Affordable Housing Development Area Structure Plan

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EXECUTIVE SUMMARY

Domain Properties Inc. has commissioned GENIVAR to develop an Area Structure Plan for the proposed Affordable Housing Development (the Subdivision), located on Lot 5, Plan No. 2518ET, within the Hamlet of Lac La Biche (the Hamlet). See location plan 4207125ASP-01: SITE PLAN LOT 1 TO LOT 8 (Appendix A). The Subdivision consists of 58 duplex/fourplex dwellings and one multi-family development. The general Subdivision layout is shown along with the existing land zoning on Drawing 4207125ASP-02: EXISTING LAND ZONING (Appendix A).

The Affordable Housing concept is based on the reduction of dwelling/lot purchase costs by maximizing the number of dwelling within the Subdivision limits.

This is accomplished by:

- the reduction of individual lot depths and widths;
- the reduction in available front, side and rear yard areas;
- the construction of multi-story buildings that share common exterior walls, and
- the reduction of earth fill requirements resulting from the re-location of the storm and sanitary tie-in to Chisholm Street.

Upon reviewing the existing Subdivision configuration, researching and preparing the Subdivision Servicing report, and researching and evaluating the former Town of Lac La Biche Land Use Bylaw (#1151/99) (LUB) and County General Municipal Servicing Standards (Standards), the following findings and conclusions were reached:

Deep Servicing

- The proposed Subdivision water main configuration is sufficient and can be supported by the existing water main infrastructure.
- The proposed water main along the Subdivision street ties into the 200 mm line on 99 Street. It is recommended to tie directly into the 150 mm main on Christina (94) Avenue rather than the 150 mm hydrant lead.
- The water main 'looping' will be beneficial to the existing local system by having the potential of balancing out flows during peak demand and fire flow conditions. Modelling of the water system would quantify this effect.
- 150 mm water mains along the cul-de-sac streets (3) should be over-sized to 200 mm to allow for future developments to the east and northeast.
- Pending additional analysis of both major and minor systems, the proposed minor storm water system is sufficient for the Subdivision.
- Stormwater management within Lots 1 to 8 need to meet Alberta Environment Standards and Guidelines
- Storm mains should be placed along the cul-de-sac street (3) to allow for future developments to the east and northeast.
- The Subdivision sanitary configuration is sufficient and can be supported by the existing sanitary main infrastructure.
- Field observations indicate that the existing sanitary main on Chisholm Street is flowing at 40% to 50% during peak times. The limited capacity may limit additional development within Lots 1 to 4 and Lots 6 to 8.

- Water, storm and sanitary mains are stubbed at the end of the cul-de-sacs to allow for future main extensions (East Development Concept).
- Storm and sanitary Subdivision servicing, from the Chisholm Street tie-in location, via a 10 metre easement, allows for potential development of Lots 6 to 8 (West Development Concept).
- The existing water, storm, and sanitary infrastructures adjacent to Lots 1 through 8 are more than twenty-two years old. This exceeds the typical twenty year design horizon. The systems should be inspected for potential upgrading.
- Further existing water, storm, and sanitary flow recordings are required to quantify the existing system capacities.
- The storm and sanitary easement can be designated as a Utility R.O.W., and it can serve as the R.O.W. for a multi-use (non-motorized traffic) trail potentially extending to Lot 1.
- The storm and sanitary easement can be within sections of a road R.O.W.
- An overall development strategy, for Lot 1 to 8 does not form part of this report, but is recommended to facilitate future planned development of the area.

Zoning Requirements

- Subdivision analysis is based on the former Town of Lac La Biche Land Use Bylaw (#1151/99) (LUB) for compliance unless mentioned otherwise.
- The recommended zoning classifications are R2 – Medium Density and R3 – Multi-family. Subdivision duplex and fourplex unit configurations are compared to the R2 zoning requirements.
- R2 – Medium Density: – The Subdivision lot dimensions and corresponding areas are less than the minimum (LUB) requirements for R2 zoning.
- All (LUB) residential zoning requirements indicate 28% as the maximum area allocated to a dwelling 'footprint'. Dwelling area, based on the Subdivision lot sizes, can range from 49.0 m^2 - 54.3 m^2 (527 ft^2 - 584 ft^2). This excludes the basement area and additional floors. The maximum building heights are10 metres (duplex) and 15 metres (fourplex). The total (minimum) combined floor space is 65 m^2 (700 ft^2)
- Proposed R2 building footprints range between 40% to 50% of the total lot area, exceeding LUB requirements.
- The Subdivision meets the LUB density requirements of 40 dwellings per hectare in the cul-de-sac areas, but exceeds it by approximately 50% in the area southwest of the proposed street.
- Based on the Standard's maximum of 80 dwellings/ hectare (C.3.9.5 of the General Municipal Servicing Standards), all lots are in compliance.
- All fourplex lots are large enough to accommodate the required off-street parking of 1.0 car stalls, or a 6.0 m x 2.8 m pad, per unit in front of each dwelling. Duplex structures include an attached garage.
- Sideyards and parking areas do not form part of the outdoor living/amenities requirements.
- All vehicular access is from the street/avenue.

- Based on LUB requirements (See Section 7.4), the minimum side yard requirements range from 1.5 m to 3.0 m depending on the structure type, footprint, and location.
- A multi-family complex is proposed for the R3 (multi-family) zoning. Based on the 28% (of total lot area) complex 'footprint' requirement, the footprint is in the order of 1050 m^2-1100 m^2 (11,300 ft^2-11,830 ft^2).
- The proposed (multi-family) lot meets the minimum area for the complex and parking areas.

Project Phasing

- Each project phase requires a water main infrastructure that adequately services the area with domestic and fire flow rates without reducing the water flow rates below the required minimums.
- The water main layout for each phase shall meet the Hamlet operational and maintenance requirements.
- The first phase needs to include the storm and sanitary mains to the (recommended) Chisholm Street tie-in location (See Storm and Sanitary Sewer Servicing Option – Appendix B).
- Project phasing needs to allow for continuous, uninterrupted domestic (local) and emergency traffic.
- Each phase needs to provide for all sustainable transportation including pedestrian (non-motorized) traffic within the site and access/egress to existing transportation facilities.

Roadway System

- Temporary cul-de-sacs should be constructed where the three avenues terminate, thus providing for vehicular traffic access/egress to/from the cul-de-sacs.
- At the cul-de-sac locations, the concrete curb and gutter profiles can be deferred until the future extension of the avenues; pin-on concrete curb can be used in the interim.
- Temporary concrete curbs are removed and the concrete curb and gutter profile is carried through when the avenues are extended eastward.
- Roadway widths are below the Standard (C.3.9.1) requirement for on-street parking and future traffic volume increases when the avenues are extended northeast.
- An increased carriageway width requires lot 'cut-offs' at the roadway intersections in order to maintain the minimum curb return radii.
- Utility easement access is required; the final location is based on the storm and sanitary easement location.
- Approaches/driveways off of Christina Avenue should meet the requirements of Section G.15 in the Lac La Biche Municipal Design Standards.
- The roadways system needs to allow for uninterrupted domestic and emergency access/egress during all phases.
- The LUB does not address roadway requirements.

