EAS 702
MASTER’S PRACTICUM
THE APPLICATION OF EAS 588 & EAS 691 IN RESIDENTIAL RAIN GARDEN DESIGN

STUDENT: ZHAOWEI SHI
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BACKGROUND:
THE SITE IS A PRIVATE PROPERTY SOUTHEAST TO UMICH, OWNED BY AN OLD COUPLE, WITH FLOODING ISSUES IN THE BACKYARD. OUR CLIENTS REACH TO US, WISHING TO SOLVE THIS ISSUE WITH LANDSCAPE DESIGN, WHILE ALSO BRINGING MORE COLORS TO THEIR HOUSE.

THE LARGE AMOUNT OF PRECEDENTS OF RESIDENTIAL RAIN GARDENS IN ANN ARBOR, ALONG WITH LESSONS GIVEN IN EAS 588 SITE ENGINEERING AND EAS 691 PLANTING DESIGN GIVE US IDEAS TO BUILD A SYSTEM COMBINING EROSION CONTROL AND RAIN GARDEN TOGETHER TO FIX THE ISSUE.

THE SYSTEM WILL USE SWALES, CREATED BY CONTOUR GRADING, TO SLOW DOWN AND DIRECT RUNOFF INTO RAIN GARDEN, WHERE TO STORE RAINWATER AND GROW BLOSSOM PLANTS.

INTRODUCTION
PROBLEMS:
1. RAINWATER AND SNOW ACCUMULATE IN THE LOWEST AREA OF BACKYARD;
2. DAMAGED WOODEN RETAINING WALL;
3. BIG SLOPE BETWEEN CONTOUR LINES;
4. TREES AND GRASSES ONLY PROVIDE GREEN COLOR TO THE BACKYARD.

SOLUTIONS:
1. USE RAIN GARDEN TO CAPTURE AND HOLD WATER IN A PROPOSED AREA;
2. REPLACE WITH CONCRETE RETAINING WALL;
3. DIG CONTOUR SWALES TO BREAK AND DIRECT RAINWATER TO DRAINAGE SWALES;
4. USE BLOSSOM PLANTS IN RAIN GARDEN TO PROVIDE SEASONAL COLORS.

SITE ANALYSIS
EROSION CONTROL GOALS:
1. REDESIGN THE STORMWATER FLOW DIRECTIONS TO AVOID BACKYARD;
2. USE DRY SWALES TO CARRY THE SURFACE RUN-OFF AWAY;
3. CONNECT SWALES BY CATCH BASINS AND WATER WILL BE CARRIED BY PIPES TO FRONTYARD;
4. BALANCE CUT AND FILL CAUSED BY LANDFORM CHANGES FOR SWALES;
5. BUILD RETAINING WALL TO BLOCK SURFACE RUN-OFF FROM ENTERING BACKYARD

EROSION CONTROL PLAN

1-1 EROSION CONTROL SECTION

EROSION CONTROL DESIGN
RAIN GARDEN GOALS:
1. COLLECT AND INFILTRATE RAIN RUN-OFF FROM BACKYARD AREA;
2. CAPTURE EXCESS RUN-OFF FROM SWALES;
3. BOTH SIZE AND DEPTH ARE LARGER THAN THE CFS REQUIRED;
4. BEAUTIFUL NATIVE FLOWERS TO VIEW FROM KITCHEN WINDOW;
5. ATTRACT BIRDS TO YARD;
6. PLANTS THAT DO WELL IN SHADY AND WET CONDITIONS.

BLOSSOM COLOR PATCH

- BOTTLEBUSH SEDGE
- FOX SEDGE
- FRAGRANT SUMAC
- RED BANEHERRY
- BLACK EYED SUSAN
- GOLDEN ALEXANDER
- CANADA ANEMONE
- SWAMP MILKWEED
- JACOB’S LADDER

RAIN GARDEN DESIGN