WESTON CONSULTING
planning + urban design

SHADOW STUDY

NYX TANNERY LTD.

51, 57 TANNERY STREET & 208 EMBY DRIVE
CITY OF MISSISSAUGA

AUGUST 2020
WESTON FILE# 8059

TABLE OF CONTENTS

1.Introduction 4

2.Key Plans 5

3.Criteria 7

3.1. Residential Private Outdoor Amenity 7

3.2. Communal Outdoor Amenity 7

3.3. Public Realm: Tannery St Sidewalk 7

3.4. Turf and Flower Gardens 7

3.5. Building Faces to Allow for the Possibility of Using Solar Energy 7

4. Conclusion 7

5. Appendix 1 - Shadow Impact Analysis Tables 8

6. Appendix 2 - Shadow Study Diagrams 17

LIST OF TABLES

TABLE 1: 3.1 RESIDENTIAL PRIVATE OUTDOOR AMENITY: JUNE 21 9

TABLE 2: 3.1 RESIDENTIAL PRIVATE OUTDOOR AMENITY: SEPTEMBER 21 9

TABLE 3: 3.2 COMMUNAL OUTDOOR AMENITY: JUNE 21 10

TABLE 4: 3.2 COMMUNAL OUTDOOR AMENITY: SEPTEMBER 21 10

TABLE 5: 3.2 COMMUNAL OUTDOOR AMENITY: DECEMBER 21 11

TABLE 6: 3.3 PUBLIC REALM: TANNERY ST NORTH WEST SIDEWALK (JUNE 21) 12

TABLE 7: 3.3 PUBLIC REALM: TANNERY ST NORTH WEST SIDEWALK (SEPTEMBER 21) 12

TABLE 8: 3.3 PUBLIC REALM: TANNERY ST NORTH EAST SIDEWALK (JUNE 21) 13

TABLE 9: 3.3 PUBLIC REALM: TANNERY ST NORTH EAST SIDEWALK (SEPTEMBER 21). 13

TABLE 10: 3.3 PUBLIC REALM: TANNERY ST SOUTH SIDEWALK (JUNE 21) 14

TABLE 11: 3.3 PUBLIC REALM: TANNERY ST SOUTH SIDEWALK (SEPTEMBER 21) 14

TABLE 12: 3.4 TURF AND FLOWER GARDENS: SEPTEMBER 21 15

TABLE 13: 3.5 SOLAR ENERGY ZONE: JUNE 21. 16

TABLE 14: 3.5 SOLAR ENERGY ZONE: SEPTEMBER 21 16

1.0 INTRODUCTION

The proposed development consists of 7 townhouse blocks located at 51, 57 Tannery Street & 208 Emby Drive, in the City of Mississauga. This shadow Study was completed by Weston Consulting on behalf of NYX Tannery Ltd. in support of applications for an Official Plan and Zoning By-law amendment. The document has been prepared in response to the City of Mississauga's Standards for Shadow Studies (2014).

Mullet Creek runs to the west and south of the property, forming a buffer between the proposed development and the neighbouring commercial buildings to the south. The Valley Lands within the subject property are hazard lands that are not programmable, nor accessible by the public, and therefore are not considered to be part of the public realm. The Streetsville Secondary School lies within the shadow study area to the southwest of the proposed development. The neighbouring sites at 170, 180 and 190 Rutledge Street have been approved for the development of a 4 storey apartment building. This building has been modelled according to publicly available information for the approved development, to demonstrate the future built context. The Credit River Retirement Residence lies to the northwest of the proposed development at 7 storeys in height, and casts relatively significant shadows. A communal, private garden associated with the retirement residence is located at the intersection of Tannery Street and Rutledge Road. Generally, other buildings surrounding the site are low-rise. The building at 61 Tannery St is being operated as a commercial building at present and is designated for development.

As per the 2014 Standards, *"Shadow Studies illustrate the impact of development in terms of sun and daylight access to the surrounding context including, surrounding buildings, the public realm, public and private open space."* As such, shadow impacts within the subject lands themselves have not been included in this analysis.The key map outlines the relevant surrounding context subject to criteria designated for analysis. The report finds the following:

3.1 Residential Private Outdoor Amenity: there have been no residential private outdoor amenity spaces identified within the Study Area. As per the standards, these criteria apply to the months of June and September 21st.

3.2 Communal Outdoor Amenity: the green space associated with the retirement residence at 175 Rutledge Road is considered as Communal Outdoor Amenity space, though private. As per the standards, Communal Outdoor Amenity includes outdoor amenity areas used by seniors. It has therefore been included in this analysis as it falls within the Study Area. As per the standards, these criteria apply to the months of June, September and December 21st.

3.3 Public Realm: the Public Realm identified within the Study Area consists of the Tannery Street sidewalk. This falls within the Study Area and has been included in this analysis. As per the standards, these criteria apply to the month of September 21st.

3.4 Turf and Flower Gardens: there have been no Turf and Flower Gardens identified within the Study Area. As per the standards, these criteria apply to the month of September 21st.

3.5 Building Faces to allow for the possibility of using solar energy: as there have been no low-rise residential properties identified within the Study Area, an analysis of the Solar Energy Zone has not been conducted. As per the standards, these criteria apply to the month of September 21st. 61 Tannery St has the built form of a residential dwelling, but is being operated as a commercial use, primarily as DIS Trucking Services.

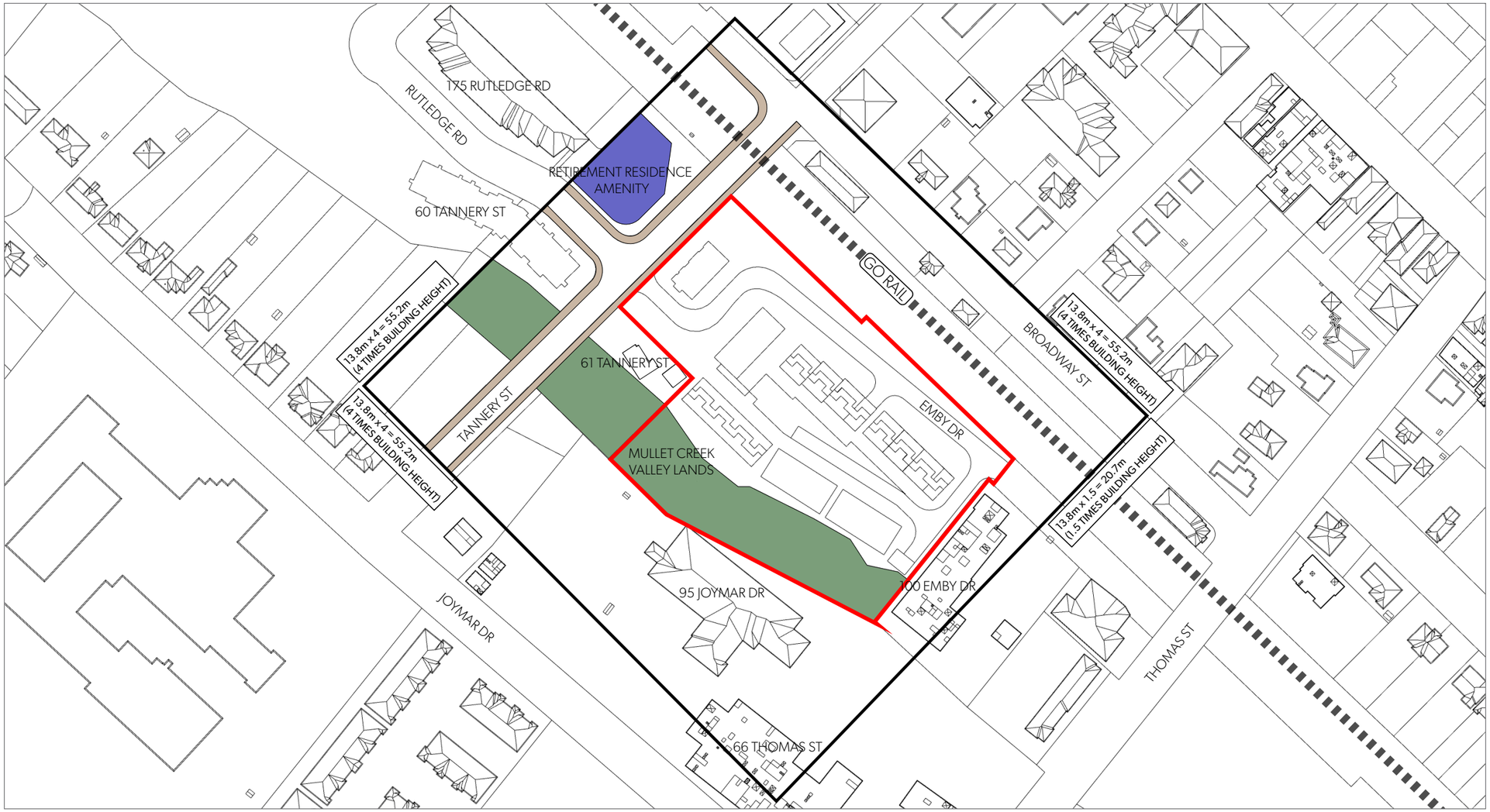
The reference bearing for this Study is N40°08'00"E Dundas Street West, Mississauga. The approximate site latitude in this Study is 43.580280°N (43° 34' 49.008" N). The approximate site longitude is -79.715927°W (79° 42' 57.3372" W).

Astronomic or True North has been determined using GPS Google Map Data 2019 supplemented by georeferencing software powered by Trimble. The Shadow Study Diagrams have been prepared according to the Mississauga Standards for Shadow Studies (2014). Shadow test times were taken on June 21st, September 21st, and December 21st based on the required hourly times (Sunrise +1.5hrs, hourly +/- solar noon, sunset -1.5hrs) and include Eastern Daylight Savings Time (EDST) for the months of June and September.

The mapping has been modelled to an area 4 times the proposed building height to the north, east and west and 1.5 times the building height to the south.

The parcel mapping is as referenced from Teranet, subject to confirmation by survey.

The Shadow Drawings have been prepared by Brendan Schoug and Holly Templeton under the direction and review of Shane Morgan.



KEY PLAN 1 - BASE MAPPING

Study Area

Mullet Creek Valley Lands

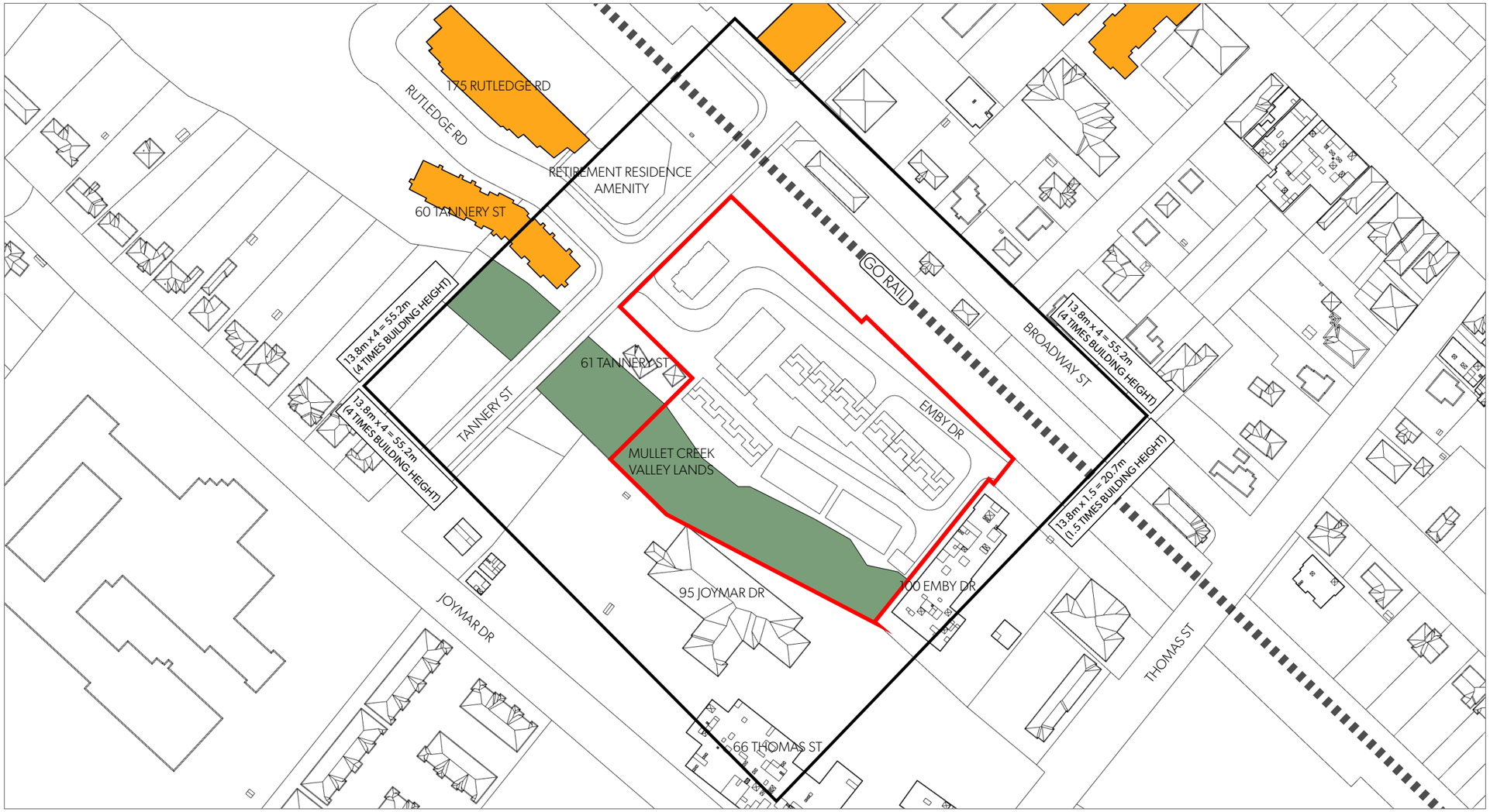
Communal Outdoor Amenity

Sidewalk [public realm]