Land Use Bylaw Amendments: R2 Medium Density

The former LUB requires the following amendments in order to be compliant with current County requirements.

- Amendment 1

Under LUB, a variance would be required to conform to maximum building footprint for each lot. Under LUB the maximum is 28%. The proposed development requires 35% to 45%. The following amendment is recommended.

- Maximum lot coverage for main/accessory buildings shall be 50%
- Minimum lot area for duplexes shall be 196 square metres
- Minimum lot area for fourplexes shall be 175 square metres

- Amendment 2

The minimum LUB rearyard depth requirements are not met. The proposed depths range between 44% to 65% of the required minimum. The following amendment is recommended.

- Duplex and fourplex rearyard setbacks shall be 4.0 metres minimum.

- Amendment 3

The proposed lot depths range from 23.9 metres to 24.5 metres. This is below the required minimum of 36 metres. The proposed lot depths, range between 66% to 72 % of the required LUB minimums. The following amendment is recommended.

- The minimum lot depth for duplexes and fourplexes shall be 23.96 metres

- Amendment 4

The proposed lot widths are below the LUB requirements. This also affects the minimum side yard requirements. The following amendment is recommended.

- The minimum lot width for duplexes shall be 7.5 metres
- The minimum lot width for fourplexes shall be 6.1 metres.

1. INTRODUCTION

Domain Properties Inc. has commissioned GENIVAR to develop an Area Structure Plan for the proposed Affordable Housing Development (the Subdivision), located on Lot 5, Plan No. 2518ET, within the Hamlet of Lac La Biche (the Hamlet). See location plan 4207125ASP-01: SITE PLAN LOT 1 TO LOT 8 (Appendix A). The Subdivision is located on Lot 5 and consists of 58 duplex/fourplex dwellings and one multi-family development. The general Subdivision layout is shown along with the existing land zoning on Drawing 4207125ASP-02: EXISTING LAND ZONING (Appendix A).

This report is based on the following:

- Minimum land allocation for road right-of-ways, municipal reserves, environmental reserves, and utility requirements as per Alberta Environment Guidelines;
- A storm water management plan as outlined by ALBERTA ENVIRONMENTAL PROTECTION and the 'LAC LA BICHE COUNTY – STORM WATER MANAGEMENT MASTER PLAN';
- Subdivision storm and sanitary servicing recommended in the 'Affordable Housing Development - Storm and Sanitary Servicing Options' report dated October 8, 2008 (Appendix B);
- Town of Lac La Biche – Water Assessment Report (April 2008);
- Town of Lac La Biche Land Use Bylaw – Bylaw No. 1151/99 (LUB);
- Phase I Environmental Site Assessment Southwest of 99 Avenue and 95 Street Lac La Biche, AB (Lot 5, Block 1, Plan No. 2518ET), and
- Lac La Biche County General Minimum Design Standards (Standards).

This report looks at:

- The feasibility of connecting into the existing water, storm mains, and sanitary mains to meet the servicing requirements for the Subdivision;
- the impact of the proposed development on existing surface drainage conditions;
- the proposed zoning and the development requirements according to the LUB;
- the phasing sequence for development of the Subdivision;
- the vehicular and pedestrian access to/from the Subdivision, and the potential effects on the surrounding transportation network;
- the population density increase, and
- the potential for future development in the area.

2. SITE FEASIBILITY

2.1 General

The feasibility evaluation is based on the Subdivision requirements, effects on existing infrastructure, and potential future developments within Lots 1 to 4 (East Development Concept) and Lots 6 to 8 (West Development Concept).

This section looks at the following:

- Feasibility of connecting into the existing water, storm, and sanitary systems.
- Storm and sanitary easement requirements
- Flexibility for future servicing in Lots 1 to 4 and Lots 6 to 8.

2.2 Water, Storm and Sanitary Main

2.2.1 Water Mains

A proposed 200 mm water main would tie into an existing 200 mm water main on 99 Avenue and a 150 mm hydrant lead on Christina (94) Avenue. The hydrant lead is serviced by a 150 mm water main on the south side of Christina Avenue; this is sufficient to meet the needs of the Subdivision, but it is not recommended as there is a potential excessive fire flow reduction to the adjacent hydrant. The 200 mm main should extend further and connect into the existing 150 mm main instead. The water mains surrounding Lots 1 to 8 offer the potential for 'looping' the existing water system in the area. 'Looping' generally allows for higher sustainable water pressures and flow rates. This is based on earlier water modelling (Town of Lac La Biche Water Assessment Report - 2007) of the Hamlet water infrastructure. The 'looping', using a 200 mm water main, will provide sufficient fire flow and potable water supply to the Subdivision, without lowering the service level below minimum requirements in other areas serviced by the existing mains.

The water mains branching into the cul-de-sacs are 150 mm in diameter. Pending additional analysis, this should be sufficient, although in the event that the mains are extended eastward (East Development Concept), depending on the additional flow requirements, it would be prudent to upsize the 150 mm mains to 200 mm.

Summary:

- The 200 mm water main along the proposed street and the 150 mm water mains into the cul-de-sacs should provide the minimum fire and domestic flows required for the Subdivision.
- The stubbed-off 150 mm mains may not have the capacity for future developments in Lots 1 to 4; these mains should be upsized to 200 mm.

2.2.2 Storm Mains

For the purpose of this report, the downstream storm main infrastructure is assumed to handle the contributing flows from the Subdivision. Proposed storm mains complete with catch basins are located at each avenue/street intersection. The overland flow distance, from the cul-de-sac end to the catch basins, is below the maximum catch basin spacing required. Therefore, there are no storm mains presently proposed. In the event the utilities and/or roadway are extended eastward, depending on the increased contributing area(s) and the increased overland flow distance, the maximum allowable distance between catch basins can be exceeded. The following options are available:

- Reduce the overland flow distance by providing additional catch basins on both sides of the three internal Subdivision intersections.
- Include storm sewer mains along the three cul-de-sac avenues and plug at the east Subdivision property line. Future developments will install catch basins at the required distances in order to remain within the design guidelines. The storm mains would need to be sized accordingly.

The proposed storm main servicing the Subdivision extends through Lots 6 to 8 and ties, via a 10 metre easement, into an existing 675 mm storm line. Preliminary observations indicate that the existing downstream storm mains have the capacity to handle these additional flows. Additional analysis will determine final sizing of the proposed main. This report does not address the requirements for storm water management, but it is key to organized developments within Lots 1 to 8.

