

# BELLA FLATS 6-LOT SUBDIVISION

4111 ELMRAN DRIVE  
WEST LINN, OREGON

"AS-BUILT"

THE "AS-BUILT" INFORMATION ON THIS SHEET WAS PROVIDED BY THE CONTRACTOR. CONDITIONS MAY VARY FROM THESE "AS-BUILT" DRAWINGS.

*Don Cushing* 9/2/11  
SIGNED DATE

REVISIONS

- △
- △
- △
- △



RENEWAL DATE 12/31/11

BELLA FLATS SUBDIVISION  
4111 ELMRAN DRIVE  
WEST LINN, OREGON

COVER SHEET

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DATE: 9-14-2011

SCALE: NONE

DRAWN: AKS

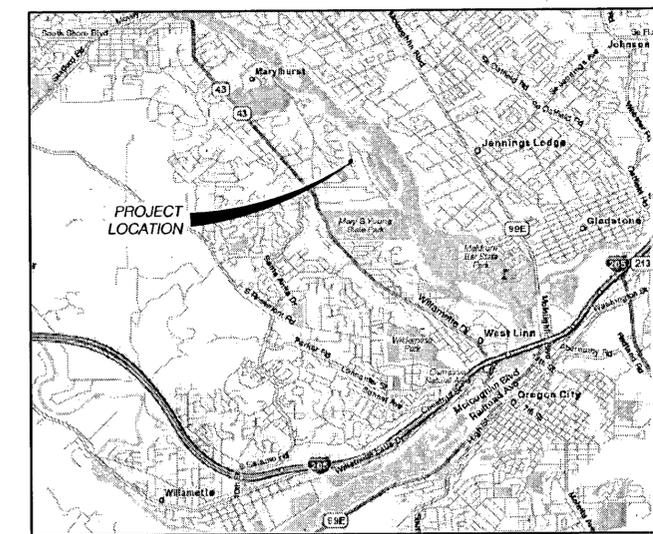
JOB: 06-011

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SHEET

**C1.0**

OF 20



AREA MAP  
N.T.S.

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V1.0	TOPOGRAPHIC SURVEY

**PROJECT LOCATION**

4111 ELMRAN DRIVE  
WEST LINN, OR 97068

**PROPERTY DESCRIPTION:**

"PARTITION PLAT CEDAROK PARK"  
SW ¼ SEC 13, T 2 S, R 1 E, W. M.

**BENCHMARK INFORMATION**

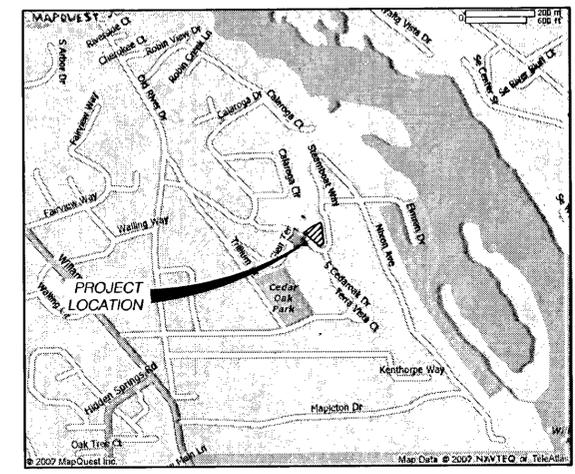
THERE ARE NO AGENCY BENCHMARKS WITHIN 1/2 MILE OF THE SITE. THE VERTICAL DATUM IS NAVD '88 PER THE ONLINE POSITIONING USER SERVICE "OPUS". THE HORIZONTAL DATUM IS ASSUMED.

**APPLICANT/OWNER**

GARRIN ROYER  
REDSIDE DEVELOPMENT  
221 MOLLALA AVENUE SUITE 220  
OREGON CITY, OR 97045

IMPERVIOUS AREAS	
EXISTING	13,806 sf
PROPOSED	22,874 SF

TOTAL SITE AREA = 69,125 sf  
TOTAL SLOPE EASEMENT AND TREE PRESERVATION AREA = 2,851 sf



VICINITY MAP  
N.T.S.

WEST LINN PLANNING COMMISSION  
FINAL DECISION NOTICE  
SUB 07-01

IN THE MATTER OF A PROPOSED SIX-LOT SUBDIVISION ON 1.7 ACRES LOCATED AT 4111 ELMRAN DRIVE

At their meeting of May 10, 2007 the West Linn Planning Commission held a public hearing to consider the request by Canyon Development (Garrin Royer) to approve the development of a six-lot subdivision on 1.7 acres at 4111 Elmrان Drive. The site is located in the Robinwood Neighborhood of West Linn, north of the intersection of Elmrان and Cedarbrook Drives. The approval criteria for the subdivision application are found within Chapter 85 of the West Linn Community Development Code (CDC). The hearing was conducted pursuant to the provisions of CDC Chapter 99.

The hearing commenced with a staff report presented by Gordon Howard. The applicant's presentation was made by Garrin Royer, Matt Haste of Cogan Owens Cogan, and Civil Engineer Don Cushing. Alice Richmond and Tom Baker testified in support of the application. Providing neutral testimony were the representative of the Robinwood Neighborhood Association and Michael Berger. Written testimony was received from Mr. Berger, the Robinwood Neighborhood Association, Gregory Morse, and Anne Morse.

FINDINGS

As the conclusion of the public hearing, the Planning Commission adopted the findings provided by the applicant, as supplemented in the staff report, and made the following additional findings:

A. The Planning Commission determined that the applicant's proposed "green street" design on Upper Elmrان Drive was appropriate. The Planning Commission determined that design of the paved pathway for pedestrians should properly balance the need for a smooth surface to ensure safe access for all individuals with the need to reduce storm runoff from the additional paved surface. The Planning Commission determined that the applicant should provide a paving surface that accommodates both needs, consistent with a reasonable cost.

B. The Planning Commission determined that the prudent approach of city staff in requiring replacement of the asbestos cement water line under Elmrان Drive in association with frontage street improvements was appropriate. The Commission was not presented evidence regarding the proportionality of the applicant's impact to the existing water system, nor specific findings related to the safety issues associated with trying to leave the existing water line in place during road construction. Therefore, the Commission determined that the precise share of the applicant vs. the city's costs of

SUB 07-01 Final Decision 1

replacement needed further city analysis. This could be accomplished by amending the relevant condition of approval to require such analysis.

C. The Planning Commission determined that the staff-proposed condition to repave Lower Elmrان Drive was not proportional to impacts caused by the applicant's proposed subdivision, since none of the proposed lots take access to Lower Elmrان. Therefore, the Commission deleted this proposed condition of approval.

D. The Planning Commission determined that the staff-recommended public stairway down the steep slope between Lots 3 and 4 to Upper Elmrان Drive was unwise because 1) it would result in pedestrians being deposited at the bottom of the stairway along Upper Elmrان at a spot where walking in either direction from the end of the stairway would be on the street and unsafe; and 2) the stairway would require significant grading and creation of retaining walls, resulting in removal of native vegetation, potential erosion issues, and an unsightly placement of large amounts of concrete along the bank.

The proposal of the Robinwood Neighborhood Association, agreed to by the applicant, would extend the pathway from Upper Elmrان around the corner to Lower Elmrان to a terminus near Tree #41 as shown on the site plan. At this point, pedestrians would have a clear view up and down Lower Elmrان, and could continue on the downhill (east) side of the street to Nixon Avenue and the Willamette River. The Commission determined that the applicant's proposed clearing of the existing right of way for the path and, clearing on the property itself for placement of storm drainage facilities, will help to improve site distance for both pedestrians and vehicles at the intersection of Elmrان and Cedarbrook Drives. Additionally, the Planning Commission determined that an additional "clear vision area" twelve feet wide within the subject property was appropriate to maintain additional site distance for pedestrians and vehicles above and beyond clearance of the right of way.

While the Planning Commission acknowledged that there exist significant additional issues with traffic at the intersection of Cedarbrook and Elmrان, the Commission did not believe that requiring this applicant to fix all existing problems at this intersection was justified by the proportionality of the applicant's additional traffic placed upon the existing situation at the intersection. The Commission urged the City Engineering Department to coordinate additional improvements that may be necessary at this intersection with those improvements required of the applicant.

R. The Planning Commission determined that the staff's recommendations regarding trees #5 and #6 were essentially the same as the applicant's proposals for those trees, but amended the staff condition of approval to clarify that the applicant will be permitted to remove those trees if necessary to place an appropriate residential structure on Lot 1, and also if, upon further analysis, those two trees represent a hazard justifying removal. In addition, the Commission accepted testimony that Tree #2, located on the north property line, should be further evaluated at the time of home construction on Lot 1 to determine if it constitutes a hazard and should also be removed.

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F. The Planning Commission determined that the Robinwood Neighborhood Association's request to prohibit construction vehicles from parking in the public street right of way during construction of the project was not appropriate and unenforceable. However, the Commission acknowledged the narrow nature of the streets in the area and the traffic associated with Cedarbrook School to the south, and included a condition of approval requiring the applicant to provide enough space on the site itself during construction to accommodate all vehicles associated with the construction.

DECISION

Based upon the findings discussed above, a motion was made by Commissioner Kovash and seconded by Commissioner Wittenbrink to approve the proposed subdivision with the following conditions of approval.

- The applicant shall construct street improvements to Upper Elmrان Drive as shown on the tentative plan, and in addition shall repave the half-street of Upper Elmrان Drive along the project frontage. The pedestrian pathway shall be constructed with materials that maintain wheelchair accessibility and provide cost-effective reductions in storm runoff.
- The applicant shall replace the existing asbestos cement water line under Upper Elmrان Drive with a new water line built to current city standards as part of the construction activities along the frontage. The applicant's share of the cost shall be determined through a proportionality analysis prepared by the city with the participation of the applicant.
- The applicant shall extend the pedestrian pathway from Upper Elmrان Drive around on Lower Elmrان Drive to the point where the path meets the root zone for Tree #41 as shown on the site plan, at which point the path shall end. The applicant shall also place an easement over that portion of the property within twelve feet of the Elmrان Drive right of way between Tree #41 and Tree #42 as shown on the site plan that restricts all fences, structures, and vegetation to a maximum height of three feet.
- The applicant's final storm drainage plan shall be approved by the City Engineer and be required to meet all requirements of the City's Storm Drainage Detention and treatment requirements. The applicant shall place a public drainage easement on all elements of the proposed storm drainage system. The easement shall also specifically prohibit any landscaping, grading, or structures that would interfere with the storm drainage functions of these areas. The storm drainage facilities in the vicinity of the intersection of Lower Elmrان Drive, Upper Elmrان Drive, and Cedarbrook Drive shall also prohibit any vegetation, grading, or other alterations, that would interfere with clear vision at this intersection (no structures or landscaping or earth berms over three feet in height). The final storm drainage plan shall also include improvements to the existing open channel along the uphill side of Lower Elmrان Drive to slow the velocity of storm flows.

SUB 07-01 Final Decision 3

5. The applicant will be responsible for undergrounding (or free in-line) all utilities along all property frontages.

6. Prior to commencement of any site development or construction work on the site, the applicant shall place anchored chain-link fencing around all trees designated as significant and to be protected, with locations of the fencing to be approved by the City Arborist. The chain link fencing shall remain in place on each individual lot until all construction activities are complete on that lot.

7. Prior to commencement of any site development or construction work on the site, the applicant shall place anchored chain-link fencing around Trees # 5 and #6 as shown on the Tentative Plat, with locations of the fencing to be approved by the City Arborist. The ultimate fate of these trees, and tree # 2 along the property's northern boundary, shall be determined at the time a building permit is issued for this lot, and the trees may be removed if necessary to place a desired residence on Lot 1, or for safety reasons.

8. The private street shown on the final plat shall not be placed into a separate tract, but will be divided among the adjacent lots, and subject to a reciprocal access easement along with a public pedestrian easement.

9. The applicant shall dedicate an open space easement over the area of steeply sloped bank (over 25% slope) along Lower Elmrان Drive. The easement shall prohibit removal of existing trees or vegetation without city arborist approval.

10. As part of public improvement plans, the applicant shall provide an off-street parking area on site during construction activities sufficient to park vehicles associated with project construction on the site, rather than on adjacent streets.

The motion was approved, with three in favor (Kovash, Wittenbrink Bonoff), and one opposed (Babbitt).

SUB 07-01 Final Decision 4

This decision will become effective 14 days from the date of mailing of this final decision as identified below. Those parties with standing (i.e., those individuals who submitted letters into the record, or provided oral or written testimony during the course of the hearing, or signed in on the attendance sheet at the hearing, or who have contacted City Planning staff and made their identities known to staff) may appeal this decision to the West Linn City Council within 14 days of the mailing of this decision pursuant to the provisions of Chapter 99 of the Community Development Code. Such appeals would require a fee of \$400 and a completed appeal application form together with the specific grounds for appeal to the Planning Director prior to the appeal-filing deadline.

*Michael Jones* 5/21/07  
MICHAEL JONES, CHAIR DATE  
WEST LINN PLANNING COMMISSION

Mailed this 23rd day of May, 2007.  
Therefore, this decision becomes final at 5 p.m., June 6, 2007.  
2007.

SUB 07-01 Final Decision 5

CITY PROJECT # PI-07-14  
K/J 0591005.00

FOR CONSTRUCTION



BELLA FLATS SUBDIVISION  
4111 ELMFRAN DRIVE  
WEST LINN, OREGON

COVER SHEET

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DATE: 9-14-2011

SCALE: NONE

DRAWN: AKS

JOB: 06-011

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SHEET

C1.1

WEST LINN PLANNING COMMISSION  
FINAL DECISION NOTICE  
MISC-10-15

APPROVED  
SEP 23 2010

IN THE MATTER OF THE PROPOSAL OF A TWO-YEAR EXTENSION OF APPROVAL  
OF A 6-LOT SUBDIVISION (ORIGINAL FILE SUB-07-01) AT 4111-4125 ELMFRAN  
DRIVE

At their meeting of September 15, 2010, the West Linn Planning Commission held a public hearing to consider the request by Canyon Development to approve a two-year extension of subdivision entitlements for the six lot subdivision originally approved as SUB-07-01, at 4111-4125 Elmfran Drive. This required an Extension permit. The approval criteria for Extensions are found in Section 99.325 of the Community Development Code (CDC). The approval criteria for subdivisions are found in Chapter 85 of the CDC. The provisions for development in the R-10 zone are found in Chapter 11 of the CDC. The hearing was conducted pursuant to the provisions of CDC Chapter 99.

The hearing commenced with a staff report presented by Tom Soppe, Associate Planner. Melynda Retalack of Canyon Development gave the applicant's presentation. Alice Richmond spoke in favor of the application. Michael Berger provided neutral testimony. Greg Morse spoke in opposition to the application. Ms. Retalack provided the applicant's rebuttal.

A motion was made, seconded, and passed to approve the application with one new finding and with staff's conditions of approval with one change to Condition of Approval 4. The additional finding is as follows:

**Additional Finding 1:** CDC Section 11.070(B) requires an accessway within a flaglot stem to be 15 feet wide, so Condition of Approval 4 should require a 15 foot wide driveway in the Lot 3 stem, not a 16 foot wide driveway.

The approved conditions of approval are as follows:

- Site Plan.** With the exception of modifications required by these conditions, the project shall conform to the site plan in Exhibit PC-6, map C2.0, on Page 50, dated June 1, 2010.
- Previous Approval.** Unless modified by these conditions, the project shall conform to the conditions of original approval contained in file SUB-07-01.
- Elmfran Drive Sidewalk.** The proposed sidewalk along Elmfran Drive shall be 6 feet wide for its entire length.

- Lot 3 Driveway Width.** The private street and the Lot 3 driveway stub shall be 15 feet wide for their entire length, to the west end of the stem of Lot 3, per CDC Section 11.070(B).

This decision will become effective 14 days from the date of mailing of this final decision as identified below. Those parties with standing (i.e., those individuals who submitted letters into the record, or provided oral or written testimony during the course of the hearings, or signed in on an attendance sheet or testimony form at either of the hearings, or who have contacted City Planning staff and made their identities known to staff) may appeal this decision to the West Linn City Council within 14 days of the mailing of this decision pursuant to the provisions of Chapter 99 of the Community Development Code. Such appeals would require a fee of \$400 and a completed appeal application form together with the specific grounds for appeal to the Planning Director prior to the appeal-filing deadline.

*Michael Jones* 9/20/2010  
MICHAEL JONES, VICE CHAIR DATE  
WEST LINN PLANNING COMMISSION

Mailed this 21 day of September, 2010.  
Therefore, this decision becomes effective at 5 p.m., October 5, 2010.

C:\Users\Projects\Index\Projects\2010\MISC-10-15\MISC-10-15 Final Decision

"AS-BUILT"

THE "AS-BUILT" INFORMATION ON THIS SHEET WAS PROVIDED BY THE CONTRACTOR. CONDITIONS MAY VARY FROM THESE "AS-BUILT" DRAWINGS.

*Don Cushing* 9/21/11  
SIGNED DATE

## GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO CURRENT CITY OF WEST LINN'S "PUBLIC WORKS DESIGN STANDARDS 2010".

2. DURING CONSTRUCTION, THE CONTRACTOR AND/OR SUB CONTRACTORS SHALL HAVE A MINIMUM OF ONE FULL SIZE SET OF CITY APPROVED PLANS AND SPECIFICATIONS ON THE JOB AT ALL TIMES.

3. ANY REVISIONS MADE TO THESE PLANS MUST BE REVIEWED AND APPROVED BY THE CITY ENGINEER, THE PROJECT ENGINEER AND THE OWNER PRIOR TO ANY IMPLEMENTATION IN THE FIELD.

4. THE CONTRACTOR SHALL HAVE ALL UTILITIES VERIFIED ON THE GROUND PRIOR TO ANY CONSTRUCTION. CALL "ONE CALL LOCATE" AT LEAST 48 HOURS IN ADVANCE. THE OWNER AND THE ENGINEER SHALL BE CONTACTED IMMEDIATELY IF A CONFLICT EXISTS.

5. THE CONTRACTOR SHALL AT ALL TIMES ABIDE BY APPLICABLE SAFETY RULES OF O.S.H.A. AND IN PARTICULAR THOSE PERTAINING TO ADEQUATE SHORING AND TRENCH PROTECTION.

6. THE CONTRACTOR SHALL OBTAIN NECESSARY PERMITS FROM THE CITY OF WEST LINN FOR STREET OPENINGS, WATER, STORM AND SANITARY CONNECTIONS.

7. ANY WORK PERFORMED IN THE PUBLIC RIGHT OF WAY SHALL CONFORM TO THE MOST RECENT CITY OF WEST LINN PUBLIC WORKS SPECIFICATIONS.

8. THE CONTRACTOR SHALL INSTALL AND MAINTAIN ALL REQUIRED EROSION CONTROL MEASURES IN ACCORDANCE WITH THE MOST CURRENT CITY OF WEST LINN STANDARDS EROSION AND SEDIMENTATION STANDARDS.

9. TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND ODOT'S "TRAFFIC PRACTICES HANDBOOK FOR LOCAL ROADS AND STREETS IN OREGON". DURING THE WORK DAY, ONE LANE OF TRAFFIC SHALL BE MAINTAINED AT ALL TIMES. TWO LANES OF TRAFFIC SHALL BE RESTORED AT THE END OF EACH DAY.

10. UTILITY LOCATIONS ARE APPROXIMATE ONLY. EXACT LOCATIONS TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL COORDINATE WORK WITH ALL UTILITY COMPANIES AS REQUIRED TO COMPLETE THE PROJECT.

11. THE EXCAVATION CONTRACTOR SHALL CALL THE OREGON UTILITY NOTIFICATION CENTER AT "811" AT LEAST 48 HOURS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE BEGINNING EXCAVATION. OREGON LAW REQUIRES THAT THE RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090 ARE FOLLOWED. COPIES OF THESE RULES MAY BE OBTAINED THROUGH THE OREGON UTILITY NOTIFICATION CENTER. THE CITY SHALL NOT BE HELD LIABLE FOR IMPROPER OR UNAUTHORIZED INSTALLATIONS.

12. ALL EXISTING ASPHALT CONCRETE PAVEMENT (AC) AND PORTLAND CEMENT CONCRETE SHALL BE SAWCUT AS REQUIRED - NEW IMPROVEMENTS SHALL MATCH EXISTING CONDITIONS AS A MINIMUM. ASPHALT AND CONCRETE SHALL BE INSTALLED PER CITY STANDARDS.

13. ALL DAMAGE CAUSED BY THE CONTRACTOR SHALL BE RESTORED TO AN "AS GOOD OR BETTER" CONDITION AT CONTRACTOR'S EXPENSE AND NO ADDITIONAL COST TO OWNER/DEVELOPER.

14. AFTER COMPLETION OF ALL ITEMS SHOWN ON THESE PLANS AND BEFORE ACCEPTANCE OF THE PROJECT, THE CONTRACTOR SHALL OBTAIN A "PUNCH LIST" PREPARED BY THE ENGINEER DETAILING REMAINING ITEMS OF WORK TO BE COMPLETED. ALL ITEMS OF WORK SHOWN ON THESE PLANS SHALL BE COMPLETED TO THE SATISFACTION OF THE ENGINEER PRIOR TO ACCEPTANCE.

15. ANY STRUCTURE AND/OR OBSTRUCTION, WHICH REQUIRES REMOVAL OR RELOCATION RELATING TO THIS PROJECT, SHALL BE DONE SO AT THE DEVELOPER'S EXPENSE.

16. THE CONTRACTOR SHALL INSTALL, REPLACE, OR RELOCATE ALL SIGNS, AS SHOWN ON THE PLANS.

17. DURING CONSTRUCTION MAINTAIN ACCESS FOR TRUCKS BY PROVIDING STEEL PLATES OVER EXCAVATION.

18. SURVEYOR TO LOCATE R-O-W LINE IN THE FIELD.

19. CONTRACTOR TO REMOVE AND DISPOSE OF ALL EXCESS MATERIALS, EXCAVATED FROM THE SITE AND AREAS OF ORGANIC MATERIAL REMOVALS, IN APPROVED OFF-SITE LOCATION AS NECESSARY FOR COMPLETION OF CONSTRUCTION EFFORTS. REMOVE OVERBURDEN IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.

## GEOTECHNICAL NOTES

1. IN AREAS WHERE STRUCTURES WILL BE CONSTRUCTED, THE TOP LAYER OF NATIVE ORGANIC SILT TOPSOIL WILL BE REMOVED. THE DEPTH VARIES FROM 8 TO 16 INCHES. THE EXPOSED SUBGRADE SHALL BE PROOF-ROLLED TO IDENTIFY AREAS OF EXCESSIVE YIELDING PRIOR TO BACKFILL.

2. ALL COMPACTION SHALL BE DONE PER THE CITY OF WEST LINN PUBLIC WORKS STANDARDS.

3. STRUCTURAL BACKFILL SHOULD BE PLACED IN MAXIMUM 10-INCH-THICK LOOSE LIFT, AND COMPACTED TO NOT LESS THAN 95% OF THE MATERIAL'S MAXIMUM DRY DENSITY, AS DETERMINED IN GENERAL ACCORDANCE WITH ASSHTO-T-180/ASTM D1557.

