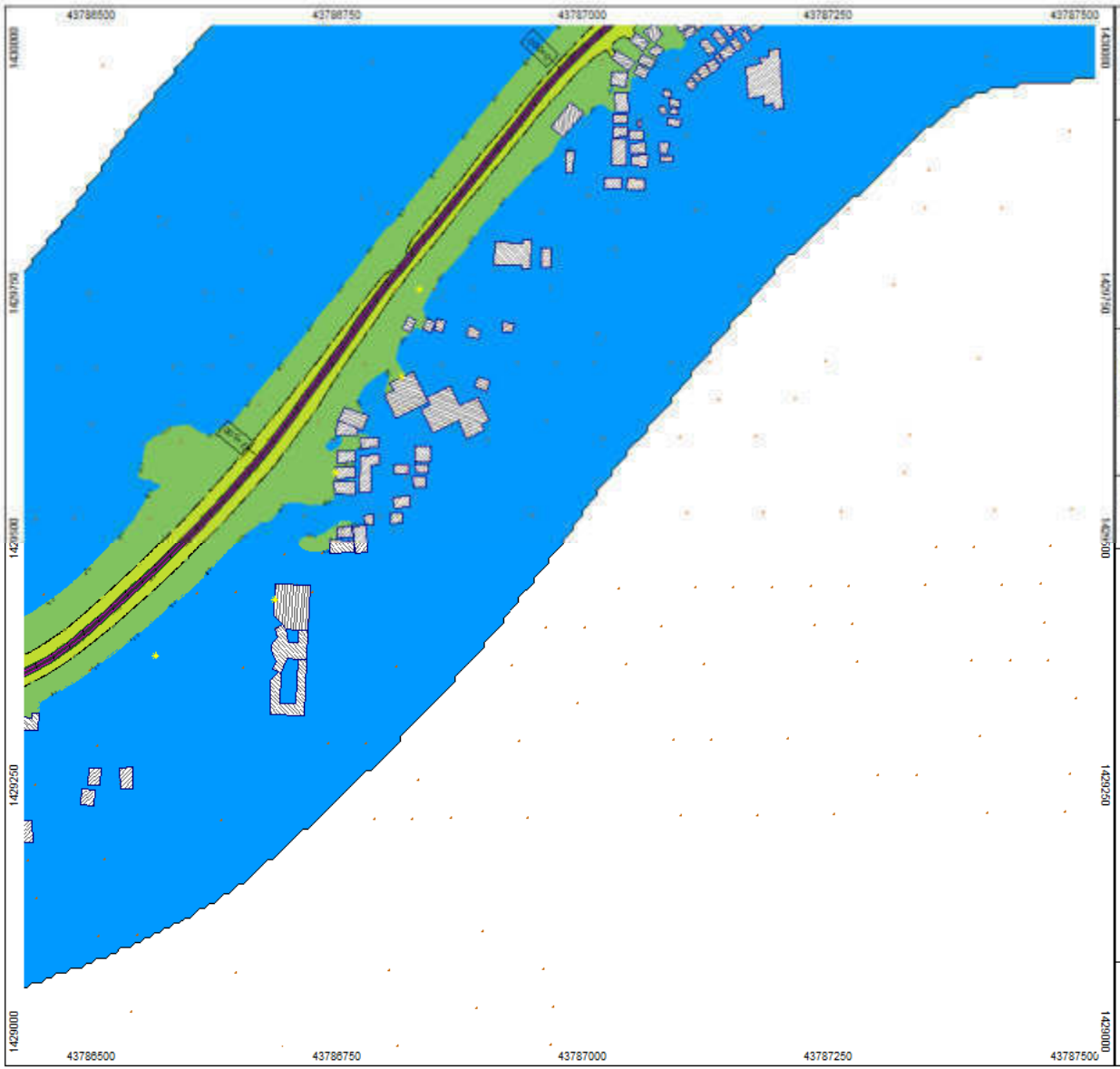

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from DMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2041 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
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- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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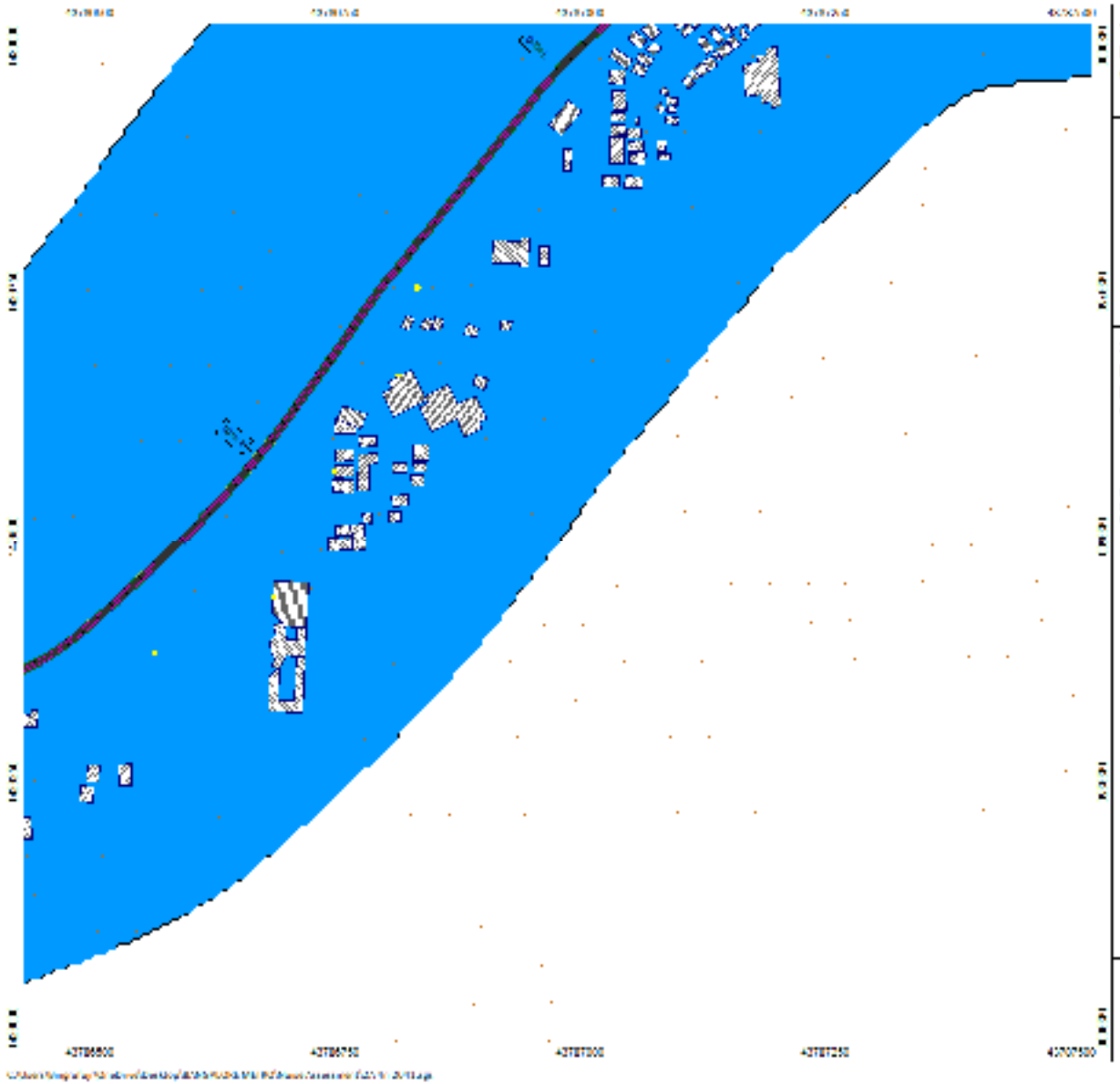