2.2.3 Sanitary Mains

Tie-in locations were reviewed in the 'Affordable Housing Development – Storm and Sanitary Serving Options' report dated October 8, 2008 (Appendix B). The report evaluated three possible locations: Christina (94) Avenue, 99 Avenue, and Chisholm Street. The Chisholm Street, OPTION B, tie-in location was deemed the most feasible.

Like the storm main, the sanitary main ties in to the existing sanitary main at the Chisholm Street location, via the 10 metre easement.

The 200 mm sanitary mains within the proposed Subdivision will adequately service the Subdivision. Based on field observation, the existing 200 mm sanitary main at the Chisholm tie-in location flows at 40-50% during peak periods, so the main can handle the additional wastewater flows generated from the Subdivision.

The following observations are:

- The existing sanitary main has the capacity to handle the additional flows generated from the Subdivision.
- Additional contributing flows from future developments will require a more accurate analysis of the remaining down stream flow capacities. These flows may limit the amount of future development in Lots 1 to 4 and 6 to 8.

2.3 Potential for Future Development Adjacent in Lots 1 to 4 and Lots 6 to 8

Infrastructure requirements for potential future development in Lots 1 to 4 may exceed the servicing requirements for the Subdivision. It is prudent to oversize the proposed deep utilities, and adjust the roadway geometry to accommodate this future development.

DESCRIPTION	LOCALE	PROPOSED	OVERSIZING
Water main	3 cul-de-sacs	150 mm	200 mm
Storm mains	3 cul-de-sacs	None	375 mm [1]

Note [1] – Final sizing will be based on a contributing area calculation.

Potential future development of the lands in Lots 6 to 8 should have the option of being serviced from the storm and sanitary utility easement.

The adjacent existing sanitary main capacities presently govern the amount and type of development within Lots 1to 8. Based on main size, grading, and potential contributing areas, there should be no need to oversize the proposed 200 mm mains within the Subdivision to allow for future residential developments. See Drawing 4207125-05ASP – Future Development Concept Appendix A).

3. FLEXIBILITY FOR FUTURE LOT SERVICING

The most viable option for sanitary and storm sewer servicing is connecting to existing mains at the Chisholm Street location. This 200 mm main is presently flowing at 40%-50% capacity during peak periods, but it should be able to handle the contributing flows from the Subdivision. Note that the remaining main capacity may limit development in the area. In the event that existing developments on Lots 1 to 4 and Lots 6 to 8 wish to connect into the proposed sanitary and storm lines, individual flow rate monitoring will be required to determine how much additional development can be done without overloading the existing sanitary system. See Drawing 4207125 -05ASP: Future Development Concept (Appendix A).

Future development is based on the following assumptions:

- The existing system does not have the capacity to handle complete residential development of Lots 1 to 4 and Lots 6 to 8, once the Subdivision is serviced.
- Developments outside the Lots 1 to 8 will not affect the Subdivision.
- No upgrading of the existing sanitary system is necessary.
- Wastewater flow rates from existing developments on Lots 6 and 7 have been determined.
- Future development density within Lots 1 to 8 is comparable to the proposed Subdivision.

Scenario 1: East Development Concept – Lots 4, 3, and portions of 2.

Not all of the Lots can be serviced based on comparable multi-family and residential population densities. In addition to the Subdivision, only Lots 4, 3, and a portion of 2 *or* Lots 6, 7, and 8, can be comparatively serviced. The proposed Subdivision includes three cul-de-sacs, of which two can be potentially extended eastward including the roadways, water, storm and sanitary mains. See Drawing 4207125-05ASP – Future Development Concept (Appendix A).

Scenario 2: West Development Concept – Lots 6, 7, and 8.

The contributing flow rates for the existing and future developments on Lots 6, 7, and 8 who wish to connect on to the storm and sanitary service mains, would determine the remaining additional contributing flows that can be handled from development discussed in scenario 1. See Drawing 4207125 – 05ASP: Future Development Concepts (Appendix A).

The combination of options 1 and 2 that add up to the maximum contributing wastewater flow is possible.

Note: The requirements of the existing storm and water main systems would have to be evaluated to determine their capacities. This report does not address the requirements for a stormwater management plan, although it is key to the structured development of Lots 1 to 4 and Lots 6 to 8.

4. ENVIRONMENTAL IMPACT DUE TO SUBDIVISION AND 10 METRE UTILITY EASEMENT DEVELOPMENT

The additional Subdivision surface runoff flow rates will be addressed according to Alberta Environment and the 'LAC LA BICHE COUNTY – STORM WATER MANAGEMENT MASTER PLAN' guidelines.

Roughly 50% of the utility easement length is through bush/treed area. The clearing of the land and the re-seeding of the area should minimize any significant increase in the surface water runoff rate until the areas are further developed.

The existing stormwater/snowmelt flows are generally SE flowing from Lots 1 through 8. The Subdivision has the potential of adversely altering the pre-construction flows. The requirements for the Subdivision and future developments in the area (Lots 1 to 8) will be based on the Lac La Biche County Storm Water Master Plan presently being reviewed by the County.

5. PROPOSED ZONING REQUIREMENTS

As requested by the County, the Subdivision zoning requirements were based on the former Town of Lac La Biche Zoning Bylaw (LUB). The Subdivision includes:

- duplex and fourplex housing, and
- a multi-family housing complex.

The existing area zoning is outlined in Drawing No. 4207125-02ASP – Existing Land Zoning. The applicable residential classifications, as outlined in the LUB are listed in the table 5.1: Minimum Residential Zoning Requirements.

Tabie 5.1: Minimum Residential Zoning Parameters

Zoning Class	(m^2) Lot Size	(m) Lot Width	(m) Lot Depth	(m) Side Yard
R2 - Medium Density				
Detached	540	15	36	1.5
Duplex	**324**	**18** (1)	**36**	**1.5**
Triplex	290	21	36	4
Fourplex	**290**	21 (2)	**36**	**3** (3)
Row Housing	230	21	30	3
R3 - Multi-Family	800	21	36	3

(1) Total requirement for duplex (9 metres per unit)
(2) Estimate at 10.5 metres for each end dwelling unit
(3) Sideyard requirement when adjacent to roadway: 4 metres
Note: Depending on the structure 'footprint,' the side yard requirement will need to be re-evaluated.

5.1 Single Family Zoning Classification

The average subdivision lots between the cul-de-sacs and south-west of the proposed street are 194 m^2 to 196 m^2 and 175 m^2, respectively. Similarly, the lot widths are 7.4 m to 8.5 m and 7.6 m, respectively. These dimensions are substantially less than the minimum values shown in the 'Residential Zoning Parameters' table, for the proposed duplex and fourplex residences. The classification corresponds with section C.3.9 Medium Density Hamlet Residential District (MDR) of the County's General Minimum Servicing and Standards.