4. REFER TO GEOTECHNICAL REPORT BY CARLSON GEOTECHNICAL, DATED 25 JULY, 2007, FOR ADDITIONAL REQUIREMENTS.

5. NO STRUCTURE, PAVEMENTS, OR UTILITIES WILL BE ALLOWED WITHIN 20 FEET OF THE TOP OF THE CUT SLOPE ON THE NORTH SIDE OF THE SITE ADJACENT TO ELMRAN DRIVE. THE SITE SHOULD BE GRADED TO DRAIN WATER AWAY FROM THE SLOPE, ALTHOUGH THIS APPEARS IMPRACTICAL BASED ON THE EXISTING TERRAIN.

## SANITARY SEWER NOTES

1. PIPE SHALL BE PVC SEWER PIPE CONFORMING TO ASTM D-3034-SDR 35. MINIMUM STIFFNESS SHALL BE 48 PSI AND JOINT TYPE SHALL BE ELASTOMERIC GASKET CONFORMING TO ASTM D-3212. SEWER PIPE SHALL BE C-900 OR CLASS 50 DUCTILE IRON AT WATER LINE CROSSINGS PER CITY OF WEST LINN STANDARD DRAWING WL-408. GASKETS SHALL CONFORM TO ASTM F-477.

2. MANHOLE BASE SHALL BE POURED IN-PLACE CONCRETE BASE WITH A MINIMUM COMPRESSIVE STRENGTH OF 3,300 PSI PER THE CITY OF WEST LINN PUBLIC WORKS STANDARDS. MANHOLE RISERS AND TOPS SHALL BE PRECAST SECTIONS WITH MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. TOPS SHALL BE ECCENTRIC CONES WHERE INSUFFICIENT HEADROOM REQUIRES FLAT TOPS. INVERTS SHALL BE CONSTRUCTED SO AS TO PROVIDE SMOOTH FLOW-THROUGH CHARACTERISTICS. PVC PIPE SHALL BE CONNECTED TO MANHOLE BY MEANS OF AN ELASTOMERIC GASKET, AN APPROVED WATERSTOP, OR FLEXIBLE SLEEVE. CEMENT GROUT FOR CONNECTING PVC SEWER PIPE TO MANHOLE WILL NOT BE PERMITTED.

3. ALL MANHOLES LOCATED IN EASEMENTS AREAS REQUIRE TAMPER PROOF LIDS. ALL MANHOLE RIMS NOT IN PAVEMENT AREA TO BE SET 12 INCHES ABOVE PROPOSED GRADE.

4. CLEANOUT PIPE, FITTINGS, AND JOINTS SHALL BE THE SAME SPECIFICATIONS AS FOR PIPE. CASTINGS ARE AS SHOWN ON DETAIL AND SHALL CONFORM TO ASTM A48 (GRADE 30).

5. GRANULAR BACKFILL IS TO BE COMPACTED TO 95% MAXIMUM DRY DENSITY PER ASTM D1557 TEST METHOD AND NATIVE MATERIAL SHALL BE COMPACTED TO 85% OF IN-PLACE DRY DENSITY OF SURROUNDING SOIL. COMPACTION SHALL BE TESTED PER AASHTO-T-180/ASTM D1557 AS STATED IN THE GEOTECHNICAL REPORT.

6. PVC SERVICE LATERALS SHALL BE 4" PIPE CONFORMING TO THE SAME SPECIFICATIONS AS THE SEWER MAINS, STAKED AND CAPPED PER CITY OF WEST LINN STANDARDS. SERVICE LATERALS SHALL BE INSTALLED TO A POINT BEYOND THE LINE OF THE SEWER OR UTILITY EASEMENT AS SHOWN ON THE PLAN. THE SERVICE LATERAL SHALL BE PLUGGED WITH A 4" RUBBER RING PLUG, AND THE LOCATION OF THE LATERALS END MARKED WITH A 2"x4" STAKE.

7. ALL SANITARY TESTING SHALL BE DONE PER THE CITY OF WEST LINN PUBLIC WORKS STANDARDS.

8. ALL MATERIALS, INSTALLATION, TESTS, AND INSPECTIONS TO BE MADE IN STRICT ACCORDANCE WITH THE CITY OF WEST LINN STANDARDS AND WITH APWA'S STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION. IF CONFLICT THE STRICTER SHALL APPLY.

9. SANITARY SEWER LINES CROSSING LESS THAN 12 INCHES BELOW A STORM DRAIN SHALL BE CONSTRUCTED WITH DUCTILE IRON PIPE.

## GRADING AND PAVING NOTES

1. THE CITY WILL INSPECT IMMEDIATELY FOLLOWING FINE GRADING OPERATIONS. PROOF ROLL SUBGRADE AREAS TO ACHIEVE 90% OF MAXIMUM DENSITY FOR A 6" DEPTH PER ASTM D-1557 TEST METHOD. EMBANKMENTS OR FILLS ARE TO BE CONSTRUCTED IN 6" MAXIMUM LIFTS, WITH EACH LIFT BEING COMPACTED TO 95% MAXIMUM OF DENSITY PRIOR TO PROCEEDING WITH THE NEXT LIFT. AREAS RECEIVING STRUCTURAL FILL ARE TO BE TESTED BY AN INDEPENDENT TESTING LAB. FILL PLACED IN LANDSCAPE AREAS SHOULD BE COMPACTED TO 90% OF ASTM D-1557. PROOF ROLL WITH 10CY TRUCK LOADED WITH ROCK.

2. INSPECTION OF SUBGRADE, BASEROCK, AND A.C. WILL BE MADE BY AN INDEPENDENT TESTING LAB AND REPORT FINDINGS TO OWNER AND CITY. SUBMIT TEST RESULTS TO THE CITY. CITY STAFF MUST BE PRESENT FOR SUBGRADE AND BASEROCK PROOF ROLLS IN ADDITION TO ASPHALT PLACEMENT.

3. ALL MATERIALS, INSTALLATION, TEST, AND INSPECTIONS ARE TO BE IN STRICT ACCORDANCE WITH THE CITY OF WEST LINN PUBLIC WORKS STANDARDS.

4. ASPHALT CONCRETE TO BE CLASS "C" A.C. INSTALLED IN 2 LIFTS PER CITY OF WEST LINN SPECIFICATIONS. CONTRACTOR IS TO PROVIDE THE OWNER WITH A CERTIFICATE OF COMPLIANCE FROM THE ASPHALT PAVEMENT PLANT. PAVE ONLY DURING DRY WEATHER AND WHEN THE TEMPERATURE IS WITHIN LIMITS SET BY CITY STANDARDS. THE PAVING SECTION SHALL BE PER CITY STANDARDS.

- LOCAL STREETS - 4" OF ASPHALTIC CONCRETE, CONSISTING OF 2" OF CLASS C OVER 2" OF CLASS C, WITH 12" ROCK BASE.
- NEIGHBORHOOD ROUTES - 4" OF ASPHALTIC CONCRETE, CONSISTING OF 2" OF CLASS C OVER 2" OF CLASS C, WITH 12" ROCK BASE.
- COLLECTORS - 5" OF ASPHALTIC CONCRETE, CONSISTING OF TWO 1 1/2" LIFTS OF CLASS C OVER 2" OF CLASS C, WITH 14" ROCK BASE.
- ARTERIAL - 6" OF ASPHALTIC CONCRETE, CONSISTING OF 2" OF CLASS C OVER 4" OF CLASS C IN TWO LIFTS, WITH 14" ROCK BASE.
- EACH LIFT SHALL BE TESTED, APPROVED AND ACCEPTED PRIOR TO THE NEXT ONE BEING PLACED OVER.
- ROCK BASE SHALL CONSIST OF REQUIRED AMOUNT OF 1 1/2"-0 CRUSHED ROCK AND 2" OF 3/4"-0 LEVELING COURSE.

5. AGGREGATE BASE ROCK SHALL BE 1 1/2"-0 CRUSHED ROCK WITH A LEVEL COURSE OF 3/4"-0 CRUSHED ROCK. AGGREGATE BASE IS TO BE COMPACTED IN 6" MAXIMUM LIFTS TO 95% OF MAXIMUM DRY DENSITY PER ASTM D-1557.

6. IF GRADING CONFLICTS BETWEEN EXISTING PAVEMENT AND NEW PAVEMENT ARISE, ENGINEER IS TO BE NOTIFIED. CONTRACTOR TO ENSURE POSITIVE DRAINAGE IN ALL PAVEMENT AREAS.

7. ALL ORGANIC MATERIAL TO BE STRIPPED TO A MINIMUM OF 12" AND PRIOR TO PLACEMENT OF BASEROCK. REMOVE OVERBURDEN IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.

8. ALL COMPACTION SHALL BE DONE PER THE CITY OF WEST LINN PUBLIC WORK STANDARDS.

9. CONCRETE TO BE MINIMUM 3300 PSI STRENGTH IN 28 DAYS UNLESS OTHERWISE SPECIFIED.

10. STRUCTURES, PAVEMENTS AND UTILITIES WILL NOT BE ALLOWED WITHIN 20 FEET OF TOP OF CUT SLOPE ON THE NORTH SIDE OF THE SITE ADJACENT TO ELMRAN DRIVE.

## EROSION CONTROL NOTES

1. OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

2. THE IMPLEMENTATION OF THESE ESC PLANS AND CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED BY THE LOCAL JURISDICTION, AND VEGETATION/LANDSCAPING IS ESTABLISHED.

3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

4. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

5. THE ESC FACILITIES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DOES NOT LEAVE THE SITE.

6. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

7. AT NO TIME SHALL SEDIMENT BE ALLOWED TO ACCUMULATE MORE THAN 1/3 THE BARRIER HEIGHT. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATIONS SHALL NOT FLUSH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM SYSTEM.

8. STABILIZED ROCK CONSTRUCTION ENTRANCES SHALL BE INSTALLED PER DETAIL AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT.

9. STORM DRAIN INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED. PAVEMENT SURFACES AND VEGETATION ARE TO BE PLACED AS RAPIDLY AS POSSIBLE.

10. SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1 FOR EACH PHASE OF CONSTRUCTION. SEEDING SHALL TAKE PLACE NO EARLIER THAN APRIL 1 AND NO LATER THAN SEPTEMBER 1.

11. IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY ESTABLISHED FROM OCTOBER 1ST THROUGH APRIL 30TH, THE WET WEATHER EROSION PREVENTION MEASURES WILL BE IN EFFECT. SEE THE CURRENT CITY OF WEST LINN'S CURRENT EROSION AND SEDIMENTATION CONTROL STANDARDS FOR ADDITIONAL WET WEATHER MEASURES.

12. THE DEVELOPER SHALL REMOVE ESC MEASURES WHEN VEGETATION IS FULLY ESTABLISHED.

13. REFER TO SECTION 206 FOR CITY OF WEST LINN SURFACE RESTORATION REQUIREMENTS. USE HOBBS & HOPKINS COMPANION MIX FOR THE GRASS SEED MIXTURE.

## WATER NOTES

1. WATER MAINS SHALL CONFORM TO CITY OF WEST LINN SPECIFICATIONS. PIPE MATERIAL IS TO BE DI CLASS 52. JOINTS ARE TO BE PUSH-ON JOINT. PIPE FITTINGS ARE TO BE OF THE SAME MATERIAL AND CLASS AS PIPE AND OF DOMESTIC ORIGIN.

2. WATER MAINS TO HAVE A MINIMUM COVER OF 36".

3. RESTRAINING JOINTS SHALL BE USED (MEGALUG OR EQUIVALENT) AT ALL CHANGES IN DIRECTION AND BRANCHES. FIELD LOK GASKETS SHALL BE USED IN ADDITION TO MEGALUG FOR DISTANCES AS CALCULATED AND SPECIFIED.

4. GATE VALVES SHALL BE A RESILIENT SEAT, NON RISING STEM WITH "O" RING PACKAGE COMPLYING WITH AWWA CLASS C SPECIFICATIONS. BUTTERFLY VALVES SHALL BE CLASS 150 B SHORT BODY TYPE IN CONFORMANCE WITH AWWA C504. VALVE BOXES SHALL BE VANCOUVER STYLE NO. 910 SEE WL-411 & 412.

5. CHECK WITH THE CITY OF WEST LINN AS TO ALLOWABLE MAKES OF FIRE HYDRANTS. PUMPER OUTLET IS TO FACE THE DIRECTION OF ACCESS. FIRE HYDRANTS ARE TO BE INSTALLED PER CITY OF WEST LINN STANDARDS.

6. GRANULAR BACKFILL IS TO BE COMPACTED TO 95% MAXIMUM DRY DENSITY PER AASHTO T-180 TEST METHOD AND NATIVE MATERIAL SHALL BE COMPACTED TO 85% OF IN-PLACE DRY DENSITY OF SURROUNDING SOIL. BACKFILL IN R.O.W. SHALL BE IN ACCORDANCE WITH CLASS "B" BACKFILL AS INDICATED ON THE DETAIL SHEET OF THE PLANS.

7. SERVICE LATERALS SHALL BE TYPE K. LATERAL SIZE SHALL BE 1" IN PUBLIC R.O.W. CORPORATION STOPS SHALL BE FORD OR APPROVED EQUAL. CORP STOP SHALL BE 1" FORD METER STOP. USE SCH. 40 PVC FROM METER TO THE HOME. METER BOXES SHALL BE EQUAL TO BROOKS #31. METER BOXES ARE TO BE INSTALLED 1" ABOVE FINISH GRADE.

8. ALL WATERLINES WILL BE PRESSURE TESTED AND PURIFICATION TESTED BEFORE CONNECTION TO THE CITY WATER SYSTEM.

9. CHLORINATION IS TO BE DONE IN ACCORDANCE TO SPECIFICATION OF THE CITY OF WEST LINN AND STANDARDS. STANDARD INCLUDES FLUSHING THE WATER LINES PRIOR TO CHLORINATION, ACCEPTABLE METHODS OF CHLORINATION (ADDING CHLORINE TABLETS AT JOINT ENDS IS NOT AN ACCEPTABLE METHOD), RETENTION PERIOD, AND FINAL FLUSHING REQUIREMENTS.

10. ALL MATERIALS, INSTALLATION, TESTS, AND CHLORINATION TO BE IN STRICT ACCORDANCE WITH THE STANDARDS AND CODES OF THE CITY OF WEST LINN AND THE OREGON STATE HEALTH DIVISION ADMINISTRATION RULES, CHAPTER 333. DISPOSE OF CHLORINATED TEST WATER PER OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY'S REQUIREMENTS.

## STORM WATER NOTES I

### 601.02.01 GENERAL

1. USE ALL STORM SEWER PIPE AND FITTINGS OF THE SIZE, STRENGTH, MATERIAL AND JOINT TYPE SPECIFIED ON THE DRAWINGS AND/OR THE PROPOSAL. USE JOINTING MATERIAL AS HERINAFTER SPECIFIED FOR EACH PIPE MATERIAL. EACH PIECE OF PIPE SHALL BE CLEARLY IDENTIFIED AS TO STRENGTH, CLASS AND DATE OF MANUFACTURE. THE MANUFACTURER OR FABRICATOR SHALL FURNISH APPROPRIATE CERTIFICATION, BASED ON MANUFACTURER'S ROUTINE QUALITY CONTROL TESTS, THAT THE MATERIALS IN THE PIPE AND FITTINGS MEET THE REQUIREMENTS SPECIFIED HEREIN. STRENGTH, PERMEABILITY, HYDROSTATIC TESTS AND PIPE JOINTS WILL BE USED AS THE BASIS OF ACCEPTANCE AS DESCRIBED UNDER PROOF TESTS HEREIN. MINIMUM LENGTH OF PIPE SHALL BE 3.5 FEET.

IT IS NOT INTENDED THAT MATERIALS LISTED HEREIN ARE TO BE CONSIDERED EQUAL OR GENERALLY INTER CHANGEABLE FOR ALL APPLICATIONS. THE DESIGN ENGINEER SHALL DETERMINE THE MATERIALS SUITABLE FOR THE PROJECT AND SO SPECIFY.

USE PIPE AND FITTINGS OF ONE TYPE OF MATERIAL THROUGHOUT; NO INTERCHANGING OF PIPE AND FITTINGS WILL BE ALLOWED. ALL PIPES SHALL BE RUBBER GASKETED.

DO NOT COAT PIPES FOR STORM SEWERS INTERNALLY OR EXTERNALLY WITH ANY SUBSTANCE OF ANY TYPE IN AN ATTEMPT TO IMPROVE ITS PERFORMANCE WHEN AIR TESTED.

### 601.02.03 DUCTILE IRON PIPE

2. DUCTILE IRON PIPE CENTRIFUGALLY CAST OF 60\_42\_10 IRON SHALL CONFORM TO ANSI A21.51 CLASS 150 OR AWWA C151, WITH PUSH-ON JOINT OR MECHANICAL JOINTS AS SPECIFIED, CONFORMING TO ANSI SPECIFICATION A21.1/AWWA C111. DUCTILE IRON PIPE SHALL BE LINED WITH CEMENT MORTAR AND SEAL COATED IN ACCORDANCE WITH ANSI STANDARD A21.4/AWWA C104.

### 601.02.07 FLARED END SECTIONS

3. PRECAST CONCRETE FLARED END SECTIONS SHALL CONFORM TO THE REQUIREMENTS FOR REINFORCED CONCRETE PIPE HEREIN SPECIFIED. THE AREA OF STEEL REINFORCEMENT PER LINEAR FOOT OF FLARED END SECTION SHALL BE AT LEAST EQUAL TO THE MINIMUM STEEL REQUIREMENTS FOR CIRCULAR REINFORCEMENT IN CIRCULAR PIPE FOR THE INTERNAL DIAMETER OF THE CIRCULAR PORTION OF THE FLARED END SECTION. SUBMIT ALL DETAILS OF CONSTRUCTION TO THE CITY ENGINEER.

### 601.03.12 TELEVISION INSPECTION OF STORM DRAINS

4. UPON COMPLETION OF ALL STORM DRAIN CONSTRUCTION, REPAIRS, CLEANING, AND REQUIRED TESTS, NOTIFY THE CITY ENGINEER THAT ALL LINES ARE READY FOR TELEVISION INSPECTION.

ALL TESTS TO BE DONE PER THE CITY OF WEST LINN PUBLIC WORKS STANDARDS.

BEFORE RELEASE OF THE MAINTENANCE OR WARRANTY BOND, THE CITY ENGINEER MAY REQUIRE TELEVISION INSPECTION OF THE PIPING AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL CORRECT ALL DEFICIENCIES FOUND BY THIS INSPECTION.

WHEN PERFORMING TELEVISION INSPECTIONS, WATER SHALL BE ADDED, TRACING DYE AND A ONE-INCH MEASURING BALL SHALL BE UTILIZED.

### 601.03.13 SUBSEQUENT FAILURE

5. NO INFILTRATION OF GROUND WATER IN THE SYSTEM IS ALLOWED. NO STANDING WATER GREATER THAN 1/4" IS ALLOWED.

### 603.03.01 EXCAVATION AND BACKFILL

6. CONFORM TO REQUIREMENTS OF SECTION 204 EXCAVATION, EMBANKMENT, BEDDING AND BACKFILL. ALL EXCAVATION SHALL BE UNCLASSIFIED.

7. CONSTRUCT MANHOLES OVER EXISTING OPERATING STORM SEWERS AT LOCATIONS SHOWN. PERFORM NECESSARY EXCAVATION AND CONSTRUCT NEW MANHOLES IN CONFORMANCE WITH APPLICABLE REQUIREMENTS OF SECTION 302 MANHOLES AND CONCRETE STRUCTURES.

8. CONSTRUCT MANHOLES AS SHOWN ON THE DETAIL DRAWINGS OR STANDARD DRAWINGS. DENSIFY THE CONCRETE BASE BY VIBRATING OR WORKING AS APPROVED AND SCREED TO PROVIDE A LEVEL, UNIFORM BEARING FOR PRECAST SECTIONS.

## STORM WATER NOTES II

PLACE THE FIRST PRECAST SECTION OF MANHOLE IN CONCRETE BASE BEFORE CONCRETE HAS SET AND DEPOSIT SUFFICIENT MORTAR ON THE BASE TO ASSURE A WATERTIGHT SEAL BETWEEN THE BASE AND THE MANHOLE WALL. FIRST SECTION SHALL BE PROPERLY LOCATED AND PLUMB. STACKING ADDITIONAL PRECAST MANHOLE SECTIONS SHALL BE PROHIBITED UNTIL THE CONCRETE HAS CURED A SUFFICIENT AMOUNT TO SUPPORT THE ADDITIONAL WEIGHT IN MOST CONDITIONS.

PREVENT BROKEN MATERIAL OR DEBRIS FROM ENTERING STORM SEWER. MAINTAIN FLOW THROUGH APPROVED LINES AT ALL TIMES. PROTECT NEW CONCRETE AND MORTAR FOR A PERIOD OF 7 DAYS AFTER PLACING.

### 603.03.03 CONNECTION TO EXISTING MANHOLES, INLETS AND CONCRETE STRUCTURES

13. PROVIDE ALL DIVERSION FACILITIES AND PERFORM ALL WORK NECESSARY TO MAINTAIN FLOW IN EXISTING LINES DURING CONNECTION. MANHOLE CONNECTIONS SHALL BE DONE BY CORE DRILLING ONLY. GROUT IN NEW PIPE TO PROVIDE WATERTIGHT SEAL, AND WHEN APPLICABLE, SMOOTH FLOW INTO AND THROUGH EXISTING MANHOLE AS SPECIFIED IN SUBSECTION 603.03.09 RECONSTRUCT MANHOLE BASE.

### 603.03.08 ADJUST EXISTING STRUCTURES TO GRADE

14. EXISTING MANHOLES, INLETS, CATCH BASINS AND SIMILAR STRUCTURES SHALL BE BROUGHT TO THE SPECIFIED FINISHED GRADE BY METHODS OF CONSTRUCTION AS REQUIRED IN SECTION 511 ADJUSTMENT OF EXISTING STRUCTURES TO GRADE.

### 603.03.09 RECONSTRUCT MANHOLE BASE

15. CONFORM TO APPLICABLE REQUIREMENTS OF SECTION 302 MANHOLES AND CONCRETE STRUCTURES. EXERCISE CAUTION IN CHIPPING OUT EXISTING CONCRETE BASE SO AS TO PREVENT CRACKING OF MANHOLE WALLS. PREVENT ALL MATERIAL FROM ENTERING THE FLOW. POUR NEW BASE TO A MINIMUM OF SIX INCHES BELOW THE LOWEST PROJECTION OF THE PIPE. CONSTRUCT NEW CHANNELS TO THE ELEVATIONS SHOWN. CONFORM TO DETAILS FOR CHANNEL CONSTRUCTION IN THE STANDARD DRAWINGS. REPAIR ANY CRACKS WHICH OCCUR AS A RESULT OF WORK OPERATIONS WITH NEW GROUT TO FORM A WATERTIGHT SEAL.