Subject Site

0 20 50 100 200m

2.0 KEY PLANS



KEY PLAN 2 - BUILDING HEIGHTS

3.0 CRITERIA

3.1 RESIDENTIAL PRIVATE OUTDOOR AMENITY

There is no residential private outdoor amenity within the study area. This criterion has been met.

3.2 COMMUNAL OUTDOOR AMENITY

The communal outdoor amenity space is 1304.06 m^2.

On June 21, the average Sun Access Factor is 1.00 which exceeds the minimum requirement of 0.50. This criterion has been met.

On September 21, the average Sun Access Factor is 1.00, which exceeds the minimum requirement of 0.50. This criterion has been met.

On December 21, the Average Sun Access Factor is 0.86, which exceeds he minimum requirement of 0.50. This criterion has been met.

3.3 PUBLIC REALM: TANNERY ST SIDEWALK

The public realm on the northwest sidewalk is 465.13 m^2.

On September 21, the average Sun Access Factor for this sidewalk is 0.99, which exceeds the minimum requirement of 0.50. This criterion has been met.

The public realm on the northeast sidewalk is 536.93 m^2.

On September 21, the average Sun Access Factor for this sidewalk is 0.98, which exceeds the minimum requirement of 0.50. this criterion has been met.

The public realm on the south sidewalk is 613.62 m^2.

On September 21, the average Sun Access Factor is 0.94, which exceeds the minimum requirement of 0.50. This criterion has been met.

The proposed development casts shadow on the opposite boulevard of Tannery Street between 8:35am and 9:12am. The criterion is not met as it is required that there is no incremental shadow on the opposite boulevard at 9:12 am, 10:12 am, 11:12 am, 3:12 am, 4:12 am and 5:12 am.

3.4 TURF AND FLOWER GARDENS

There are no turf and flower gardens within the study area. This criterion has been met.

3.5 BUILDING FACES TO ALLOW FOR THE POSSIBILITY OF USING SOLAR ENERGY

There are no solar energy zones within the study area. This criterion has been met.

4.0 CONCLUSION

There are no impacts upon 3.1 Residential Private Outdoor Amenity; 3.4 Turf and Flower Gardens, and; 3.5 Building faces for the possibility of using solar energy.

There is no impact from the proposed development upon the Communal Outdoor Amenity area adjacent to the retirement residence at 175 Rutledge Road.

The impacts upon the public realm sidewalk of Tannery Street are moderate, and considered to be acceptable. Shadowing is partial and generally limited to the early hours of the morning for the required test month of September 21st. Its is therefore our opinion that shadowing cast by the proposed townhouse development will be minor and will have limited impact upon the existing context.

5. APPENDIX 1: SHADOW IMPACT ANALYSIS TABLES

TABLE 1: 3.1 RESIDENTIAL PRIVATE OUTDOOR AMENITY: JUNE 21

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 5:37	235.73	13.8	0	N/A	N/A	N/A
RISE + 1.5 hr: 7:07	250.48	13.8	0	0	0	N/A
SN - 6 hr: 7:20	252.58	13.8	0	0	0	N/A
SN - 5 hr: 8:20	262.02	13.8	0	0	0	N/A
SN - 4 hr: 9:20	272.04	13.8	0	0	0	N/A
SN - 3 hr: 10:20	283.79	13.8	0	0	0	N/A
SN - 2 hr: 11:20	299.52	13.8	0	0	0	N/A
SN - 1 hr: 12:20	323.67	13.8	0	0	0	N/A
SOLAR NOON (SN): 13:20	0	13.8	0	0	0	N/A
SN + 1 hr: 14:20	36.32	13.8	0	0	0	N/A
SN + 2 hr: 15:20	60.47	13.8	0	0	0	N/A
SN + 3 hr: 16:20	76.21	13.8	0	0	0	N/A
SN + 4 hr: 17:20	87.96	13.8	0	0	0	N/A
SN + 5 hr: 18:20	97.98	13.8	0	0	0	N/A
SN + 6 hr: 19:20	107.42	13.8	0	0	0	N/A
SET - 1.5 hr: 19:33	109.41	13.8	0	0	0	N/A
SET: 21:03	124.27	13.8	0	N/A	N/A	N/A
					TOTAL AVG.	N/A

TABLE 2: 3.1 RESIDENTIAL PRIVATE OUTDOOR AMENITY: SEPTEMBER 21

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 7:05	268.27	13.8	0	N/A	N/A	N/A
RISE + 1.5 hr: 8:35	284.22	13.8	0	0	0	N/A
SN - 4 hr: 9:12	291.23	13.8	0	0	0	N/A
SN - 3 hr: 10:12	304.14	13.8	0	0	0	N/A
SN - 2 hr: 11:12	319.68	13.8	0	0	0	N/A
SN - 1 hr: 12:12	338.54	13.8	0	0	0	N/A
SOLAR NOON (SN): 13:12	0	13.8	0	0	0	N/A
SN + 1 hr: 14:12	21.45	13.8	0	0	0	N/A
SN + 2 hr: 15:12	40.28	13.8	0	0	0	N/A
SN + 3 hr: 16:12	55.79	13.8	0	0	0	N/A
SN + 4 hr: 17:12	68.68	13.8	0	0	0	N/A
SET - 1.5 hr: 17:48	75.63	13.8	0	0	0	N/A
SET: 19:18	91.46	13.8	0	N/A	N/A	N/A
					TOTAL AVG.	N/A

TABLE 3: 3.2 COMMUNAL OUTDOOR AMENITY: JUNE 21

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 5:37	235.73	13.8	1304.06	N/A	N/A	N/A
RISE + 1.5 hr: 7:07	250.48	13.8	1304.06	0	1304.06	1.0
SN - 6 hr: 7:20	252.58	13.8	1304.06	0	1304.06	1.0
SN - 5 hr: 8:20	262.02	13.8	1304.06	0	1304.06	1.0
SN - 4 hr: 9:20	272.04	13.8	1304.06	0	1304.06	1.0
SN - 3 hr: 10:20	283.79	13.8	1304.06	0	1304.06	1.0
SN - 2 hr: 11:20	299.52	13.8	1304.06	0	1304.06	1.0
SN - 1 hr: 12:20	323.67	13.8	1304.06	0	1304.06	1.0
SOLAR NOON (SN): 13:20	0	13.8	1304.06	0	1304.06	1.0
SN + 1 hr: 14:20	36.32	13.8	1304.06	0	1304.06	1.0
SN + 2 hr: 15:20	60.47	13.8	1304.06	0	1304.06	1.0
SN + 3 hr: 16:20	76.21	13.8	1304.06	0	1304.06	1.0
SN + 4 hr: 17:20	87.96	13.8	1304.06	0	1304.06	1.0
SN + 5 hr: 18:20	97.98	13.8	1304.06	0	1304.06	1.0
SN + 6 hr: 19:20	107.42	13.8	1304.06	0	1304.06	1.0
SET - 1.5 hr: 19:33	109.41	13.8	1304.06	0	1304.06	1.0
SET: 21:03	124.27	13.8	1304.06	N/A	N/A	N/A
					TOTAL AVG.	1.0

TABLE 4: 3.2 COMMUNAL OUTDOOR AMENITY: SEPTEMBER 21

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 7:05	268.27	13.8	1304.06	N/A	N/A	N/A
RISE + 1.5 hr: 8:35	284.22	13.8	1304.06	7.65	1296.41	0.99
SN - 4 hr: 9:12	291.23	13.8	1304.06	0	1304.06	1.0
SN - 3 hr: 10:12	304.14	13.8	1304.06	0	1304.06	1.0
SN - 2 hr: 11:12	319.68	13.8	1304.06	0	1304.06	1.0
SN - 1 hr: 12:12	338.54	13.8	1304.06	0	1304.06	1.0
SOLAR NOON (SN): 13:12	0	13.8	1304.06	0	1304.06	1.0
SN + 1 hr: 14:12	21.45	13.8	1304.06	0	1304.06	1.0
SN + 2 hr: 15:12	40.28	13.8	1304.06	0	1304.06	1.0
SN + 3 hr: 16:12	55.79	13.8	1304.06	0	1304.06	1.0
SN + 4 hr: 17:12	68.68	13.8	1304.06	0	1304.06	1.0
SET - 1.5 hr: 17:48	75.63	13.8	1304.06	0	1304.06	1.0
SET: 19:18	91.46	13.8	1304.06	N/A	N/A	N/A
					TOTAL AVG.	1.0

TABLE 5: 3.2 COMMUNAL OUTDOOR AMENITY: DECEMBER 21

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 7:49	302.37	13.8	1304.06	N/A	N/A	N/A
RISE + 1.5 hr: 9:19	319.05	13.8	1304.06	557.53	746.53	0.57
SN - 2 hr: 10:17	331.25	13.8	1304.06	767.47	536.59	0.41
SN - 1 hr: 11:17	345.21	13.8	1304.06	150.5	1153.56	0.88
SOLAR NOON (SN): 12:17	0	13.8	1304.06	0	1304.06	1.0
SN + 1 hr: 13:17	14.79	13.8	1304.06	0	1304.06	1.0
SN + 2 hr: 14:17	28.75	13.8	1304.06	0	1304.06	1.0
SET - 1.5 hr: 15:15	41.06	13.8	1304.06	0	1304.06	1.0
SET: 16:45	57.63	13.8	1304.06	0	1304.06	1.0
					TOTAL AVG.	0.86

TABLE 6: 3.3 PUBLIC REALM: TANNERY ST NORTH WEST SIDEWALK (JUNE 21)

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 5:37	235.73	13.8	465.13	N/A	N/A	N/A
RISE + 1.5 hr: 7:07	250.48	13.8	465.13	0	465.13	1.0
SN - 6 hr: 7:20	252.58	13.8	465.13	0	465.13	1.0
SN - 5 hr: 8:20	262.02	13.8	465.13	0	465.13	1.0
SN - 4 hr: 9:20	272.04	13.8	465.13	0	465.13	1.0
SN - 3 hr: 10:20	283.79	13.8	465.13	0	465.13	1.0
SN - 2 hr: 11:20	299.52	13.8	465.13	0	465.13	1.0
SN - 1 hr: 12:20	323.67	13.8	465.13	0	465.13	1.0
SOLAR NOON (SN): 13:20	0	13.8	465.13	0	465.13	1.0
SN + 1 hr: 14:20	36.32	13.8	465.13	0	465.13	1.0
SN + 2 hr: 15:20	60.47	13.8	465.13	0	465.13	1.0
SN + 3 hr: 16:20	76.21	13.8	465.13	0	465.13	1.0
SN + 4 hr: 17:20	87.96	13.8	465.13	0	465.13	1.0
SN + 5 hr: 18:20	97.98	13.8	465.13	0	465.13	1.0
SN + 6 hr: 19:20	107.42	13.8	465.13	0	465.13	1.0
SET - 1.5 hr: 19:33	109.41	13.8	465.13	0	465.13	1.0
SET: 21:03	124.27	13.8	465.13	N/A	N/A	N/A
					TOTAL AVG.	1.0