"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

110 2041 2A with Parapet Wall

Noise Contour Map

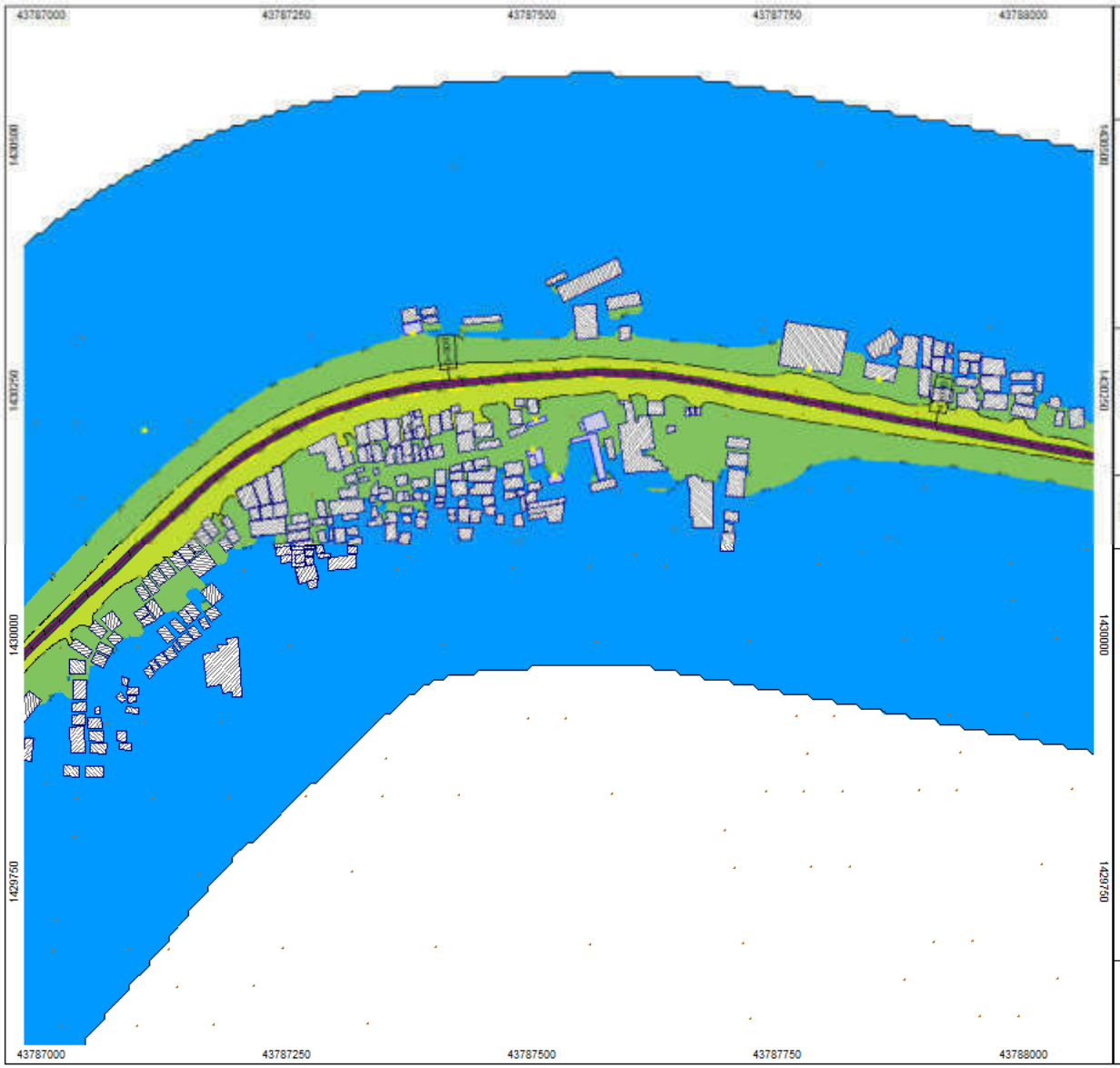
$Leq_{,}n$

Calculation in 1.5 m above ground

Levels $Leq_{,}n$ in dB(A)

Signs and symbols

Length scale 1:3887



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMG Soundplan 8.1 Library and BAMCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2041 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
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- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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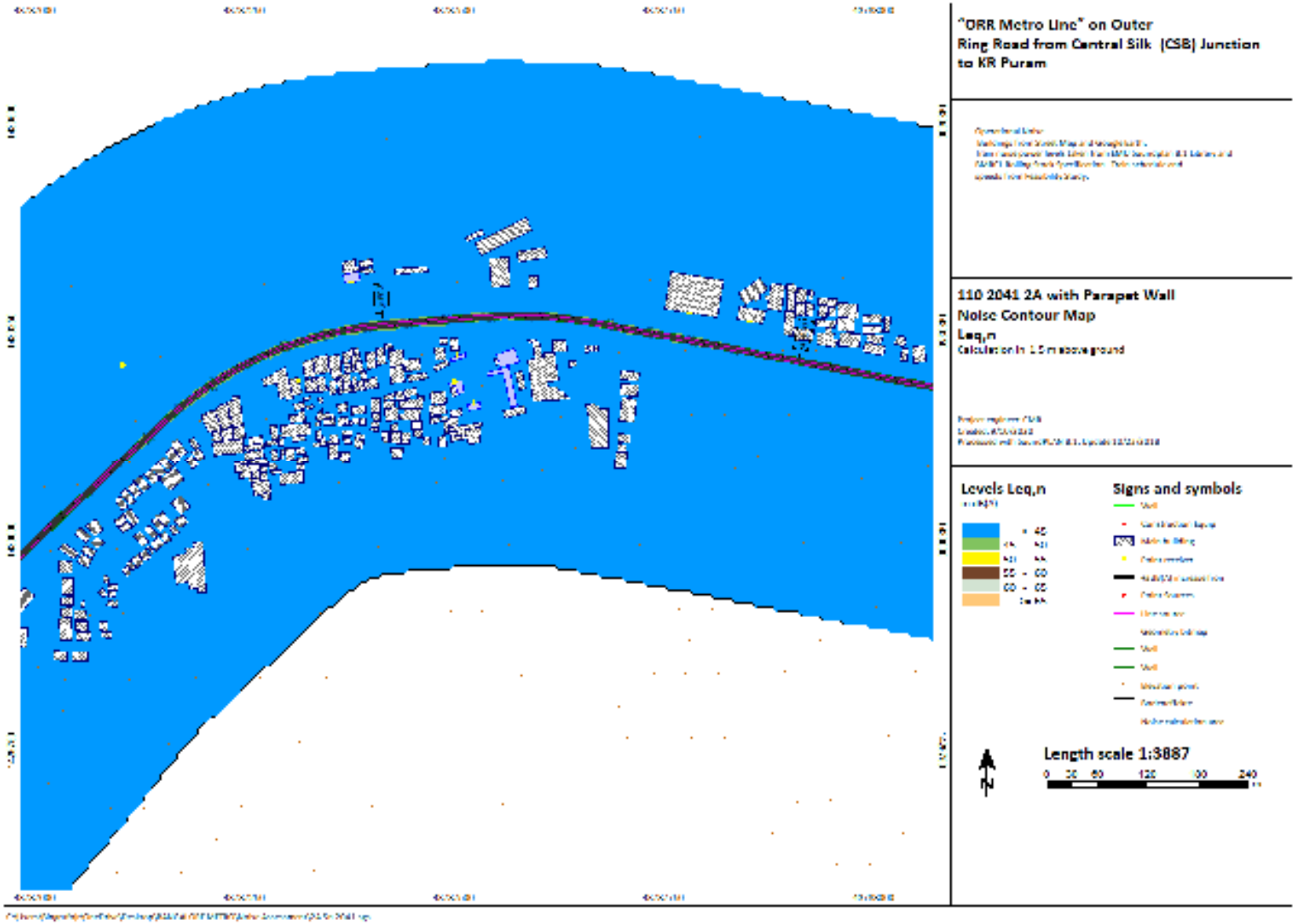
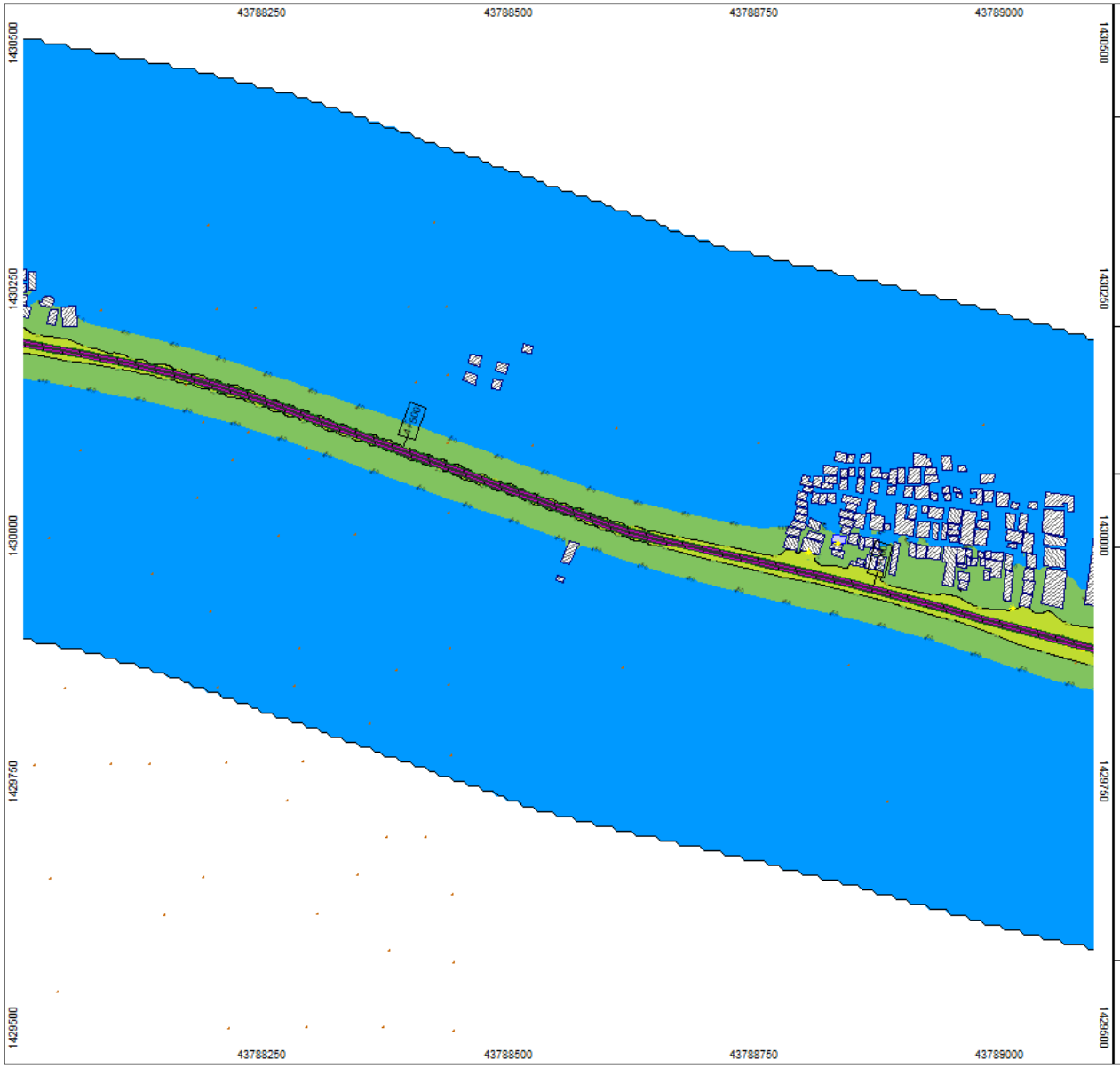