### MISCELLANEOUS

16. MODIFIED FLOW-THROUGH PLANTER BOXES AND ASSOCIATED PIPING ARE PRIVATE.

17. PLANTER BOX DETENTION TESTING WILL BE CONDUCTED PER CITY STANDARDS, SECTION 2.0048.

## SIGN NOTES

1. JACKSON COURT IS A 16-FOOT WIDE ROADWAY, WHERE FIRE APPARATUS ROADWAYS ARE NOT OF SUFFICIENT WIDTH TO ACCOMMODATE PARKED VEHICLES AND 20 FEET OF UNOBSTRUCTED DRIVING SURFACE. "NO PARKING" SIGNS SHALL BE INSTALLED ON ONE OR BOTH SIDES OF THE ROADWAY AND IN TURNAROUNDS AS NEEDED. ROADS 20 FEET WIDE OR LESS SHALL BE POSTED ON BOTH SIDES AS A FIRE LANE. ROADS MORE THAN 28 FEET TO 32 FEET WIDE SHALL BE POSTED ON ONE SIDE AS A FIRELANE. SIGNS SHALL READ "NO PARKING - FIRE LANE" AND SHALL BE INSTALLED WITH A CLEAR SPACE ABOVE GRADE LEVEL OF 7 FEET. SIGNS SHALL BE 12 INCHES WIDE BY 18 INCHES HIGH AND SHALL HAVE RED LETTERS ON A WHITE REFLECTIVE BACKGROUND.

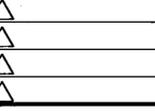
## FIRE NOTES

1. FIRE HYDRANT LOCATIONS SHALL BE IDENTIFIED BY INSTALLATION OF REFLECTIVE MARKERS. THE MARKERS SHALL BE BLUE. THEY SHALL BE LOCATED ADJACENT AND TO THE SIDE OF THE CENTER LINE OF THE ACCESS ROADWAY THAT THE FIRE HYDRANT IS LOCATED ON. IF THERE IS NO CENTER LINE, THEN ASSUME A CENTER LINE AND PLACE REFLECTORS ACCORDINGLY.

2. APPROVED FIRE APPARATUS ACCESS ROADWAYS AND FIREFIGHTING WATER SUPPLIES SHALL BE INSTALLED AND OPERATIONAL PRIOR TO ANY COMBUSTIBLE CONSTRUCTION AND STORAGE OF COMBUSTIBLE MATERIALS ON THE SITE.

3. NFPA 13 ATOMATIC FIRE PROTECTION SPRINKLER SYSTEMS WILL BE INSTALLED FOR LOTS 1,2,3, AND 4. LOTS 5 AND 6 HAVE ACCESS OFF OF UPPER ELMRAN DR. AND WILL NOT BE REQUIRED TO BE SPRINKLED.

REVISIONS



BELLA FLATS SUBDIVISION  
4th ELMRAN DRIVE  
WEST LINN, OREGON

GENERAL NOTES



Don Cushing Associates  
Civil Engineers  
4677 SE Pinchurst Ave  
Suite 201  
Milwaukie, OR 97267  
Voice: (503) 387-5331  
Fax: (360) 286-2164

DATE: 9-14-2011

SCALE: NONE

DRAWN: JEG

JOB: 08-011

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SHEET

C1.2

FOR CONSTRUCTION OF 20



RENEWAL DATE 12/31/11

BELLA FLATS SUBDIVISION  
4111 ELMRAN DRIVE  
WEST LINN, OREGON

DEMOLITION AND  
TREE REMOVAL PLAN



Don Cushing Associates  
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4677 SE Pinchurst Ave  
Suite 201  
Milwaukie, OR 97267  
Voice: (503) 387-5331  
Fax: (360) 286-2164

DATE: 9-14-2011

SCALE: 1" = 20'

DRAWN: JEG

JOB: 08-011

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SHEET

C1.3

#	DBH	Species	#	DBH	Species	Common Name	Code	Scientific Name
1	13	SS	26	7	BLM	Bigleaf Maple	BLM	Acer macrophyllum
2	45	WRC	27	9	BLM	Western Red Cedar	WRC	Thuja plicata
3	34	WRC	28	6	BLM	Sitka spruce	SS	Picea sitchensis
4	34	WRC	29	11	BLM	Engelmann spruce	ES	Picea engelmannii glauca
5	35	WRC	30	6	BLM	Magnolia	M	Magnolia cordata
6	38	WRC	31	8	BLM	Holly	HO	Ilex aquifolium
7	24	SP	32	8	BLM	Ginkgo biloba	G	Ginkgo biloba
8	15	SS	33	8	BLM	Deodar cedar	DC	Cedrus deodara
9	9	HO	34	7	BLM	Oregon Ash	OA	Fraxinus latifolia
10	14	SS	35	10	BLM	Oregon White oak	OWO	Quercus garyana
11	7	WL	36	9	BLM	Douglas Fir	DF	Pseudotsuga menziesii
12	7	DW	37	8	BLM	Hawthorn	H	Crataegus monogyna
13	14	SS	38	32	BLM	California hazelnut	HZ	Corylus cornuta
14	20	NF	39	10	ES	White birch	WB	Betula populifolia
15	7	DC	40	38	BLM	English Ivy	EI	Hedera helix
16	7	DC	41	38	WRC	Serviceberry	SB	Amelanchier alnifolia
17	8	M	42	40	BLM	Poison oak	PO	Rhus diversiloba
18	12	G	43	9	SP	Willow	W	Salix lasiandra
19	39	DC	44	10	DF	Cherry	CH	Prunus species
20	13	ES	45	31	WRC	Mountain Ash	MA	Sorbus aucuparia
21	13	SP	46	46	DF	Horse Chestnut	HC	Esculus Hippocastanum
22	38	DC	47	32	BLM	Elderberry	EB	Sambucus glauca
23	13	G	48	47	BLM	Noble Fir	NF	Abies procera
24	6	WRC	49	8	HO	Scotch Broom	P	Cytisus scoparius
25	8	WRC						

NOTE: PER ARBORIST REPORT DATED 12/29/08, TREE #35 WITHIN THE TREE PRESERVATION AREA IS MARKED AS BEING IN POOR CONDITION AND IS RECOMMENDED FOR REMOVAL. CITY ARBORIST TO DETERMINE WHETHER OR NOT TREE SHOULD BE REMOVED.

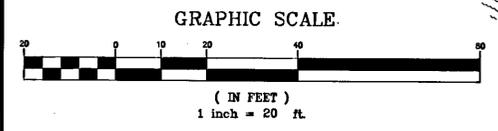
R10

DAVID D. HUNTER ASCA REGISTERED CONSULTING ARBORIST #408 ISA CERTIFIED ARBORIST #PN-1068 A PINW ISA CERTIFIED TREE RISK ASSESSOR #0150 PROFESSIONAL FORESTER PO BOX 324 FOREST GROVE, OR 97116 OFFICE: 503-357-4344 CELL: 503-319-0390 FAX: 503-992-0169 EMAIL: DDHUNTERARBORIST@AOL.COM

LEGEND

- TREES TO REMOVE
- TREES TO SAVE
- R10 ZONE
- TREE CANOPY
- TREE PROTECTION ZONE
- BUILDING REMOVAL
- BUILDING TO REMOVE
- PAVEMENT REMOVAL

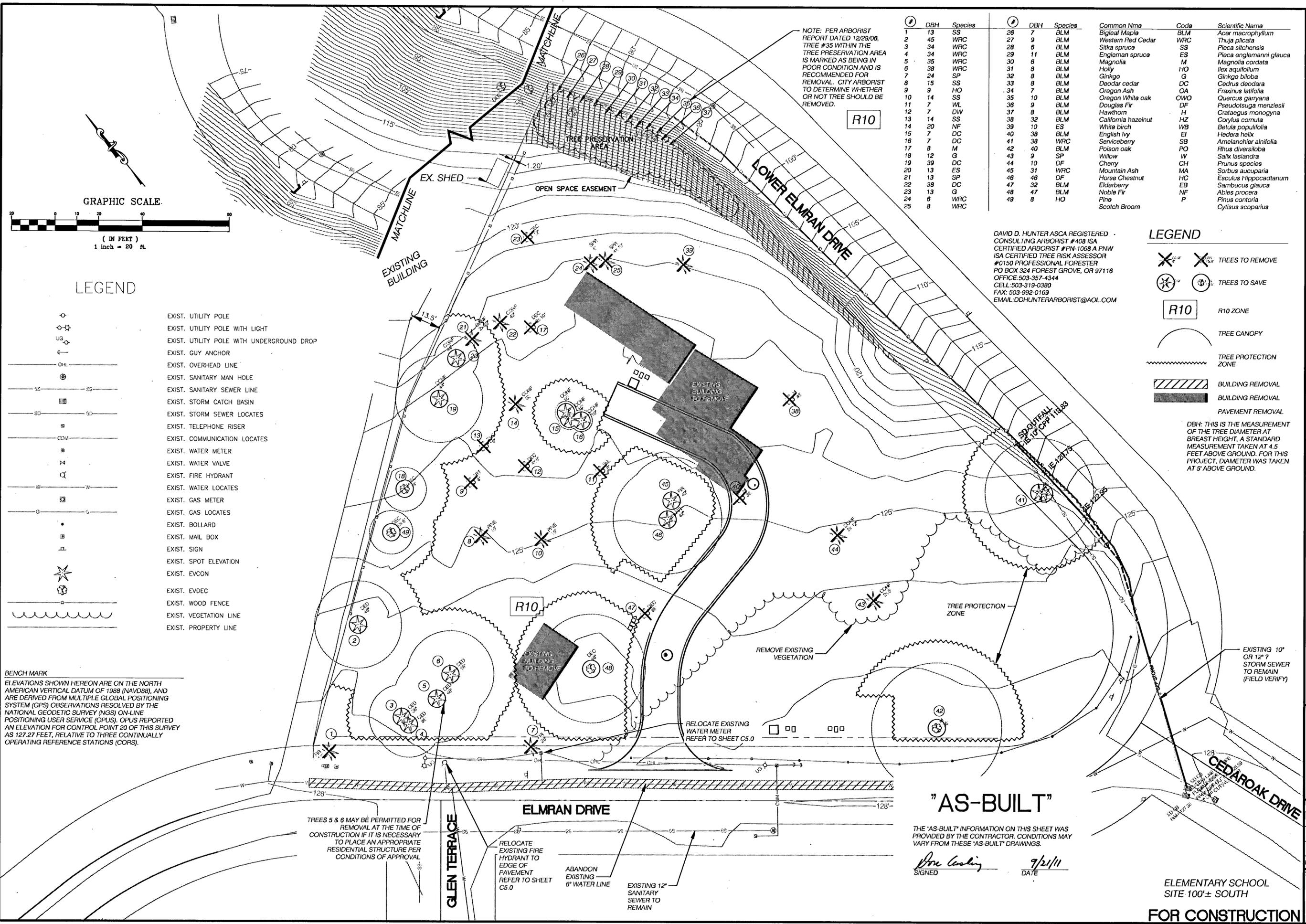
DBH: THIS IS THE MEASUREMENT OF THE TREE DIAMETER AT BREAST HEIGHT, A STANDARD MEASUREMENT TAKEN AT 4.5 FEET ABOVE GROUND. FOR THIS PROJECT, DIAMETER WAS TAKEN AT 5' ABOVE GROUND.



LEGEND

- EXIST. UTILITY POLE
- EXIST. UTILITY POLE WITH LIGHT
- EXIST. UTILITY POLE WITH UNDERGROUND DROP
- EXIST. GUY ANCHOR
- EXIST. OVERHEAD LINE
- EXIST. SANITARY MAN HOLE
- EXIST. SANITARY SEWER LINE
- EXIST. STORM CATCH BASIN
- EXIST. STORM SEWER LOCATES
- EXIST. TELEPHONE RISER
- EXIST. COMMUNICATION LOCATES
- EXIST. WATER METER
- EXIST. WATER VALVE
- EXIST. FIRE HYDRANT
- EXIST. WATER LOCATES
- EXIST. GAS METER
- EXIST. GAS LOCATES
- EXIST. BOLLARD
- EXIST. MAIL BOX
- EXIST. SIGN
- EXIST. SPOT ELEVATION
- EXIST. EVCON
- EXIST. EVDEC
- EXIST. WOOD FENCE
- EXIST. VEGETATION LINE
- EXIST. PROPERTY LINE

BENCH MARK  
ELEVATIONS SHOWN HEREON ARE ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), AND ARE DERIVED FROM MULTIPLE GLOBAL POSITIONING SYSTEM (GPS) OBSERVATIONS RESOLVED BY THE NATIONAL GEODETIC SURVEY (NGS) ON-LINE POSITIONING USER SERVICE (OPUS). OPUS REPORTED AN ELEVATION FOR CONTROL POINT 20 OF THIS SURVEY AS 127.27 FEET, RELATIVE TO THREE CONTINUALLY OPERATING REFERENCE STATIONS (CORS).



"AS-BUILT"

THE "AS-BUILT" INFORMATION ON THIS SHEET WAS PROVIDED BY THE CONTRACTOR. CONDITIONS MAY VARY FROM THESE "AS-BUILT" DRAWINGS.

*Don Cushing* 9/21/11  
SIGNED DATE

TREES 5 & 6 MAY BE PERMITTED FOR REMOVAL AT THE TIME OF CONSTRUCTION IF IT IS NECESSARY TO PLACE AN APPROPRIATE RESIDENTIAL STRUCTURE PER CONDITIONS OF APPROVAL

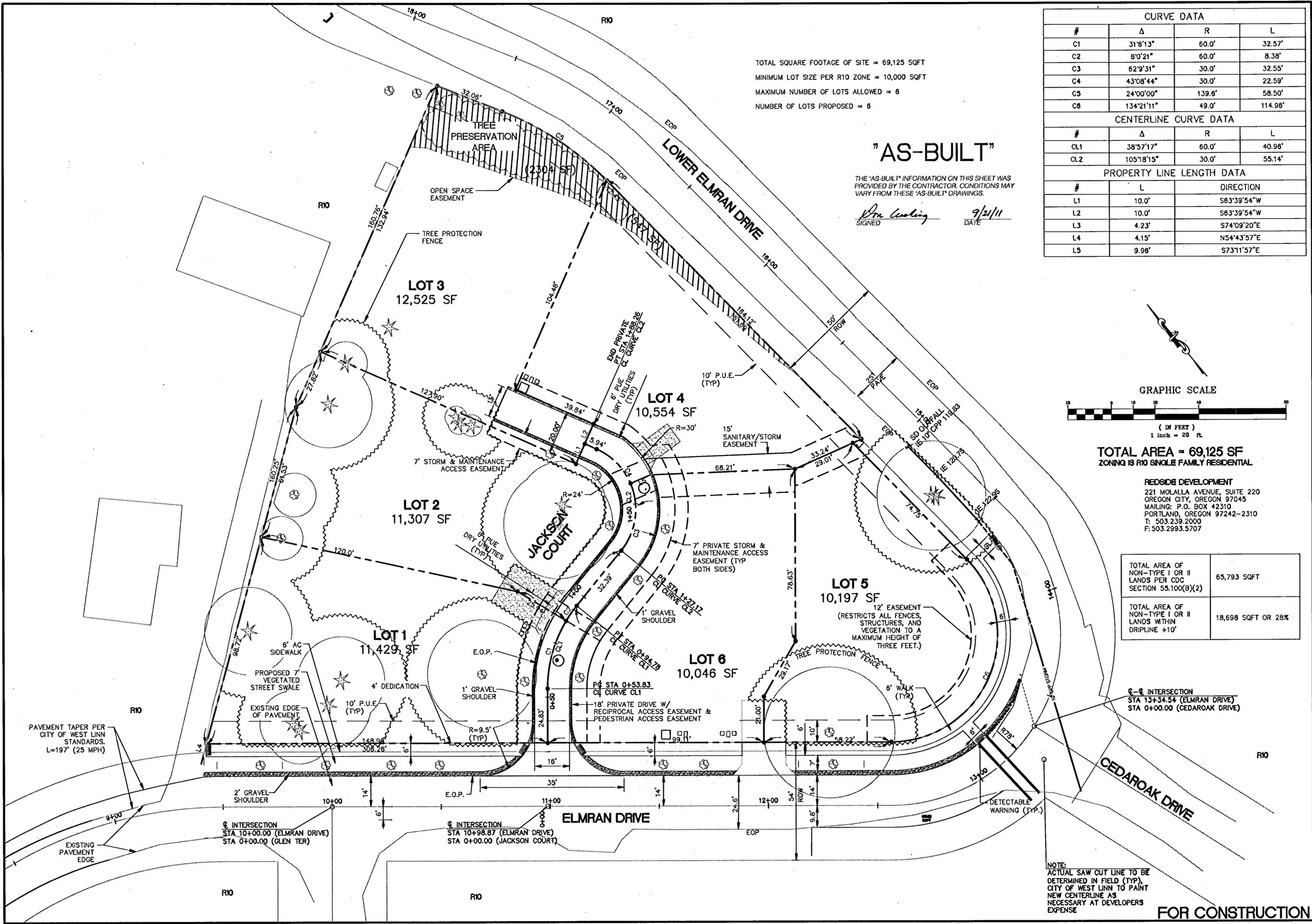
RELOCATE EXISTING FIRE HYDRANT TO EDGE OF PAVEMENT REFER TO SHEET C5.0

ABANDON EXISTING 6" WATER LINE

EXISTING 12" SANITARY SEWER TO REMAIN

ELEMENTARY SCHOOL SITE 100'± SOUTH

FOR CONSTRUCTION



CURVE DATA			
#	Δ	R	L
C1	31°8'13"	60.0'	32.57'
C2	8°0'21"	60.0'	8.38'
C3	62°9'31"	30.0'	32.55'
C4	43°08'44"	30.0'	22.59'
C5	24°00'00"	139.6'	58.50'
C6	134°21'11"	49.0'	114.98'

CENTERLINE CURVE DATA			
#	Δ	R	L
CL1	38°57'17"	60.0'	40.98'
CL2	105°18'15"	30.0'	55.14'

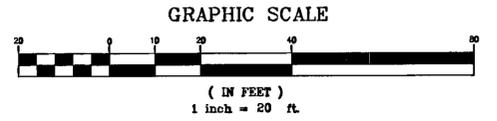
PROPERTY LINE LENGTH DATA		
#	L	DIRECTION
L1	10.0'	S63°39'54"W
L2	10.0'	S63°39'54"W
L3	4.23'	S74°09'20"E
L4	4.15'	N54°43'57"E
L5	9.98'	S73°11'57"E

REVISIONS


**REGISTERED PROFESSIONAL ENGINEER**  
 14688  
*Don Cushing*  
 OREGON  
 DEC. 07, 1980  
 DON CUSHING  
 RENEWAL DATE 12/31/11

BELLA FLATS SUBDIVISION  
 4111 ELMRAN DRIVE  
 WEST LINN, OREGON

SITE DIMENSION PLAN  
 TENTATIVE PLAN



**TOTAL AREA = 69,125 SF**  
 ZONING IS R10 SINGLE FAMILY RESIDENTIAL

**REDSIDE DEVELOPMENT**  
 221 MOLALLA AVENUE, SUITE 220  
 OREGON CITY, OREGON 97045  
 MAILING: P.O. BOX 42310  
 PORTLAND, OREGON 97242-2310  
 T: 503.239.2000  
 F: 503.2993.5707

TOTAL AREA OF NON-TYPE I OR II LANDS PER CDC SECTION 55.100(B)(2)	65,793 SQFT
TOTAL AREA OF NON-TYPE I OR II LANDS WITHIN DRIPLINE +10'	18,698 SQFT OR 28%

©-© INTERSECTION  
 STA 13+34.54 (ELMRAN DRIVE)  
 STA 0+00.00 (CEDAROAK DRIVE)

**cushing**  
 Don Cushing Associates  
 Civil Engineers  
 4677 SE Pinchurst Ave  
 Suite 201  
 Milwaukie, OR 97267  
 Voice: (503) 387-5331  
 Fax: (360) 286-2164

DATE: 9-14-2011  
 SCALE: 1" = 20'  
 DRAWN: JEG  
 JOB: 06-011  
 © 2011 DON CUSHING ASSOCIATES  
 SHEET

**C2.0**  
 OF 20

NOTE:  
 ACTUAL SAW CUT LINE TO BE DETERMINED IN FIELD (TYP), CITY OF WEST LINN TO PAINT NEW CENTERLINE AS NECESSARY AT DEVELOPERS EXPENSE

**FOR CONSTRUCTION**

REVISIONS


RENEWAL DATE 12/31/11

BELLA FLATS SUBDIVISION  
4th ELMRAN DRIVE  
WEST LINN, OREGON

EROSION CONTROL AND  
TREE PROTECTION PLAN

**cushing**  
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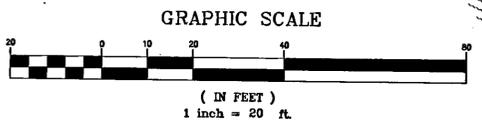
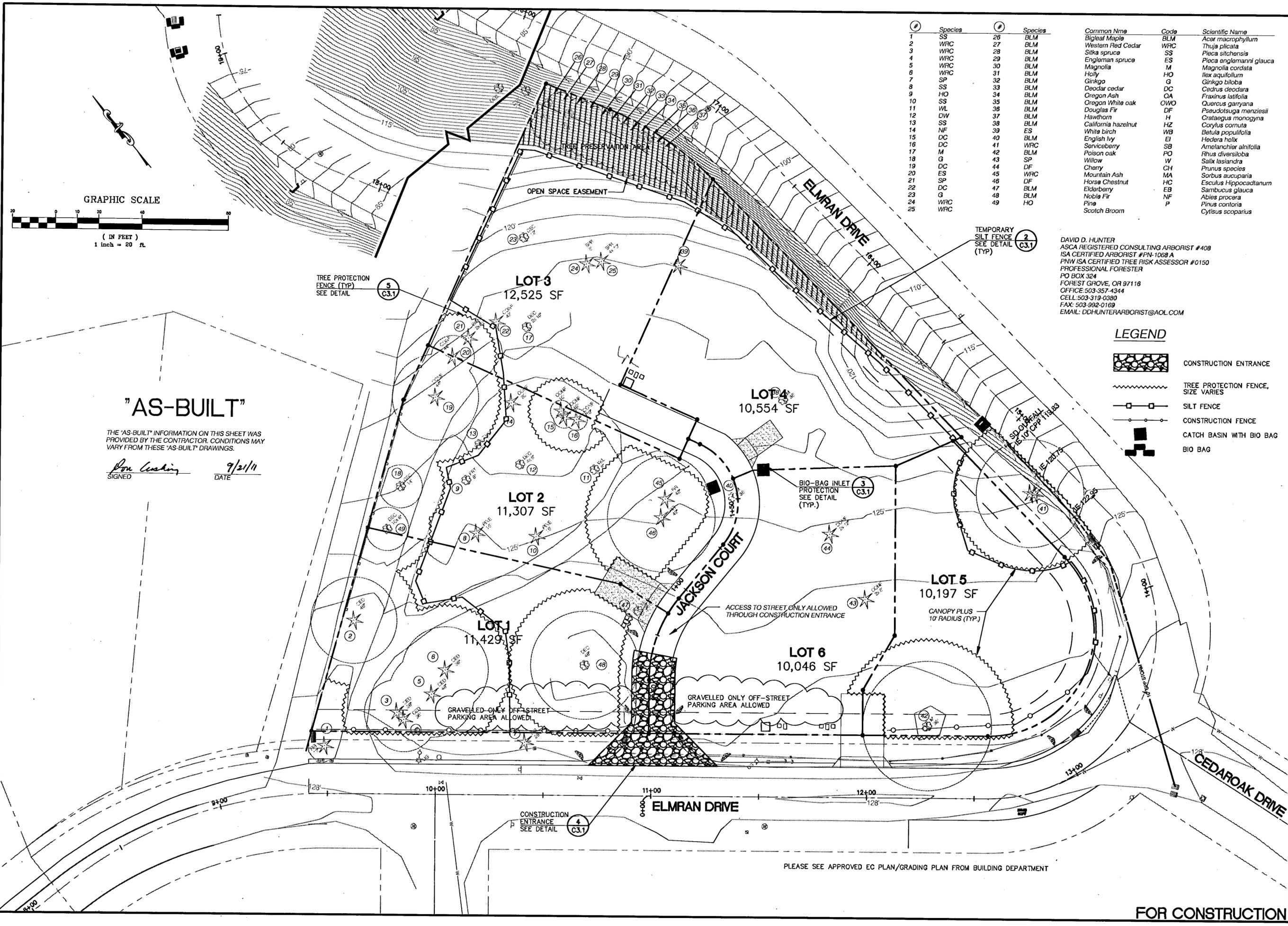
**C3.0**  
OF 20