TABLE 7: 3.3 PUBLIC REALM: TANNERY ST NORTH WEST SIDEWALK (SEPTEMBER 21)

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 7:05	268.27	13.8	465.13	N/A	N/A	N/A
RISE + 1.5 hr: 8:35	284.22	13.8	465.13	41.92	423.21	0.91
SN - 4 hr: 9:12	291.23	13.8	465.13	0	465.13	1.0
SN - 3 hr: 10:12	304.14	13.8	465.13	0	465.13	1.0
SN - 2 hr: 11:12	319.68	13.8	465.13	0	465.13	1.0
SN - 1 hr: 12:12	338.54	13.8	465.13	0	465.13	1.0
SOLAR NOON (SN): 13:12	0	13.8	465.13	0	465.13	1.0
SN + 1 hr: 14:12	21.45	13.8	465.13	0	465.13	1.0
SN + 2 hr: 15:12	40.28	13.8	465.13	0	465.13	1.0
SN + 3 hr: 16:12	55.79	13.8	465.13	0	465.13	1.0
SN + 4 hr: 17:12	68.68	13.8	465.13	0	465.13	1.0
SET - 1.5 hr: 17:48	75.63	13.8	465.13	0	465.13	1.0
SET: 19:18	91.46	13.8	465.13	N/A	N/A	N/A
					TOTAL AVG.	0.99

TABLE 8: 3.3 PUBLIC REALM: TANNERY ST NORTH EAST SIDEWALK (JUNE 21)

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 5:37	235.73	13.8	536.93	N/A	N/A	N/A
RISE + 1.5 hr: 7:07	250.48	13.8	536.93	0	536.93	1.0
SN - 6 hr: 7:20	252.58	13.8	536.93	0	536.93	1.0
SN - 5 hr: 8:20	262.02	13.8	536.93	0	536.93	1.0
SN - 4 hr: 9:20	272.04	13.8	536.93	0	536.93	1.0
SN - 3 hr: 10:20	283.79	13.8	536.93	0	536.93	1.0
SN - 2 hr: 11:20	299.52	13.8	536.93	0	536.93	1.0
SN - 1 hr: 12:20	323.67	13.8	536.93	0	536.93	1.0
SOLAR NOON (SN): 13:20	0	13.8	536.93	0	536.93	1.0
SN + 1 hr: 14:20	36.32	13.8	536.93	0	536.93	1.0
SN + 2 hr: 15:20	60.47	13.8	536.93	0	536.93	1.0
SN + 3 hr: 16:20	76.21	13.8	536.93	0	536.93	1.0
SN + 4 hr: 17:20	87.96	13.8	536.93	0	536.93	1.0
SN + 5 hr: 18:20	97.98	13.8	536.93	0	536.93	1.0
SN + 6 hr: 19:20	107.42	13.8	536.93	0	536.93	1.0
SET - 1.5 hr: 19:33	109.41	13.8	536.93	0	536.93	1.0
SET: 21:03	124.27	13.8	536.93	N/A	N/A	N/A
					TOTAL AVG.	1.0

TABLE 9: 3.3 PUBLIC REALM: TANNERY ST NORTH EAST SIDEWALK (SEPTEMBER 21)

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 7:05	268.27	13.8	536.93	N/A	N/A	N/A
RISE + 1.5 hr: 8:35	284.22	13.8	536.93	76.34	460.59	0.86
SN - 4 hr: 9:12	291.23	13.8	536.93	54.86	482.07	0.90
SN - 3 hr: 10:12	304.14	13.8	536.93	0	536.93	1.0
SN - 2 hr: 11:12	319.68	13.8	536.93	0	536.93	1.0
SN - 1 hr: 12:12	338.54	13.8	536.93	0	536.93	1.0
SOLAR NOON (SN): 13:12	0	13.8	536.93	0	536.93	1.0
SN + 1 hr: 14:12	21.45	13.8	536.93	0	536.93	1.0
SN + 2 hr: 15:12	40.28	13.8	536.93	0	536.93	1.0
SN + 3 hr: 16:12	55.79	13.8	536.93	0	536.93	1.0
SN + 4 hr: 17:12	68.68	13.8	536.93	0	536.93	1.0
SET - 1.5 hr: 17:48	75.63	13.8	536.93	0	536.93	1.0
SET: 19:18	91.46	13.8	536.93	N/A	N/A	N/A
					TOTAL AVG.	0.98

TABLE 10: 3.3 PUBLIC REALM: TANNERY ST SOUTH SIDEWALK (JUNE 21)

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 5:37	235.73	13.8	613.62	N/A	N/A	N/A
RISE + 1.5 hr: 7:07	250.48	13.8	613.62	135.75	477.87	0.78
SN - 6 hr: 7:20	252.58	13.8	613.62	120.73	492.89	0.80
SN - 5 hr: 8:20	262.02	13.8	613.62	90.05	523.57	0.85
SN - 4 hr: 9:20	272.04	13.8	613.62	73.18	540.44	0.88
SN - 3 hr: 10:20	283.79	13.8	613.62	27.09	586.53	0.96
SN - 2 hr: 11:20	299.52	13.8	613.62	0	613.62	1.0
SN - 1 hr: 12:20	323.67	13.8	613.62	0	613.62	1.0
SOLAR NOON (SN): 13:20	0	13.8	613.62	0	613.62	1.0
SN + 1 hr: 14:20	36.32	13.8	613.62	0	613.62	1.0
SN + 2 hr: 15:20	60.47	13.8	613.62	0	613.62	1.0
SN + 3 hr: 16:20	76.21	13.8	613.62	0	613.62	1.0
SN + 4 hr: 17:20	87.96	13.8	613.62	0	613.62	1.0
SN + 5 hr: 18:20	97.98	13.8	613.62	0	613.62	1.0
SN + 6 hr: 19:20	107.42	13.8	613.62	0	613.62	1.0
SET - 1.5 hr: 19:33	109.41	13.8	613.62	0	613.62	1.0
SET: 21:03	124.27	13.8	613.62	N/A	N/A	N/A
					TOTAL AVG.	0.95

TABLE 11: 3.3 PUBLIC REALM: TANNERY ST SOUTH SIDEWALK (SEPTEMBER 21)

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 7:05	268.27	13.8	613.62	N/A	N/A	N/A
RISE + 1.5 hr: 8:35	284.22	13.8	613.62	89.17	524.45	0.85
SN - 4 hr: 9:12	291.23	13.8	613.62	83.11	530.51	0.86
SN - 3 hr: 10:12	304.14	13.8	613.62	74.67	538.95	0.88
SN - 2 hr: 11:12	319.68	13.8	613.62	71.31	542.31	0.88
SN - 1 hr: 12:12	338.54	13.8	613.62	67.98	545.64	0.89
SOLAR NOON (SN): 13:12	0	13.8	613.62	0	613.62	1.0
SN + 1 hr: 14:12	21.45	13.8	613.62	0	613.62	1.0
SN + 2 hr: 15:12	40.28	13.8	613.62	0	613.62	1.0
SN + 3 hr: 16:12	55.79	13.8	613.62	0	613.62	1.0
SN + 4 hr: 17:12	68.68	13.8	613.62	0	613.62	1.0
SET - 1.5 hr: 17:48	75.63	13.8	613.62	0	613.62	1.0
SET: 19:18	91.46	13.8	613.62	N/A	N/A	N/A
					TOTAL AVG.	0.94

TABLE 12: 3.4 TURF AND FLOWER GARDENS: SEPTEMBER 21

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 7:05	268.27	13.8	0	N/A	N/A	N/A
RISE + 1.5 hr: 8:35	284.22	13.8	0	0	0	N/A
SN - 4 hr: 9:12	291.23	13.8	0	0	0	N/A
SN - 3 hr: 10:12	304.14	13.8	0	0	0	N/A
SN - 2 hr: 11:12	319.68	13.8	0	0	0	N/A
SN - 1 hr: 12:12	338.54	13.8	0	0	0	N/A
SOLAR NOON (SN): 13:12	0	13.8	0	0	0	N/A
SN + 1 hr: 14:12	21.45	13.8	0	0	0	N/A
SN + 2 hr: 15:12	40.28	13.8	0	0	0	N/A
SN + 3 hr: 16:12	55.79	13.8	0	0	0	N/A
SN + 4 hr: 17:12	68.68	13.8	0	0	0	N/A
SET - 1.5 hr: 17:48	75.63	13.8	0	0	0	N/A
SET: 19:18	91.46	13.8	0	N/A	N/A	N/A
					TOTAL AVG.	N/A

TABLE 13: 3.5 BUILDING FACES TO ALLOW FOR THE POSSIBILITY OF USING SOLAR ENERGY: JUNE 21

LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 5:37	235.73	13.8	0	N/A	N/A	N/A
RISE + 1.5 hr: 7:07	250.48	13.8	0	0	0	N/A
SN - 6 hr: 7:20	252.58	13.8	0	0	0	N/A
SN - 5 hr: 8:20	262.02	13.8	0	0	0	N/A
SN - 4 hr: 9:20	272.04	13.8	0	0	0	N/A
SN - 3 hr: 10:20	283.79	13.8	0	0	0	N/A
SN - 2 hr: 11:20	299.52	13.8	0	0	0	N/A
SN - 1 hr: 12:20	323.67	13.8	0	0	0	N/A
SOLAR NOON (SN): 13:20	0	13.8	0	0	0	N/A
SN + 1 hr: 14:20	36.32	13.8	0	0	0	N/A
SN + 2 hr: 15:20	60.47	13.8	0	0	0	N/A
SN + 3 hr: 16:20	76.21	13.8	0	0	0	N/A
SN + 4 hr: 17:20	87.96	13.8	0	0	0	N/A
SN + 5 hr: 18:20	97.98	13.8	0	0	0	N/A
SN + 6 hr: 19:20	107.42	13.8	0	0	0	N/A
SET - 1.5 hr: 19:33	109.41	13.8	0	0	0	N/A
SET: 21:03	124.27	13.8	0	N/A	N/A	N/A
					TOTAL AVG.	N/A

TABLE 14: 3.5 BUILDING FACES TO ALLOW FOR THE POSSIBILITY OF USING SOLAR ENERGY: SEPTEMBER 21

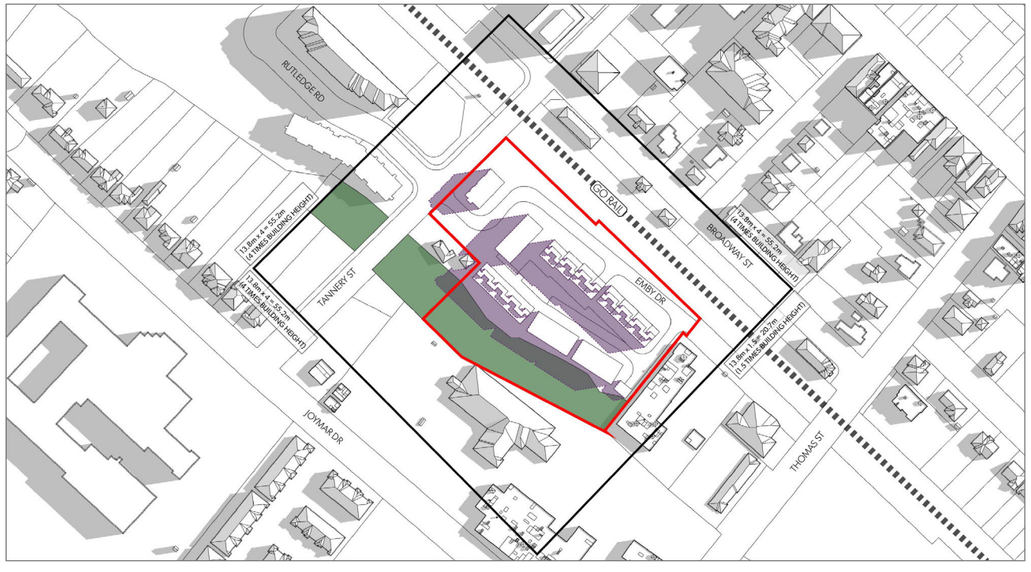
LOCAL TIME	AZIMUTH (DEG)	BUILDING HEIGHT (m)	TOTAL AREA, AT (m^2)	PROPOSED BUILDING SHADOW AREA (m^2)	AREA IN SUNSHINE, AS (m^2)	SUN ACCESS FACTOR, AS (ave)/AT
RISE: 7:05	268.27	13.8	0	N/A	N/A	N/A
RISE + 1.5 hr: 8:35	284.22	13.8	0	0	0	N/A
SN - 4 hr: 9:12	291.23	13.8	0	0	0	N/A
SN - 3 hr: 10:12	304.14	13.8	0	0	0	N/A
SN - 2 hr: 11:12	319.68	13.8	0	0	0	N/A
SN - 1 hr: 12:12	338.54	13.8	0	0	0	N/A
SOLAR NOON (SN): 13:12	0	13.8	0	0	0	N/A
SN + 1 hr: 14:12	21.45	13.8	0	0	0	N/A
SN + 2 hr: 15:12	40.28	13.8	0	0	0	N/A
SN + 3 hr: 16:12	55.79	13.8	0	0	0	N/A
SN + 4 hr: 17:12	68.68	13.8	0	0	0	N/A
SET - 1.5 hr: 17:48	75.63	13.8	0	0	0	N/A
SET: 19:18	91.46	13.8	0	N/A	N/A	N/A
					TOTAL AVG.	N/A