"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram
110 2041 2A with Parapet Wall
Noise Contour Map
Leq,n
Levels Leq,n
Signs and symbols
Length scale 1:3887
0 20 60 120 00 240



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2041 2A with Parapet Wall
Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m

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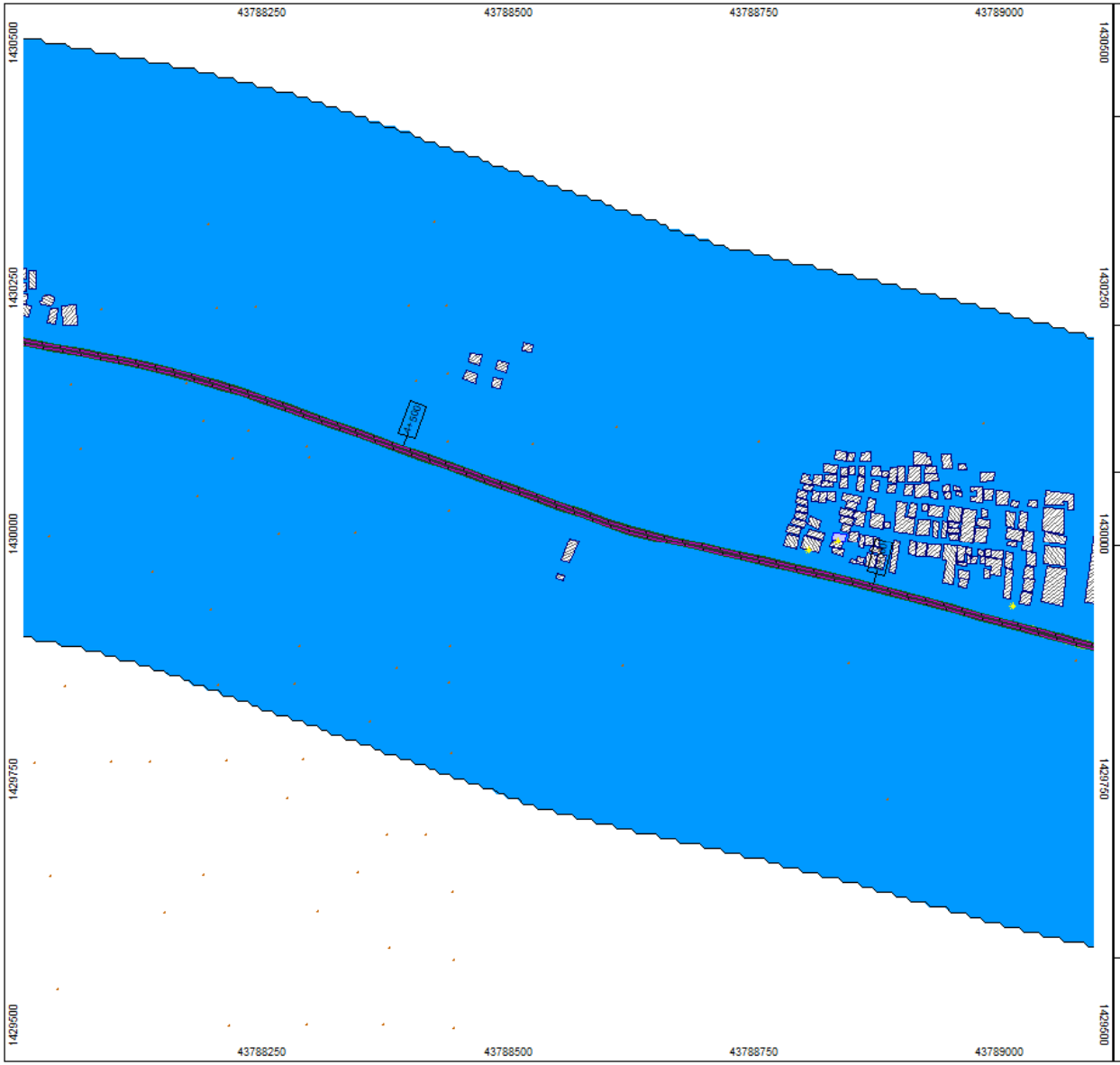

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"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification. Train schedule and speeds from Feasibility Study.

110 2041 2A with Parapet Wall
Noise Contour Map
Leq,n
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,n
in dB(A)

	< 45
	45 - 50
	50 - 55
	55 - 60
	60 - 65
	>= 65

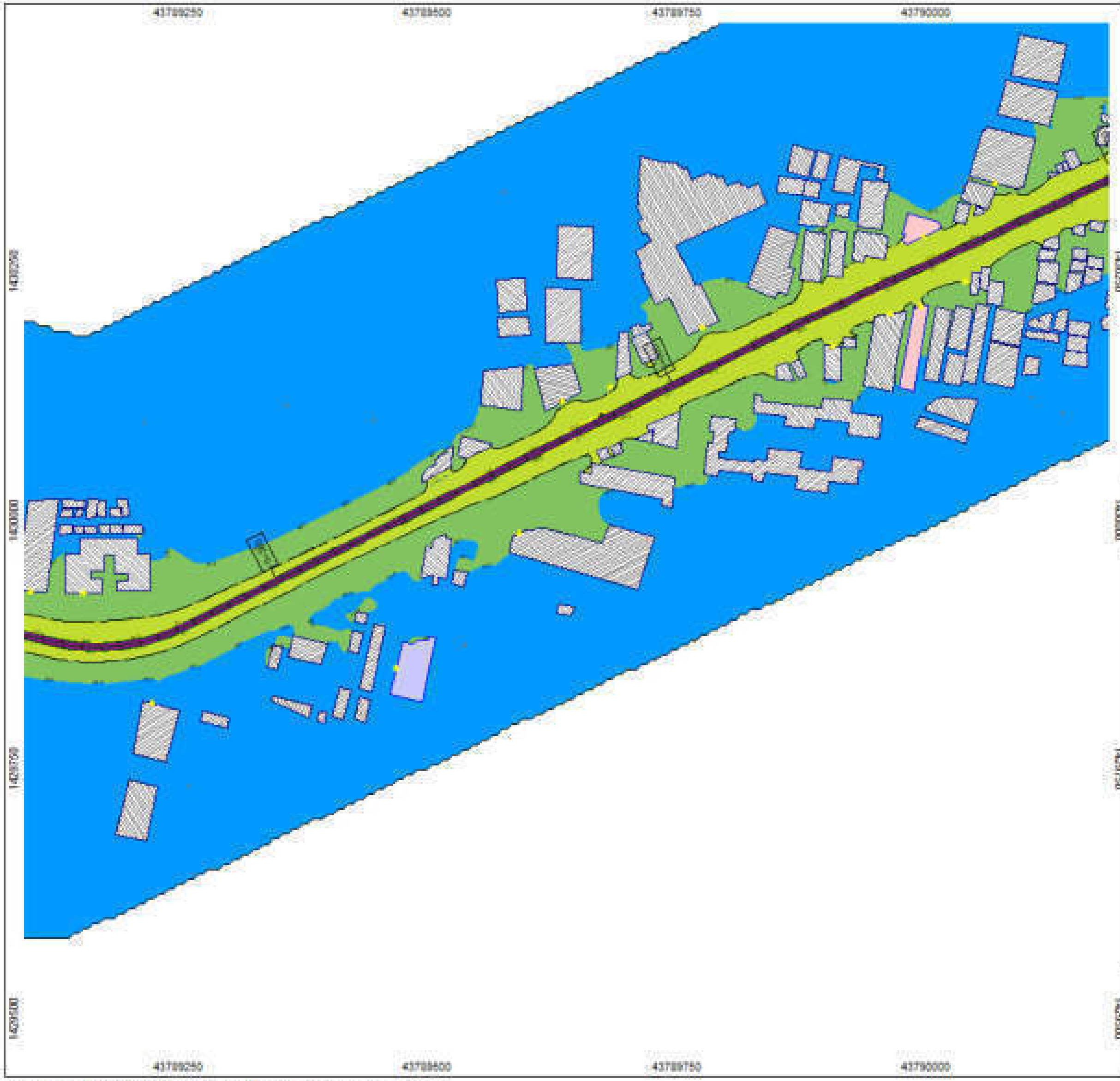
Signs and symbols

- Wall
- Construction Equip
- Main building
- Point receiver
- +3dB(A) increase from
- Point Sources
- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:3887

0 30 60 120 180 240 m



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Leq,d
Calculation in 1.5 m above ground

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Levels Leq,d
in dB(A)

