



13. because it is being required/encouraged by governing agencies
14. we must review the landscape treatment for the bio retention ponds, etc. In trying to become better trained on this engineering topic, the manuals become my main source since our city Engineering utilizes much of this information.
15. The projects I work on do not include any items that will minimize directly connected impervious area--it is either pavement or concrete for parking lots, roadways, sidewalks or green belts/tree lawns.
16. It just seems like standard practice.
17. Most projects come to me already laid out, or are so small that the opportunity is negligible.
18. Constantly trying to improve water quality through design
19. Often find resistance to current stormwater trends from Public Works Department
20. Don't know why designers don't present it - maybe snow plowing concerns, maybe not status quo
21. Developer does not leave enough room on the site.
22. Layouts are usually prepared by the architect or planner and we have to work with a plan given to us and make something work.
23. Few municipalities seem to want to pay for it...ditto for private developers.
24. Try to keep water on the surface before entering the WQ Pond
25. The designs for multi-family usually do not allow for much un-used space and stromwater run-off facilities are usaully jammed into what space is left. Our single family projects allow more area and area to accomodate more of the larger facilities.
26. This is key to a sustainable approach to site design consistent with our firm's design philosophy.
27. We strive to be an environmentally sustainable developer and therefore place a high emphasis on LID strategies. We have one project in the USGBC LEED Neighborhood Development pilot program and one of the credit requirements rewards us for LID strategies. We also believe LID strategies have both financial and aesthetic benefits. Our primary emphasis is on reducing our volume requirements.
28. Usually, our designs are related to roadway draiange where these considerations would be difficult to implement.
29. My firm is infrequently involved in typical land development projects where such MDCIA practices are more applicable.
30. Has not been tested or used much in our county.
31. Good design practice, bonus points for water quality, and volume reductions.
32. Many times the nature of the project does not lend itself to incorporate these techniques.
33. Typically not required by Owners or Municipalities
34. Not my own designs... but everything from NEPA and construction projects that I review, I emphasize volume reduction.
35. Many jurisdictions refer to UDFCD criteria
36. Typically the architect for the project does the site layout and we have a minimal ability to make site changes.
37. Not required by local regs.
38. Our firm frequently recommends MDCIA and volume reduction techniques, but we have not seen widespread acceptance. Some of the problems encountered include: Liability concerns with expansive soils. Reluctance of clients to try new practices/lack of incentives. Integrated too late in design process to be cost effective.
39. I generally do stream restoration work, not new development
40. We require the use of MDCIA, but the majority of plans submitted for review only include the

very minimum to no effort to comply.

41. I think it is a wise design approach and I try to incorporate it where possible.
42. Owners are less willing to give up valuable land for impervious areas. For most projects the reduction techniques do not offer much relief and thus make it not worth the effort.
43. We promote the use of Low Impact Development techniques whenever possible.
44. Stormwater detention is a major issue for the Far NE drainage basins and impacts the design of on site detention and channeling of water so that these features can become part of the built environment.
45. A significant component, roadside ditches and swales, require mild longitudinal slopes for long-term stability and function. We find that topography limits the application in many cases.
46. Manage regional detention/water quality projects and channel improvements, infrequently deal with projects that create impervious area.
47. I am always looking for ways to reduce runoff and improve water quality.
48. Even if the suggestions are not always taken, I try to suggest them during my limited opportunities in the design phase of roadway projects.
49. I am not a designer - I review what is proposed. I have recently begun encouraging alternative methods to reduce impervious area, but am limited in the standards available which will require a developer to redesign a proposal.
50. Design engineers are not proposing them due to lack of experience and concerns for costs.
51. we encourage consultants to use these techniques.
52. Many of our projects are located in areas of expansive soils, therefore we don't encourage infiltration. Minimizing DCIA is done when it make sense from a planning standpoint, but in many jurisdictions there is no credit given for doing so, e.g. no reduction of storage or water quality volume. Therefore there is no incentive to do so.
53. due to the nature of highway construction it is not practicle to reduce imperviousness as this would require a reduction in lane width, or shoulder width, which are fundamentally sized to provide safe travel. When an opportunity arises to minimize the affects that result from a paved highway surface, they are incorporated. An example of an opportunity to reduce, or mitigate, the affects of paving highways would include directing runoff into roadside swales or ditches prior to final discharge downstream.
54. Just learned of the concepts and am trying to apply in my corridor planning projects.
55. I'd prefer to implement these techniques frequently; however, the decisions are often out of my control.
56. Included frequently as req'd by local codes (i.e. Aurora, Arap/Douglas counties).
57. I have worked both as a plan reviewer for municipalities and as a designer. I would say that wherever possible the engineering community is aware of MDCI design and strives to accomplish MDCI, but there are more instances where this is not practical because of land use constraints than where it is practical.
58. We are just now starting to see this application. We hope to add incentives to our process/fees/et. for these practices in the future, but have not done so yet. I think we (engineers and developers) are still in the learning phases and need to feel comfortable with the concept before they are implemented as "the norm". I think that the guidance and criteria from UDFCD will be an enormous assistance in this progress.
59. Either the design layout has been set by others before I start my work, or I am working with with a roadway-type project that does not have much impervious area.
60. Usually not realistic
61. Land is cheaper than new technology and typically it costs less to do a traditional detention pond than to try and reduce volume.
62. Because site design/layout is done by professional planners, not engineers. Engineers usually have to fight just to get enough land to install detention ponds. The manual is

targeting the wrong profession.