6. APPENDIX 2: SHADOW STUDY DIAGRAMS

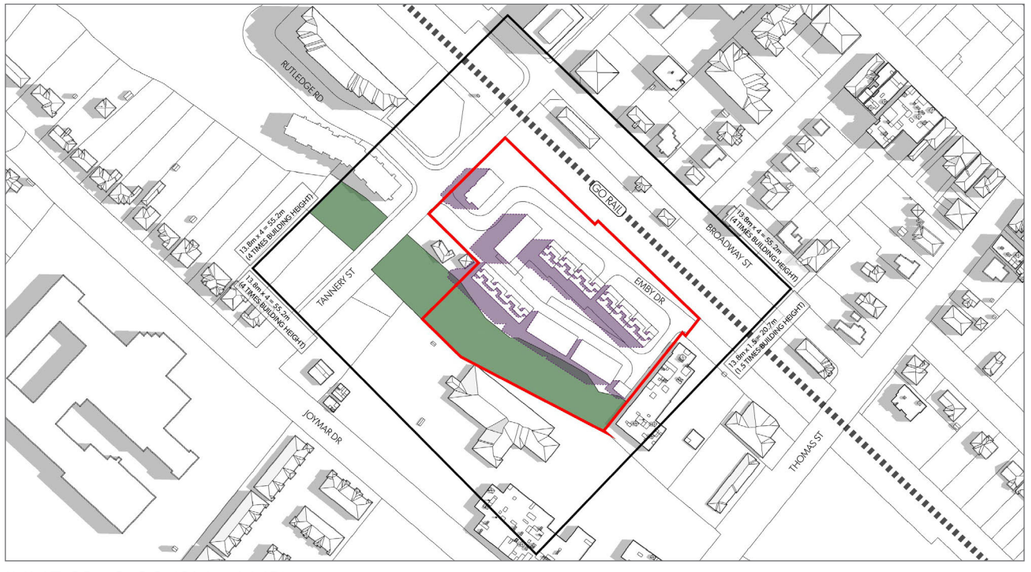
SHADOW STUDY **JUNE 21**

JUNE 21 - 7:07 (RISE + 1.5 HR)

JUNE 21 - 7:20 (SN - 6 HR)



JUNE 21 - 8:20 (SN - 5 HR)



JUNE 21 - 9:20 (SN - 4 HR)

Incremental Shadow

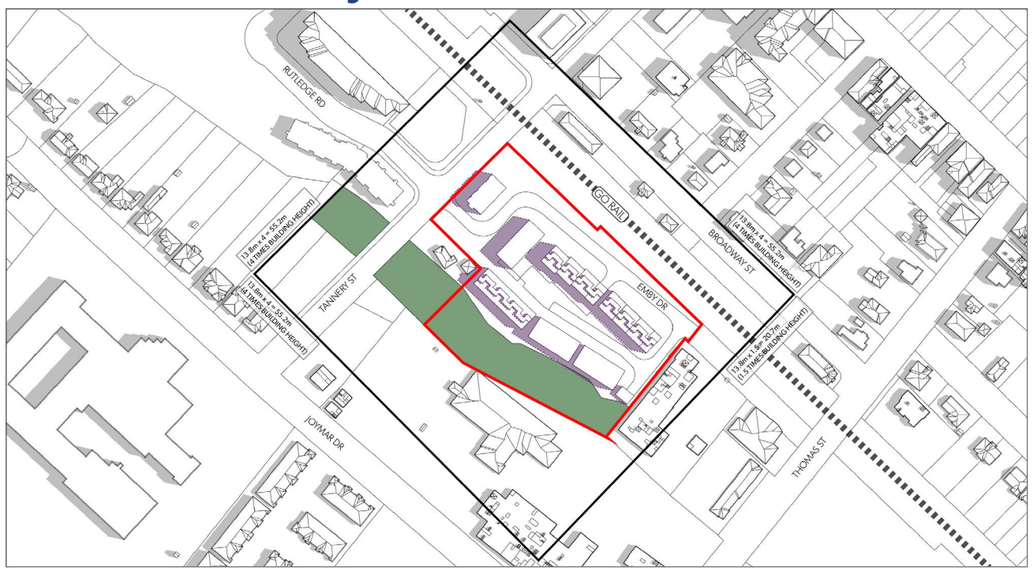
Existing Shadow

Mullet Creek Valley Lands

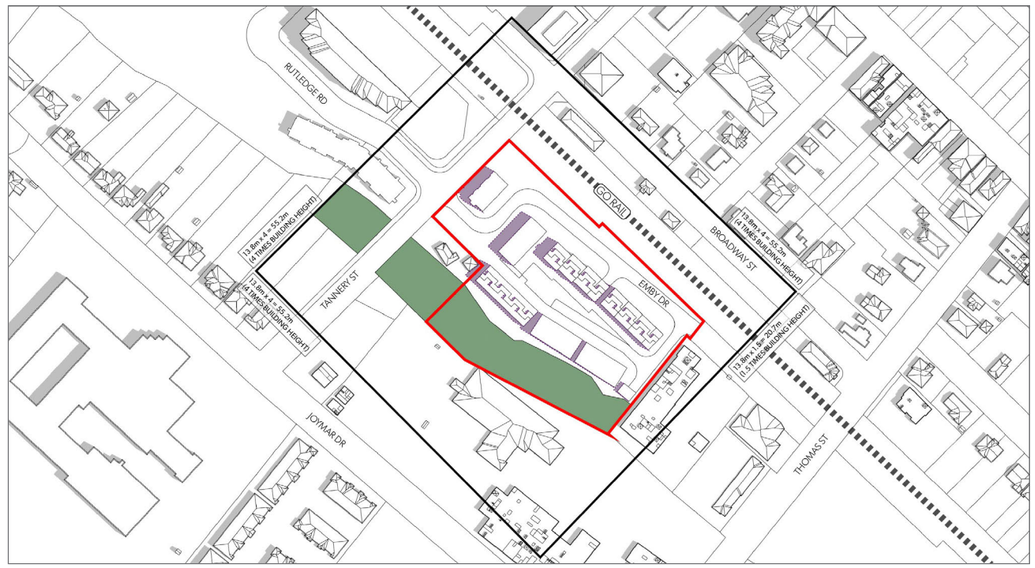
0 20 50 100 200m

WESTON CONSULTING
planning + urban design

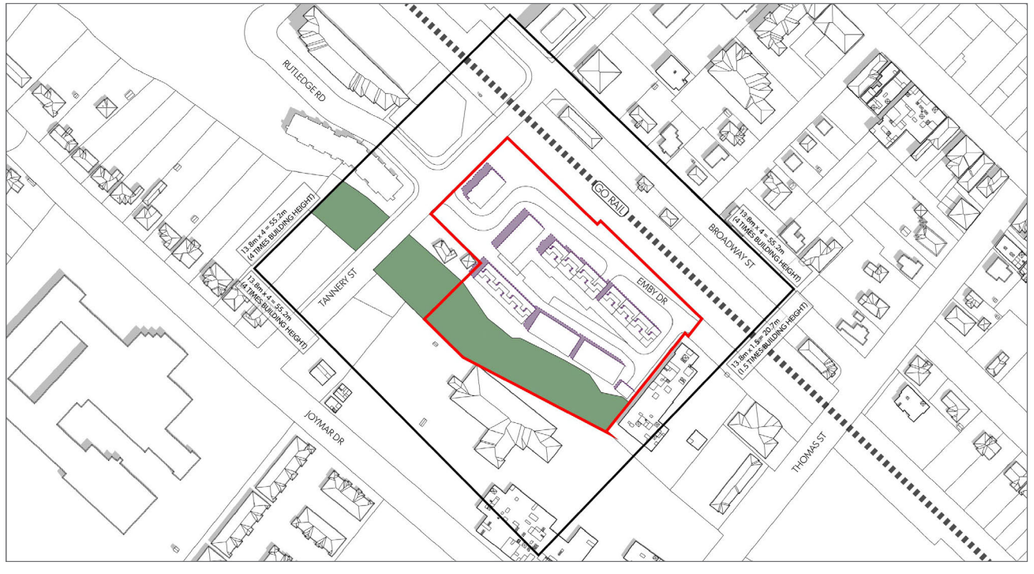
SHADOW STUDY **JUNE 21**



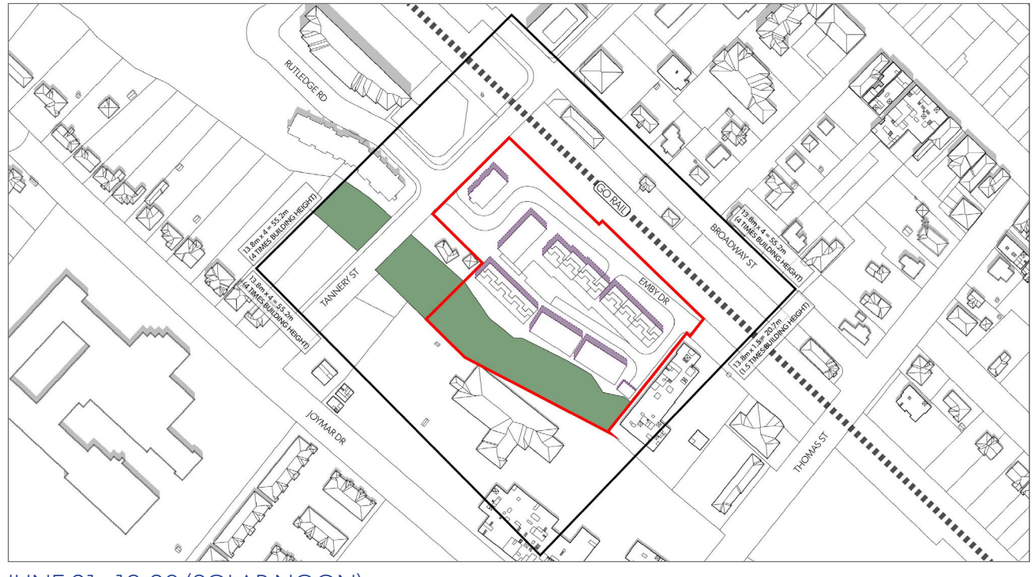
JUNE 21 - 10:20 (SN - 3 HR)



JUNE 21 - 11:20 (SN - 2 HR)



JUNE 21 - 12:20 (SN - 1 HR)



JUNE 21 - 13:20 (SOLAR NOON)