Table 5.2: Lot Parameter Evaluation gives a more detailed comparison between the Subdivision lot layout and the 'R2-Medium Density' (duplex and fourplex) lot minimum requirements.

Table 5.2: Lot Parameter Evaluation

Detailed Comparison for the R2 – Medium Density: Duplex /Fourplex [1]			
Average Lot Parameter	Minimum Lot Size Requirement (Duplex/Fourplex)	Proposed Lot (Duplex/Fourplex	Compliance (%)[2] (Duplex/Fourplex)
Lot Area (m^2)	324/290	175 – 196	54/60 – 59/68
Lot Depth (m)	36/36	24 – 26	67 - 72
Lot Width (m)	9/10.5 [3]	6.1 – 7.6	68/58 – 84/72

(1) Includes utility easement along lot fronts (widths)
(2) Percentage of Minimum Requirement
(3) Minimum lot width for end units. Does not include the additional lot width required where sideyard is adjacent to roadway

5.2 Multi-Family Zoning Classification

The area at the north end of the Subdivision is slated for a multi-family complex. Preliminary review indicates that the LUB requirements can be met. The corresponding zoning classification would be R3 – Multi-family. The zoning classification corresponds to High-Density Hamlet Residential District (HDR), as outlined in section C.3.10 of the County Municipal Servicing Standards.

5.3 Building Requirements

5.3.1 R2 – Medium Density Housing

The LUB requires a maximum of 28% of the total lot area be allocated for the main dwelling. These 'footprint' dwelling areas are listed below:

Minimum Building Area: Housing Classification

Zoning	Location	Required Dwelling Size (m^2) [1]
R2	Cul-de-sac	54.3 (584 ft^2) [2]
R2	Along street	49.0 (527 ft^2) [2]

Notes

(1) Based on proposed Subdivision lot dimensions
(2) Structures can include additional floors up to a total building height of 10 m and 15m, duplexes and fourplexes respectively.

- The minimum combined floor area required is 65 m^2 (700 ft^2). This does not include the basement level.
- Cul-de-sac areas – Lot constraint can reduce the building 'footprint' area to approximately 49 m^2 (527 ft^2).
- South-west of proposed street – Lot constraints can reduce the building 'footprint' area to approximately 40 m^2 (430 ft^2). Any potential lot width adjustments can be performed when the land requirements for the proposed servicing corridor are determined.

Structures located between the cul-de-sacs comply, but the units southwest of the proposed street exceed that limit. Based on a total area of 0.40 ha and one unit per lot, the LUB maximum allowable number of units in the area is sixteen (16). At one unit per lot, the Subdivision would contain 24 units; this is 150% of the maximum density. See Drawing 4207125ASP-03 – Development Concept and Lot Sizing for proposed building configurations

Note: The Standard regulates a maximum of 80 dwellings per ha. The former LUB on the other hand requires a maximum of 40 units/ha.

5.3.2 Outdoor Living Space/Amenity Area

Outdoor living space/amenity area requirements for duplex units are not addressed specifically but form part of the minimum rear yard requirements. Based on the LUB, minimum yard area would be in the order of 63 sq. metres. The proposed dwelling/lot configuration would allow for approximately 28 m^2 to 40 m^2, or 44% to 65% of minimum requirement.

The LUB does outline the outdoor living space/amenity area requirements for fourplex units. Based on the proposed three-bedroom dwellings, approximately 93 m^2 would be required. Hence, the proposed fourplex building configuration allows for 30% to 45% of the required minimum.

5.3.3 Vehicle Parking Requirements

Proposed duplex units include attached garages at the front of each unit, providing for off-street parking. The LUB appears to only address detached garages, but taking the front and side yard requirements, and the dwelling 'footprint' into consideration, there does not appear to be a conflict.

There is a provision for an attached garage at each fourplex dwelling unit, but for the purpose of this report, these units do not include attached garages. The LUB requires a minimum of 1off-site parking space per dwelling unit. See section 7.0 for on-street parking requirements.

5.3.4 R3 – Multi-Family Complex

A complex containing 35 single and 48 double bedroom units, is being evaluated. Ultimately, the final building layout, the bedroom type and quantity, will be based on Domain Properties' vision while remaining within the County's development requirements. These observations are based on the 28% rule discussed earlier and the general unit floor requirements. Based on the dedicated lot sizes, this equates to roughly a 1050 m^2 to 1100 m^2 dwelling 'footprint.' In addition, the parking area, which is based on 1.5 parking spaces per unit, will be dependent on the final building layout. There is sufficient area allotted to conform to the LUB requirements.

6. AFFORDABLE HOUSING CONCEPT

The Subdivision concept is based on the reduction of dwelling/lot purchase costs by maximizing the number of dwelling within the Subdivision limits.

This is accomplished by:

- the reduction of individual lot depths and widths;
- the reduction in available front, side and rear yard areas;
- the construction of multi-story buildings that share common exterior walls, and
- the reduction of earth fill requirements resulting from the re-location of the storm and sanitary tie-in to Chisholm Street

The proposed concept meets the maximum Lac la Biche County density requirement of 80 dwelling units per hectare.

7. AFFORDABLE HOUSING PROJECT PHASING

Presently, the Affordable Housing Development consists of 3 phases. In addition to providing fire and domestic water supply, the first phase would need to incorporate the storm and sanitary sewer main servicing to Chisholm Street. Drawing 4207125-04ASP: PROPOSED SUBDIVISION LAYOUT & TENTATIVE PHASE PLAN looks at tentative phasing of the project. Depending on the final location of the storm and sanitary main alignments, the Phase 01 limits may be adjusted accordingly. These are shown as Phase 01 OPT.

The general land allocation breakdown at the completion of Phase 3 is as follows.

Description	Percentage (%)	
• Lots	62	
• Roadways	35	
• Municipal Reserve	1	(See Section 9.0)
• Utility R.O.W.	2	
Total	100	

Note: There is the potential for only one Subdivision access/egress during Phases I and II. Each project phase needs to provide uninterrupted vehicular and pedestrian traffic, not only within the developed phases, but from and to the Subdivision. Access requirements range from domestic to emergency and maintenance traffic.

The proposed Chisholm street utility connection option does not affect the level of service in or out of the proposed Affordable Housing Development. See Drawing 4207125 -04ASP: Future Development Concept (Appendix A).

8. ROADWAY SYSTEM

The Subdivision roadway system is evaluated based the Standards for compliance.

The Subdivision street information indicates 9.0 metres (face of curb (FOC) to FOC) wide structures for all roadways. A width of 9.0 metres is sufficient for Low Density Housing (LDR) only where there is no on street parking permitted (Section C3.8). The present lot layout does not allow for a wider roadway width in the cul-de-sac branches without the provision for 'cut-offs' at the six (6) corner lots located at the three (3) interior 'T' intersections. The future eastward extension of these roadways can result in a potential increase in traffic volume. The curb (C&G) return radii, at 9.0 metres, meet the Standard's requirements.