Level
< 45
45 - 50
50 - 55
55 - 60
60 - 65
>= 65

Signs and symbols

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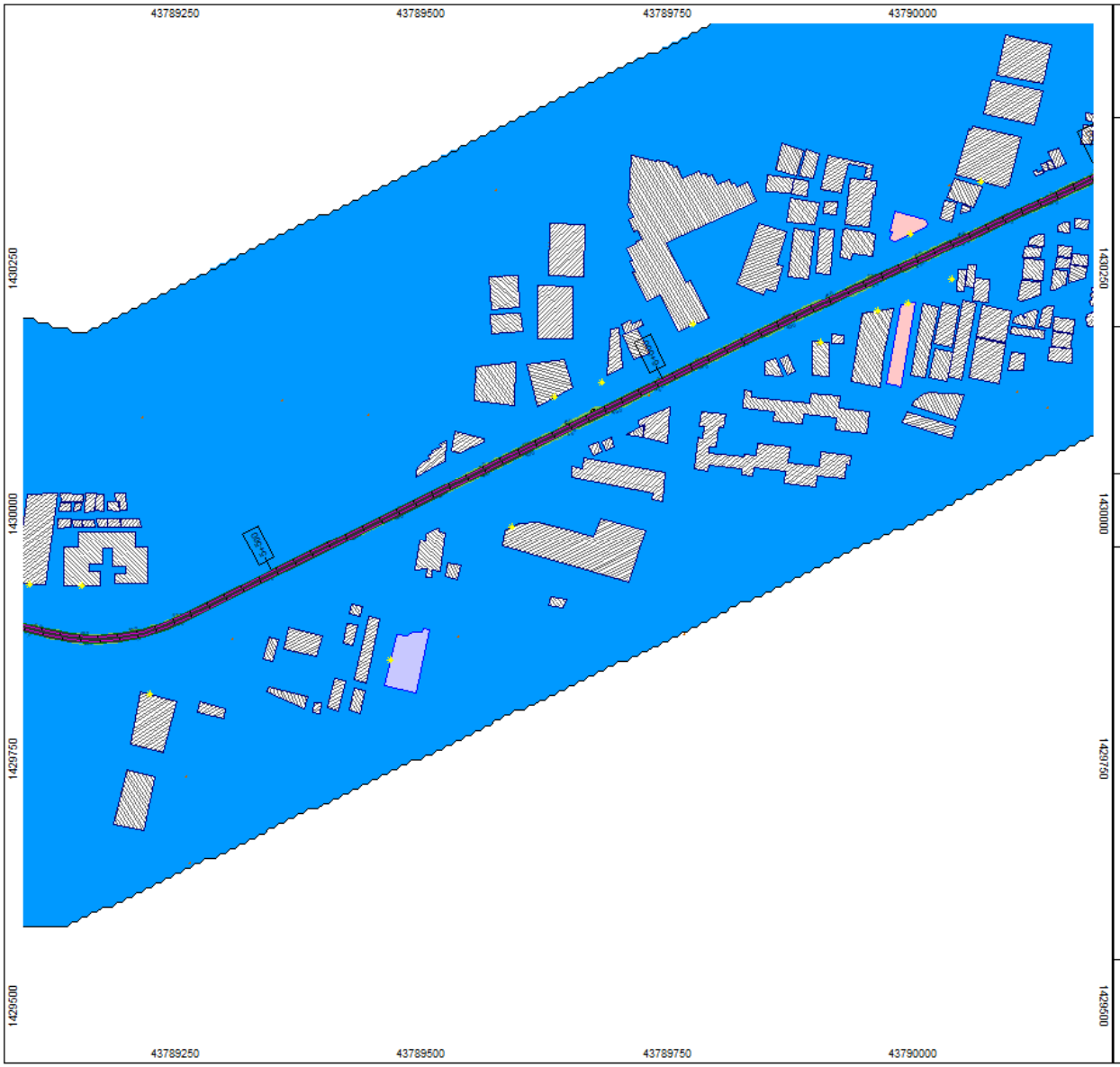
Length scale 1:3887

0 30 60 120 180 240 m



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

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Length scale 1:3887

0 30 60 120 180 240 m

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"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise.
Buildings from Street Map and Google Earth.
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Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
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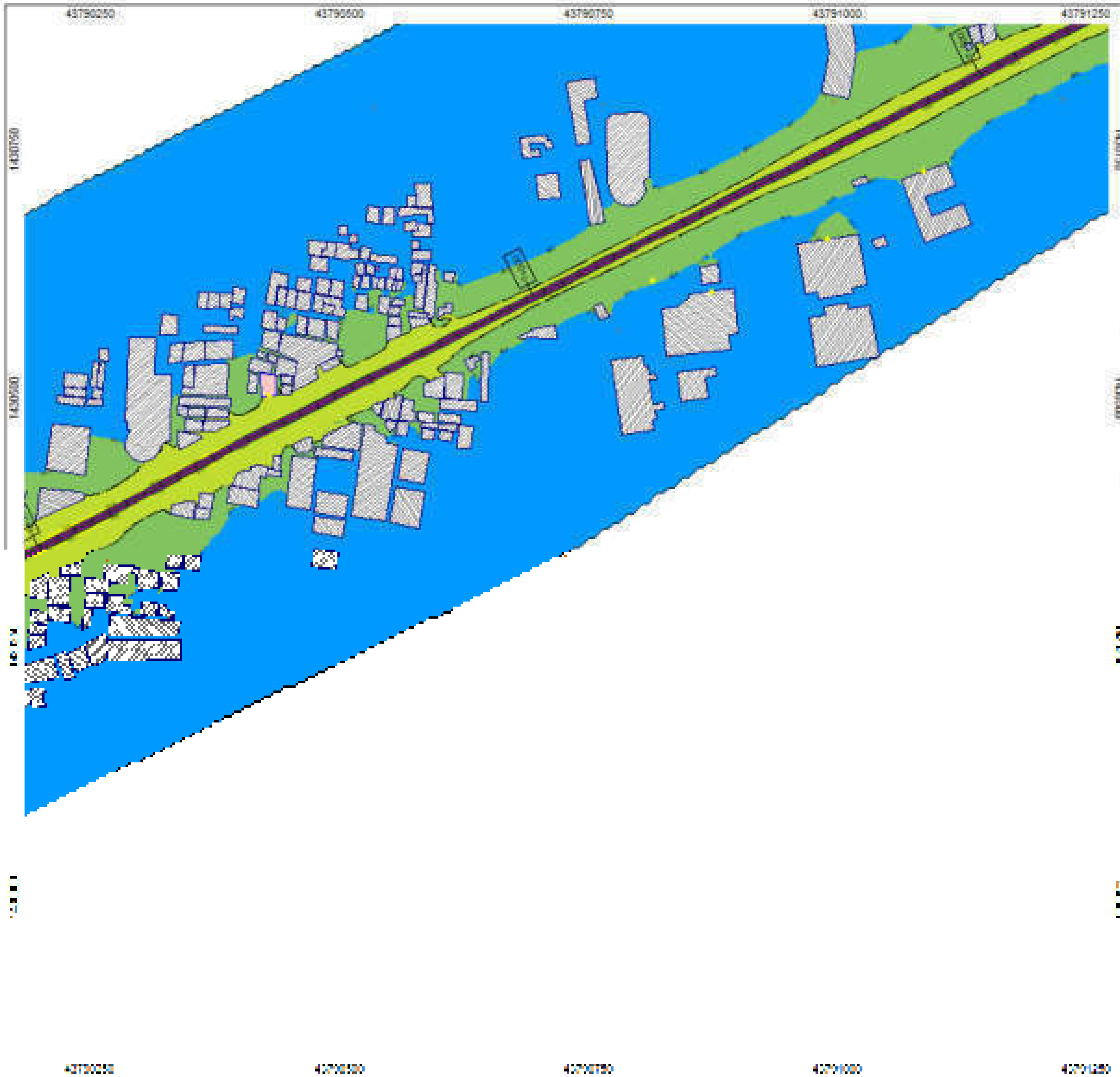
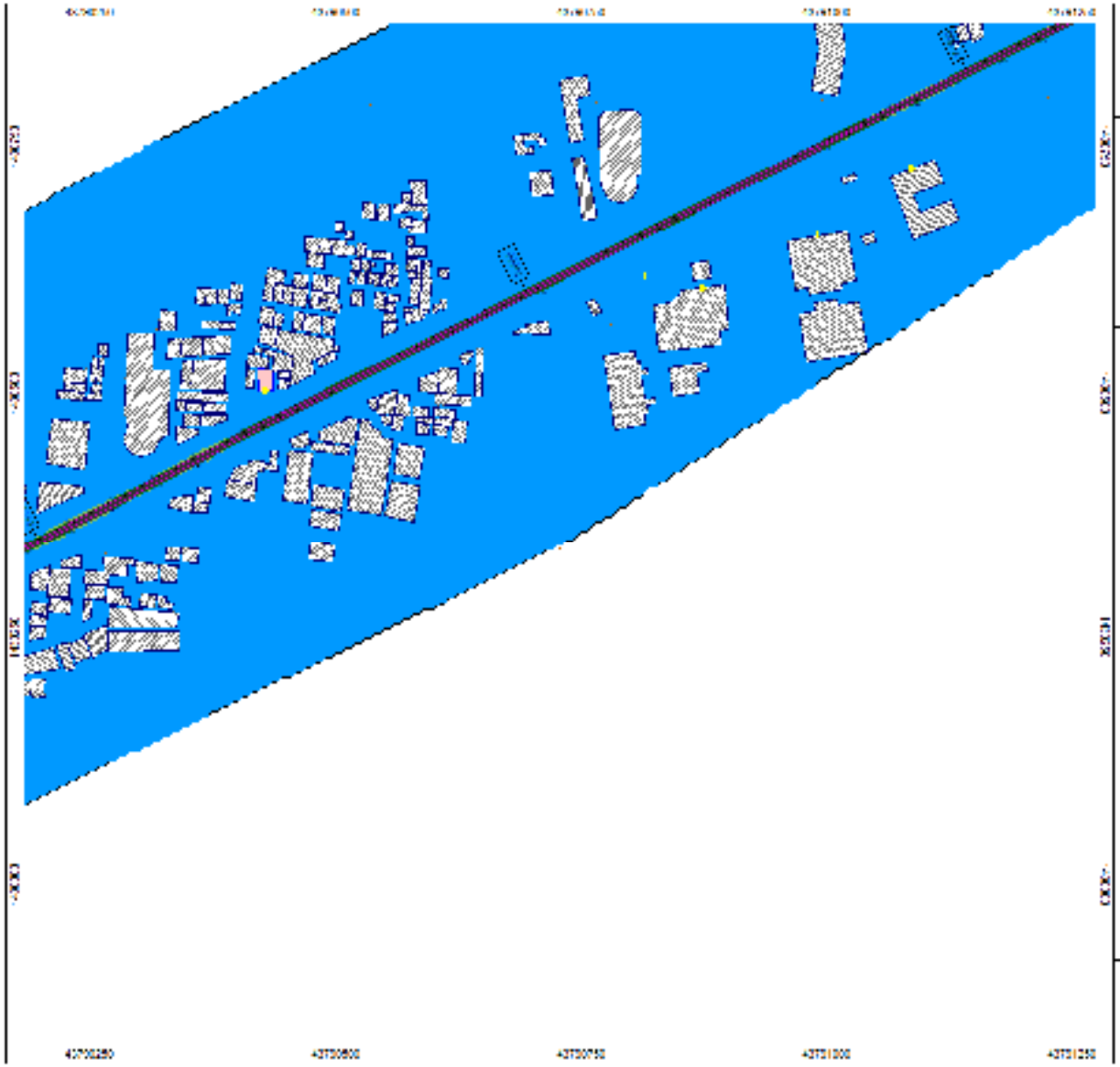