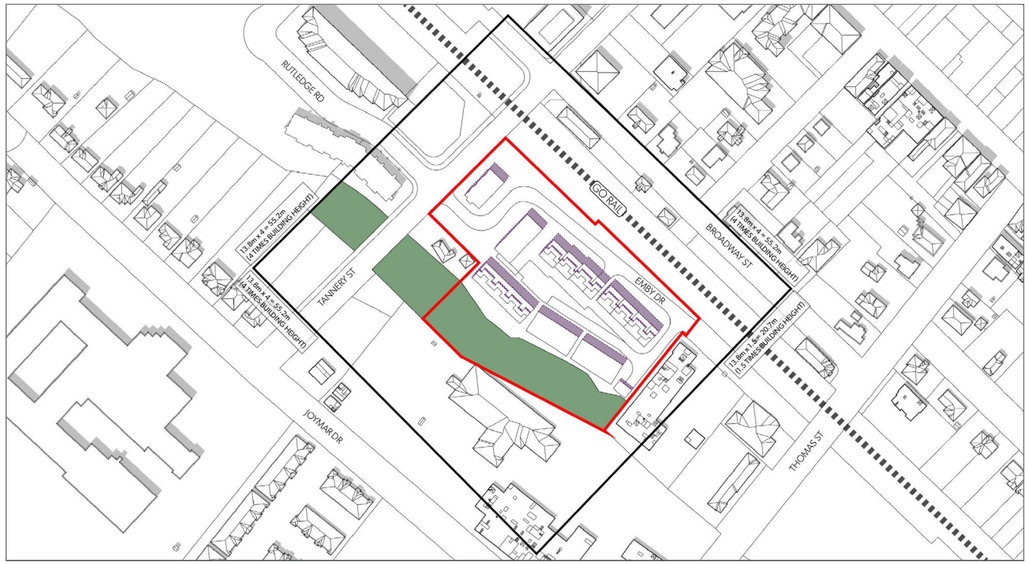
Incremental Shadow

Existing Shadow

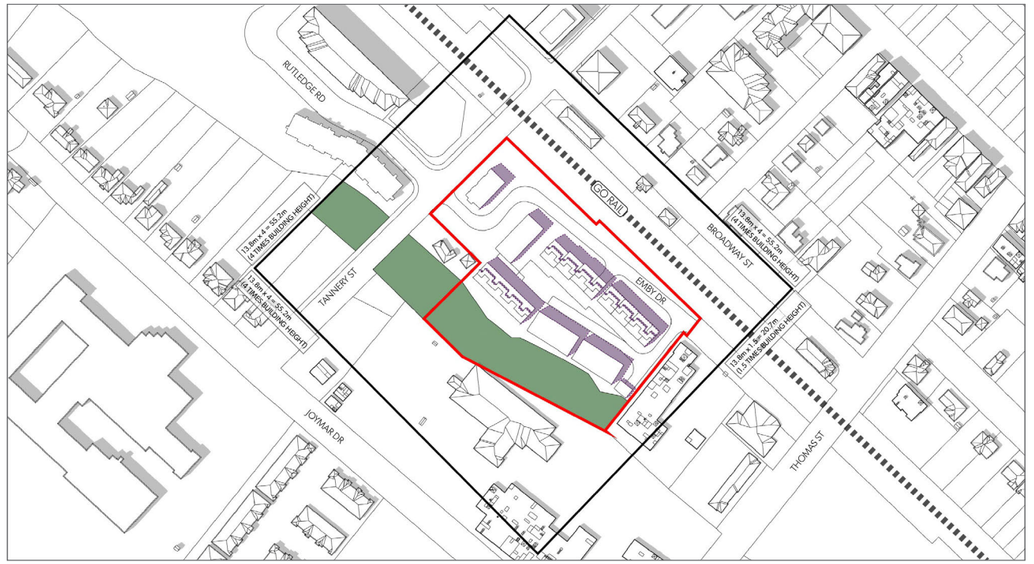
Mullet Creek Valley Lands

0 20 50 100 200m

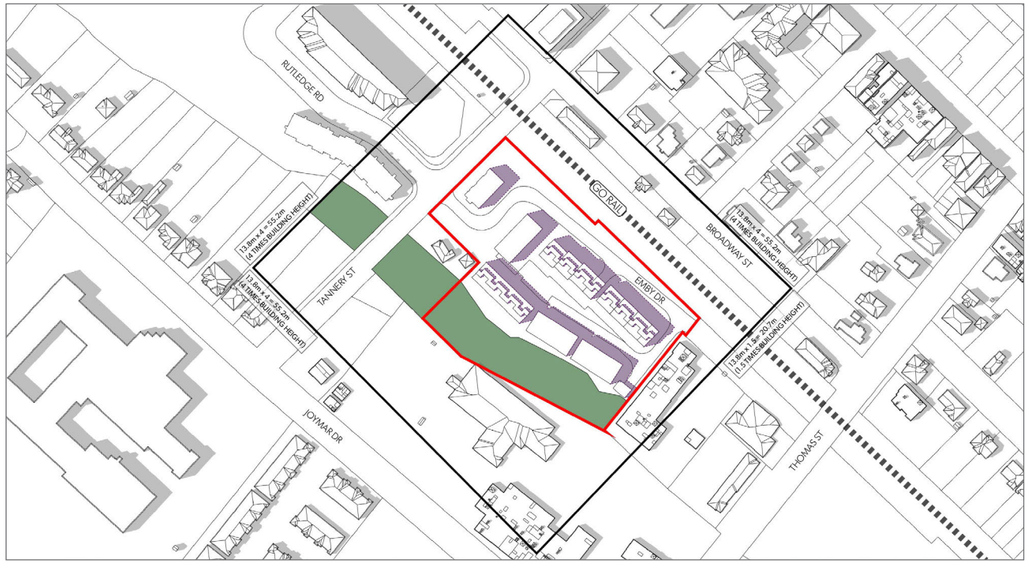
SHADOW STUDY **JUNE 21**



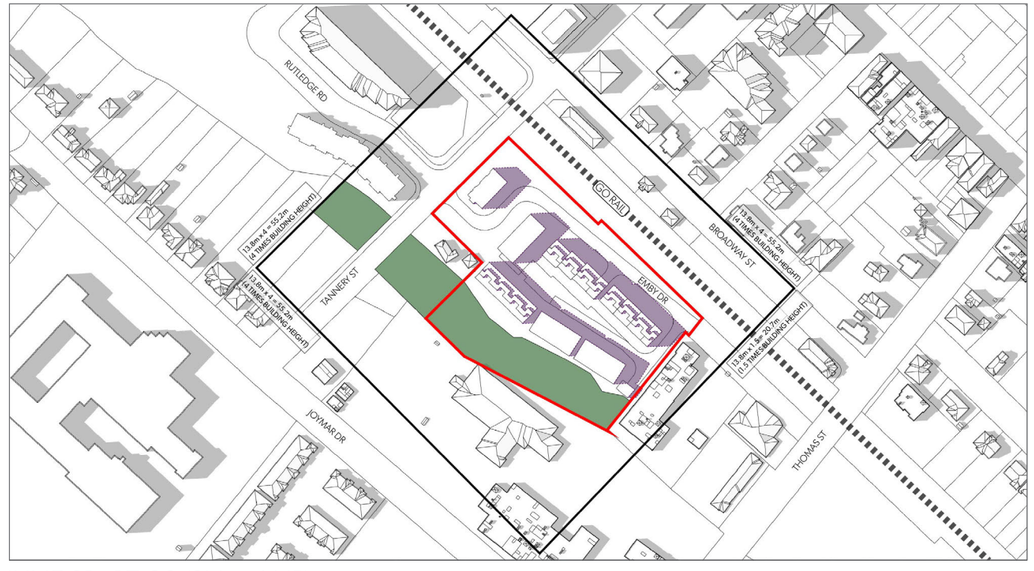
JUNE 21 - 14:20 (SN + 1 HR)



JUNE 21 - 15:20 (SN + 2 HR)



JUNE 21 - 16:20 (SN + 3 HR)



JUNE 21 - 17:20 (SN + 4 HR)

Incremental Shadow

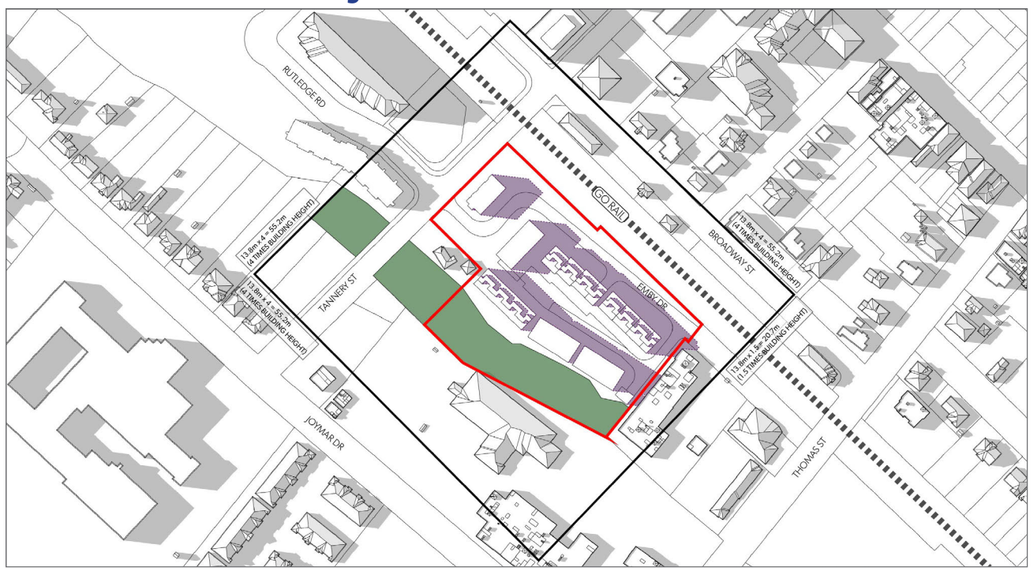
Existing Shadow

Mullet Creek Valley Lands

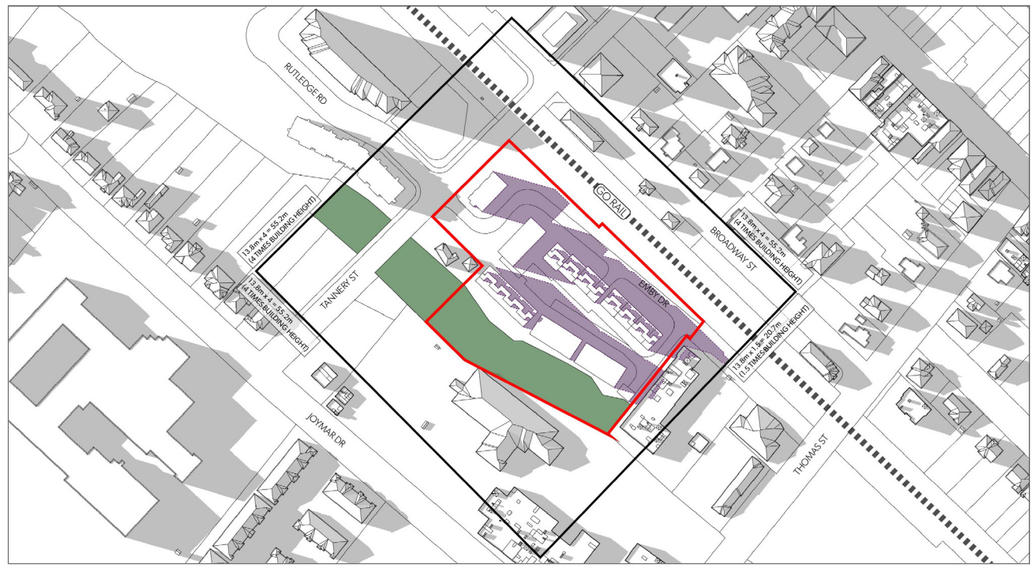
0 20 50 100 200m

WESTON CONSULTING
planning + urban design

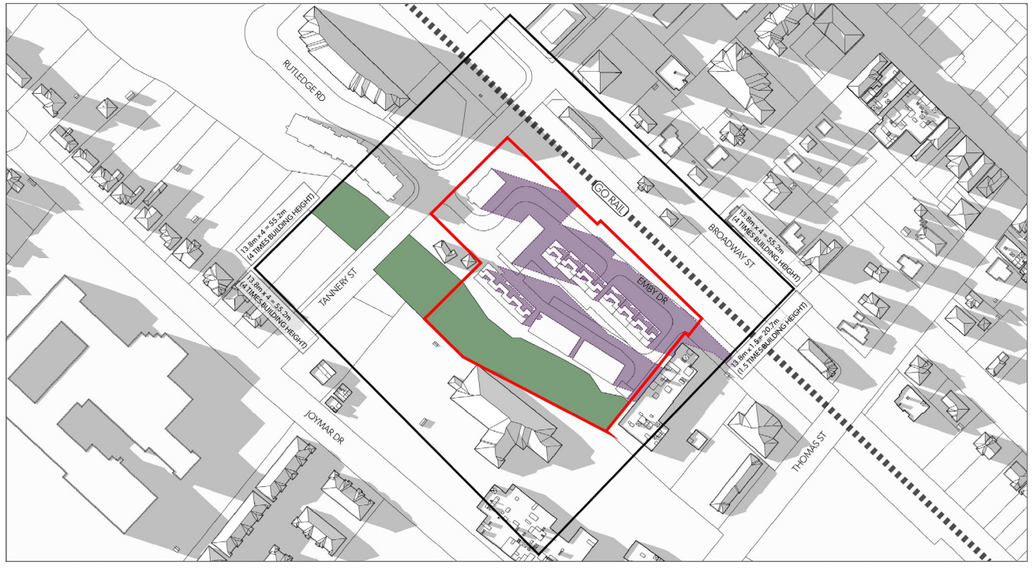
SHADOW STUDY **JUNE 21**



JUNE 21 - 18:20 (SN + 5 HR)