Until future development east and northeast of the Subdivision occurs, temporary cul-de-sacs are required to provide for adequate vehicular traffic in and out of the avenues. Proposed curb and gutter and roadway profiles would terminate at the start of each cul-de-sac and temporary pin-on concrete curbs can then be poured over graded surface.

Upon future roadway extension, the pin-on curbs would be removed and the curb and gutter/roadway cross-section would be extended as required; this would minimize construction and future removal costs.

The roadway system must be developed in such a manner that uninterrupted domestic and emergency vehicular (and pedestrian) access is maintained at all times.

The proposed Subdivision is serviced by 99 Avenue to the north, Christina (94 Avenue) to the south and Chisholm Street to the west. The former Town of Lac La Biche Municipal

Development Plan (Bylaw 1150/99) had identified the three roadways as Collector Roads within its roadway system. Pending additional detailed analysis, the traffic volume from the Subdivision during Phase I can be absorbed by the existing adjacent roadway system. There is the potential for overloading this system in the vicinity of the Subdivision during peak morning and evening periods once Phases II and III are completed

9. MUNICIPAL RESERVE REQUIREMENTS

Pursuant to Section 666 of the Municipal government Act, a Municipal Reserve (MR) shall consist of a minimum of 10% of the proposed subdivision area. With the total Subdivision area being 2.59 +/- hectares (6.40 +/- acres), the minimum required MR area is 0.259 +/- hectares (0.64 acres). The proposed amenity area consisting of 0.0239 +/- hectares (0.059 +/- acres) does not meet that minimum land allocation requirement.

Therefore, the balance of 0.2351 +/- hectares (0.581 +/- acres) shall be deferred to the remnant parcel by way of deferred reserve caveat at an agreed-upon monetary rate in lieu.

10. CONCLUSIONS

Upon reviewing the proposed Subdivision building and lot configurations, researching and preparing the Subdivision Servicing report, and researching and evaluating the former Town of Lac La Biche Land Use Bylaw (#1151/99) (LUB) and County General Municipal Servicing Standards (Standards), the following conclusions and recommendations were reached:

Deep Servicing

- The proposed Subdivision water main configuration is sufficient and can be supported by the existing water main infrastructure.
- The proposed water main along the Subdivision street ties into the 200 mm line on 99 Street. It is recommended to tie directly into the 150 mm main on Christina (94) Avenue rather than the 150 mm hydrant lead.
- The water main 'looping' should be beneficial to the existing local system by having the potential of balancing out flows during peak demand and fire flow conditions. Modelling of the water system would quantify this effect.
- 150 mm water mains along the cul-de-sac streets (3) should be over-sized to 200 mm to allow for future developments to the east and northeast.
- Pending additional analysis of both major and minor systems, the proposed minor storm water system is sufficient for the subdivision.
- Storm water runoff control strategy within Lots 1 to 8 shall be based on Alberta Environment regulations.
- Storm mains should be placed along the cul-de-sac street (3) to allow for future developments to the east and northeast.
- The Subdivision sanitary configuration is sufficient and can be supported by the existing sanitary main infrastructure.
- Field observations indicate that the existing sanitary main on Chisholm Street is flowing at 40% to 50% during peak times. The limited capacity may limit additional development within Lots 1 to 4 and Lots 6 to 8.

- Water, storm and sanitary mains are stubbed at the end of the cul-de-sacs to allow for future main extensions (East Development Concept).
- Storm and sanitary Subdivision servicing, from the Chisholm Street tie-in location, via a 10 metre easement, allows for potential development of Lots 6 to 8 (West Development Concept).
- The existing water, storm, and sanitary infrastructures adjacent to Lots 1 through 8 are more than twenty-two years old. This exceeds the typical twenty year design horizon. The systems should be inspected for potential upgrading.
- Further existing water, storm, and sanitary flow recordings are required to quantify the existing system capacities.
- The storm and sanitary easement can be designated as a Utility R.O.W., and it can serve as the R.O.W. for a multi-use (non-motorized traffic) trail potentially extending to Lot 1.
- The storm and sanitary easement can be within sections of a road R.O.W.
- There needs to be a development strategy for the lands within Lots 1 to 8.

Zoning Requirements

- Subdivision analysis is based on the former Town of Lac La Biche Land Use Bylaw (#1151/99) (LUB) for compliance unless mentioned otherwise.
- The recommended zoning classifications are R2 – Medium Density and R3 – Multi-family. Subdivision duplex and fourplex unit configurations are compared to the R2 zoning requirements.
- R2 – Medium Density: – The Subdivision lot dimensions and corresponding areas are less than the minimum (LUB) requirements for R2 zoning.
- All (LUB) residential zoning requirements indicate 28% as the maximum area allocated to a dwelling 'footprint'. Dwelling area, based on the Subdivision lot sizes, can range from 49.0 m^2 - 54.3 m^2 (527 ft^2 - 584 ft^2). This excludes the basement area and additional floors. The maximum building heights are 10 metres (duplex) and 15 metres (fourplex). The total (minimum) combined floor space is 65 m^2 (700 ft^2)
- Proposed R2 building footprints range between 40% to 50% of the total lot area, exceeding LUB requirements.
- The Subdivision meets the LUB density requirements of 40 dwellings per hectare in the cul-de-sac areas, but exceeds it by approximately 50% in the area southwest of the proposed street.
- Based on the Standard's maximum requirement of 80 dwellings/ hectare (C.3.9.5 of the General Municipal Servicing Standards), all lots are in compliance.
- All fourplex lots are large enough to accommodate the required off-street parking of 1.0 car stalls, or a 6.0 m x 2.8 m pad, per unit in front of each dwelling. Duplex structures include an attached garage.
- Sideyards and parking areas do not form part of the outdoor living/amenities requirements.
- All vehicular access is from the street/avenue.

- Based on LUB requirements (See Section 7.4), the minimum side yard requirements range from 1.5 m to 3.0 m depending on the structure type, footprint, and location.
- A multi-family complex is proposed for the R3 (multi-family) zoning. Based on the 28% (of total lot area) complex 'footprint' requirement, the footprint is in the order of 1050 m^2-1100 m^2 (11,300 ft^2-11,830 ft^2).
- The proposed (multi-family) lot meets the minimum area for the complex and parking areas.

Affordable Housing Complex

The Subdivision concept is based on the reduction of dwelling/lot purchase costs by maximizing the number of dwelling within the Subdivision limits.

This is accomplished by;

- the reduction of individual lot depths and widths,
- the reduction in available front, side and rear yard areas, and
- the construction of multi-story buildings that share common exterior walls.
- The reduction of earth fill requirements resulting from the re-location of the storm and sanitary tie to Chisholm Street
- The proposed concept meets the maximum Lac la Biche County density requirement of 80 dwelling units per hectare.