Levels Leq,d
in dB(A)

45 - 50
50 - 55

Signs and symbols

Length scale 1:3887



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

110 2041 2A with Parapet Wall

Noise Contour Map

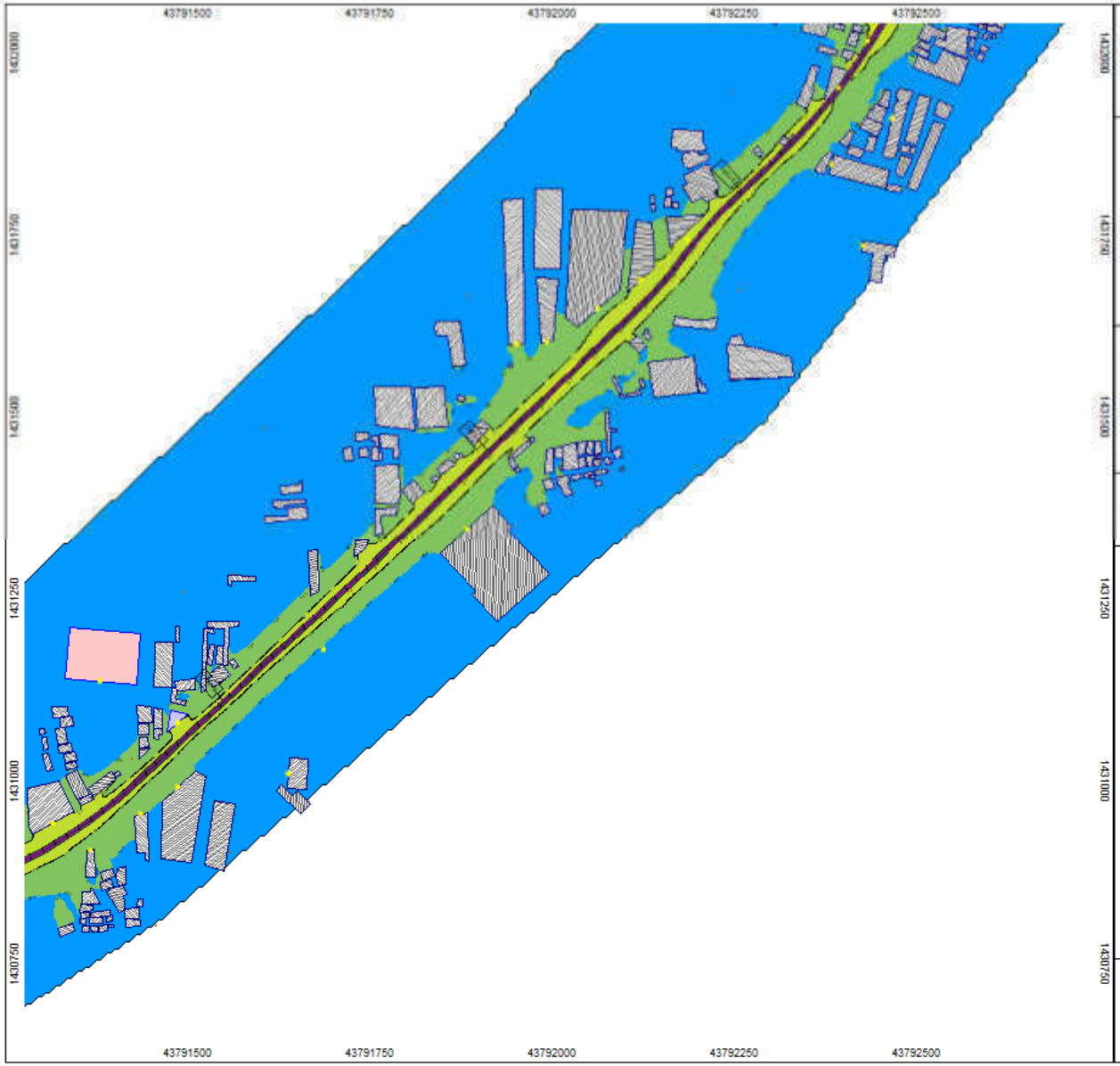
Leq,n

Calculation in 1.5 m above ground

Levels Leq,n in d(A)

Signs and symbols

Length scale 1:3887



"ORR Metro Line" on Outer Ring Road from Central Silk (CSB) Junction to KR Puram

Operational Noise:
Buildings from Street Map and Google Earth.;
Train noise power levels taken from EMU Soundplan 8.1 Library and BMRCL Rolling Stock Specification; Train schedule and speeds from Feasibility Study.

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Noise Contour Map
Leq,d
Calculation in 1.5 m above ground

Project engineer: CMR
Created: 9/10/2020
Processed with SoundPLAN 8.1, Update 10/23/2018

Levels Leq,d
in dB(A)

	< 45
	45 - 50
	50 - 55
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	60 - 65
	>= 65

Signs and symbols
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- Line source
- Geometry bitmap
- Wall
- Wall
- Elevation point
- Bodeneffekte
- Noise calculation area

N

Length scale 1:5245
0 45 90 180 270 360 m

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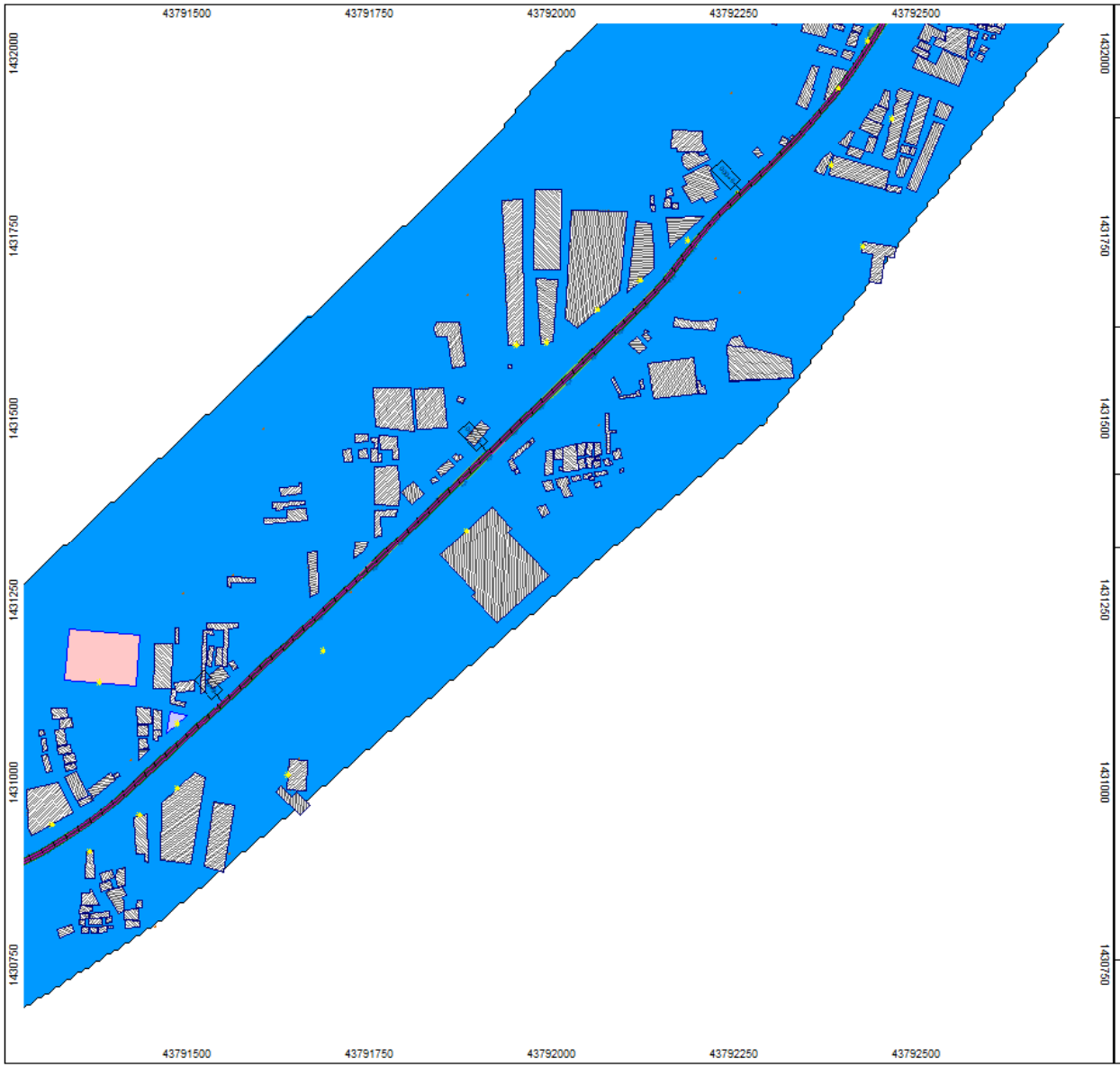