#	Species	#	Species	Common Name	Code	Scientific Name
1	SS	26	BLM	Bigleaf Maple	BLM	Acer macrophyllum
2	WRC	27	BLM	Western Red Cedar	WRC	Thuja plicata
3	WRC	28	BLM	Sitka spruce	SS	Picea sitchensis
4	WRC	29	BLM	Engelman spruce	ES	Picea engelmanni glauca
5	WRC	30	BLM	Magnolia	M	Magnolia cordata
6	WRC	31	BLM	Holly	HO	Ilex aquifolium
7	SP	32	BLM	Ginkgo	G	Ginkgo biloba
8	SS	33	BLM	Deodar cedar	DC	Cedrus deodara
9	HO	34	BLM	Oregon Ash	OA	Fraxinus latifolia
10	SS	35	BLM	Oregon White oak	OWO	Quercus garryana
11	WL	36	BLM	Douglas Fir	DF	Pseudotsuga menziesii
12	DW	37	BLM	Hawthorn	H	Crataegus monogyna
13	SS	38	BLM	California hazelnut	HZ	Corylus cornuta
14	NF	39	ES	White birch	WB	Betula populifolia
15	DC	40	BLM	English Ivy	EI	Hedera helix
16	DC	41	WRC	Serviceberry	SB	Amelanchier alnifolia
17	M	42	BLM	Poison oak	PO	Rhus diversiloba
18	G	43	SP	Willow	W	Salix lasiandra
19	DC	44	DF	Cherry	CH	Prunus species
20	ES	45	WRC	Mountain Ash	MA	Sorbus aucuparia
21	SP	46	DF	Horse Chestnut	HC	Esculus Hippocadatum
22	DC	47	BLM	Elderberry	EB	Sambucus glauca
23	G	48	BLM	Noble Fir	NF	Abies procera
24	WRC	49	HO	Pine	P	Pinus contorta
25	WRC			Scotch Broom		Cytisus scoparius

DAVID D. HUNTER  
ASCA REGISTERED CONSULTING ARBORIST #408  
ISA CERTIFIED ARBORIST #PN-1068 A  
PNW ISA CERTIFIED TREE RISK ASSESSOR #0150  
PROFESSIONAL FORESTER  
PO BOX 324  
FOREST GROVE, OR 97116  
OFFICE: 503-357-4344  
CELL: 503-319-0380  
FAX: 503-992-0169  
EMAIL: DDHUNTERARBORIST@AOL.COM

**LEGEND**

- CONSTRUCTION ENTRANCE
- TREE PROTECTION FENCE, SIZE VARIES
- SILT FENCE
- CONSTRUCTION FENCE
- CATCH BASIN WITH BIO BAG
- BIO BAG



**"AS-BUILT"**

THE "AS-BUILT" INFORMATION ON THIS SHEET WAS PROVIDED BY THE CONTRACTOR. CONDITIONS MAY VARY FROM THESE "AS-BUILT" DRAWINGS.

*Don Cushing* 9/21/11  
SIGNED DATE

CONSTRUCTION ENTRANCE SEE DETAIL (C3.1)

TEMPORARY SILT FENCE SEE DETAIL (TYP)

PLEASE SEE APPROVED EC PLAN/GRADING PLAN FROM BUILDING DEPARTMENT

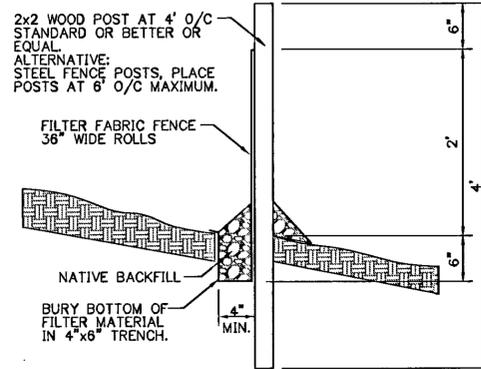
FOR CONSTRUCTION

**EROSION CONTROL NOTES**

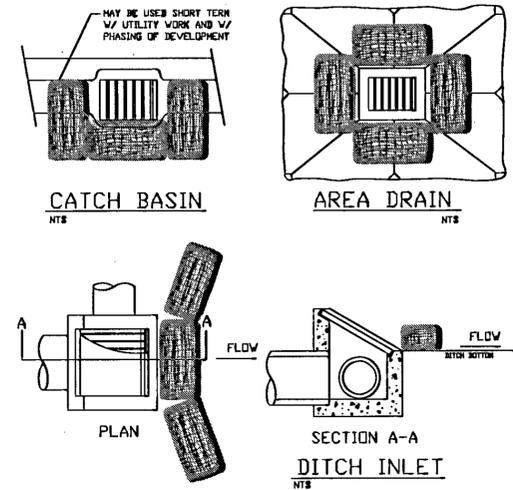
1. OWNER OR DESIGNATED PERSON SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
2. THE IMPLEMENTATION OF THESE ESC PLANS AND CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED BY THE LOCAL JURISDICTION, AND VEGETATION/LANDSCAPING IS ESTABLISHED.
3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
4. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
5. THE ESC FACILITIES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DOES NOT LEAVE THE SITE.
6. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

7. AT NO TIME SHALL SEDIMENT BE ALLOWED TO ACCUMULATE MORE THEN 1/3 THE BARRIER HEIGHT. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATIONS SHALL NOT FLUSH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM SYSTEM.
8. STABILIZED ROCK CONSTRUCTION ENTRANCES SHALL BE INSTALLED PER DETAIL AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT.
9. STORM DRAIN INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED. PAVEMENT SURFACES AND VEGETATION ARE TO BE PLACED AS RAPIDLY AS POSSIBLE.
10. SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1 FOR EACH PHASE OF CONSTRUCTION. SEEDING SHALL TAKE PLACE NO EARLIER THAN APRIL 1 AND NO LATER THAN SEPTEMBER 1.
11. IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY ESTABLISHED FROM OCTOBER 1ST THROUGH APRIL 30TH, THE WET WEATHER EROSION PREVENTION MEASURES WILL BE IN EFFECT. SEE THE CURRENT CITY OF WEST LINN'S CURRENT EROSION AND SEDIMENTATION CONTROL STANDARDS FOR ADDITIONAL WET WEATHER MEASURES.
12. THE DEVELOPER SHALL REMOVE ESC MEASURES WHEN VEGETATION IS FULLY ESTABLISHED.
13. REFER TO SECTION 208 FOR CITY OF WEST LINN SURFACE RESTORATION REQUIREMENTS. USE HOBBS & HOPKINS COMPANION MIX FOR THE GRASS SEED MIXTURE.

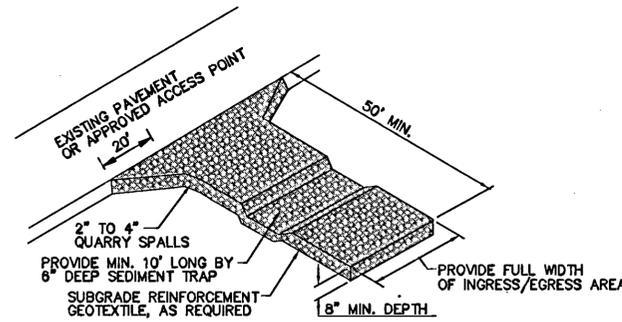
**1 EROSION CONTROL NOTES + SEQUENCING**  
N.T.S.



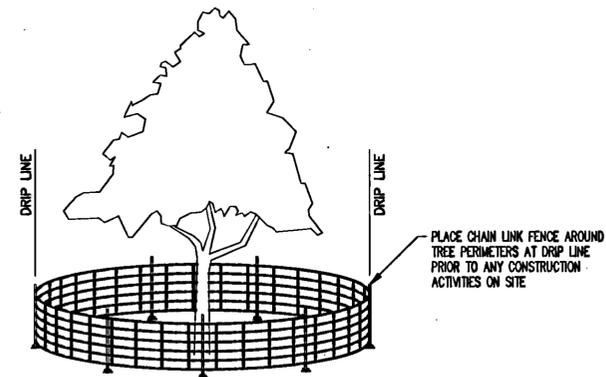
**2 FILTER FABRIC SEDIMENT FENCE**  
N.T.S.



**3 BIO-BAG INLET PROTECTION**  
N.T.S.



**4 CONSTRUCTION ENTRANCE W/ WASH**  
N.T.S.



**5 TREE PROTECTION FENCING**  
N.T.S.

**"AS-BUILT"**

THE "AS-BUILT" INFORMATION ON THIS SHEET WAS PROVIDED BY THE CONTRACTOR. CONDITIONS MAY VARY FROM THESE "AS-BUILT" DRAWINGS.

*Don Cushing* 9/2/11  
SIGNED DATE

REVISIONS



BELLA FLATS SUBDIVISION  
4111 ELMFRAN DRIVE  
WEST LINN, OREGON

EROSION CONTROL DETAILS

**cushing**  
Don Cushing Associates  
Civil Engineers  
4677 SE Pinehurst Ave  
Suite 201  
Milwaukie, OR 97267  
Voice: (503) 387-5331  
Fax: (360) 286-2164

DATE: 9-14-2011  
SCALE: NONE  
DRAWN: JEG  
JOB: 06-011  
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SHEET

**C3.1**  
OF 20

FOR CONSTRUCTION

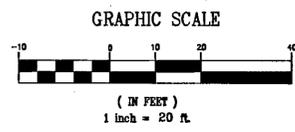


EXISTING CATCH BASIN  
RIM = (VERIFY)  
NEW I.E. IN = 69.39 (12" SW, VERIFY)  
I.E. OUT = (12" NE, VERIFY)

DITCH INLET  
RIM TOP = (VERIFY)  
RIM BOTTOM = 72.23 (VERIFY)  
I.E. OUT = 69.46 (12" NE, VERIFY)  
SEE DETAIL 3 ON SHEET C7.4,  
SECTION C-C

**LEGEND**

- EXIST. UTILITY POLE
- EXIST. UTILITY POLE WITH LIGHT
- EXIST. UTILITY POLE WITH UNDERGROUND DROP
- EXIST. GUY ANCHOR
- EXIST. OVERHEAD LINE
- EXIST. SANITARY MAN HOLE
- EXIST. SANITARY SEWER LINE
- EXIST. STORM CATCH BASIN
- EXIST. STORM SEWER LOCATES
- EXIST. TELEPHONE RISER
- EXIST. COMMUNICATION LOCATES
- EXIST. WATER METER
- EXIST. WATER VALVE
- EXIST. FIRE HYDRANT
- EXIST. WATER LOCATES
- EXIST. GAS METER
- EXIST. GAS LOCATES
- EXIST. BOLLARD
- EXIST. MAIL BOX
- EXIST. SIGN
- EXIST. EVCON
- EXIST. EVDEC
- EXIST. WOOD FENCE
- EXIST. VEGETATION LINE
- EXIST. PROPERTY LINE
- PROPOSED 8x8x8 MJxMJxFLG HOT TAPPING SLEEVE W/ THRUST RESTRAINT & 8" G.V.
- PROPOSED WATER METER
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER SHALLOW MANHOLE
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED CATCH BASIN
- PROPOSED DITCH INLET
- PROPOSED STORM DRAIN, SIZE
- PROPOSED STORM FLOW ARROW
- PROPOSED CHECK DAM
- PROPOSED RIP-RAP
- PROPOSED DOMESTIC WATER LINE, SIZE
- PROPOSED SANITARY SEWER, SIZE
- PROPOSED SWALE
- MODIFIED FLOW-THROUGH PLANTER (PRIVATE)



**"AS-BUILT"**

THE "AS-BUILT" INFORMATION ON THIS SHEET WAS PROVIDED BY THE CONTRACTOR. CONDITIONS MAY VARY FROM THESE "AS-BUILT" DRAWINGS.

*Don Cushing*  
SIGNED DATE 9/21/11

**SEWER MH DATA**

- ① SS MH OVER EXISTING LINE  
STA 0+13.93 9.64' RT  
RIM = 127.74  
I.E. IN = 121.69 (8" NE) 121.50  
EXISTING FLOW = 121.49 (12" VERIFY) 121.24
- ② SS MH STA 0+77.42 5.48' RT  
RIM = 126.60  
I.E. IN = 122.33 (8" NE) 122.25  
I.E. OUT = 122.13 (8" SW) 122.02
- ③ SS SHALLOW MANHOLE  
STA 1+46.63 3.69' RT  
RIM = 125.58  
I.E. IN = 123.00 (4" E) 122.91  
I.E. IN = 123.00 (4" N) 122.91  
I.E. IN = 123.00 (4" SE) 122.91  
I.E. OUT = 122.80 (8" SW) 122.79  
COVER = 2.3'

**STORM MH DATA**

- ① STORM MANHOLE  
RIM = 125.00  
I.E. IN = 118.50 (12" NW) 117.60  
I.E. IN = 119.28 (6" N) 118.67  
I.E. IN = 119.28 (6" S) 118.50  
I.E. IN = 119.28 (6" W) 118.67  
I.E. OUT = 118.30 (12" SE) 117.42
- ② STORM MANHOLE  
RIM = 95.00  
I.E. IN = 90.68 (12" S)  
I.E. OUT = 90.48 (12" N)

**CATCH BASIN DATA**

- ① CATCH BASIN  
RIM = 124.52  
I.E. OUT = 120.00 (12" SE) 119.77  
25 LF 8" S = 0.52%  
SEE DETAILS ① ②
- ② CATCH BASIN  
RIM=124.52 124.30  
IE IN = 119.88 (12" NW) 119.60  
IE OUT = 119.67 (12" SE) 119.45

PRIVATE

LOT #	AREA (sq)	STORAGE (CF)
1	150	150
2	150	150
3	150	150
4	150	150
5	150	150
6	150	150

SOIL TYPE: 91B & 92F  
HYDROLOGIC SOIL GROUP 'B'

NOTE 1: FINAL RAIN GARDEN LOCATIONS WILL BE DETERMINED AT A LATER DATE, AFTER REVIEW BY THE CITY OF WEST LINN.

NOTE 2: GRADING AND TREES ON LOTS 1 AND 2 WILL BE DETERMINED ON A LOT BY LOT BASIS.

NOTE 3: WATER MAIN RESTRAINED WITH FIELD LOK GASKETS PER EBAA IRON RESTRAINT CALCULATOR

DITCH INLET  
RIM = 118.87 118.50  
I.E. IN = 114.12 (12" NW) 112.00  
I.E. OUT = 113.92 (12" N) 111.83  
SEE DETAIL 3 ON SHEET 7.4  
SECTIONS A-A & B-B.

43 LF 12" DI SD  
S = 9.7% 12.6%

NEW TYPE 1L CATCH BASIN WITH CURB INLET FACING SWALE ③ C7.3

CHECK DAMS ⑦ C7.5  
12" O.C. (TYP.)  
SEE DETAIL

STORM SYSTEM TO BE ADJUSTED DUE TO ACTUAL FIELD CONDITIONS. CONSULT DON CUSHING ASSOCIATES FOR ANY CHANGES.

THRUST BLOCK

TRANSITION FITTING FROM AC TO DI

CONNECT TO EXISTING WATERLINE STA 9+39.78 8.00' LT

INSTALL CROSS AND (3) GATE VALVES PER CITY STANDARDS SEE SHEET C7.2 FOR THRUST BLOCK DETAILS

EXISTING SANITARY SEWER MANHOLE MAY NEED TO BE RE-CONSTRUCTED PER CITY OF WEST LINN STANDARDS

NFPA 13 AUTOMATIC FIRE PROTECTION SPRINKLER SYSTEMS WILL BE INSTALLED FOR LOTS 1, 2, 3 AND 4. LOTS 5 AND 6 HAVE ACCESS OFF OF UPPER ELMRAN DR. AND WILL NOT BE REQUIRED TO BE SPRINKLED.

WIDTH OF EXISTING DITCH VARIES DEPENDING ON EXISTING GRADE CONDITIONS; SEE DETAIL ⑥ C7.5

CAUTION AROUND GAS LINE NOTIFY GAS COMPANY BEFORE DIGGING 1-800-332-2344

PLANTER BOX IE OUT = 122.50 (6" S)

17 LF 6" PVC D-3034 SD S = 18.94%

4" STUB IE = 123.48 (4" SW) PLUG AND CAP

23 LF 4" SS DI S = 2.0%

4" SS STUB I.E. = 124.58

21 LF 6" PVC D-3034 SD S = 6.9% PLANTER BOX IE OUT = 121.50 (6" N)

39 LF 6" PVC D-3034 SD S = 8.85% IE OUT = 122.50 (6" NE)

12' EASEMENT (RESTRICTS ALL FENCES, STRUCTURES, AND VEGETATION TO A MAXIMUM HEIGHT OF THREE FEET.)

19 LF DI SD 2 6" CULVERT S = (MATCH EXIST.) EXTEND ENDS OF CULVERT 5' BEYOND EDGE PAVED AREA

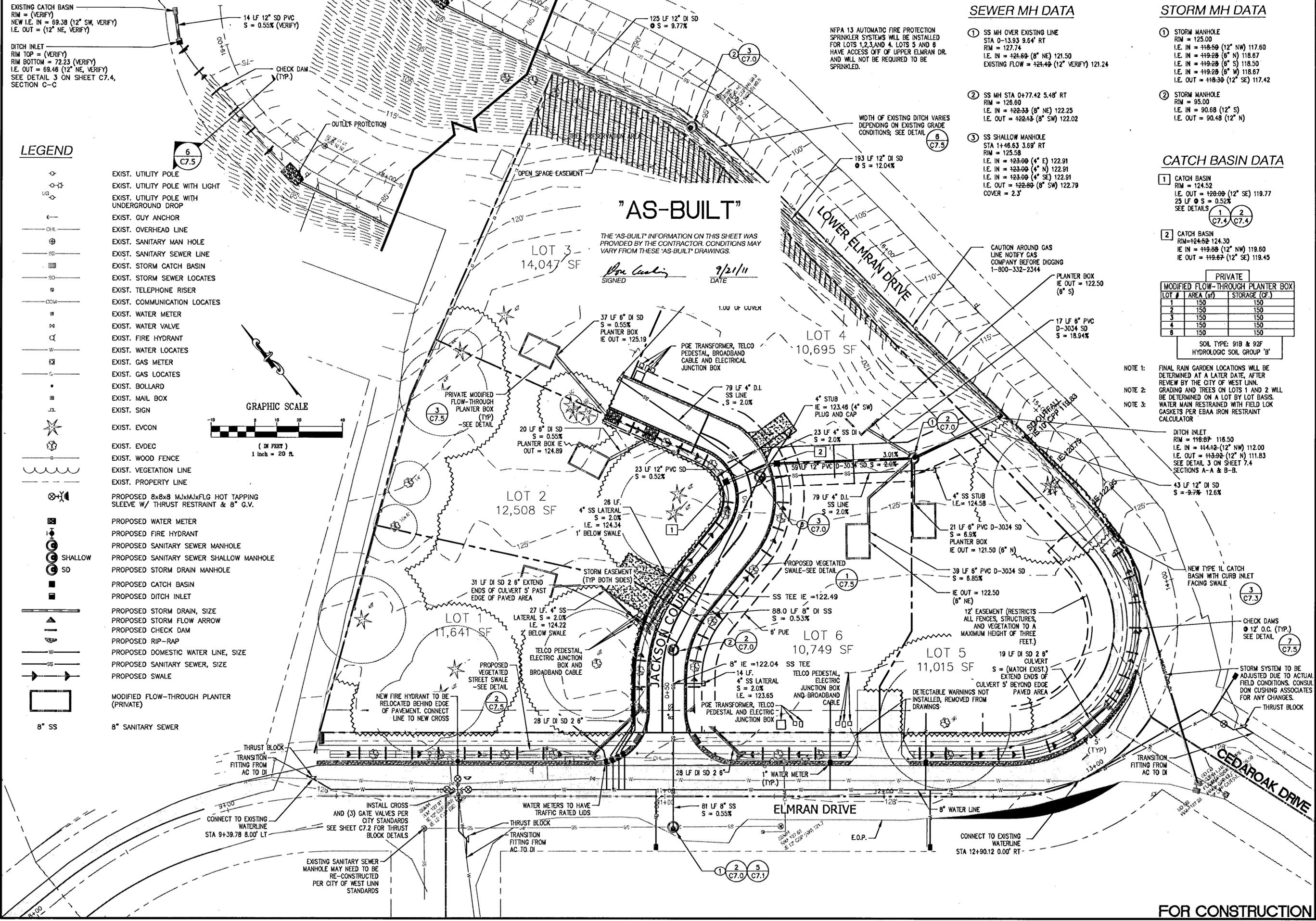
DETECTABLE WARNINGS NOT INSTALLED, REMOVED FROM DRAWINGS

TRANSITION FITTING FROM AC TO DI

CONNECT TO EXISTING WATERLINE STA 12+90.12 0.00' RT

**ELMRAN DRIVE**

**CEDAR OAK DRIVE**



REVISIONS

①	CURB INLET ADDED
②	WATER VALVES REMOVED



BELLA FLATS SUBDIVISION  
4TH ELMRAN DRIVE  
WEST LINN, OREGON

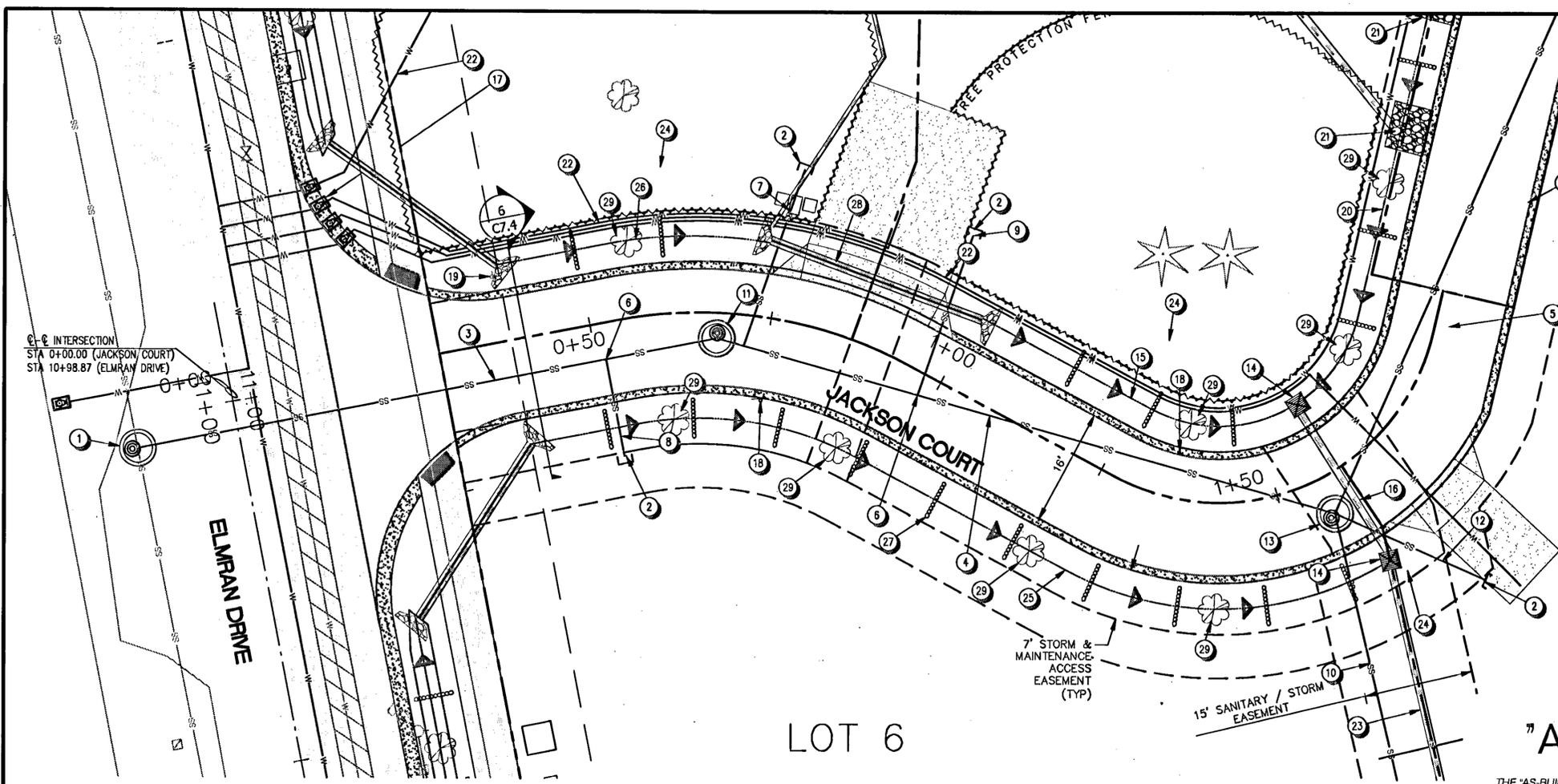
**UTILITY MASTER PLAN**

**cushing**  
Don Cushing Associates  
Civil Engineers  
4677 SE Pinchurst Ave  
Suite 201  
Milwaukie, OR 97267  
Voice: (503) 387-5331  
Fax: (360) 286-2164