Project Phasing

- Each project phase requires a water main infrastructure that adequately services the area with domestic and fire flow rates without reducing the water flow rates below the required minimums.
- The water main layout for each phase shall meet the Hamlet operational and maintenance requirements.
- The first phase needs to include the storm and sanitary mains to the (recommended) Chisholm Street tie-in location (See Storm and Sanitary Sewer Servicing Option – Appendix B).
- Project phasing needs to allow for continuous, uninterrupted domestic (local) and emergency traffic.
- Each phase needs to provide for all sustainable transportation including pedestrian (non-motorized) traffic within the site and access/egress to existing transportation facilities

Roadway System

- Temporary cul-de-sacs should be constructed where the three avenues terminate, thus providing for vehicular traffic access/egress to/from the cul-de-sacs.
- At the cul-de-sac locations, the concrete curb and gutter profiles can be deferred until the future extension of the avenues; pin-on concrete curb can be used in the interim.

- Temporary concrete curbs are removed and the concrete curb and gutter profile is carried through when the avenues are extended eastward.
- Roadway widths are below the Standard (C.3.9.1) requirement for on-street parking and future traffic volume increases when the avenues are extended northeast.
- An increased carriageway width requires lot 'cut-offs' at the roadway intersections in order to maintain the minimum curb return radii.
- Utility easement access is required; the final location is based on the storm and sanitary easement location.
- Approaches/driveways off of Christina Avenue should meet the requirements of Section G.15 in the Lac La Biche Municipal Design Standards.
- The roadways system needs to allow for uninterrupted domestic and emergency access/egress during all phases.
- The LUB does not address roadway requirements.

Land Use Bylaw Amendments: R2 Medium Density

The former LUB requires the following amendments in order to be compliant with current County requirements.

- Amendment 1

Under LUB, a variance would be required to conform to maximum dwelling footprint for each lot. Under LUB the maximum is 28%. The proposed development requires 35% to 45%. The following amendment is recommended.

- Maximum lot coverage for main/accessory buildings shall be 50%
- Minimum lot area for duplexes shall be 196 square metres
- Minimum lot area for fourplexes shall be 175 square metres

- Amendment 2

The minimum LUB rearyard depth requirements are not met. The proposed depths range between 44% to 65% of the required minimum. The following amendment is recommended.

- Duplex and fourplex rearyard setbacks shall be 4.0 metres minimum.

- Amendment 3

The proposed lot depths range from 23.9 metres to 24.5 metres. This is below the required minimum of 36 metres. The proposed lot depths, range between 66% to 72 % of the required LUB minimums. The following amendment is recommended.

- The minimum lot depth for duplexes and fourplexes shall be 23.96 metres

- Amendment 4

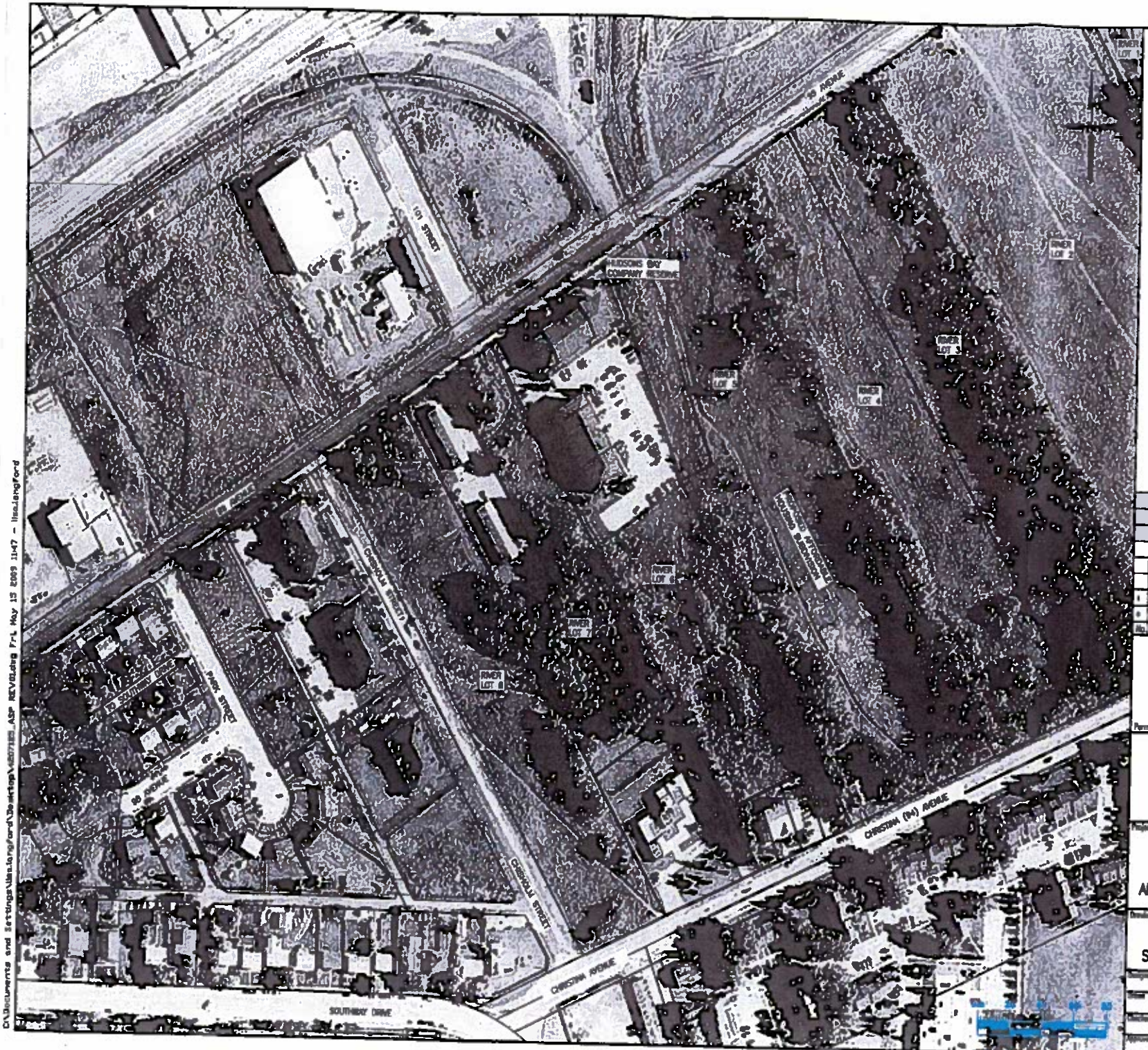
The proposed lot widths are below the LUB requirements. This also affects the minimum side yard requirements. The following amendment is recommended.

- The minimum lot width for duplexes shall be 7.5 metres
- The minimum lot width for fourplexes shall be 6.1 metres.