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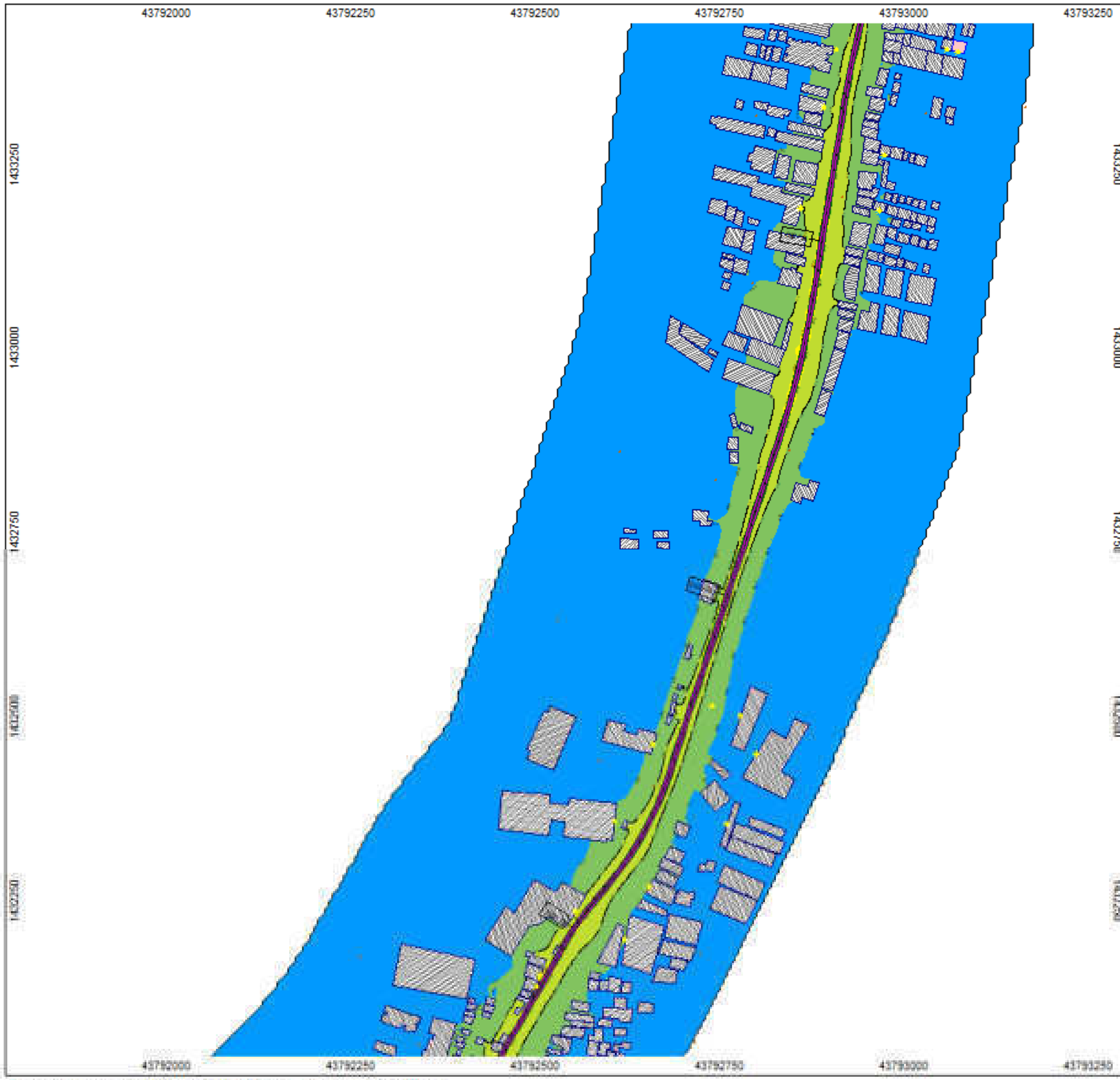

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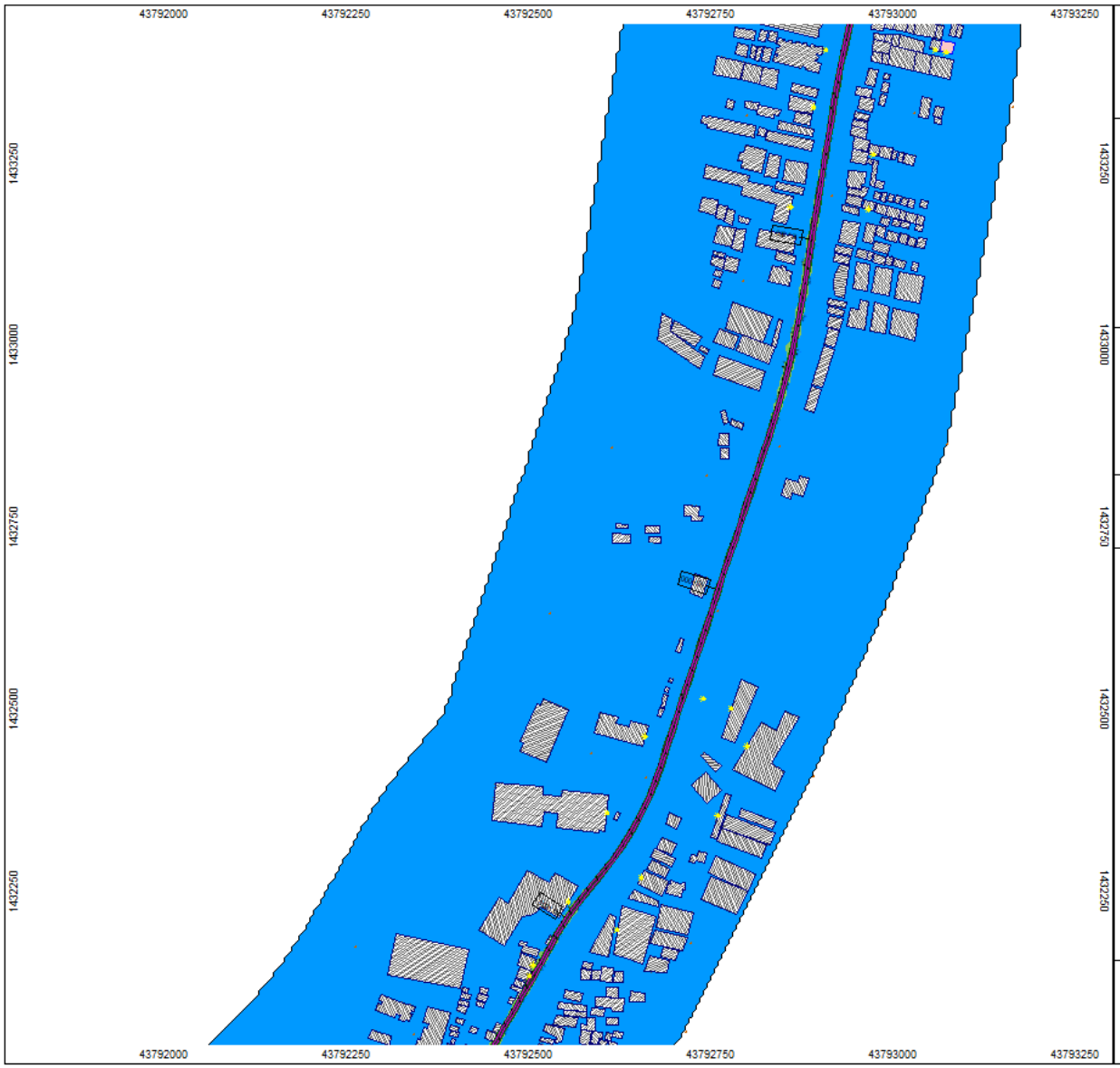