DATE: 9-14-2011  
SCALE: 1" = 20'  
DRAWN: JEG  
JOB: 06-011  
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SHEET

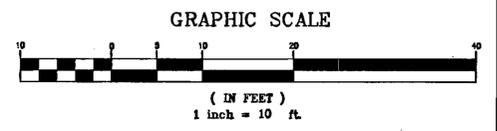
**C5.0**  
OF 20

FOR CONSTRUCTION



**KEYNOTES**

- 1 MANHOLE - SEE PROFILE & DETAIL (CONSTRUCT OVER EXISTING LINE)
- 2 PLUG AND CAP END OF 4" SAN SWR
- 3 81 LF 8" PVC-D3034 SAN SWR @ 0.55%
- 4 88 LF 8" DI SAN SWR @ 0.53%
- 5 50 LF 4" D.I. SAN SWR @ 2.0%
- 6 8" X 4" TEE
- 7 27 LF 4" DI SAN SWR @ 2.00% MIN.
- 8 14 LF 4" DI SAN SWR @ 2.00% MIN.
- 9 28 LF 4" DI SAN SWR @ 2.00% MIN.
- 10 79 LF 4" DI SAN SWR @ 2.00% MIN.
- 11 STD. SS MANHOLE - SEE PROFILE & DETAIL
- 12 23 LF 4" D.I. SAN SWR @ 2.00% MIN.
- 13 SHALLOW MANHOLE - SEE PROFILE & DETAIL
- 14 CATCH BASIN - SEE PROFILE & DETAIL
- 15 46 LF SWALE SEE DETAIL
- 16 23 LF 12" D.I. SD @ 0.52% TOP OF STORM PIPE IS 1.74' BELOW SANITARY CROSSINGS
- 17 1" WATER METER SEE DETAIL
- 18 INSTALL "NO PARKING - FIRE LANE" SIGNS ON BOTH SIDES OF JACKSON COURT ROADWAY, 7' ABOVE GRADE; SEE GENERAL NOTES
- 19 INSTALL STOP SIGN
- 20 61 LF SWALE SEE DETAIL
- 21 6'X10' CLASS 20 RIP-RAP PAD
- 22 1-1/2" SCH. 40 PVC WATER SERVICE LINES (MIN. 3" COVER)
- 23 62 LF 12" PVC SD @ 0.56%
- 24 6" PUE, DRY UTILITIES
- 25 124 LF SWALE SEE DETAIL
- 26 38 LF SWALE SEE DETAIL
- 27 INSTALL CHECK DAMS 12' O.C. (TYP) SEE DETAIL
- 28 31 LF 2" SD D.I. PIPE
- 29 INSTALL STREET TREE. TYPE OF TREE TO BE DETERMINED BY THE CITY.



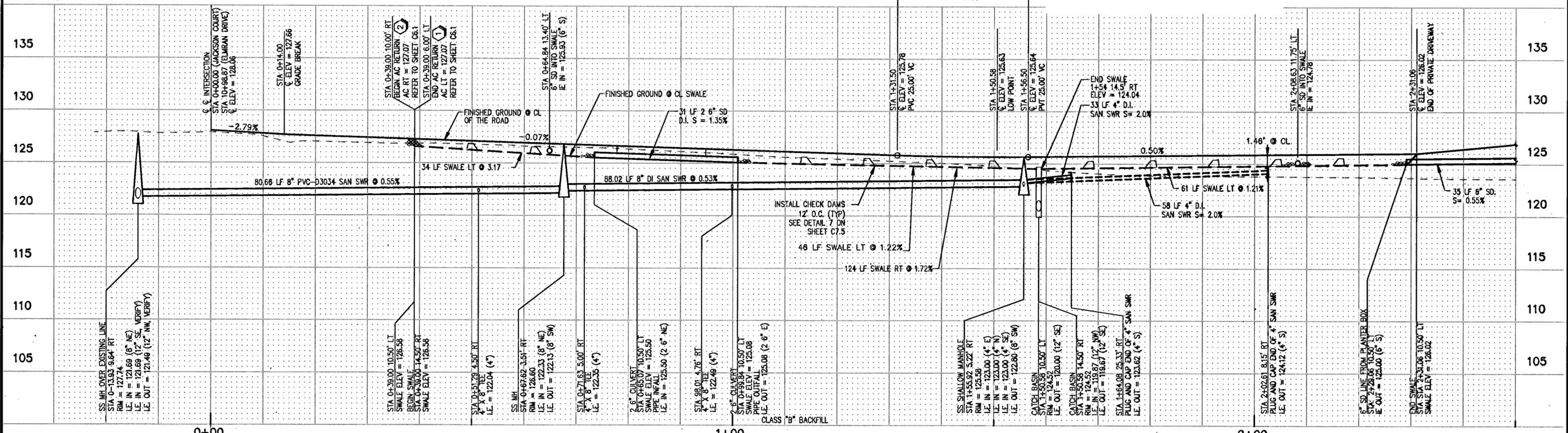
LOT 6

"AS-BUILT"

**JACKSON COURT PLAN**  
SCALE: 1" = 10'

THE "AS-BUILT" INFORMATION ON THIS SHEET WAS PROVIDED BY THE CONTRACTOR. CONDITIONS MAY VARY FROM THESE "AS-BUILT" DRAWINGS.

*Don Cushing* 9/2/11  
SIGNED DATE



**JACKSON COURT PROFILE**  
SCALE: HORIZ. 1" = 10'  
VERT. 1" = 5'

REVISIONS


REGISTERED PROFESSIONAL ENGINEER  
14688  
*Don Cushing*  
OREGON  
EXP. 07, 2011  
RENEWAL DATE 12/31/11

BELLA FLATS SUBDIVISION  
4411 ELMRAN DRIVE  
WEST LINN, OREGON

PLAN AND PROFILE  
JACKSON COURT

**cushing**  
Don Cushing Associates  
Civil Engineers  
4677 SE Pinchurst Ave  
Suite 201  
Milwaukie, OR 97267  
Voice: (503) 387-5331  
Fax: (360) 286-2164

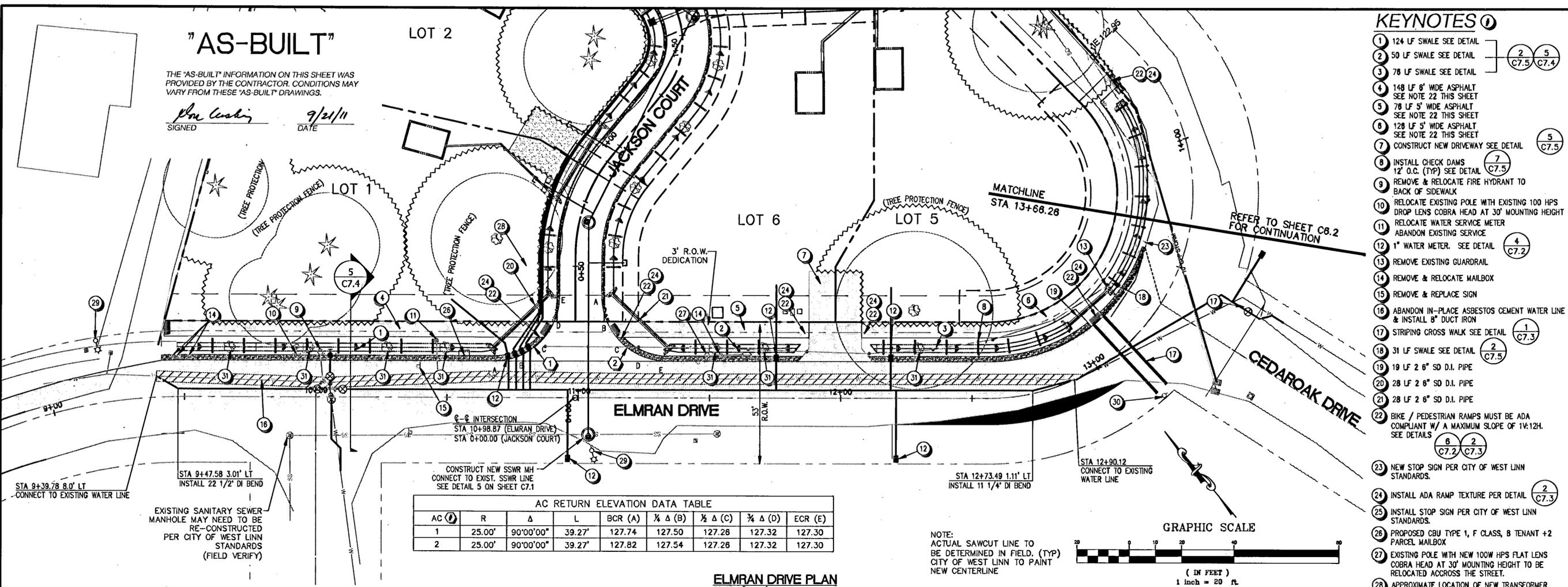
DATE: 9-14-2011  
SCALE: 1" = 10'  
DRAWN: JEG  
JOB: 06-011  
SHEET

FOR CONSTRUCTION

# "AS-BUILT"

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*Don Cushing* 9/21/11  
SIGNED DATE

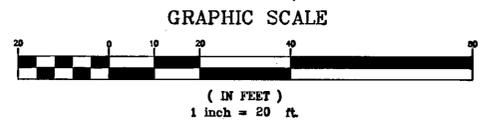


AC RETURN ELEVATION DATA TABLE

AC (A)	R	Δ	L	BCR (A)	¼ Δ (B)	½ Δ (C)	¾ Δ (D)	ECR (E)
1	25.00'	90°00'00"	39.27'	127.74	127.50	127.26	127.32	127.30
2	25.00'	90°00'00"	39.27'	127.82	127.54	127.26	127.32	127.30

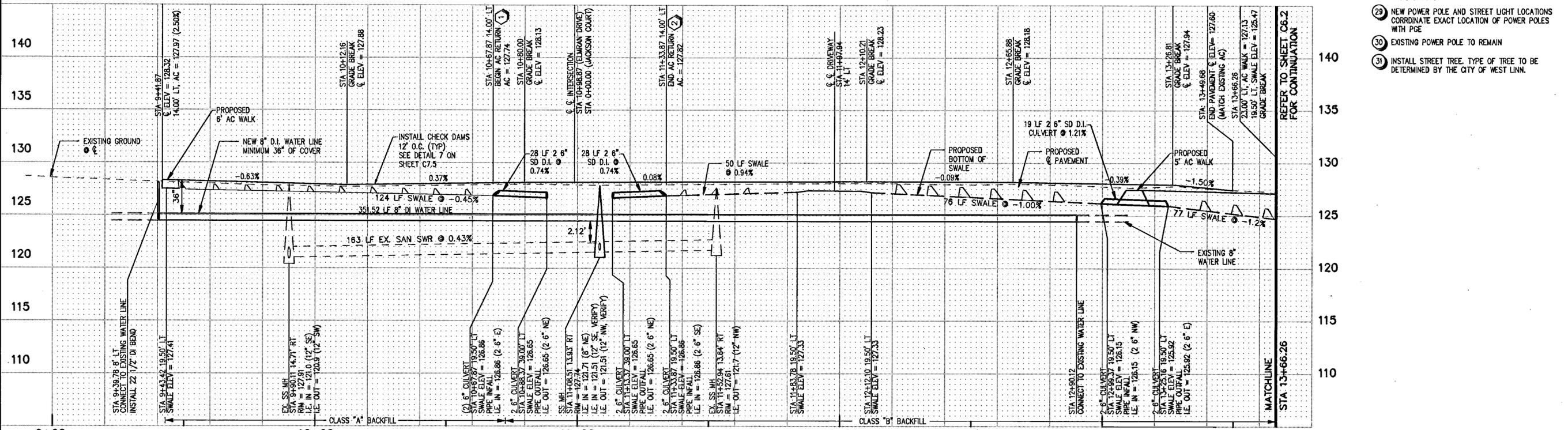
ELMRAN DRIVE PLAN  
SCALE: 1" = 20'

NOTE:  
ACTUAL SAWCUT LINE TO BE DETERMINED IN FIELD. (TYP)  
CITY OF WEST LINN TO PAINT NEW CENTERLINE



## KEYNOTES

- 1 124 LF SWALE SEE DETAIL
- 2 50 LF SWALE SEE DETAIL
- 3 78 LF SWALE SEE DETAIL
- 4 148 LF 6" WIDE ASPHALT SEE NOTE 22 THIS SHEET
- 5 78 LF 5" WIDE ASPHALT SEE NOTE 22 THIS SHEET
- 6 128 LF 5" WIDE ASPHALT SEE NOTE 22 THIS SHEET
- 7 CONSTRUCT NEW DRIVEWAY SEE DETAIL
- 8 INSTALL CHECK DAMS 12" O.C. (TYP) SEE DETAIL
- 9 REMOVE & RELOCATE FIRE HYDRANT TO BACK OF SIDEWALK
- 10 RELOCATE EXISTING POLE WITH EXISTING 100 HPS DROP LENS COBRA HEAD AT 30' MOUNTING HEIGHT
- 11 RELOCATE WATER SERVICE METER ABANDON EXISTING SERVICE
- 12 1" WATER METER. SEE DETAIL
- 13 REMOVE EXISTING GUARDRAIL
- 14 REMOVE & RELOCATE MAILBOX
- 15 REMOVE & REPLACE SIGN
- 16 ABANDON IN-PLACE ASBESTOS CEMENT WATER LINE & INSTALL 8" DUCT IRON
- 17 STRIPING CROSS WALK SEE DETAIL
- 18 31 LF SWALE SEE DETAIL
- 19 19 LF 2 6" SD D.I. PIPE
- 20 28 LF 2 6" SD D.I. PIPE
- 21 28 LF 2 6" SD D.I. PIPE
- 22 BIKE / PEDESTRIAN RAMPS MUST BE ADA COMPLIANT W/ A MAXIMUM SLOPE OF 1V:12H. SEE DETAILS
- 23 NEW STOP SIGN PER CITY OF WEST LINN STANDARDS.
- 24 INSTALL ADA RAMP TEXTURE PER DETAIL
- 25 INSTALL STOP SIGN PER CITY OF WEST LINN STANDARDS.
- 26 PROPOSED CBU TYPE 1, F CLASS, 8 TENANT +2 PARCEL MAILBOX
- 27 EXISTING POLE WITH NEW 100W HPS FLAT LENS COBRA HEAD AT 30' MOUNTING HEIGHT TO BE RELOCATED ACROSS THE STREET.
- 28 APPROXIMATE LOCATION OF NEW TRANSFORMER ALL DRY UTILITIES (ELEC, CABLE, GAS, PHONE) ARE TO BE INSTALLED UNDERGROUND, TRENCH AS REQUIRED. EXISTING POLES WILL REMAIN FOR LIGHTING WHILE UTILITIES ARE BEING PLACED UNDERGROUND.
- 29 NEW POWER POLE AND STREET LIGHT LOCATIONS COORDINATE EXACT LOCATION OF POWER POLES WITH PGE
- 30 EXISTING POWER POLE TO REMAIN
- 31 INSTALL STREET TREE. TYPE OF TREE TO BE DETERMINED BY THE CITY OF WEST LINN.



ELMRAN DRIVE PROFILE  
SCALE: HORIZ. 1" = 20'  
VERT. 1" = 5'

REVISIONS


REGISTERED PROFESSIONAL ENGINEER  
DON CUSHING  
RENEWAL DATE 12/31/11

BELLA FLATS SUBDIVISION  
4TH ELMRAN DRIVE  
WEST LINN, OREGON

PLAN AND PROFILE  
ELMRAN DRIVE  
STA 9+00.00 TO STA 13+66.26

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JOB: 06-011  
SHEET

**C6.1**  
OF 20

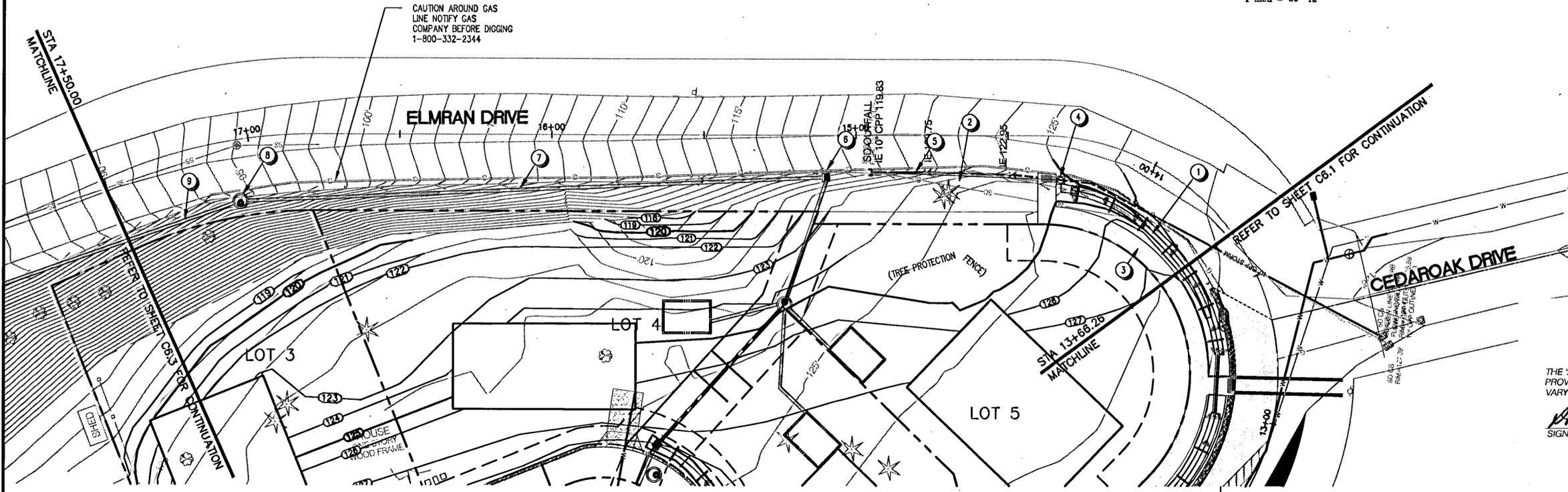
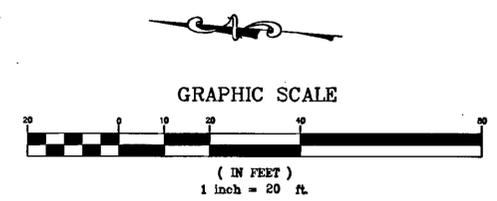
FOR CONSTRUCTION



BELLA FLATS SUBDIVISION  
4th ELMRAN DRIVE  
WEST LINN, OREGON

**KEYNOTES**

- 1 48 LF SWALE SEE DETAIL (2) C7.5
- 2 65 LF SWALE SEE DETAIL (6) C7.5
- 3 62 LF 5' WIDE ASPHALT SIDEWALK
- 4 CURB INLET CATCH BASIN FACING SWALE
- 5 INSTALL CHECK DAMS 12' O.C. (TYP) SEE DETAIL (7) C7.5
- 6 INSTALL DITCH INLET SEE PROFILE & DETAIL (3) C7.4
- 7 193 LF DI @ S=12.04%
- 8 INSTALL STD. SD MANHOLE SEE PROFILE & DETAIL (2) C7.0
- 9 125 LF DI @ S=9.77%

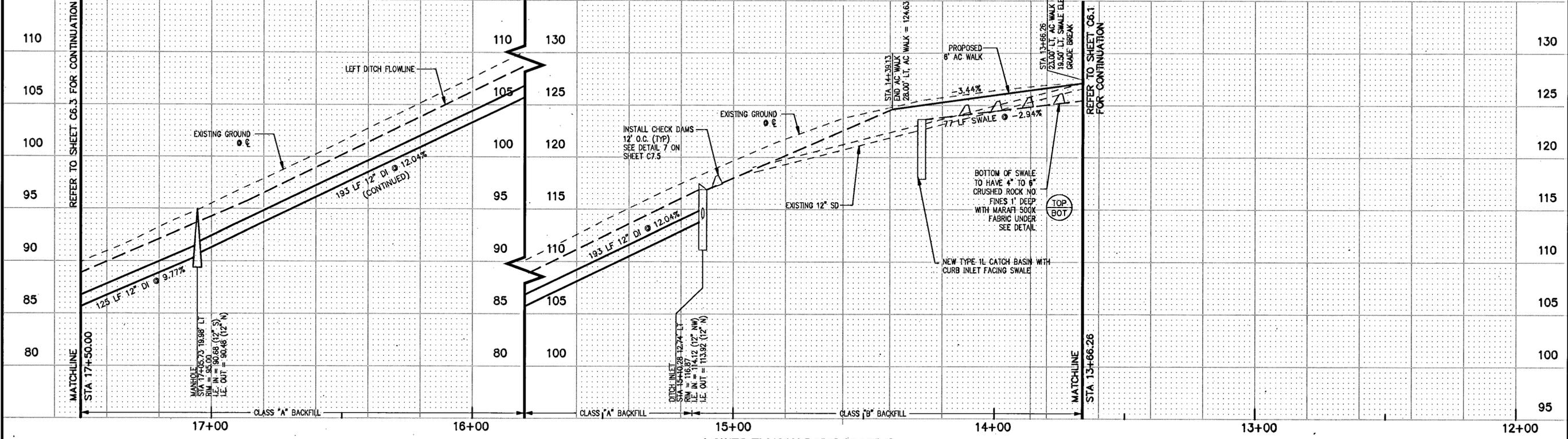


**"AS-BUILT"**

THE "AS-BUILT" INFORMATION ON THIS SHEET WAS PROVIDED BY THE CONTRACTOR. CONDITIONS MAY VARY FROM THESE "AS-BUILT" DRAWINGS.