JUNE 21 - 19:20 (SN + 6 HR)



JUNE 21 - 19:33 (SET - 1.5 HR)

Incremental Shadow

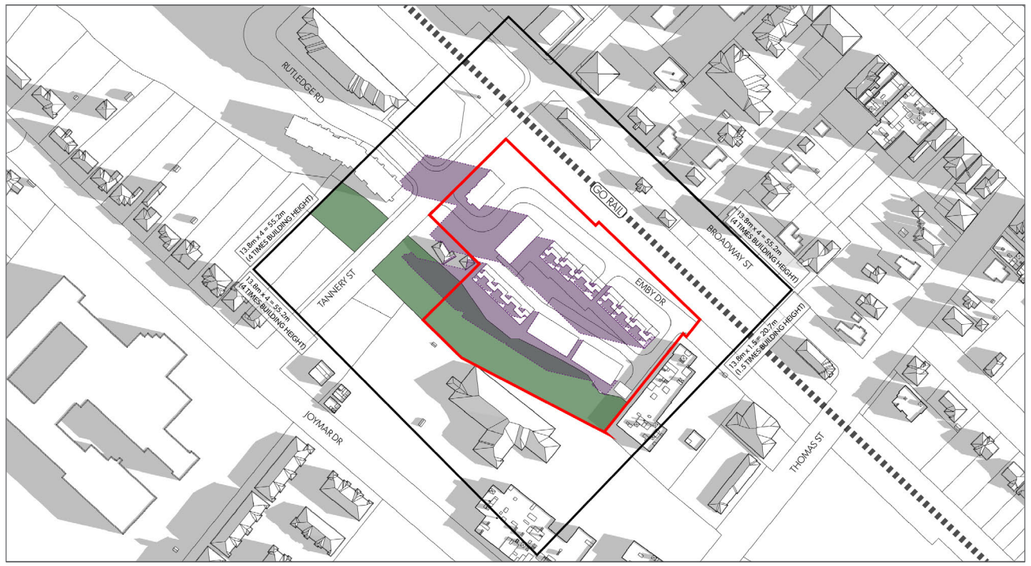
Existing Shadow

Mullet Creek Valley Lands

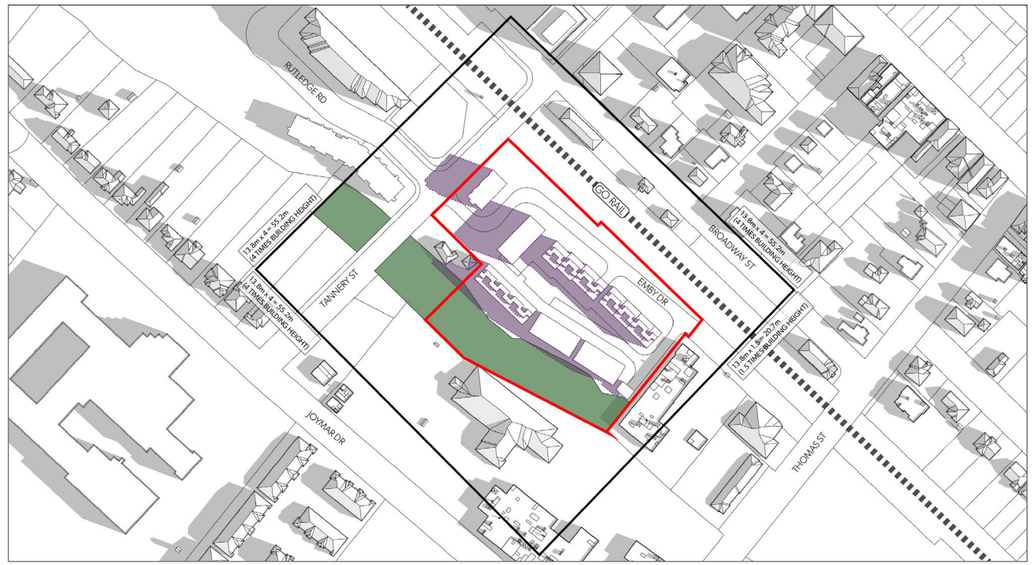
0 20 50 100 200m

WESTON CONSULTING
planning + urban design

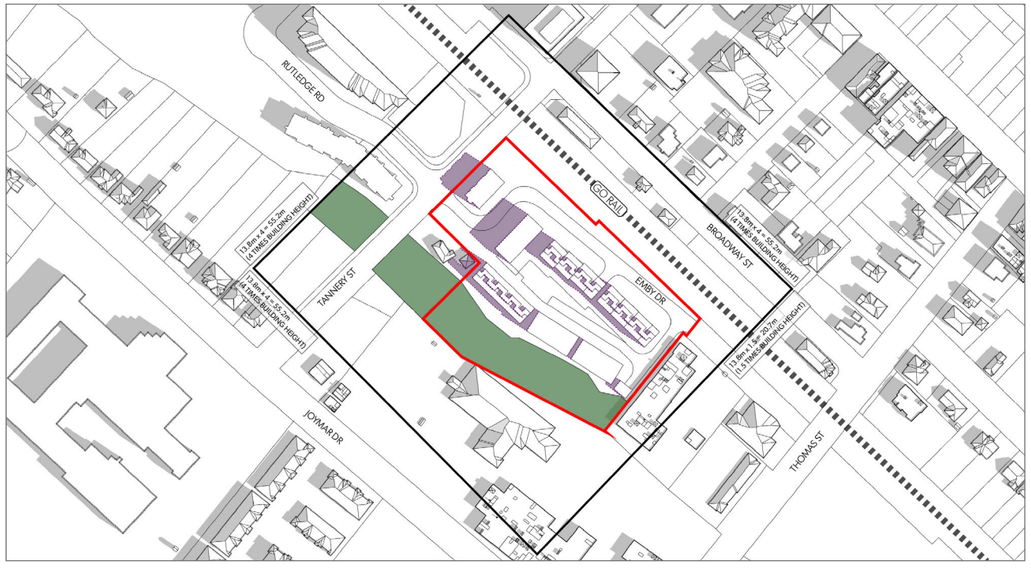
SHADOW STUDY **SEPTEMBER 21**



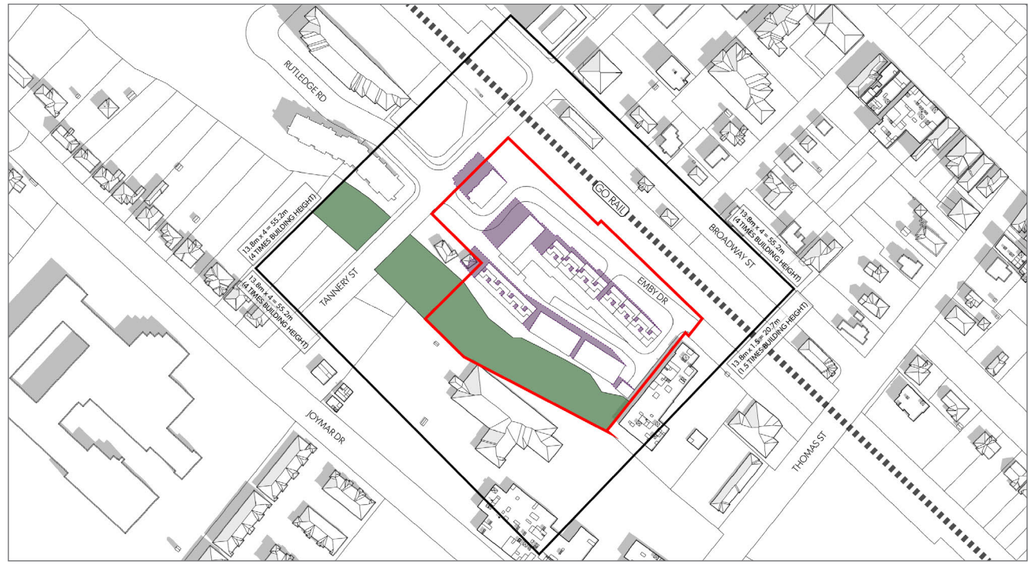
SEPTEMBER 21 - 8:35 (RISE + 1.5 HR)



SEPTEMBER 21 - 9:12 (SN - 4 HR)



SEPTEMBER 21 - 10:12 (SN - 3 HR)



SEPTEMBER 21 - 11:12 (SN - 2 HR)