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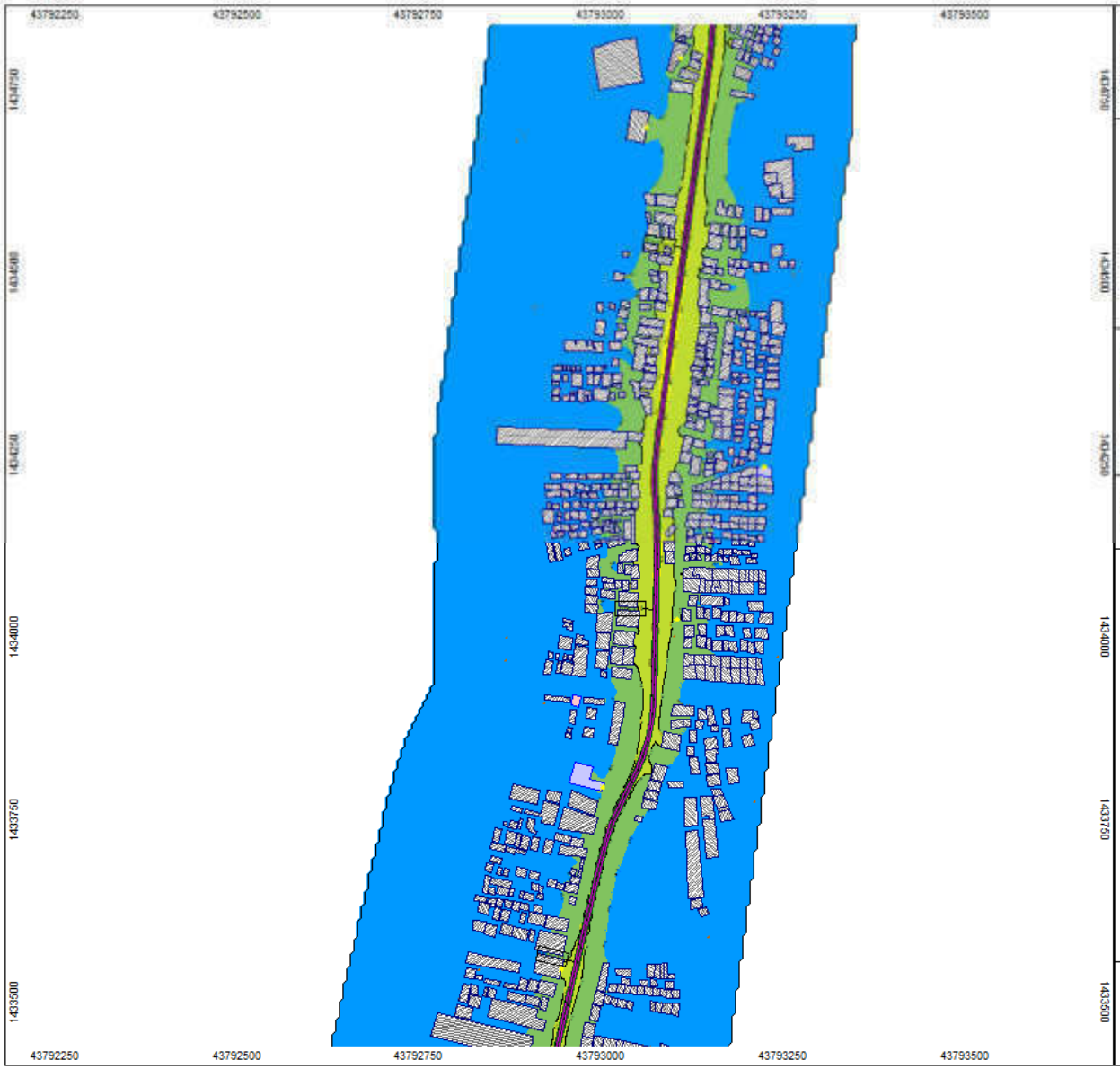

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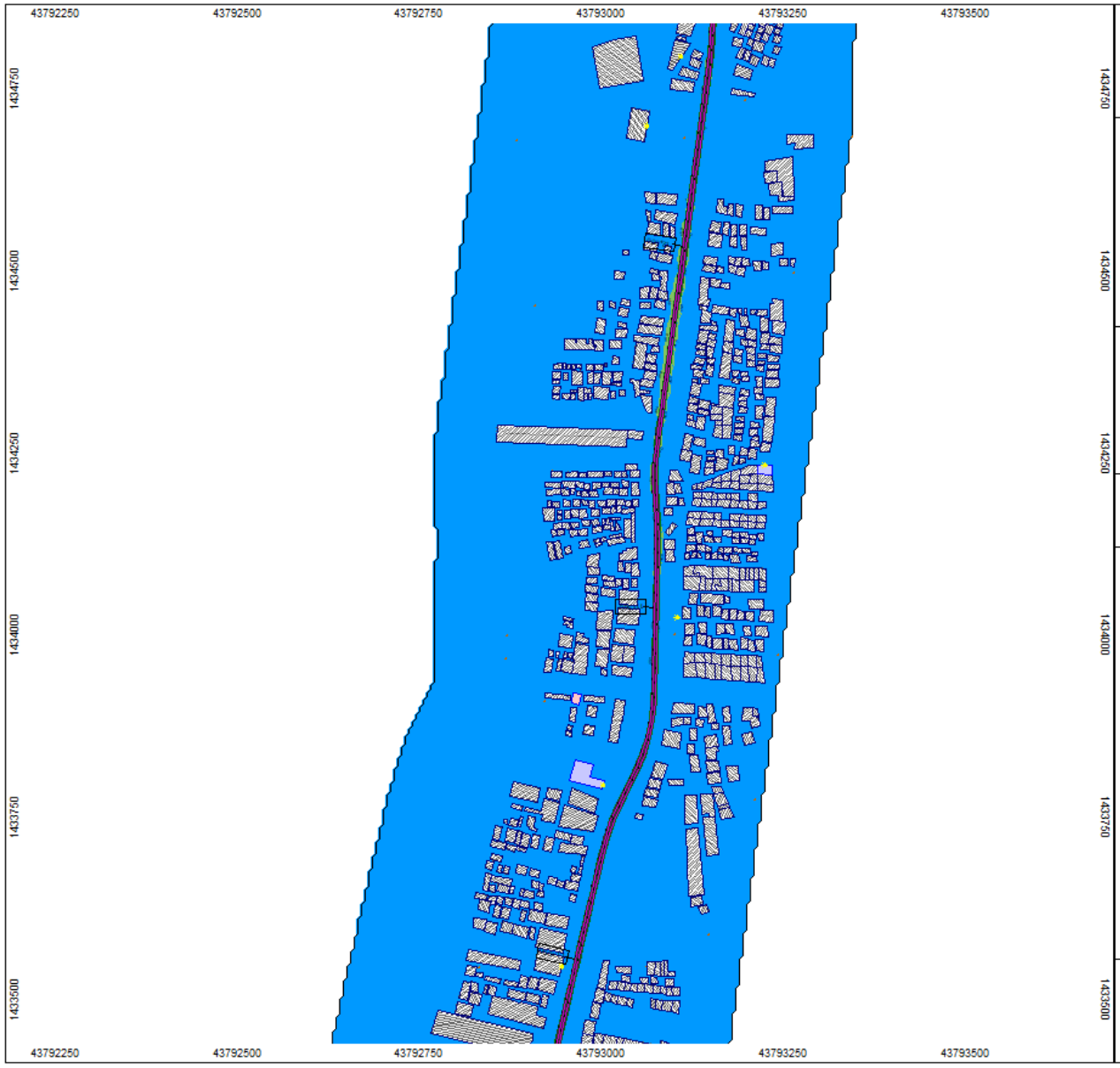

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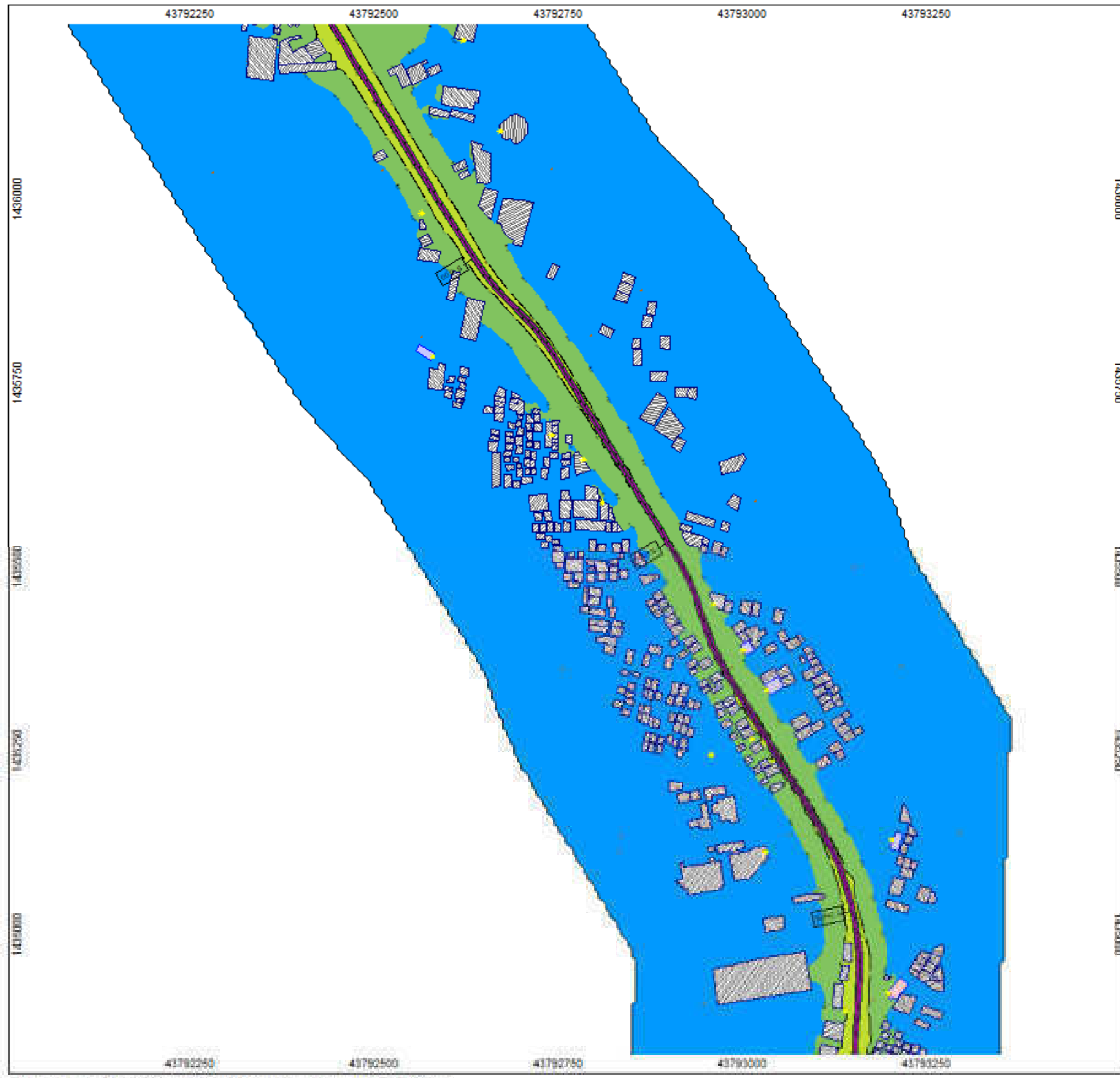