*Don Cushing*  
SIGNED DATE 9/2/11

**LOWER ELMRAN DRIVE PLAN**  
SCALE: 1" = 20'



**LOWER ELMRAN DRIVE PROFILE**  
SCALE: HORIZ 1" = 20'  
VERT. 1" = 5'

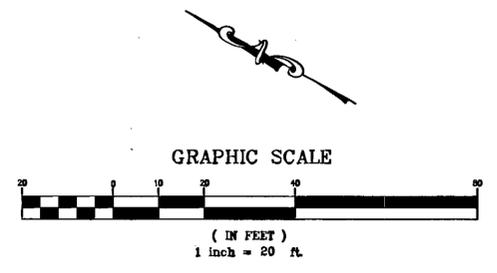
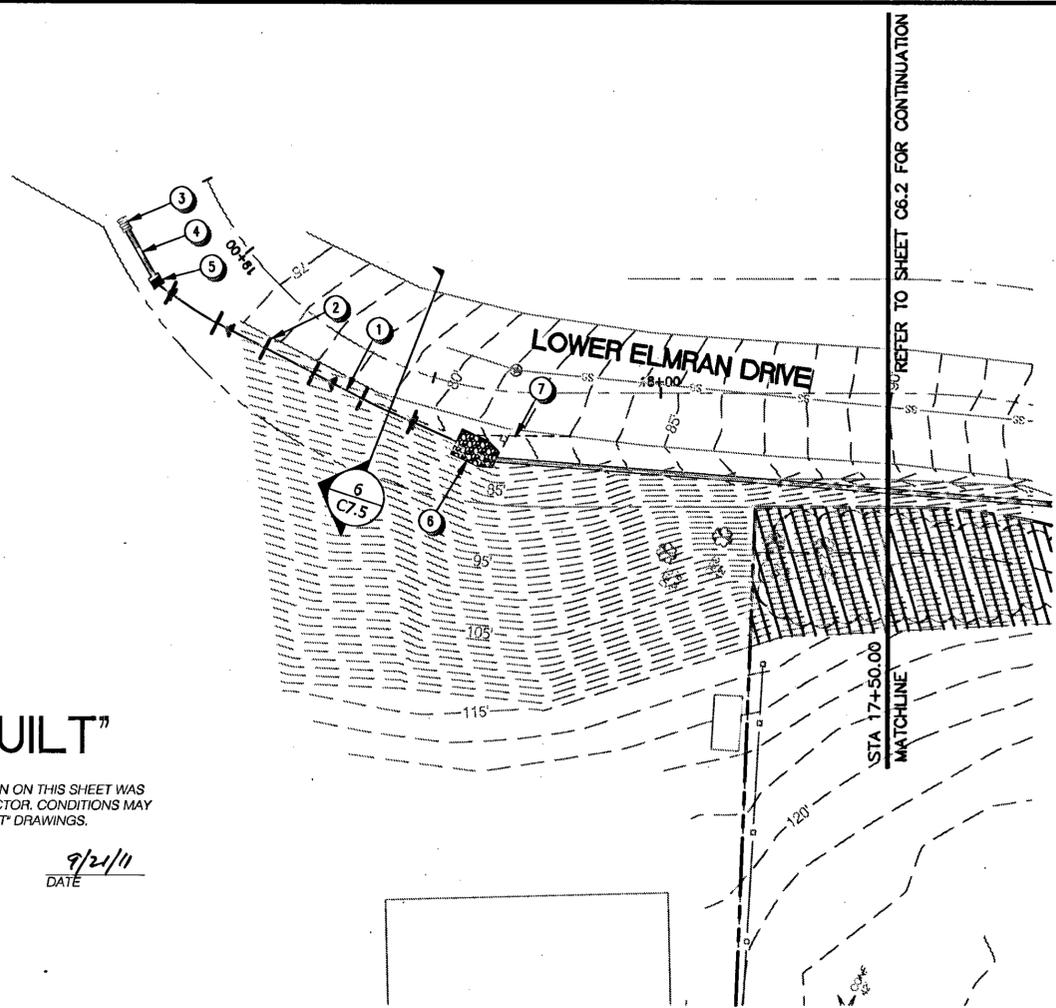
PLAN AND PROFILE  
ELMRAN DRIVE  
STA 13+66.26 TO STA 17+50.00

**cushing**  
Don Cushing Associates  
Civil Engineers  
4677 SE Pinchurst Ave  
Suite 201  
Milwaukie, OR 97267  
Voice: (503) 387-5331  
Fax: (360) 286-2164

DATE: 9-14-2011  
SCALE: 1" = 20'  
DRAWN: JEG  
JOB: 06-011  
SHEET

**C6.2**  
OF 20

FOR CONSTRUCTION



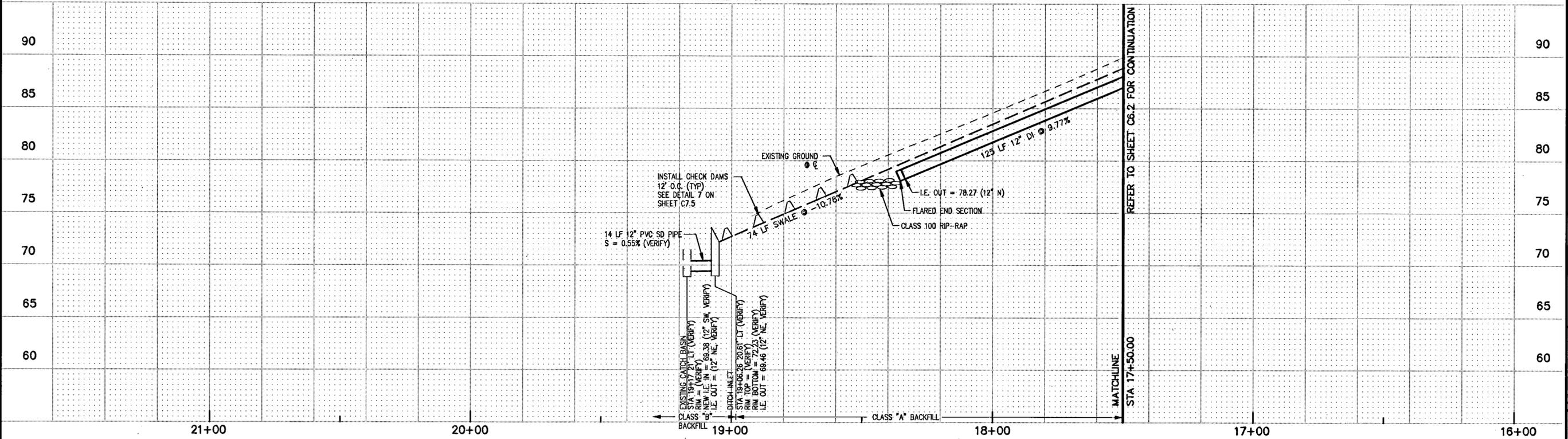
- KEYNOTES**
- 1 74 LF SWALE SEE DETAIL 6 C7.5
  - 2 INSTALL CHECK DAMS 12' O.C. (TYP) SEE DETAIL 7 C7.5
  - 3 CONNECT TO EXISTING CATCH BASIN. CATCH BASIN MAY NEED TO BE RECONSTRUCTED PER CITY OF WEST LINN STANDARDS. 3 C7.4
  - 4 14 LF 12" PVC SD PIPE @ 0.55% (VERIFY) 4 C7.4
  - 5 DITCH INLET WITH POLLUTION CONTROL OVERFLOW STRUCTURE, -SEE DETAIL, SECTION C-C 3 C7.4
  - 6 STORM SEWER OUTFALL, SEE DETAIL 6 C7.5
  - 7 GRADE SHALLOW DITCH AROUND OUTFALL, AS NEEDED. 7 C7.5

**"AS-BUILT"**

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*Don Cushing* 9/21/11  
SIGNED DATE

**LOWER ELMRAN DRIVE PLAN**  
SCALE: 1" = 20'



**LOWER ELMRAN DRIVE PROFILE**  
SCALE: HORIZ. 1" = 20'  
VERT. 1" = 5'

BELLA FLATS SUBDIVISION  
4TH ELMRAN DRIVE  
WEST LINN, OREGON

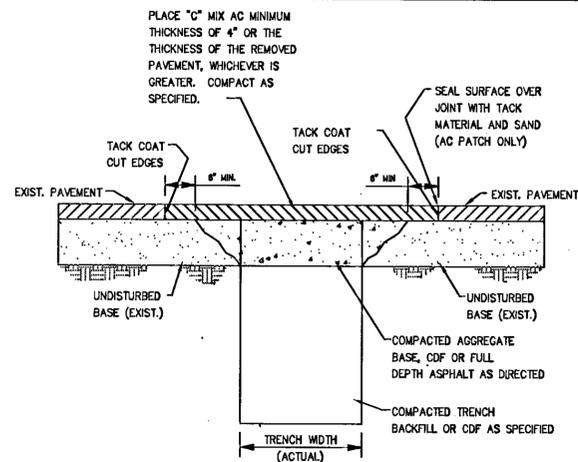
PLAN AND PROFILE  
ELMFRAN DRIVE  
STA 17+50.00 TO STA 19+50.00

**cushing**  
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DATE: 9-14-2011  
SCALE: 1" = 20'  
DRAWN: JEG  
JOB: 06-011  
COPYRIGHT DON CUSHING ASSOCIATES  
2011

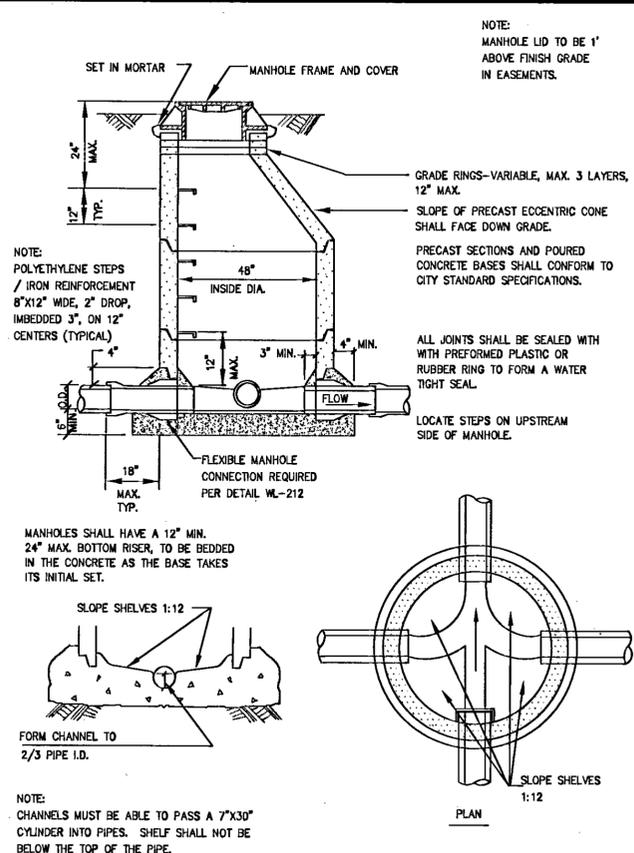
SHEET  
**C6.3**  
OF 20

FOR CONSTRUCTION

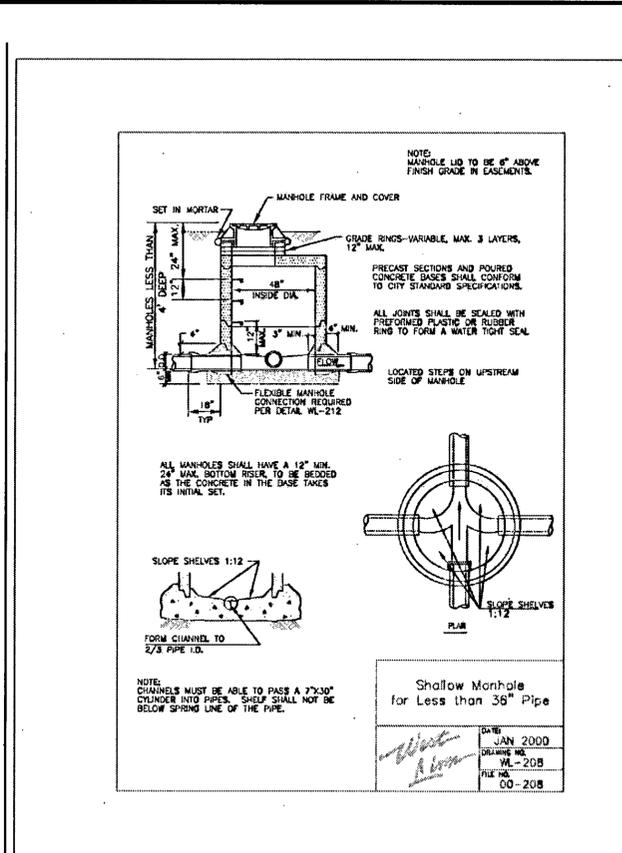


- NOTES:
1. ALL EXISTING AC OR PCC PAVEMENT SHALL BE SAWCUT TO NEAT, STRAIGHT LINES PRIOR TO REPAVING.
  2. CONCRETE PAVEMENT SHALL BE REPLACED WITH CONCRETE TO A MINIMUM THICKNESS OF REMOVED PAVEMENT, WHICHEVER IS GREATER.
  3. IF EXISTING BASE MATERIAL IS CTB OR ATB, THEN REPLACEMENT BASE MATERIAL SHALL MATCH EXISTING.
  4. ALL UTILITIES SHALL HAVE A MINIMUM COVER OF 36".
  5. ALL TRENCH BACKFILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY PER AASHTO T-180 OR AS SPECIFIED IN THE CONTRACT DOCUMENTS.
  6. ALL TRENCH BACKFILL AND PATCHING SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE CITY OF WEST LINN.
  7. APPROVED CDF SHALL BE USED OR 3/4 - 0" GRAVEL BACKFILL SHALL BE PLACED AND COMPACTED IN A MAXIMUM OF 8" LIFTS.

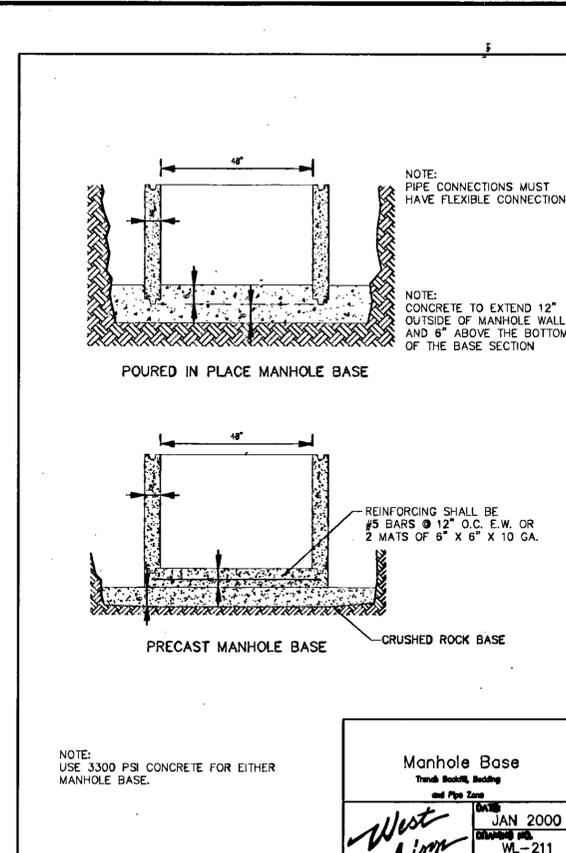
1 STREET T-CUT WL-203  
N.T.S.



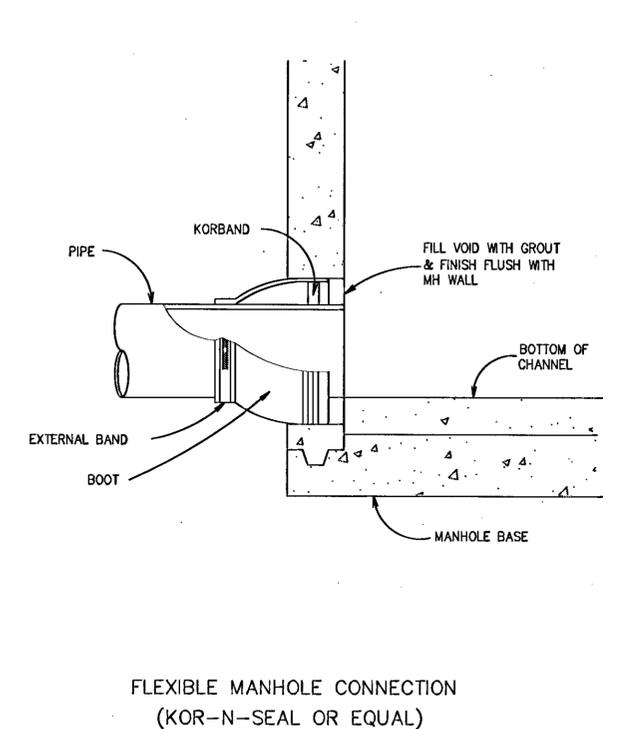
2 STANDARD MANHOLE WL-207  
N.T.S.  
FOR PIPES LESS THAN 36"



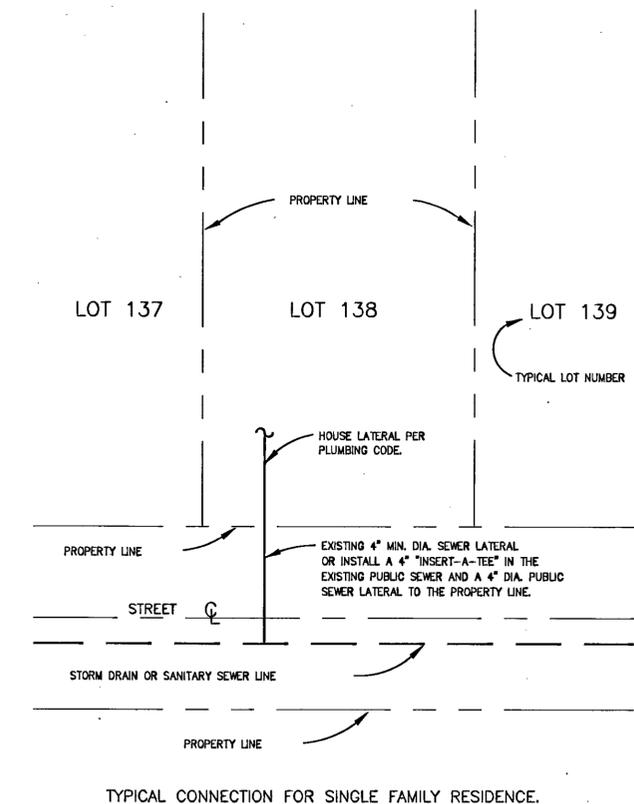
3 SHALLOW MANHOLE WL-208  
N.T.S.



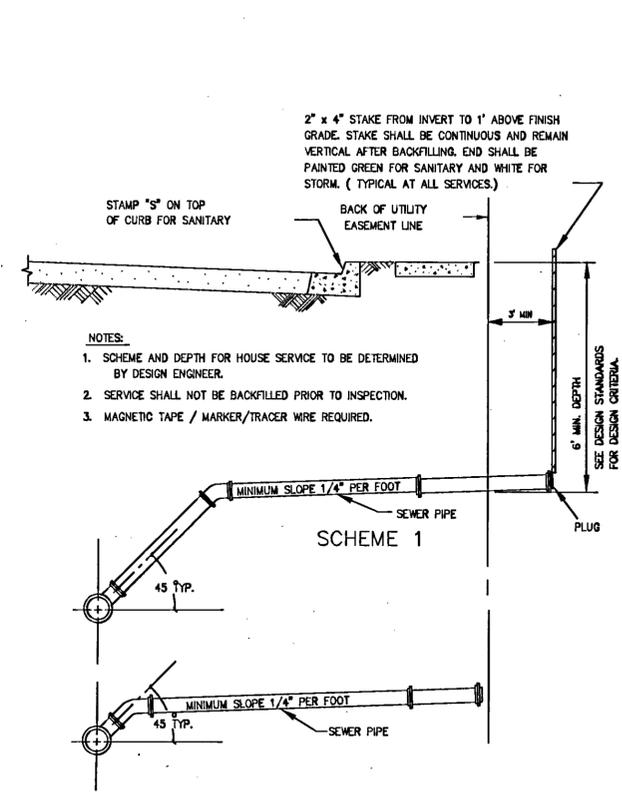
4 MANHOLE BASE WL-211  
N.T.S.