APPENDIX A

DRAWINGS

4207125-01ASP – SITE PLAN: LOT 1 TO LOT 8
4207125-02ASP – EXISTING LAND ZONING
4207125-03ASP – DEVELOPMENT CONCEPT AND LOT SIZING
4207125-04ASP – PROPOSED SUBDIVISION LAYOUT AND TENTATIVE PHASE PLAN
4207125-05ASP – FUTURE DEVELOPMENT CONCEPT



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Permit | Engineering Stamp

GENIVAR

Project
DOMAIN PROPERTIES INC.
LAC LA BICHE
AFFORDABLE HOUSING SUBDIV.

Drawing
AREA STRUCTURE PLAN
SITE PLAN: LOT 1 TO LOT 8

Designed RT	Scale AS NOTED	Date NOV 2008	
Drawn DJ	Project No. 4207125	Control No.	
Checked RT	Drawing No. 4207125-01	Revision 1	
Approved JB			


99 AVENUE
99 AVENUE
CHRISHOLM STREET
HUDSONS BAY COMPANY RESERVE
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LOT6
LOT6
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LOT7A
LOT7
LOT5
LOT4
LOT3
LOT 2
LOT 1
AFFORDABLE HOUSING SUBDIVISION Multi-Family Development
AFFORDABLE HOUSING SUBDIVISION Urban Reserve
CHRISTINA (94) AVENUE
99 STREET
ZONING LEGEND
URBAN RESERVE
RESIDENTIAL MULTI-FAMILY
INDUSTRIAL
CENTRAL COMMERCIAL
PARK
GENIVAR
DOMAIN PROPERTIES INC.
LAC LA BICHE
AFFORDABLE HOUSING SUBDIV.
AREA STRUCTURE PLAN
EXISTING LAND ZONING
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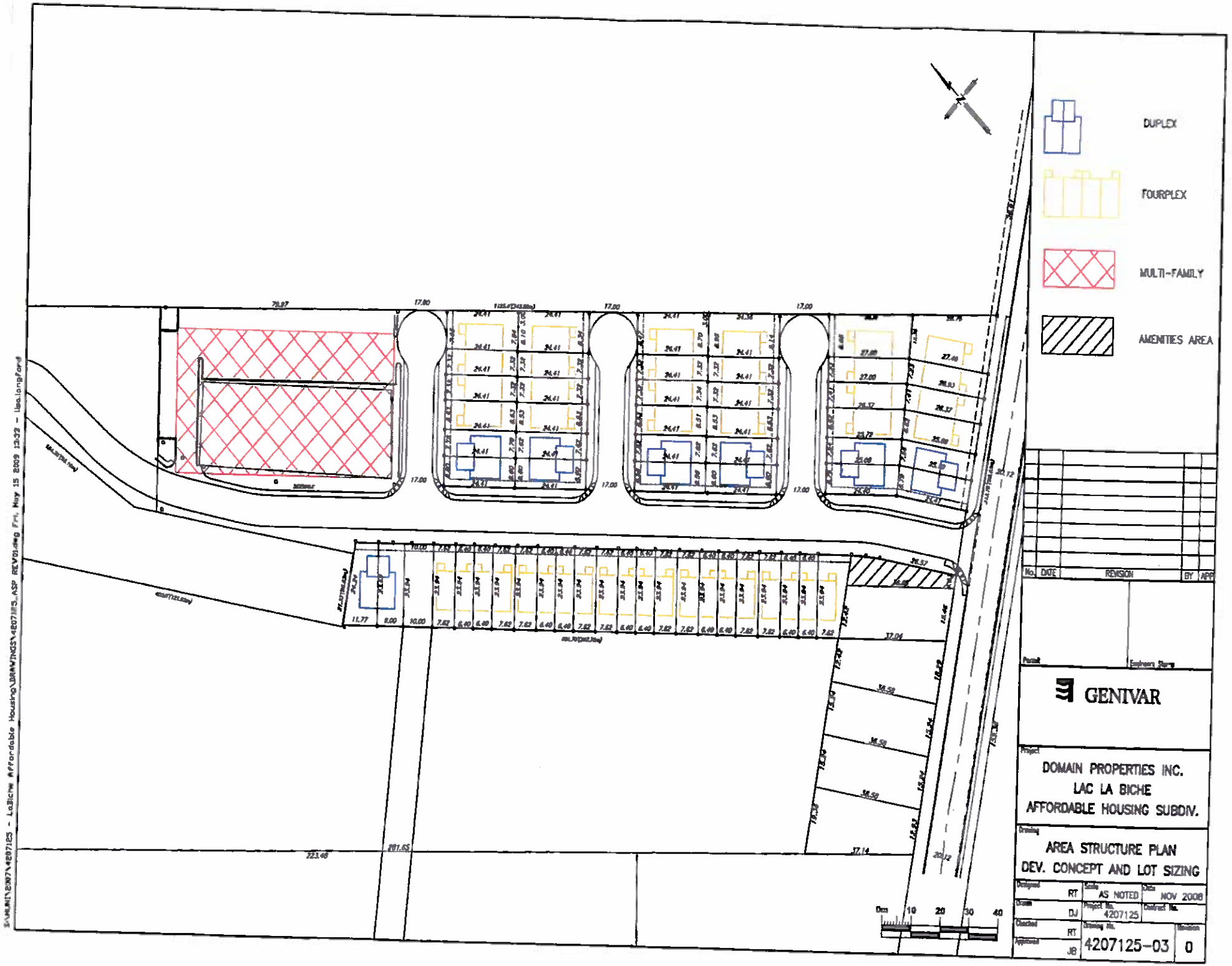
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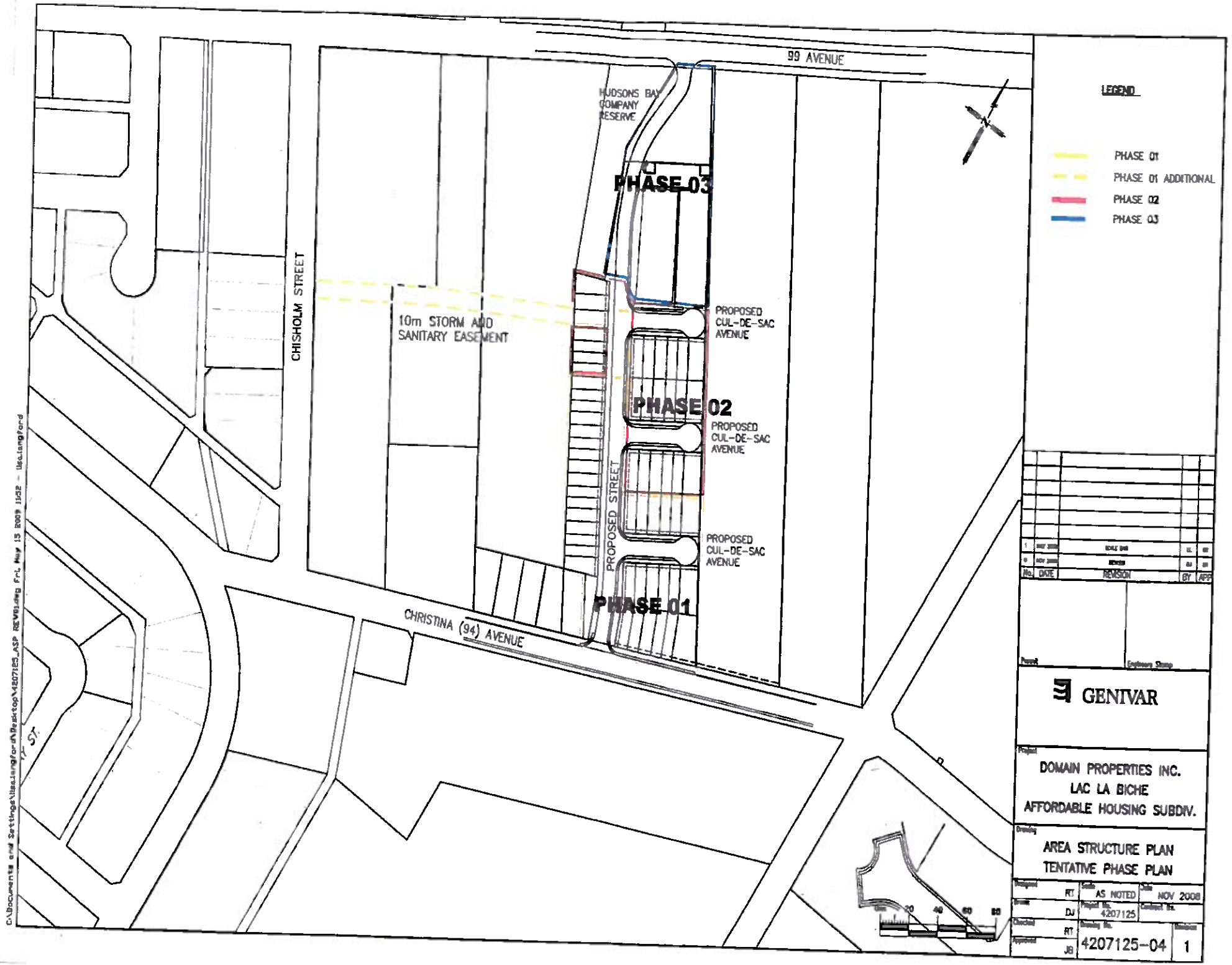
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PROPOSED CUL-DE-SAC AVENUE
PROPOSED STREET
PROPOSED CUL-DE-SAC AVENUE
PHASE 01
CHRISTINA (94) AVENUE
17 ST.
LEGEND
PHASE 01
PHASE 01 ADDITIONAL
PHASE 02
PHASE 03
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AFFORDABLE HOUSING SUBDIV.
AREA STRUCTURE PLAN
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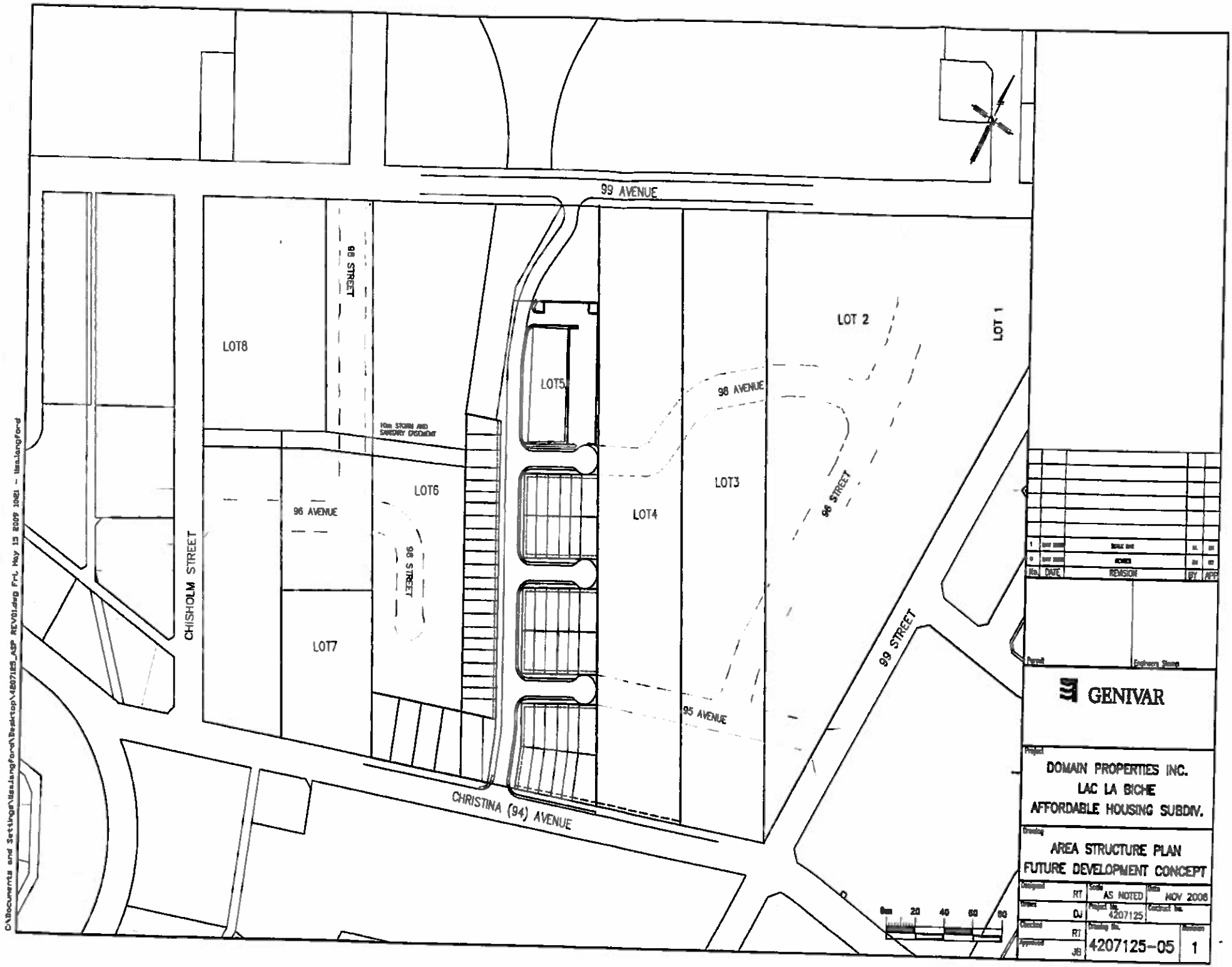
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