63. Many developments are not designed to utilize them
64. "Value engineering" takes them out.
65. We do not design, applicants for peoposed developments do that. We do recommend using longer grassy swales and such to increase pervious % and time of concentration. Onsite use of runoff must be balanced with Colorado Water Law which states that downstreams users are entitled to historic rates of runoff.
66. Most of my work is at a master planning level and is more conceptual then design. Often, we instruct the town to guide the developer to use such techniques.
67. I don't work on development projects much. I work mostly with regional detention basins.
68. Generally there is not willingness on the part of the design team or client to incorporate these concepts mainly because they take more time, don't have the proven track record of traditional methods and the government agencies do not require their use.
69. Usually work on rehabilitation projects.
70. Architechrtural or landscape site plans are frequently not condusive to LID cocepts. Expansive soils are often a concern. Many owners shy away from these ideas since they are less tested.
71. To get credit for TSS removal, phosphorus removal, etc etc etc....provides additional water quality enhancements
72. Prudent practice
73. Land owner's are reluctant to try somethinig new.
74. In clay soils it is very difficult to have runoff retun to the soil
75. Frequently, the site plans provided by developers, land planners or architects do not allocate a large area for greenspace. Land is too valuable to have a bunch of "pretty" water quality facilities that take up large areas of land. Areas for water quality features and detention ponds are minimized as much as possible to provide as much sellable/useable land as possible. If this was philospfy was not practiced, new developments would not be feasible. The newest requirements for the design of water quality features, especially EDB's, are highly suspect in my opinion. I personally do not think that having ponds that have lengths twice the width really provide any extra sedimentation in comparison to a square pond. I also strongly disagree with Urban Drainage in that water quality should be provided for runoff from roof tops. In my opinion, this runoff is clean. What contaminants come off of rooftops? Oils, anti-freeze and other chemicals are not deposited on roofs. Why is it necessary to provide water quality enhancement for this runoff?? Conversely, if I had a 10 acre park with nothing but green plants and grass, I would not need to provide water quaility features for this. Yet, fertilizer is generally added to sodded areas. The runoff from the fertilizer to me seems like it would provide a large, negative impact on water quality, especially compared to roof tops. Since UD looks at landscaping as being 0% pervious, water quality is not required. To me, these two examples show contracdiction with one another. Some common sense needs to be administered in UD guidelines and standards as I think a lot of current standards are not practical, feasible, necessary and especially effective. I have been a civil engineer for over 10 years in the Denver area so this is not coming from someone who does not deal with your criteria frequently.
76. Layout considerations and providing maximum usable land.
77. we typically try to maximize floor area ratios and have to meet parking requirements while staying within the requirements of master drainage studies.
78. Generally impractical in partially or fully developed urban areas.
79. Civil Engineering is a discipline thus far unrelated to 4 step volume reduction. The belief is that systems utilizing volume reduction techniques will fail and volumes will return to the status quo overwhelming the undersized systems put in place. Undermining pavement sections, failing foundations, dogs and cats living together, etc.
80. Don't use it per question #2.

81. Because that's the way to minimize WQCV-which costs me right of way.
82. Common issue is space limitations for new development. Any viable, accepted technique to reduce volume requirements (and reduce space needs) is usually embraced by the development community.
83. Not involved in land development plans.
84. As engineers, we have very little say in the site planning portion of the design practice. By the time we are brought onto the design team, often the site plan has been set. The MOST important impediment to implementation of MDCIA is related to typical Colorado soil conditions and the recommendations of the geotechnical engineers. We are bound legally to follow these recommendations, or risk legal action against us if there are any areas not drained according to their recommendations. The typical geotech report advises that ALL stormwater be piped away from ALL buildings and pavement, as quickly as possible, and that ALL infiltration be prohibited, unless infiltration areas are at least 50-100 feet from buildings and/or pavement, and the existing site soils are extremely porous. Typical commercial or residential site development does not meet these conditions. Even with piping, it is difficult on most sites to meet these conditions. Until the geotechnical engineers are on board with LID, and are willing to modify their reports to accommodate MDCIA, as civil engineers, our hands are tied. We cannot take on the risk of litigation, even though we often feel that LID techniques would be superior. The second most important impediment to implementation, is that many review agencies have reservations about the long-term effectiveness of LID techniques, and often require that if they are used on a site, that additional construction BMP's such as full detention and storm sewer systems, curb and gutter and typical pavement be put in place "just in case". Along with this, most agencies, and even UDFCD does not give credit to detention or water quality volume requirements for implementation of some of the LID techniques. To a developer seeking to maximize his profitability, and minimize review time and fees, the simpler the site, the better. Until LID techniques are recognized as superior, simpler, effective, maintainable, good engineering design as well as good site design, and equally or more efficient, they are not likely to be the first choice of either developers or review agencies.
85. Land use codes and development requirements are not always conducive to reducing impervious area. Planning staff have only recently become aware of Phase II requirements that encourage LID as a possible way of dealing with stormwater quality.
86. Most techniques for MDCIA and volume reduction are not realistic options given many constraints.
87. The difficulties of utilizing a LID design include: 1. Long term maintenance costs-for the developer, it becomes a question of not wanting to include a maintenance budget that may not be used. For the review agencies, it typically becomes an inter-department debate that ends in reluctance or even avoidance.
88. not part of the mind-set here
89. Because it is a sound practice.
90. Roadway work
91. we rarely see these done in our area. Probably b/c it hasn't been required and people just do stuff that they have always done. We'll need incentives or credits to get volume reduction.
92. I don't design. Standard comments on all plans reviewed reference MDCIA and volume reduction techniques per Vol.3