Incremental Shadow

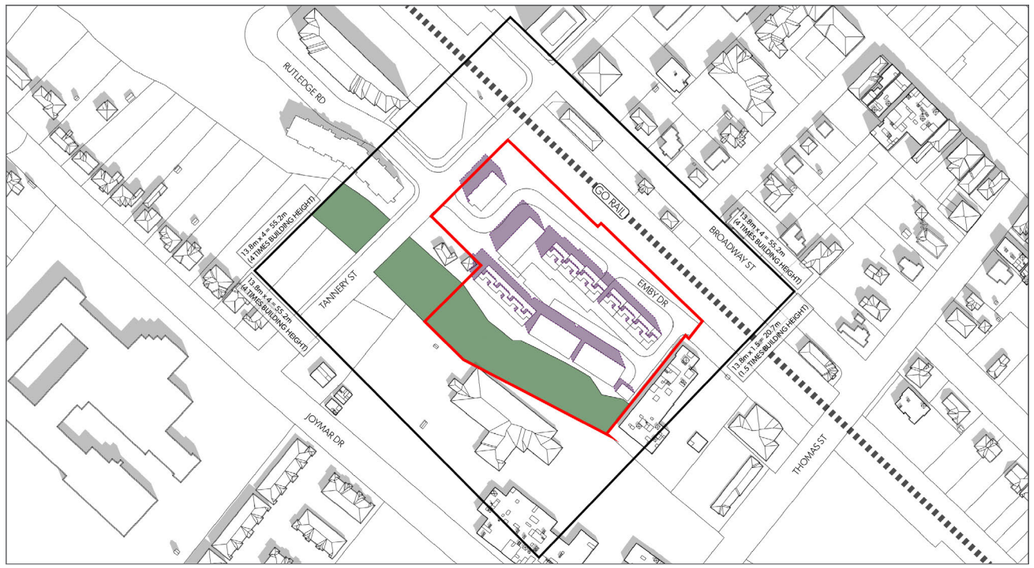
Existing Shadow

Mullet Creek Valley Lands

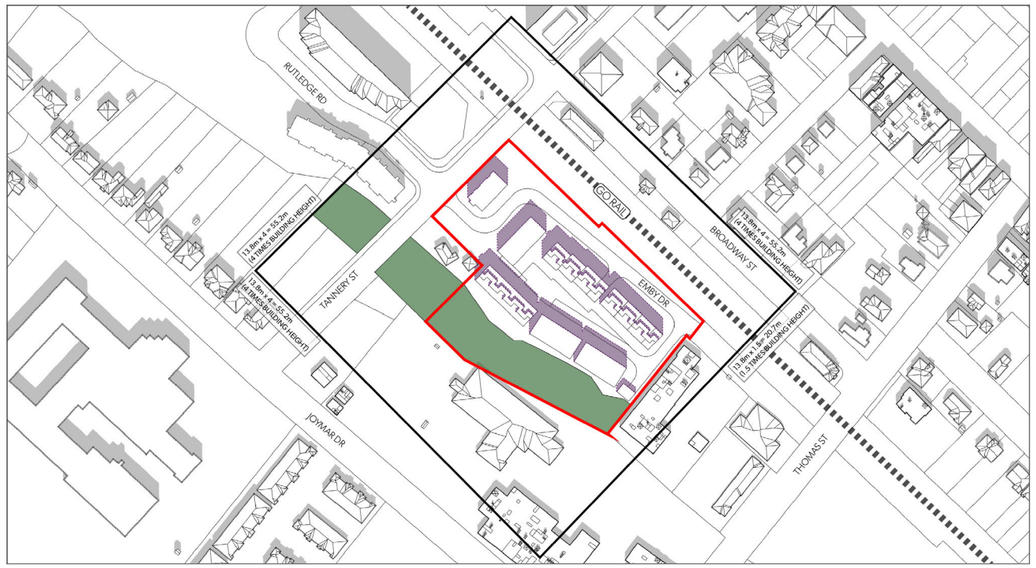
0 20 50 100 200m

WESTON CONSULTING
planning + urban design

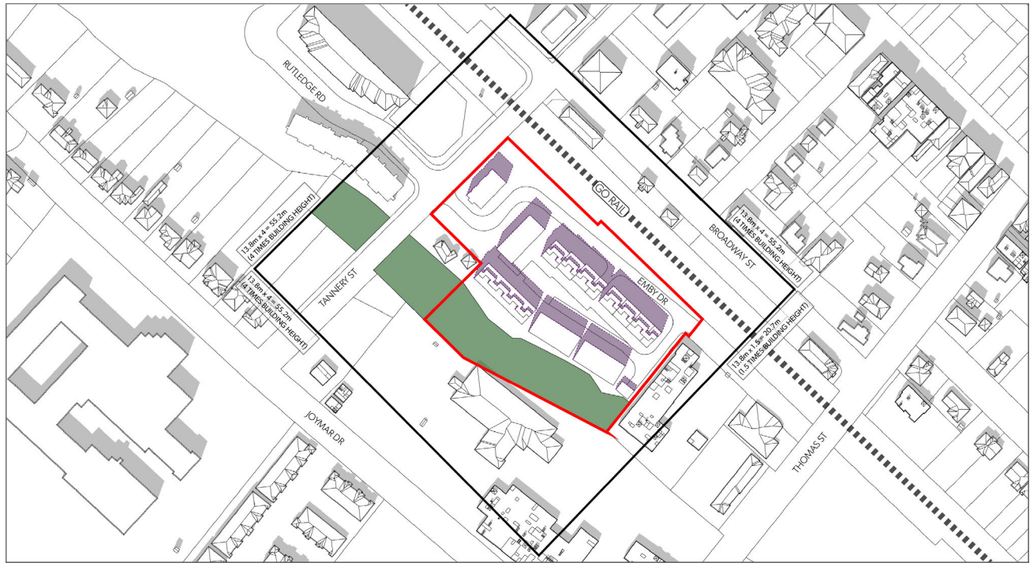
SHADOW STUDY **SEPTEMBER 21**



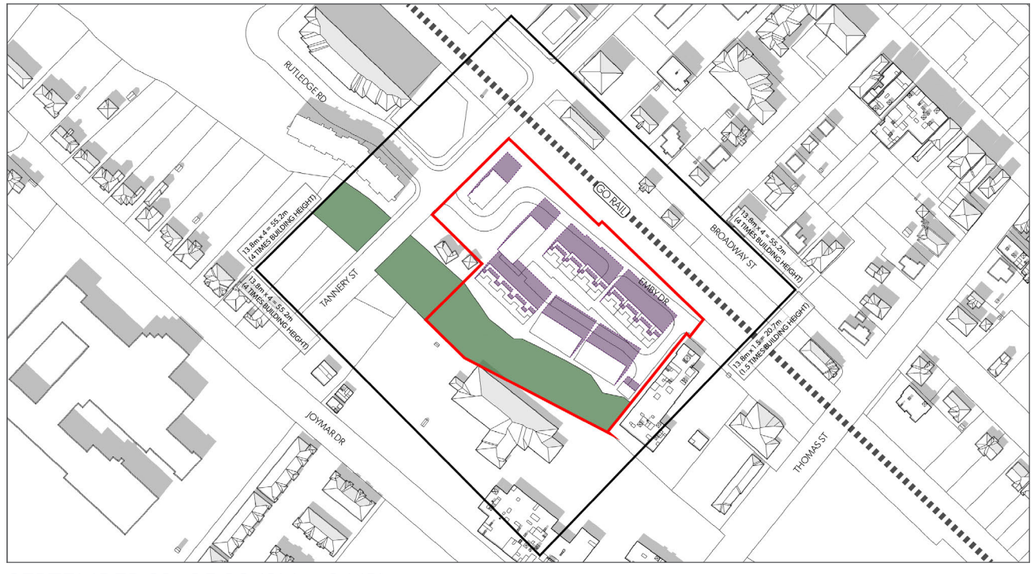
SEPTEMBER 21 - 12:12 (SN - 1 HR)



SEPTEMBER 21 - 13:12 (SOLAR NOON)



SEPTEMBER 21 - 14:12 (SN + 1 HR)



SEPTEMBER 21 - 15:12 (SN + 2 HR)

Incremental Shadow

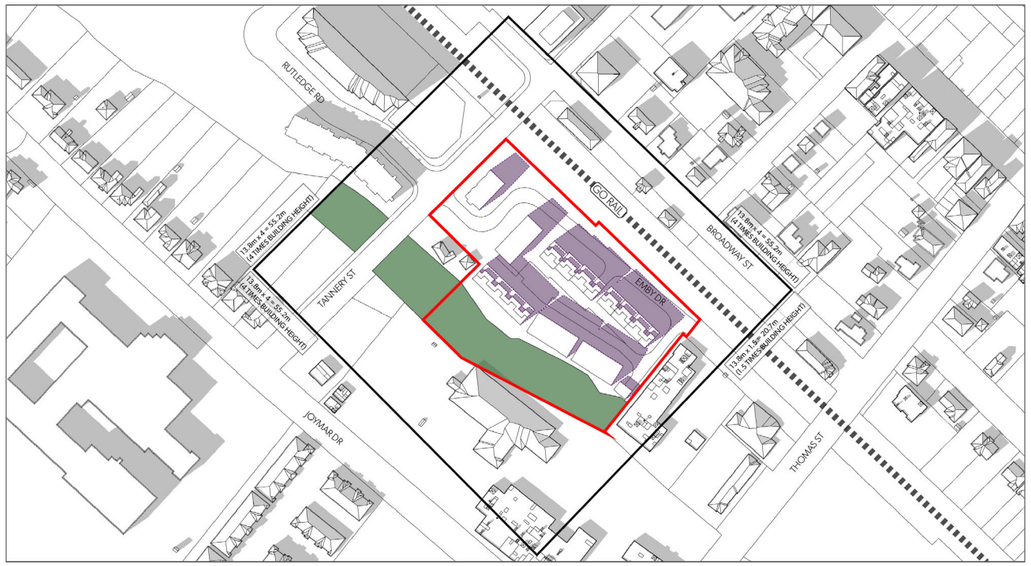
Existing Shadow

Mullet Creek Valley Lands

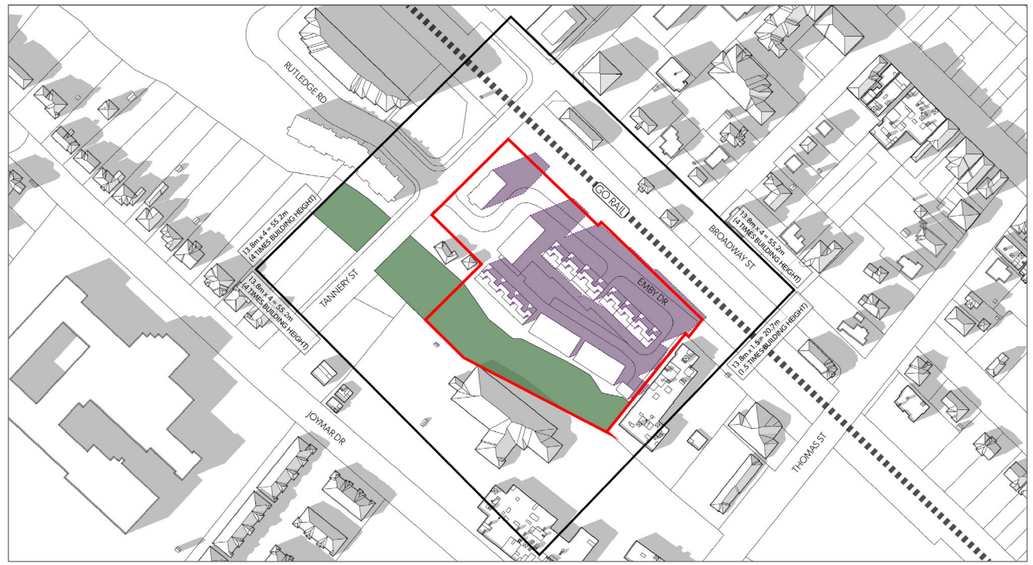
0 20 50 100 200m

WESTON CONSULTING
planning + urban design

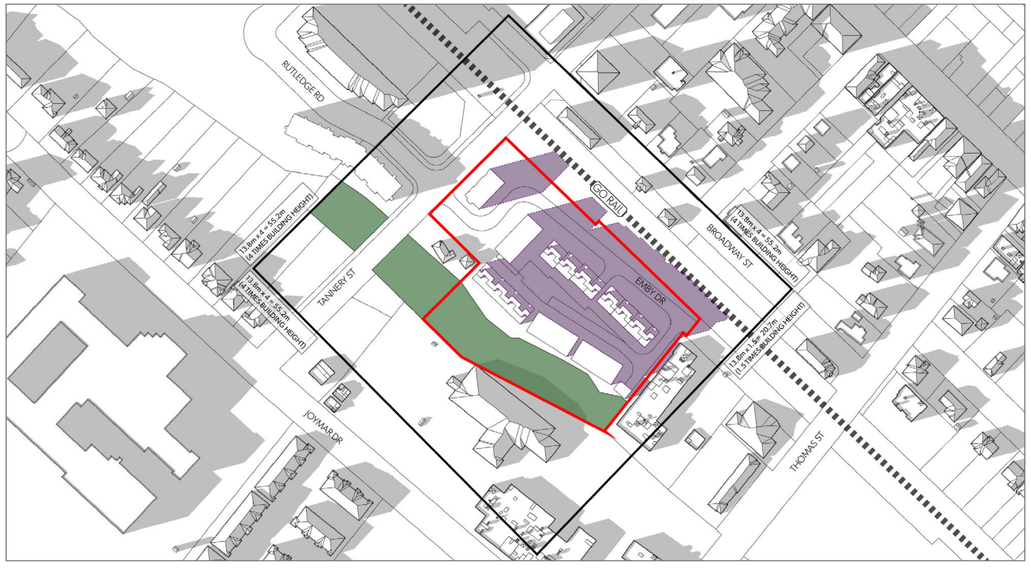
SHADOW STUDY **SEPTEMBER 21**



SEPTEMBER 21 - 16:12 (SN + 3 HR)



SEPTEMBER 21 - 17:12 (SN + 4 HR)



SEPTEMBER 21 - 17:48 (SET - 1.5 HR)