5 FLEXIBLE MANHOLE CONNECTION WL-212  
N.T.S.



6 SEWER CONNECTION WL-216  
N.T.S.  
SINGLE FAMILY



8 SERVICE BRANCH WL-218  
N.T.S.

"AS-BUILT"  
THE "AS-BUILT" INFORMATION ON THIS SHEET WAS PROVIDED BY THE CONTRACTOR. CONDITIONS MAY VARY FROM THESE "AS-BUILT" DRAWINGS.  
SIGNED: Don Cushing 9/2/11  
DATE

REVISIONS

REGISTERED PROFESSIONAL ENGINEER  
DON CUSHING  
RENEWAL DATE 12/31/11

BELLA FLATS SUBDIVISION  
4TH ELMFRAN DRIVE  
WEST LINN, OREGON

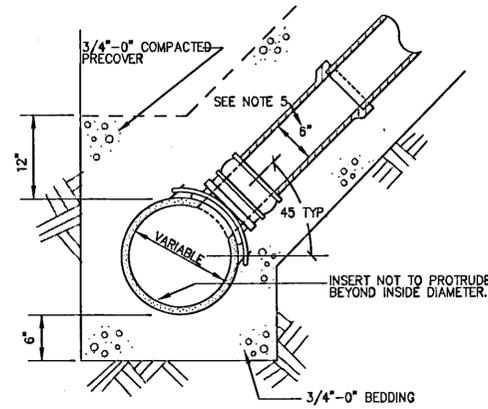
SITE DETAILS  
SANITARY

cushing  
Don Cushing Associates  
Civil Engineers  
4677 SE Pinchurst Ave  
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Milwaukie, OR 97267  
Voice: (503) 387-5331  
Fax: (360) 286-2164

DATE: 9-14-2011  
SCALE: NONE  
DRAWN: JEG  
JOB: 06-011  
SHEET

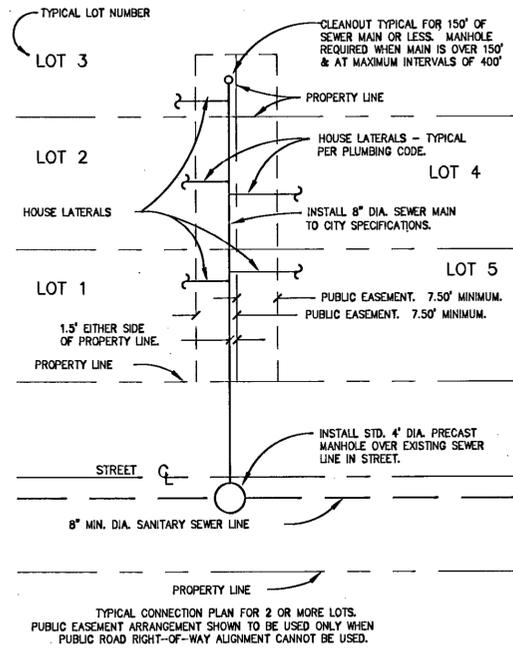
C7.0  
OF 20

FOR CONSTRUCTION

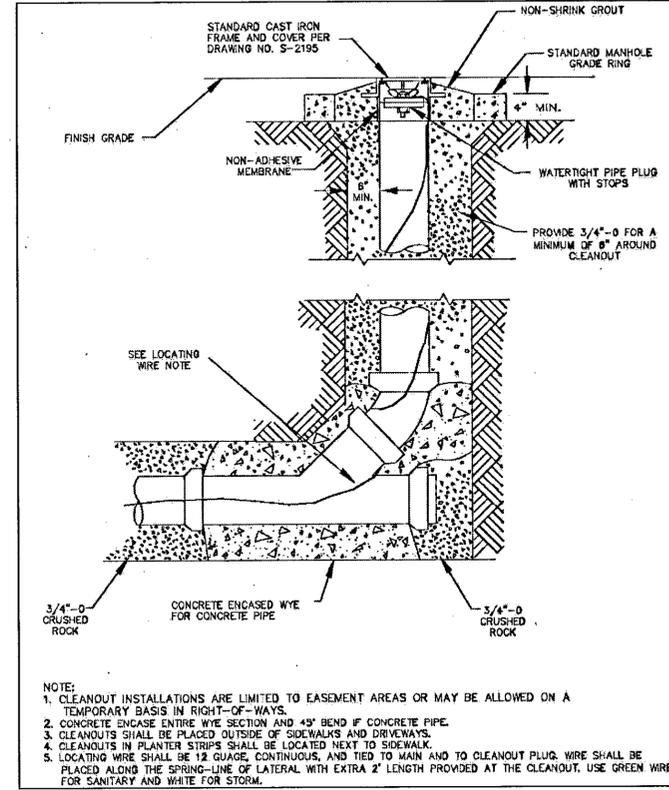


- NOTES:
- A MINIMUM OF 24 HOURS NOTICE IS REQUIRED PRIOR TO A TAP INSPECTION. ALL TRENCHES SHALL BE SHORED IN COMPLIANCE WITH OR-OSHA EXCAVATION RULES, CHAPTER 437, DIVISION "3", SUBDIVISION "P", ADOPTED SEPTEMBER 1, 1990. PUBLIC WORKS INSPECTORS WILL NOT INSPECT A TAP IN A TRENCH WITHOUT LEGAL SHORING. THE TAP SHALL BE INSPECTED BEFORE BACKFILL IS ALLOWED AND BEFORE THE SIDE SEWER CONNECTION IS MADE. THE CORE DRILLED "SLUG" IS TO BE SHOWN TO THE INSPECTOR TO INSURE IT WAS REMOVED FROM THE SEWER LINE.
  - ALL SERVICE LINE CONNECTIONS SHALL BE MADE WITH AN APPROVED CONNECTOR MANUFACTURED AND DESIGNED TO CONNECT TO A CORE DRILLED PIPE, FOWLER INSURT-A-TEE, SEAL TIGHT SADDLE, TAP TITE TEE, OR AN APPROVED EQUAL COMMERCIAL TAP.
  - THE CENTERLINE OF TAP IS TO BE ABOVE THE SPRINGLINE.
  - 4" MAXIMUM TAP FOR 8" MAIN (CUT-IN TEE TO BE USED FOR 6" HOUSE BRANCH ON 8" MAIN).
  - 4" HOUSE BRANCH MAY BE USED FOR SINGLE FAMILY LOTS ONLY.

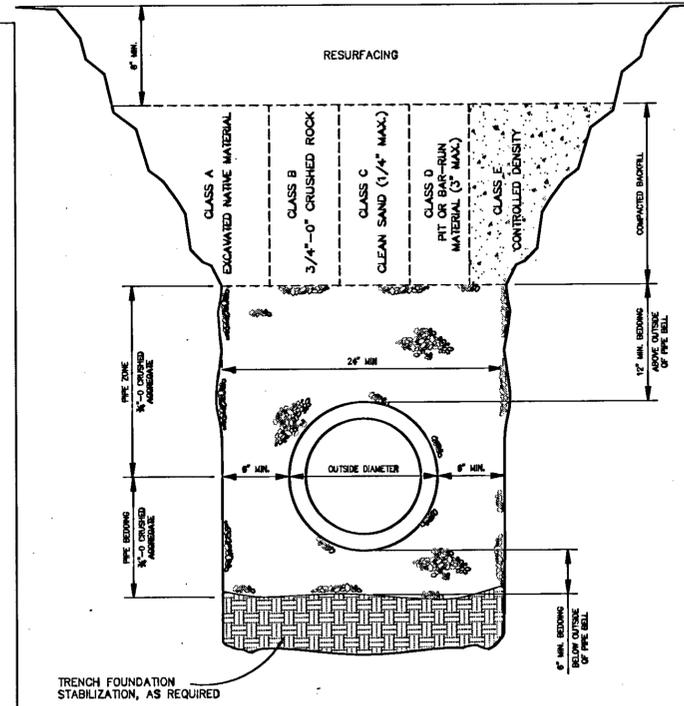
**1 SEWER SERVICE TAP WL-303**  
N.T.S.  
TO EXISTING SEWERS FOR HOUSE LATERALS



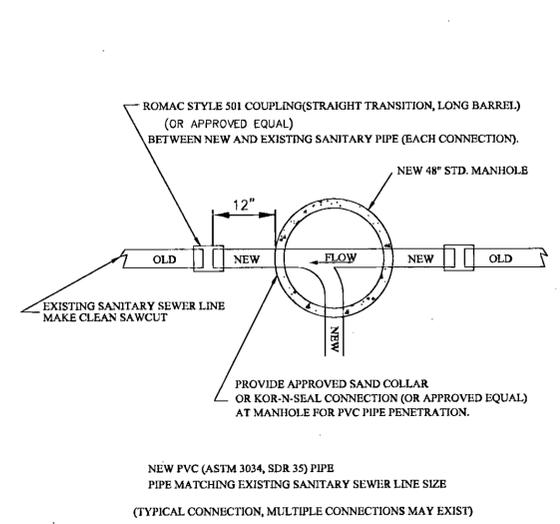
**2 SANITARY SEWER CONNECTION WL-304**  
N.T.S.  
MULTIPLE LOTS IN PUBLIC EASEMENT



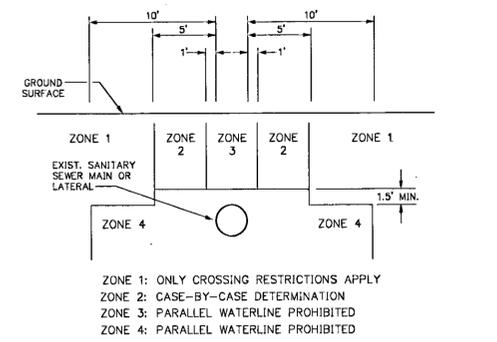
**3 CLEANOUT DETAIL WL-206**  
N.T.S.



**4 TRENCH BACKFILL, BEDDING, AND PIPE ZONE WL-200**  
N.T.S.



**5 NEW MANHOLE OVER EXIST. LINE WL-210**  
N.T.S.



**6 STANDARD SANITARY CROSSING WL 409**  
N.T.S.

**"AS-BUILT"**

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SIGNED: *Don Cushing* DATE: 9/21/11

REVISIONS




BELLA FLATS SUBDIVISION  
4111 ELMRAN DRIVE  
WEST LINN, OREGON

SITE DETAILS  
SANITARY

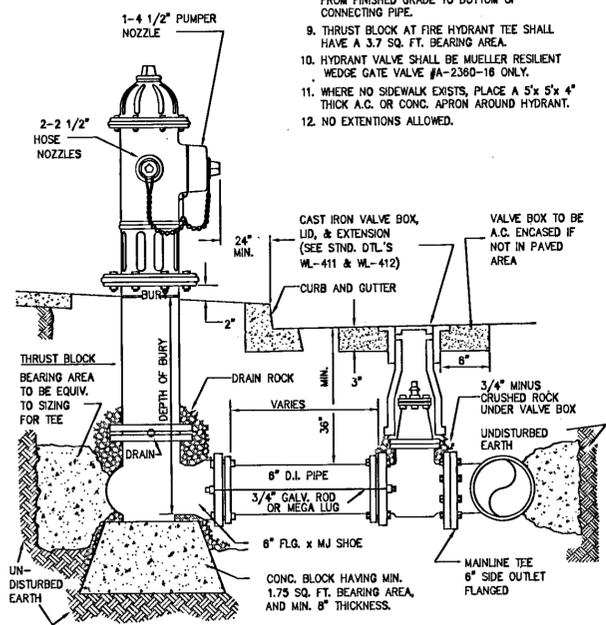
**cushing**  
Don Cushing Associates  
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Fax: (360) 286-2164

DATE: 9-14-2011  
SCALE: NONE  
DRAWN: JEG  
JOB: 06-011  
SHEET

**C7.1**  
FOR CONSTRUCTION  
OF 20

**NOTES:**

- HYDRANTS TO BE MUELLER CENTURION MDL A-423 ONLY WITH 1 1/2" OPER. NUTS OR CLOW MEDALLION F-254S.
- HYDRANT COLOR TO BE MILLER EQUIP. ENAMEL O E 40 (SAFETY YELLOW).
- JOINTS TO BE RESTRAINED BY 3/4" DIA. GALVANIZED STEEL RODS AND THRUST BLOCKS OR MEGA LUGS AND THRUST BLOCKS.
- ALL FITTINGS IN CONTACT W/CONCRETE SHALL BE WRAPPED IN PLASTIC. HYDRANT DRAIN HOLES TO REMAIN OPEN TO DRAIN ROCK AND OPERATIONAL.
- MIN. 4 CU. FT. OF 1 1/2"-3/4" CLEAN DRAIN ROCK SHALL BE PLACED AROUND SHOE UP TO A MIN. OF 6" ABOVE DRAIN OUTLETS.
- WHERE PLANTER STRIP EXISTS, HYDRANT SHALL BE PLACED SO FRONT PORT IS A MINIMUM OF 24" BEHIND FACE OF CURB.
- WHERE INTEGRAL S/W & CURB EXISTS, HYD. SHALL BE PLACED AT BACK OF SIDEWALK, OR AS DIRECTED BY ENGINEER.
- BURY OF HYDRANT SHALL BE MEASURED FROM FINISHED GRADE TO BOTTOM OF CONNECTING PIPE.
- THRUST BLOCK AT FIRE HYDRANT TEE SHALL HAVE A 3.7 SQ. FT. BEARING AREA.
- HYDRANT VALVE SHALL BE MUELLER RESILIENT WEDGE GATE VALVE #A-2360-16 ONLY.
- WHERE NO SIDEWALK EXISTS, PLACE A 5'x 5'x 4" THICK A.C. OR CONC. APRON AROUND HYDRANT.
- NO EXTENSIONS ALLOWED.

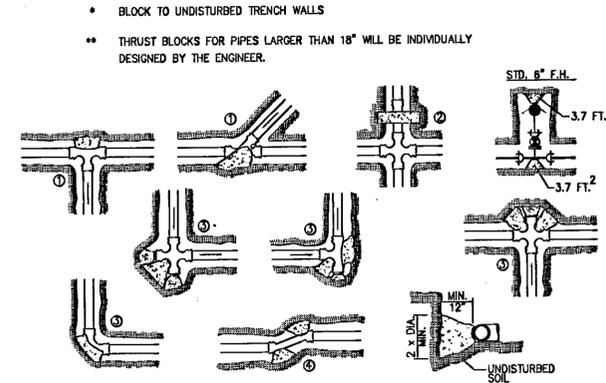


**1 STANDARD FIRE HYDRANT ASSEMBLY WL-401**  
N.T.S.

FITTING SIZE (inches)	TEE, WYE & HYDRANTS	STRADDLE BLOCK	90° BEND PLUGGED CROSS TEE	PLUGGED RUNS	45° BEND	22 1/2° BEND	11 1/2° BEND
2	*	*	*	*	*	*	*
4	1.7	2.1	2.4	1.3	*	*	*
6	3.7	4.9	5.3	2.9	1.5	*	*
8	6.7	8.7	9.5	5.1	2.7	1.3	*
10	10.5	13.6	14.8	8	4.1	2	*
12	15.1	19.6	21.3	11.6	5.9	2.9	*
14							
16	26.8	34.8	37.9	20.5	10.4	5.2	*
18	33.9	44	47.9	25.9	12.8	6.7	*
LARGER	**	**	**	**	**	**	**

BEARING AREA OF THRUST BLOCKS (sq. ft.)

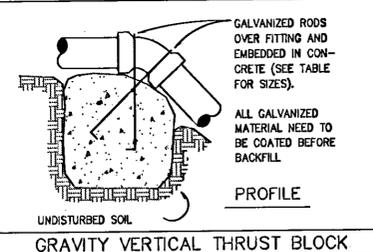
- ALL VALUES ARE BASED ON THE FOLLOWING ASSUMPTIONS:  
AVG. PRESSURE = 100 PSI X 2 (safety factor); 1500 PSF SOIL BEARING CAPACITY; NORMAL DISTRIBUTION DESIGN VELOCITY NOT TO EXCEED 5 F/S.
- ALL FITTINGS SHALL BE WRAPPED IN PLASTIC PRIOR TO PLACEMENT OF CONCRETE.
- BEARING SURFACE OF THRUST BLOCKING SHALL BE AGAINST UNDISTURBED SOIL.
- ALL CONCRETE MIX SHALL HAVE A MIN. 28 DAY STRENGTH OF 3000 PSI.
- ALL PIPE ZONES SHALL BE GRAVEL FILLED AND COMPACTED.
- THRUST BLOCKS FOR PLUGGED CROSS AND PLUGGED TEE SHALL HAVE #4 REBAR LIFTING LOOPS INSTALLED AS SHOWN.
- VERTICAL THRUST DETAILS-SEE DWG. WL-407.
- STRADDLE BLOCK DETAILS-SEE DWG. WL-408.



**2 HORIZONTAL THRUST BLOCKING WL-406**  
N.T.S.

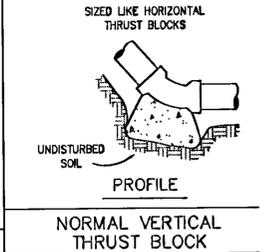
**NOTES:**

- GRAVITY VERTICAL THRUST BLOCKS SHALL BE DESIGNED BY THE ENGINEER.
- KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES. FITTINGS SHALL BE WRAPPED IN PLASTIC PRIOR TO PLACEMENT OF CONCRETE.
- CONCRETE THRUST BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH.
- CONCRETE MIX SHALL HAVE A MIN. 28 DAY STRENGTH OF 3300 P.S.I.
- THRUST BLOCK VOLUMES FOR VERTICAL BENDS HAVING UPWARD RESULTANT THRUSTS ARE BASED ON TEST PRESSURE OF 150 P.S.I.G. AND THE WEIGHT OF CONCRETE = 4050 LBS./CU.YD.
- VERTICAL BENDS THAT REQUIRE A THRUST BLOCK VOLUME EXCEEDING 5 CUBIC YARDS REQUIRE SPECIAL BLOCKING DETAILS. SEE PLANS FOR VOLUMES SHOWN INSIDE HEAVY LINE IN TABLE.
- PAYMENT SHALL BE THE SAME AS FOR HORIZONTAL THRUST BLOCKS.
- ALL REBAR SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM-123 (MIN. 3.4 MIL). REBAR SHALL BE BENT BEFORE GALVANIZATION, AND LAST 4" OF BAR SHALL BE BENT 90 DEGREES WITH A 1/2" RADIUS BEND. REBAR SHALL BE TIGHTLY FIT TO RESTRAINED FITTING.
- FOR HORIZONTAL THRUST BLOCK DETAILS SEE DWG. NO. WL-406.



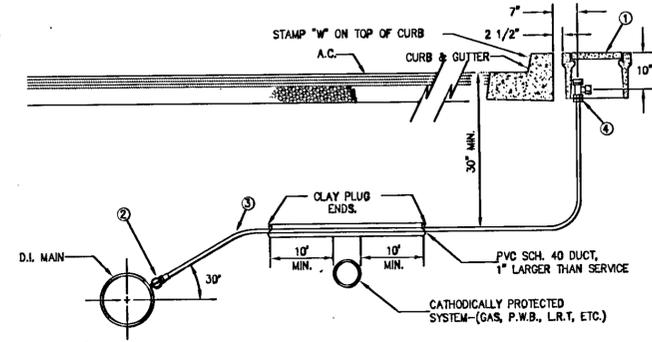
VOLUME OF THRUST BLOCK IN CUBIC YARDS (VERTICAL BENDS)

FITTING SIZE	BEND ANGLE		
	45°	22 1/2°	11 1/4°
4	1.1	0.4	0.2
6	2.7	1.0	0.4
8	4.0	1.5	0.6
10	6.0	2.3	0.9
12	8.5	3.2	1.3
14	11.5	4.3	1.8
16	14.8	5.6	2.3



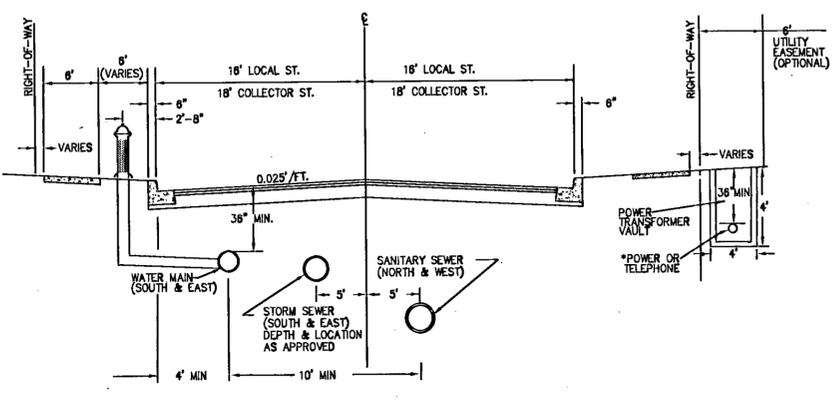
FITTING SIZE	ROD SIZE	EMBEDMENT
12" AND LESS	#8	30"
14" - 18"	#8	36"

**3 VERTICAL THRUST BLOCKING WL-407**  
N.T.S.

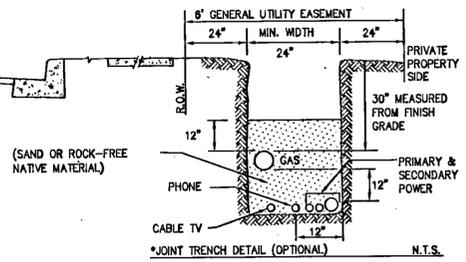


- MATERIALS:**
- BROOKS METER BOX, BODY NO. 37, LID AND COVER NO. 37-S.
  - MUELLER CORP. STOP NO. H-15008 OR FORD F1000-4Q SET CORP. STOP WITH OPERATING NUT AT 3 OR 9 O'CLOCK.
  - 1" SOFT TEMPER. TYPE 'K' COPPER TUBING COMPLYING WITH ASTM B-88.
  - MUELLER ANGLE METER STOP NO. H-14258 (FORD NO. KV43-444W-Q).
- NOTES:**
- MACHINE DRILLED AND TAPPED ONLY. NO HAND DRILLING IS ALLOWED.
  - SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE CITY ENGINEER.
  - ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING 3/4" MINUS CRUSHED AGG. AND COMPACTED TO 95% MAX DENSITY AS DETERMINED BY AASHTO T-180.
  - WHEN AN ACTIVE CATHODIC PROTECTED SYSTEM IS ENCOUNTERED, SCH. 40 PVC SHALL BE INSTALLED AS SHOWN ABOVE WITH CLAY PLUG.
  - METER BOX SHALL BE CENTERED OVER THE COMPLETED METER ASSEMBLY.
  - FOR VACANT RESIDENTIAL LOTS, LOCATE SINGLE SERVICE 18" INSIDE SIDE LOT LINE.
  - TAPS INTO MAIN TO BE AT 18" CENTERLINE MIN.
  - ANGLE METER STOPS TO BE 18" FROM PROPERTY LINE AND NOT IN DRIVEWAY APPROACH.

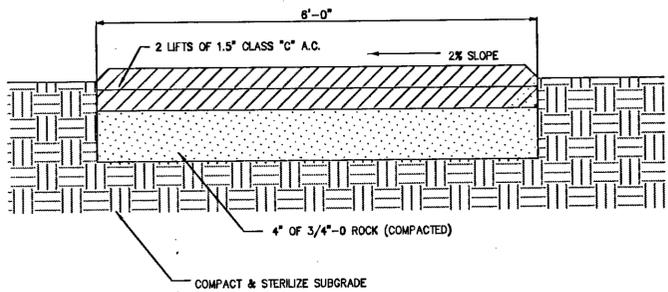
**4 STANDARD 1' WATER SERVICE WL-402**  
N.T.S.