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Signs and symbols
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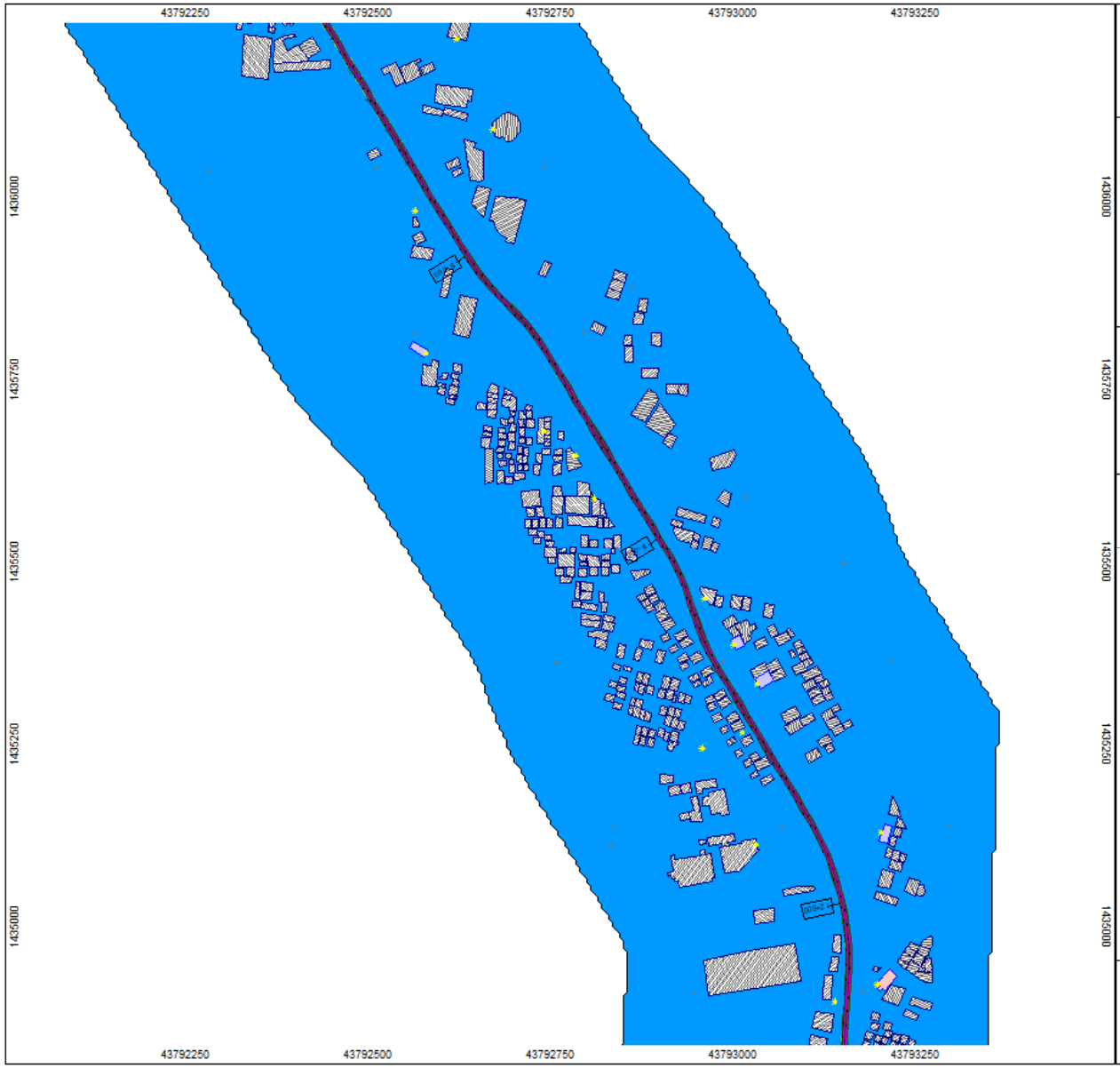

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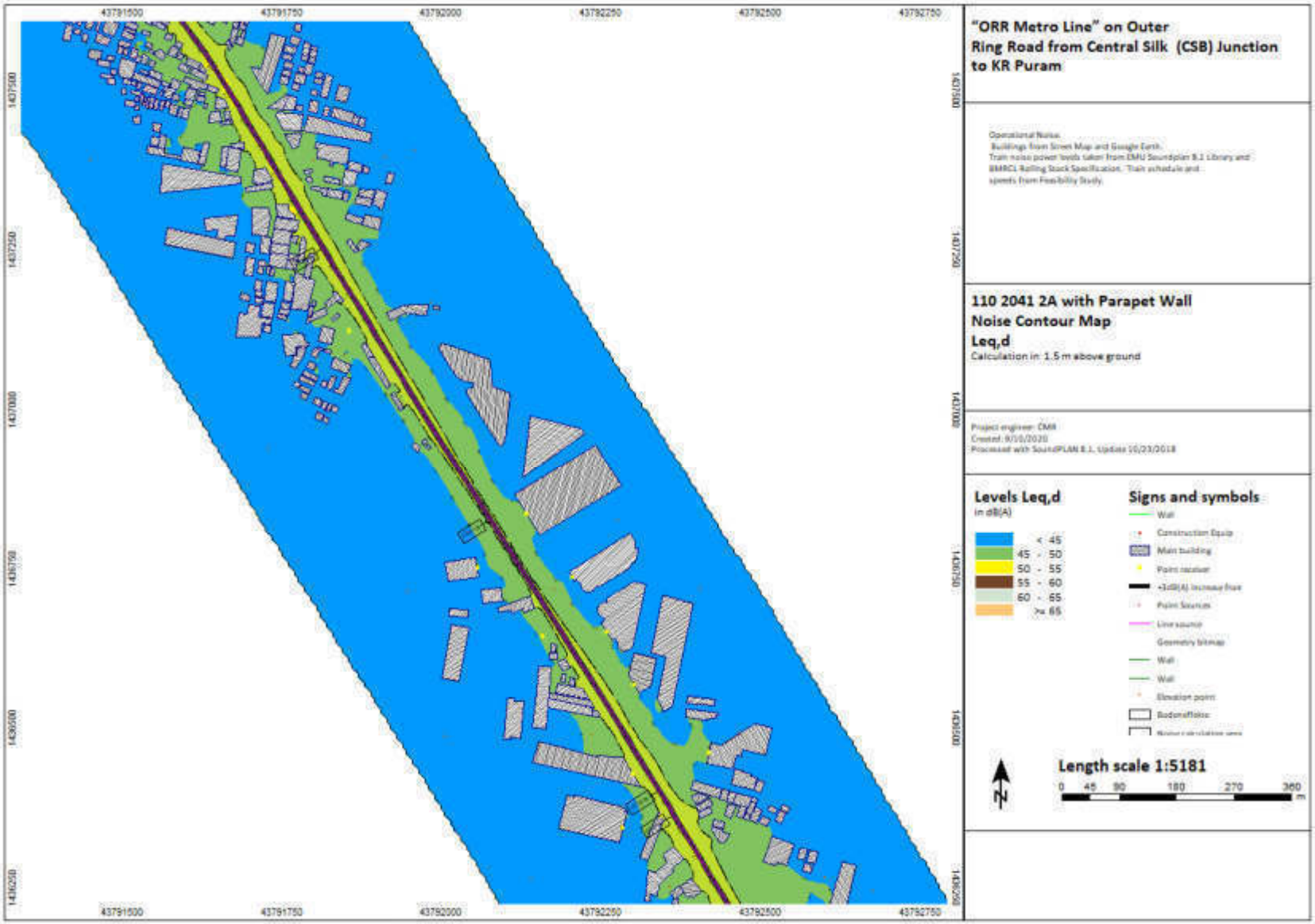

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