Incremental Shadow

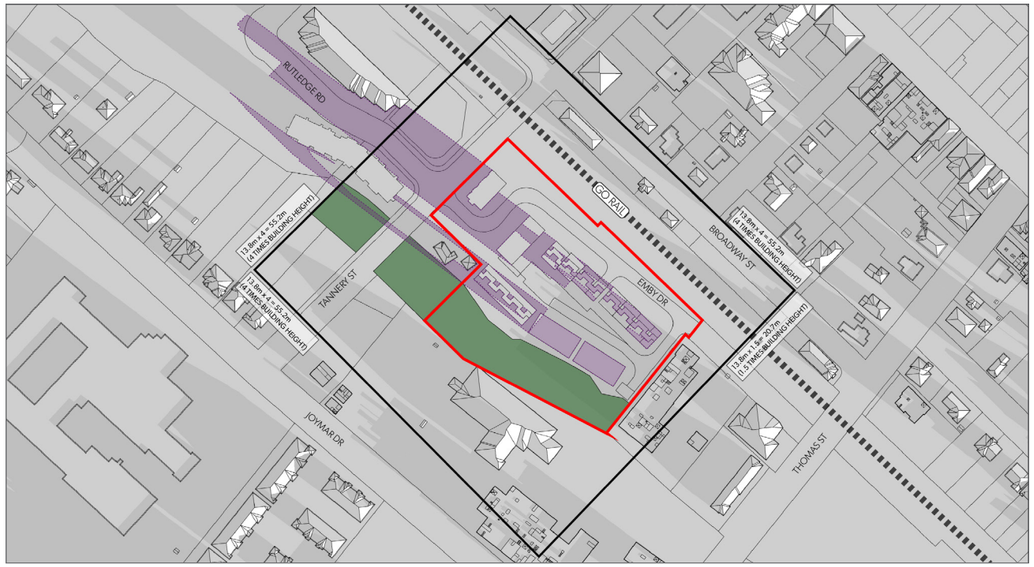
Existing Shadow

Mullet Creek Valley Lands

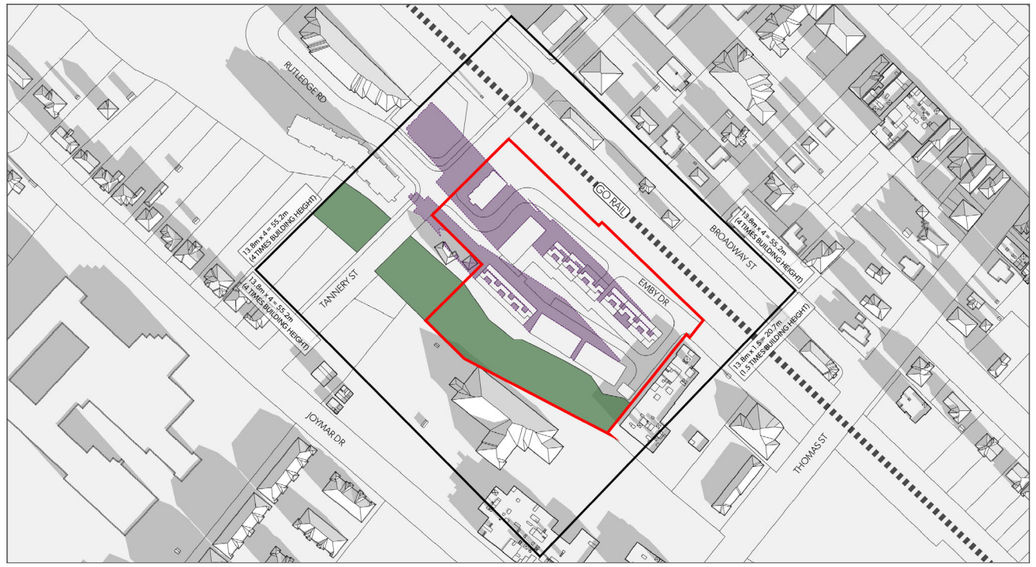
0 20 50 100 200m

WESTON CONSULTING
planning + urban design

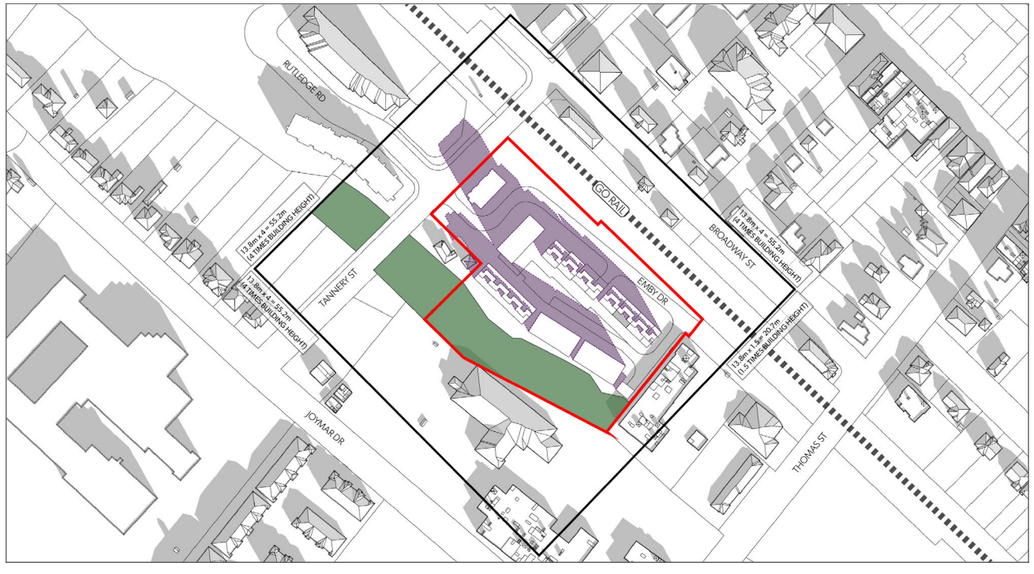
SHADOW STUDY **DECEMBER 21**



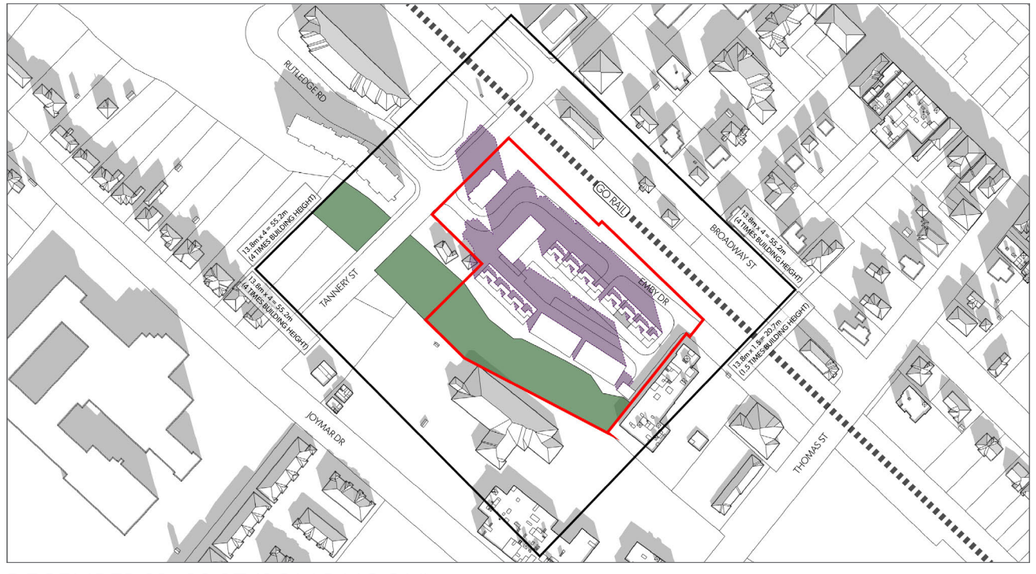
DECEMBER 21 - 9:19 (RISE + 1.5 HR)



DECEMBER 21 - 10:17 (SN - 2 HR)



DECEMBER 21 - 11:17 (SN - 1 HR)



DECEMBER 21 - 12:17 (SOLAR NOON)

Incremental Shadow

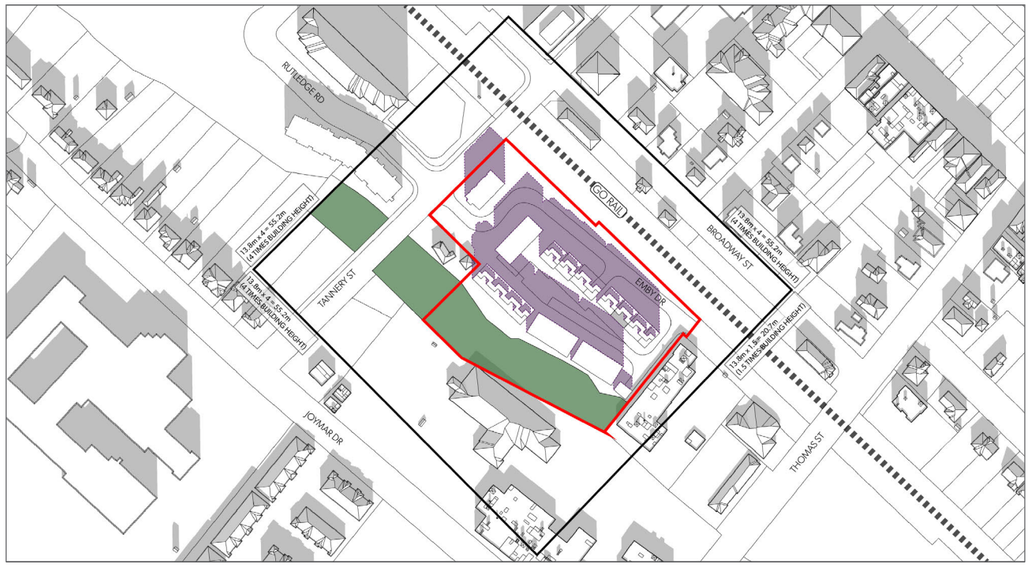
Existing Shadow

Mullet Creek Valley Lands

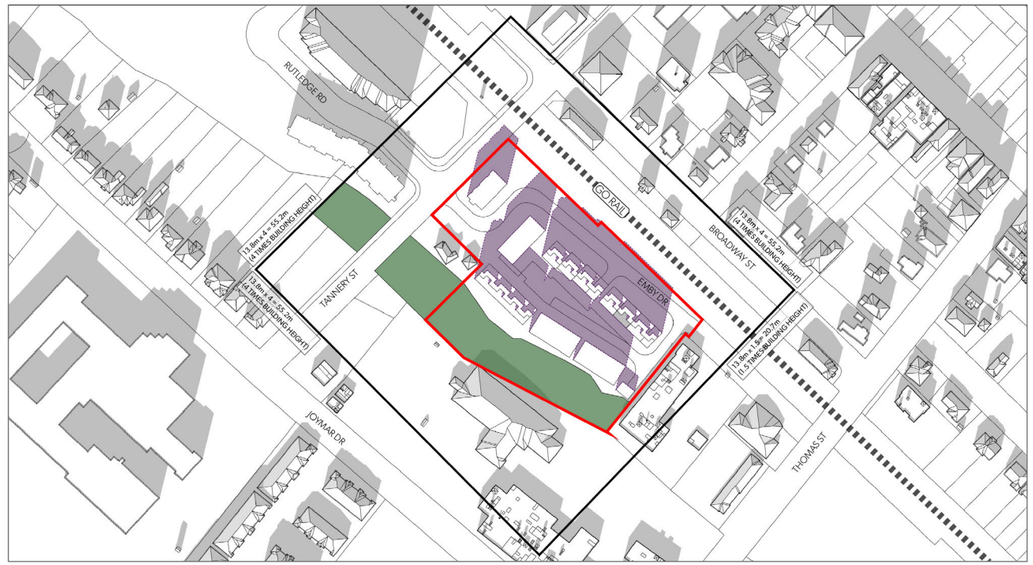
0 20 50 100 200m

WESTON CONSULTING
planning + urban design

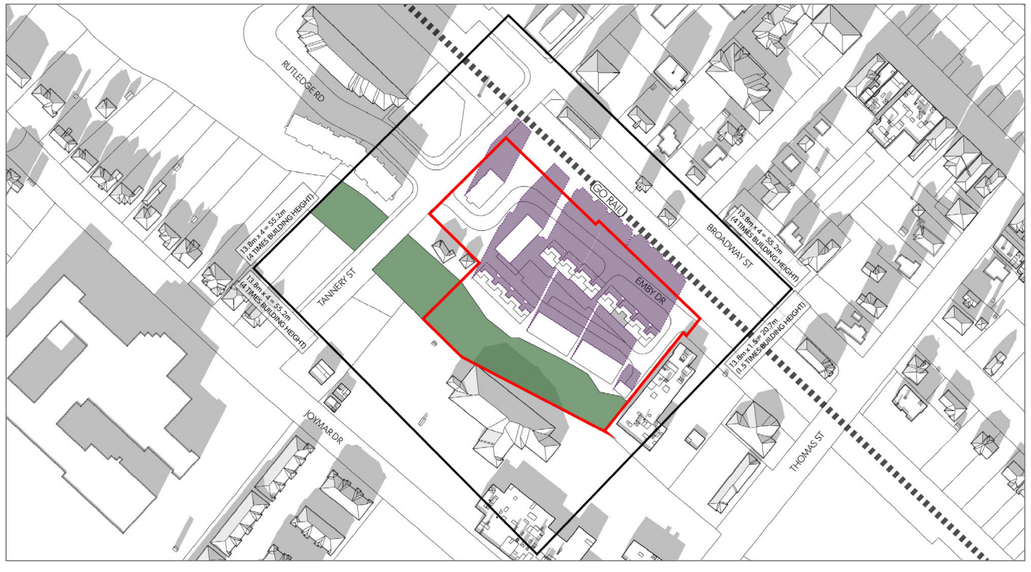
SHADOW STUDY **DECEMBER 21**



DECEMBER 21 - 13:17 (SN + 1 HR)



DECEMBER 21 - 14:17 (SN + 2 HR)



DECEMBER 21 - 15:15 (SET - 1.5 HR)

Incremental Shadow

Existing Shadow

Mullet Creek Valley Lands

0 20 50 100 200m

WESTON CONSULTING
planning + urban design