- \*NOTE: IF SIX FOOT UTILITY EASEMENT IS PRESENT ALONG PROPERTY FRONTAGE PLACEMENT SHALL BE AT BACK OF SIDEWALK WITHIN UTILITY EASEMENT.
- ON STREETS LESS THAN 16' IN WIDTH REFER TO DETAIL WL-409, FOR WATERLINE SANITARY SEWER LINE SEPARATION.
  - STORM DRAINAGE LINES ON ALL STREETS SHALL BE 5' SOUTH & EAST OF CENTER LINE WHERE DESIGN CONSTRAINTS WILL NOT ALLOW PLACEMENT OF STORM LINE SURFACE DRAINAGE IS RECOMMENDED.
  - FIRE HYDRANTS ARE TO BE LOCATED OUTSIDE THE R.O.W. IN A 5' BY 5' EASEMENT ON ALLEY, LOCAL LANE, MINOR ACCESS, & QUEUING STREETS.



**5 TYPICAL UTILITY PLACEMENT WL-500**  
N.T.S.



**6 PEDESTRIAN PATH / BIKEWAY WL-510**  
N.T.S.

REVISIONS


**REGISTERED PROFESSIONAL ENGINEER**  
DON CUSHING  
14682  
OREGON  
DEC. 07, 1983  
RENEWAL DATE 12/31/11

BELLA FLATS SUBDIVISION  
4111 ELMRAN DRIVE  
WEST LINN, OREGON

**"AS-BUILT"**

THE "AS-BUILT" INFORMATION ON THIS SHEET WAS PROVIDED BY THE CONTRACTOR. CONDITIONS MAY VARY FROM THESE "AS-BUILT" DRAWINGS.

Signed: *Don Cushing*  
DATE: 9/21/11

SITE DETAILS  
WATER AND STREET

**cushing**  
Don Cushing Associates  
Civil Engineers  
4677 SE Pinehurst Ave  
Suite 201  
Milwaukie, OR 97267  
Voice: (503) 387-5331  
Fax: (360) 286-2164

DATE: 9-14-2011  
SCALE: NONE  
DRAWN: JEG  
JOB: 06-011  
SHEET

**C7.2**  
FOR CONSTRUCTION  
OF 20.





BELLA FLATS SUBDIVISION  
4111 ELMRAN DRIVE  
WEST LINN, OREGON

SITE DETAILS  
MISC.



Don Cushing Associates  
Civil Engineers  
4677 SE Pinehurst Ave  
Suite 201  
Milwaukie, OR 97267  
Voice: (503) 387-5331  
Fax: (360) 286-2164

DATE: 9-14-2011

SCALE: NONE

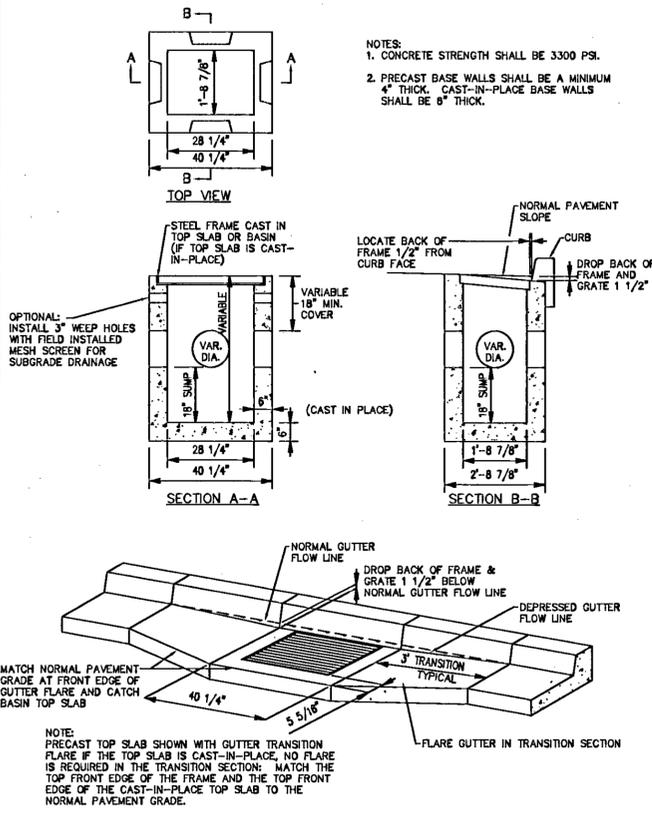
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JOB: 06-011

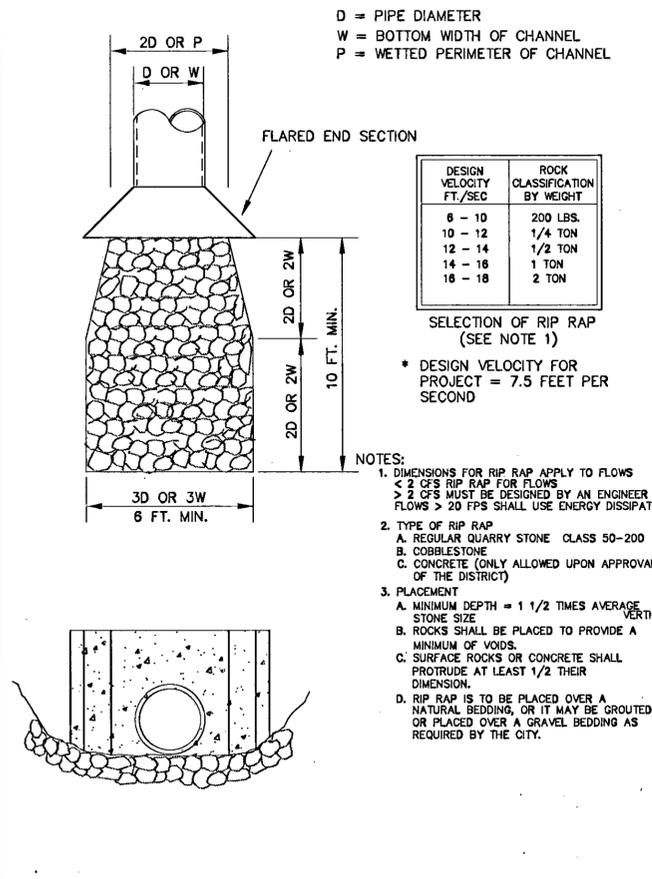
© COPYRIGHT DON CUSHING ASSOCIATES  
SHEET

C7.4

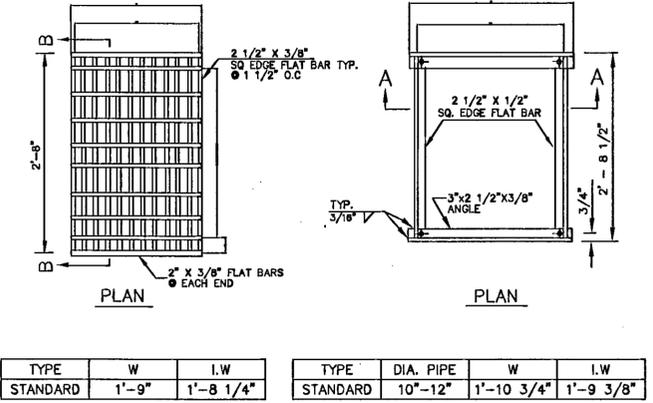
OF 20



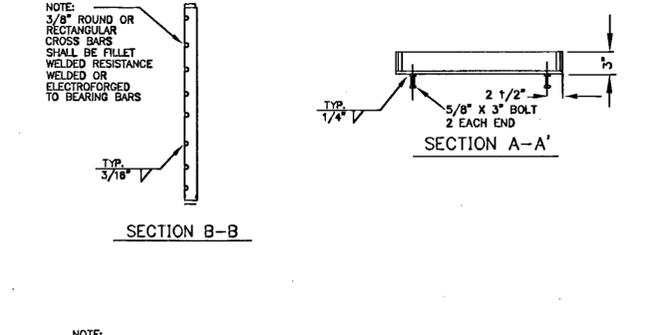
**1 TYPE G1 CATCH BASIN WITH SUMP WL-602**  
N.T.S.



**4 STORM SEWER OUTFALL WL-602**  
N.T.S.



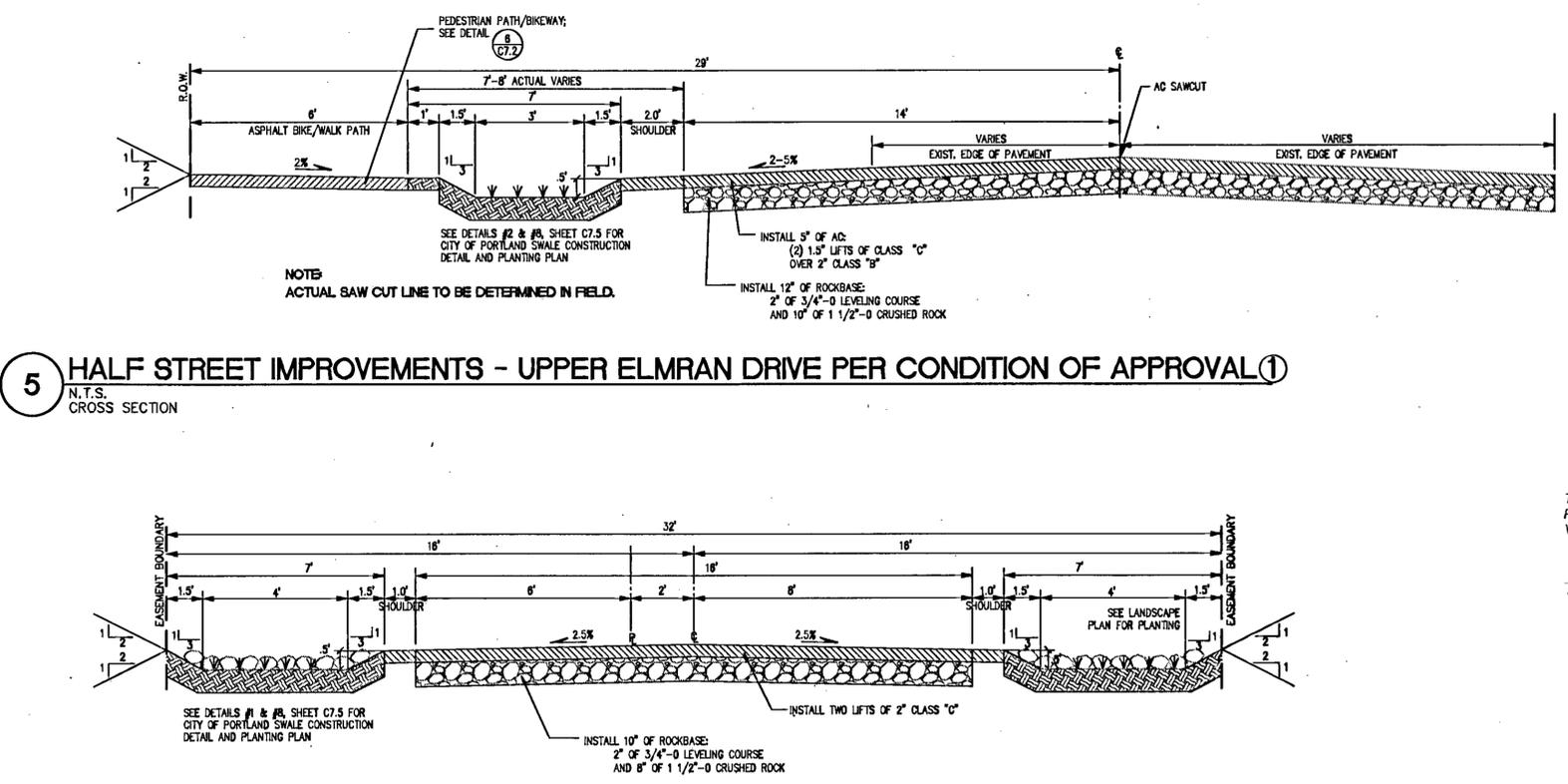
TYPE	W	I.W	TYPE	DIA. PIPE	W	I.W
STANDARD	1'-9"	1'-8 1/4"	STANDARD	10"-12"	1'-10 3/4"	1'-9 3/8"



**3 DITCH INLET**  
N.T.S.  
CITY OF WEST LINN STORM DETAIL #WL-603; SECTION C-C HAS BEEN MODIFIED TO PROVIDE POLLUTION CONTROL @ DOWNSTREAM DITCH INLET

**2 FRAME + GRATE FOR CURB INLETS**  
N.T.S.  
CITY OF WEST LINN STORM DETAIL #WL-602A

**5 HALF STREET IMPROVEMENTS - UPPER ELMRAN DRIVE PER CONDITION OF APPROVAL ①**  
N.T.S.  
CROSS SECTION



**6 JACKSON COURT**  
N.T.S.  
CROSS SECTION

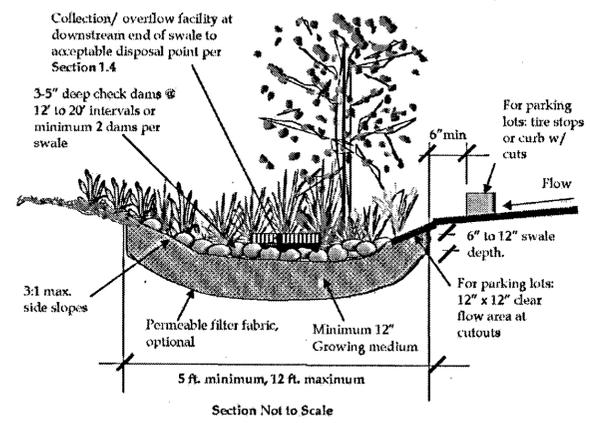
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*Don Cushing* 9/21/11  
SIGNED DATE

FOR CONSTRUCTION

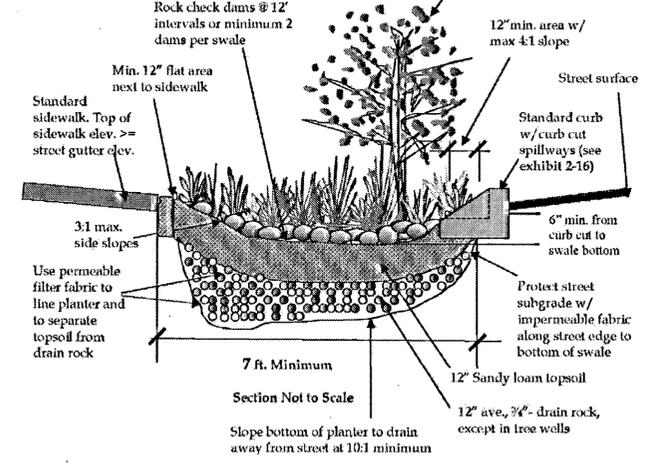
**Vegetated Swale**



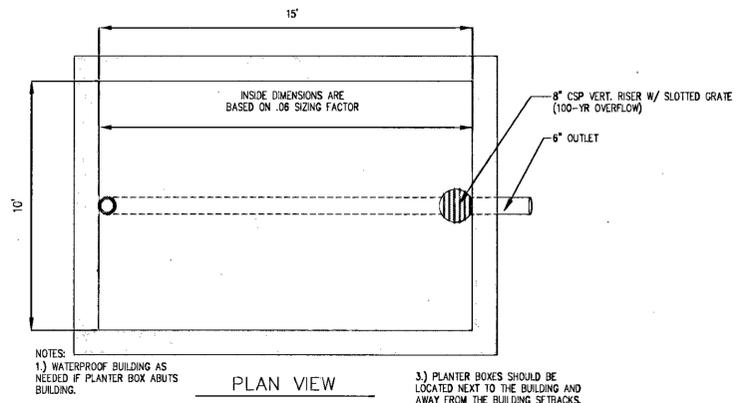
Section Not to Scale

**Street Swales**

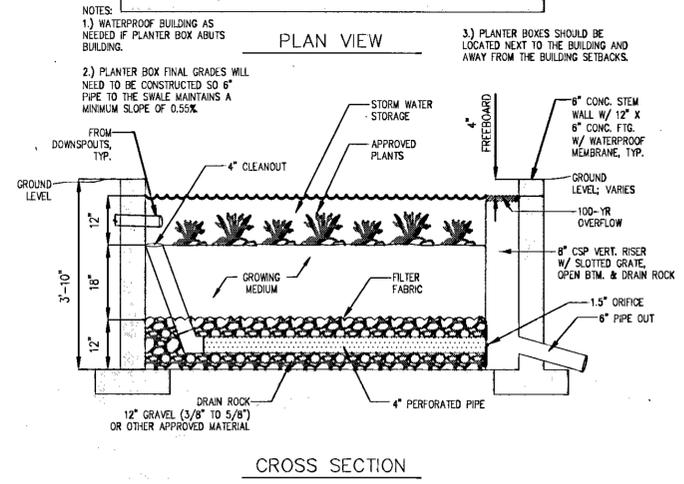
**Vegetated Street Swale**



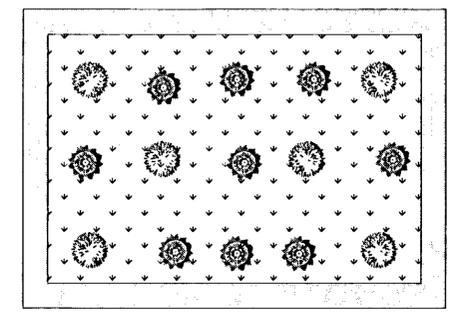
Section Not to Scale



PLAN VIEW



CROSS SECTION



150 SF OF PLANTER BOX:

SYMBOL	QUANTITY	PLANTING TYPE	SIZE
	6	SITKA WILLOW / "SALIX SITCHENSIS"	3-GALLON
	9	REDTWIG DOGWOOD / "CORNUS SERICEA"	1-GALLON
		SEED AMERICAN SLOUGH GRASS / "BECKMANNIA SYZIGACHNE" SEED	

**1 VEGETATED SWALE (JACKSON COURT)**  
N.T.S.

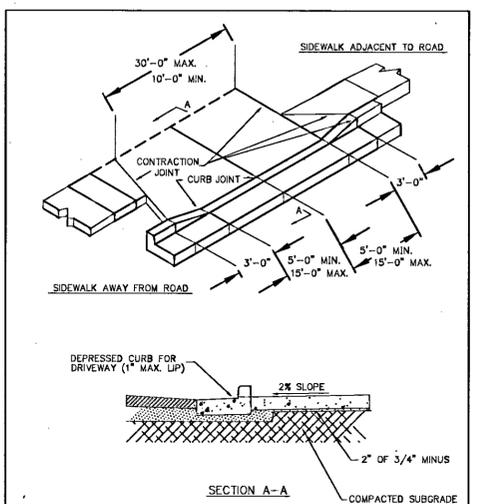
**2 VEGETATED STREET SWALE (ELMRAN)**  
N.T.S.

**3 MODIFIED FLOW-THROUGH PLANTER BOX**  
N.T.S.

**4 PLANTER BOX PLANTING PLAN**  
N.T.S.

**UPPER**

NOTE:  
NO CURB ON ELMRAN DRIVE OR JACKSON COURT; SEE SHEET C2.0.  
NEW ASPHALT TO BE FLUSH WITH CONCRETE DRIVEWAY.



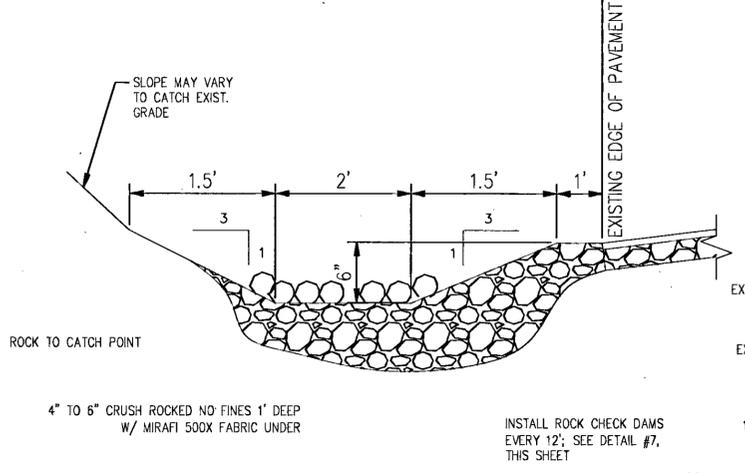
SECTION A-A

- NOTES
- CONCRETE SHALL HAVE A MINIMUM BREAKING STRENGTH OF 3300 PSI AFTER 28 DAYS, 6 SACK MIX.
  - CURB SHALL BE TROWELED JOINT WITH A MIN. 1/2" RADIUS ALONG BACK OF CURB.
  - DRIVEWAY SHALL BE A MINIMUM 6" THICK.

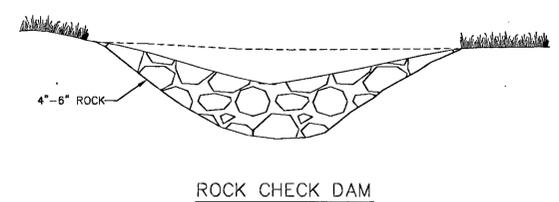
Residential Driveway

West Linn  
JAN 2000  
WL-503  
00-503

**5 DRIVEWAY DETAIL**  
N.T.S.



**6 CONVEYANCE DITCH (LOWER ELMRAN)**  
N.T.S.

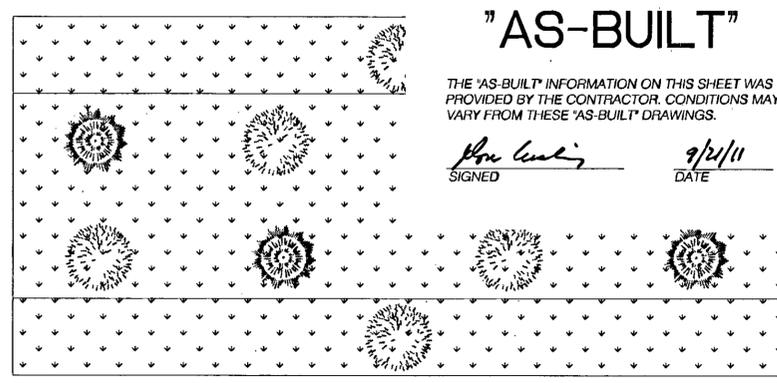


ROCK CHECK DAM

NOTE: CHECK DAMS SHALL BE CONSTRUCTED OF ROCKS BETWEEN 4" AND 6" IN SIZE. CHECK DAMS SHALL BE 12 INCHES IN LENGTH, BY THE WIDTH OF THE SWALE OR DITCH, BY 3 TO 6 INCHES IN HEIGHT. LOW POINT OF CHECK DAM SHALL BE IN THE MIDDLE OF SWALE.

**7 CHECK DAM DETAIL**  
N.T.S.

**SWALE PLANTING PLAN**



**PER 100 SF OF SWALE:**

SYMBOL	QUANTITY	PLANTING TYPE	SIZE
	4	VINE MAPLE / "ACER CIRCINATUM"	3-GALLON
	6	REDTWIG DOGWOOD / "CORNUS SERICEA"	1-GALLON
		SEED HOBBS AND HOBBS COMPANION MIX	SEED

**8 SWALE PLANTING PLAN**  
N.T.S.

SITE DETAILS  
MISC.

**cushing**  
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Fax: (360) 286-2164

DATE: 9-14-2011  
SCALE: NONE  
DRAWN: JEG  
JOB: 06-011  
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SHEET

**C7.5**  
OF 20

FOR CONSTRUCTION